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FINAL EXAMINATION/PRIVATE DEFENSE FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOFY

Name of Student: Lynn Breckenridge

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DECISION OF EXAMINATION COMMITTEE MEMBERS:

	PASS	FAIL
Dr. David Krantz DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY Committee Chairperson	✓	
Michael Feuerstein Dr. Michael Feuerstein DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY Dissertation Advisor	✓	
Dr. Mark Ettenhofer DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY Committee Member	✓	
Dr. Cara Olsen DEPARTMENT OF PREVENTIVE MEDICINE AND BIOMETRICS Committee Member	✓	

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DISSERTATION APPROVAL FOR THE DOCTORAL DISSERTATION IN THE DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY

Title of Dissertation:	"Relationship Intimacy: Associations with Psychological Distress and Work Productivity in Breast Cancer Survivors"
Name of Candidate:	Lynn Breckenridge Doctor of Philosophy Degree March 8, 2012

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DATE:

8-27-12

Dr. David Krantz
DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Committee Chairperson

8/27/12

Dr. Michael Feuerstein
DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Dissertation Advisor

8/27/12

Dr. Mark Ettenhofer
DEPARTMENT OF MEDICAL AND CLINICAL PSYCHOLOGY
Committee Member

8/27/2012

Dr. Cara Olsen
DEPARTMENT OF PREVENTIVE MEDICINE AND BIOMETRICS
Committee Member

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Lynn Marie Breckenridge
Department of Medical and Clinical Psychology
Uniformed Services University
28 August, 2012

Abstract

Title: Relationship Intimacy: Associations with Psychological Distress and Work
Productivity in Breast Cancer Survivors

Lynn Marie Breckenridge, Ph.D., 2012

Thesis directed by: Michael Feuerstein, Ph.D., MPH, ABPP, Director of Clinical
Psychology, Department of Medical and Clinical Psychology

Objectives In the general population, relationship intimacy has been associated with both psychosocial adaptation and work productivity. In breast cancer survivors (BCS), intimacy has been associated better psychosocial adaptation. This internet-based self-report study examined the association of intimacy with psychological distress and work productivity in BCS, and examined BCS status in association with intimacy, psychological distress and work productivity. *Methods* 165 BCS and 176 age matched non-cancer participants completed measures of intimacy, distress, work productivity, and work-family conflict. *Results* Significant between-groups differences were found on measures occupation, work-to-family spillover, work satisfaction, time worked on days off, perceived work performance, and days missed for partner's health. Social support was significantly positively associated with psychological distress in BCS, and work-to-family spillover was significantly associated with distress in BCS and in all participants. Family-to-work spillover had a significant negative association with work productivity in BCS, and in all participants. Lower intimacy scores and lower social support scores were associated with greater work productivity scores in all participants (but not BCS alone). *Discussion* Several key differences between BCS and non-cancer women were identified.

BCS work less over time, take more time off for their spouses, have less work-to-family spillover, and get more satisfaction from work than do non-cancer participants. This is consistent with literature that suggests that a stressor such as undergoing a cancer diagnosis and treatment can result in renewed values and priorities in life. Results also suggested that women who feel well supported by a partner and/or friends, and those who have higher family-to-work spillover are actually less productive at work.

Relationship Intimacy: Associations with Psychological Distress and Work Productivity in Breast Cancer Survivors

by
Lynn Marie Breckenridge
CPT, MS, US Army

Dissertation submitted to the faculty of the

Department of Medical and Clinical Psychology

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Introduction

The Impact of Breast Cancer

With the exception of skin carcinoma, breast cancer is the most common malignancy in women, accounting for more than one-third of all diagnoses (Smigal et al., 2006). In the United States, over 2.6 million living women have had a diagnosis of breast cancer (Howlander, et al., 2011). Approximately 12% of women born today will be diagnosed with breast cancer in their lifetime (Altekruse, Kosary, & Krapcho, 2010). The median age at diagnosis is 61 years, with 12% of women diagnosed with cancer under the age of 44, and another 23% diagnosed between 45 and 54 years of age (Howlander, et al., 2011). More than 98% of women diagnosed with localized breast cancer and almost 84% of women with regional breast cancer survive five years or more past diagnosis (Howlander, et al., 2011; American Cancer Society, 2002), making breast cancer survivors one of the largest groups of cancer survivors.

Despite this rapidly expanding population of breast cancer survivors (BCS), many psychooncology studies focus exclusively on women actively undergoing treatment. Cancer can be a traumatic and life-changing experience for patients, partners, family members, and close friends. Breast cancer patients not only face the psychological distress of a life-threatening illness, but also must cope with medical treatments that can sometimes be debilitating, humiliating, and life-consuming. If the patient is in a relationship, both she and her partner must adjust to changes in every day stressors and responsibilities, which may include occupational demands, child-rearing, household responsibilities, financial concerns, social expectations and future plans (Fitch

& Allard, 2007; Manne & Badr, 2008).

It is important to note that the impact of cancer does not end with active treatment. Breast cancer survivors (BCS) continue to experience long-term residual symptoms such as cognitive, physical and emotional fatigue (Bower, et al., 2000; Hansen, Feuerstein, Calvio, & Olsen, 2008), mood changes, cognitive limitations (Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Fan, et al., 2005; Harrington, Hansen, Moskowitz, Todd, & Feuerstein, 2010), and sexuality and body image issues (Schover, 1991; Zimmermann, Scott, & Heinrichs, 2010). Breast cancer survivors report significantly higher rates of health-related symptoms than healthy, age-matched controls, even after controlling for psychological distress and anxiety (Bower, et al., 2000; Ganz, Rowland, Desmond, Meyerowitz, & Wyatt, 1998). These symptoms include body aches (Ferrell, Grant, Funk, Otis-Green, & Garcia, 1998), chronic pain (Gulluoglu, et al., 2006), lymphedema (Norman, et al., 2009), and menopausal symptoms (Carpenter & Andrykowski, 1999; Harris, Remington, Trentham-Dietz, Allen, & Newcomb, 2002).

Psychological Distress in Breast Cancer Survivors

Across the literature, the reported rates of psychological distress among breast cancer survivors vary substantially. Several studies have suggested that BCS may have increased psychological distress when compared to matched control groups (Grunfeld et al., 2004; Kim, 2008; Northouse, Templin, Mood, & Oberst, 1998; Romero, Lindsay, Dalton, Nelson, & Friedman, 2008), and that they are at higher risk for developing mood disorders including major depression (Deshields, Tibbs, Fan, & Taylor, 2006; Fann, et al., 2008). For instance, Burgess and colleagues (2005) found that among early breast cancer survivors, 50% had depression, anxiety or both (as diagnosed by the SCID structured clinical interview) in the year after diagnosis, 25% in years two to five after diagnosis, and 15% in the fifth year. By comparison, point prevalence for depression in all women is 6.7% (Pratt & Brody, 2008), and 6.6% for generalized anxiety in women (Wittchen, et al., 2002). In a Greek study that compared breast cancer survivors who had undergone surgery three or more years prior to the study to healthy, age-matched controls, survivors scored significantly higher in depressive symptoms (Karademas, Argyropoulou, & Karvelis, 2007). A recent systematic review by Harrington and colleagues (2010) reported that studies found the presence of depressive symptoms in breast cancer survivors more often than not. Further, many BCS report a diminished threshold for emotional distress, which may be embedded in their long-term experiences (Rosedale, 2009) and quality of life. BCS report that they experience ongoing fears and intrusive thoughts which may lead to depression, irrespective of cancer stage, type of treatment, or time since diagnosis (Vickberg, 2003).

However, there are also many studies that have found no difference between breast cancer survivors and non-cancer controls in report of psychological symptoms. A systematic review of cancer survivor quality of life (QOL) literature reported that many studies indicate that long-term (five or more years) survivors and controls endorse similar psychological QOL (Bloom, Petersen, & Kang, 2007). According to Hinnen and colleagues, studies that follow breast cancer patients over time report that any symptoms of psychological distress associated with a cancer diagnosis decrease within the first months following diagnosis (Hinnen, Ranchor, et al., 2008). Similarly, Neyt and Albrecht (2006) found that among breast cancer survivors, the longer the survival time, the less impact breast cancer had on QOL. Helgeson and Tomich (2005) reported that when compared to healthy controls, disease-free BCS five years post-diagnosis reported no differences in quality of life (QOL) including emotional QOL, and Dorval and colleagues (1998) reported no difference in psychological distress scores of BCS eight years post-diagnosis, when compared to controls in a cross-sectional study.

Survivor Loneliness and Social Support

Some studies report that breast cancer survivors endorse feelings of survivor loneliness, which is described as the sensation of being alone in the awareness of their mortality and in their struggle to find meaning in personal crisis. BCS often report feeling invalidated in their ongoing experience of treatment-related symptoms and changed sense of connection to others, identity, and role (Rosedale, 2009). A study found that the majority of breast cancer patients felt that support attempts by others were inappropriate and misguided (Peters-Golden, 1982). After facing a life-threatening illness, many survivors feel a heightened sense of consciousness regarding self, the world, and others, and attempt to lead more authentic lives. They perceive the images they portray and the connections they have with others as fragile or inauthentic, which leads to an increasing sense of loneliness (Rosedale, 2009).

In two cross-sectional studies, the availability of someone with whom the patient or survivor could share illness-related concerns was rated as one of the most important types of support, but was also the specific type of support most often perceived as lacking (Helgeson & Cohen, 1996; Wortman & Dunkel-Schetter, 1979). In a longitudinal study, having affective social support mediated the relationship between optimism and psychological distress at six months post-treatment completion (Trunzo & Pinto, 2003). In another study (Taylor, Falke, Shoptaw, & Lichtman, 1986), 55% of women who attended cancer support groups reported that they wished they could be more open to share their feelings with family members, and in another study, Dunkel-Schetter (1984) found that 87% of cancer patients reported that they dealt with their diagnosis by keeping their thoughts and emotions to themselves.

Considerable research indicates that social support can play a protective role in reduction of general psychological distress (Helgeson & Cohen, 1996) and health-related symptoms (Kiecolt-Glaser, Gouin, & Hantsoo, 2010), as well as cancer-related stress reactions (Helgeson & Cohen, 1996). A recent prospective study (Schroevers, Helgeson, Sanderman, & Ranchor, 2010) reported that emotional support received in the three months following a cancer diagnosis significantly predicted a greater experience of positive post-traumatic growth (defined as the perception or experience of positive consequences to an adverse event or illness) at eight years after diagnosis. Given the potential positive benefits of social support, it is important to be aware that several studies report that breast cancer survivors endorse the experience of inadequate social networks and functional social support (Peters-Golden, 1982). In a cross-sectional study of over one thousand breast cancer survivors an average of 47 months post-diagnosis, 23% of BCS with a possible psychiatric disorder (based on symptom endorsement) and 15% of all BCS expressed a need for additional psychosocial support (Mehnert & Koch, 2007). Ashing-Giwa and colleagues (1999) reported that approximately one-third of African American women with breast cancer are lacking adequate emotional and functional social support. A cross-sectional study of 100 white women between six months and twenty or more years post-diagnosis found that the majority of women report that their social support networks did not materialize as expected when help was needed, leading to decreased adjustment (Peters-Golden, 1982). However, in a study of primarily white, rural women diagnosed with breast cancer within the past three to six months, the majority of women reported that they "often" (but not "very often") received functional, emotional, or informational support (Koopman, et al., 2001). Further, in a longitudinal study of 491 breast cancer survivors who were disease-free at five years post-diagnosis and healthy control women, researchers reported no differences in social functioning on the SF-36 from the Medical Outcomes Study (Helgeson & Tomich, 2005).

Breast cancer survivors report varied sources of support, including spiritual/church groups, family units, and breast or general cancer support groups (Koopman, et al., 2001). In three individual studies, researchers asked cancer patients between seven and twenty months post-diagnosis to describe social interactions that they found to be helpful or unhelpful. Patients indicated that emotional support was the most helpful form of support, regardless of source, and informational support was helpful when it came from health care professionals, but not from family or friends (Dakof & Taylor, 1990; Dunkel-Schetter, 1984; Helgeson & Cohen, 1996). Many cancer patients indicated that in addition to "positive support" from family and friends, they also received "negative support," including forced cheerfulness, minimization of the patient's feelings, and avoidance of discussions about cancer. Negative support was found to be extremely harmful in a patient's adjustment (Dakof & Taylor, 1990). Rook and Pietromanaco (1987) suggested that negative social interactions may be more salient than positive ones and therefore may have a stronger impact on emotional well-being. Survivors in a thematic analysis study (Yarker, Munir, Bains, Kalawsky, & Haslam, 2010) also discussed the "wear off effect" in which survivors are expected to be 100%

recovered and no longer receive any empathy or support, particularly from coworkers and supervisors in a work environment. In another qualitative study, women reported that social support at work was poorer than social support from family and friends (Frazier, et al., 2009).

Return to Work in Breast Cancer Survivors

Similar to what is reported with regard to psychological distress and social support in breast cancer survivors, there is substantial variability in what is reported regarding return-to-work in breast cancer survivors. There is no doubt that the physical, emotional, and indirect impact of a breast cancer diagnosis can make it difficult for women to fulfill their daily roles as intimate partners, mothers, and professionals (Manne, Alfieri, Taylor, & Dougherty, 1999). However, many BCS report that maintaining employment is important for their quality of life, including physical and mental health, as well as financial well being (Frazier, et al., 2009; Maunsell, et al., 2004). One study reported that between 65% and 88% of women who were working at the time of a breast cancer diagnosis continued to work three years later. Another study reported that breast cancer survivors who returned to work did not differ from matched controls in terms of work hours or earnings, an average of seven years post-diagnosis (Bradley & Bednarek, 2002), and rates of absenteeism became similar to those without cancer with time (Drolet, et al., 2005; Eaker, et al., 2011).

However, the majority of studies report that a breast cancer diagnosis can have a long-lasting negative impact. According to Drolet and colleagues (2005), 85% of women reported an absence of four or more weeks within one year of breast cancer diagnosis, compared with 18% of non-cancer control women. On average, women took almost six months off of work following diagnosis (Drolet, et al., 2005). In addition, among cancer survivors who return to work following treatment, an average of eighteen workdays are lost annually due to side effects from treatment (Maunsell, et al., 2004), and significantly more time is lost to cognitive deficits and mood-related symptoms (Bradley, Bednarek, & Neumark, 2002). In one study, breast cancer survivors more than 11 years post-diagnosis reported more days absent from work than did a matched non-cancer control group (Yabroff, Lawrence, Clauser, Davis, & Brown, 2004; Yabroff & Kim, 2009).

Breast cancer survivors also frequently endorsed experiencing difficulties in functioning while at work (Boykoff, Moieni, & Subramanian, 2009) which could be detected more than 11 years post-diagnosis (Yabroff, et al., 2004). In a study of working breast cancer survivors, participants frequently endorsed fatigue, depression, anxiety, hot flashes, and cognitive limitations (Breckenridge, Bruns, Todd, & Feuerstein, 2010; Calvio, Peugeot, Bruns, Todd, & Feuerstein, 2010). Hansen and colleagues (2008) found that an average of four years post-diagnosis, breast cancer survivors had significantly more work limitations than women who had never had cancer (Hansen, et al., 2008). An average of three years post-diagnosis, working breast cancer survivors reported significantly greater distress, fatigue, and job stress than age-matched controls, and variations in work output were found to be significantly related to report of cognitive limitations, including deficits in memory and executive functioning (Calvio, et al., 2010). One study found that breast cancer survivors reported a mean work productivity that was 3.1% lower than the healthy worker norm, which is equivalent to 2.5 work hours lost in a two-week period (Lavigne, Griggs, Tu, & Lerner, 2008). Chirikos and colleagues reported that working BCS make significantly less money than matched controls five years after diagnosis, mostly related to reduced work effort or productivity rather than reduced wages (Chirikos, Russell-Jacobs, & Cantor, 2002). Compared to matched controls, cancer survivors have lower utility values as rated by their supervisors, and higher lost work productivity scores (Yabroff, et al., 2004).

Furthermore, a meta-analysis by deBoer and colleagues (2009) calculated the pooled risk of unemployment for cancer survivors as 1.28 (95 CI=1.17-1.40). In a longitudinal study with almost 1500 participants, Short and colleagues (2005) found that 13% of cancer survivors stop work within four years of diagnosis. Eaker and colleagues (2011) reported that breast cancer survivors an average of five-years post-diagnosis draw disability pension at a higher rate than matched controls. In a study of military service members, cancer was associated with disability and high rates of attrition (Ajene, Bohnker, Malakooti, Riegodedios, & Sack, 2004).

Marital Disruption and Dissolution in Breast Cancer Survivors

Interestingly, reports of marital dissolution in breast cancer survivors are also disparate. It is inarguable that breast cancer survivors (BCS) and their partners often experience changes in relationship functioning related to the stress of a cancer diagnosis and subsequent changes in lifestyle (Fitch & Allard, 2007; Randall & Bodenmann, 2009). As focus shifts from treatment to survivorship, couples sometimes face difficulties in re-negotiation of a “normal” life (Halstead & Fernsler, 1994) with regard to family roles and responsibilities, feelings of loss of power/control and inequity in the relationship (Kuijer, Buunk, Ybema, & Wobbes, 2002), reduced engagement in social, physical and sexual activity, increased financial strain, and preoccupation with thoughts of mortality, loss, and abandonment (Fergus & Gray, 2009). Commonly, partners may be at different paces in terms of desire to return to normal life, particularly in the areas of sexual and relationship intimacy, planning for the future, social, familial, and occupational activities, and in discussing the long-term impact of cancer on psychological functioning, health behaviors, the relationship and individual outlook (Alfano & Rowland, 2006; Ganz et al., 2002; Hodgkinson et al., 2007; Manne, Ostroff, & Winkel, 2007).

Previously, studies suggested that individuals with a poor health history (Waldron, Hughes, & Brooks, 1996), and specifically those with a history of cancer (Carlsen, Dalton, Frederiksen, Diderichsen, & Johansen, 2007) were more likely to experience marital dissolution and were less likely to find a life partner following breast cancer (Syse, 2008; Waldron, et al., 1996). Most notably, Syse (2008) conducted a longitudinal study of over 2.24 million Norwegians over more than 30 years, and found that most female cancer survivors did not experience a decreased rate of marriage. However, it was noted that breast cancer in particular was associated with a significantly decreased rate of marriage (a 26% reduction; OR 0.74; 95% CI 0.69-0.79). Further, a study reported that compared to couples with a history of benign breast disease, couples with breast cancer endorsed significant decreases in marital and family functioning and more adjustment problems related to the illness, one year post-diagnosis (Northouse, Templin, Mood, & Oberst, 1998). Overall, studies report that relationships that endure chronic external stressors such as long-term loss of income, physical impairment, or life-threatening illness of a dyad member or child are more likely to end in divorce (Karney, Story, & Bradbury, 2005; Randall & Bodenmann, 2009). Further, several popular women’s magazines have published articles that leave women with the impression that their partners are more likely to leave them following breast cancer surgery, feeding into pre-existing concerns about body image and sexual functioning (Dorval, Maunsell, Taylor-Brown, & Kilpatrick, 1999). Though most of these suggestions have been more recently considered unfounded (Carlsen, et al., 2007; Dorval, et al., 1999; Eaker, et al., 2011; Taylor-Brown, Kilpatrick, Maunsell, & Dorval, 2000), some recent studies still report that women with serious medical illnesses such as cancer are at an increased risk for partner abandonment (Glantz, et al., 2009).

While it would seem logical that couples who have experienced the stress of a breast cancer diagnosis would suffer long-term detriments, most couples (approximately 56%; Dorval et. al., 2005) report that they are able to successfully maintain or even improve in relationship satisfaction following a cancer diagnosis, despite struggles. A cross-sectional study reported that when compared to population norms, couples in which one partner has received a cancer diagnosis are not significantly different in report of marital satisfaction (Fuller & Swenson, 1992), and in fact, a prospective study of 282 couples reported that nearly half of couples with a history of breast cancer (42%) report that the adversity brought them closer together (Dorval, et al., 2005). Other studies report that many BCS viewed their cancer experience as an opportunity to strengthen their relationship and feel closer to their partner (Carter & Carter, 1993), and that up to 75% of women reported that their relationship was closer after having breast cancer prior to the age of 50 (Walsh, Manuel, & Avis, 2005). It appears to be just a small percentage of couples that report difficulties in maintaining a rewarding relationship following a cancer diagnosis (Dorval et al., 2005; Dorval, Maunsell, Taylor-Brown, & Kilpatrick, 1999; Lichtman & Taylor, 1986; O'Mahoney & Carroll, 1997). However, because relationship difficulties have been associated with psychological distress (Gottman, 1998; Manne &

Badr, 2008) and poorer work outcomes (Crouter, 1984; Forthofer, Markman, Cox, Stanley, & Kessler, 1996) in previous studies, it is reasonable to assume that relationship difficulties (such as lack of intimacy) may have a ubiquitous impact on quality of life for some breast cancer survivors.

An Explanation for Discrepancies in Quality of Life Literature

There are many possible explanations for the discrepancies in psychological, occupational, and relational outcomes found in breast cancer survivorship literature. Some potential factors impacting quality of life outcomes, including education, employment status, having under-aged children, and type of treatment (Salonen, Kellokumpu-Lehtinen, Tarkka, Koivisto, & Kaunonen, 2011), social support (Sammarco, 2001), and time since diagnosis (Bloom, et al., 2007) have been addressed and accounted for in some studies. However, one potential association that has not been thoroughly explored is the association between high quality, intimate romantic relationships, and psychological and occupational outcomes. It is the position of this paper that breast cancer survivors rely heavily on their romantic partners as they negotiate a return to an active, “normal” lifestyle, and that the perceived quality of support they receive is directly related to their psychological wellbeing and ability to adapt in an occupational environment. There is ample evidence to suggest that couples that maintain intimacy in their relationships may be buffered from poor psychological and occupational outcomes, despite facing a stressor. Unfortunately for some couples, stressful situations such as a cancer diagnosis may erode relationship intimacy, which in turn may be related to poorer functioning in other areas of life. Ultimately, BCS who experience greater relationship intimacy will have fewer difficulties with both psychological and occupational functioning, and BCS who experience less relationship intimacy will have more difficulty with psychological and occupational functioning.

Stress Response Theory

According to Mages and Mendelsohn (1979), "cancer engenders a state of prolonged stress resulting from the discovery of the disease, the process of diagnosis, surgical intervention, medical treatment, medical follow-up, and fear of recurrence (Ben-Zur, Gilbar, & Lev, 2001)." The emotional and psychological impact of cancer on an individual may be best understood by operating under the assumption that a cancer diagnosis is a severe stressor, and exploring factors related to the stress response.

Stress has been defined in several different ways: 1) as a stimulus (such as a breast cancer diagnosis) that triggers psychological and physiological reactions; 2) as a specific psychological or physiological reaction to acute or enduring demands (such as the treatment process and daily life changes) or 3) as a process between a person and his/her environment (Randall & Bodenmann, 2009), wherein an individual's appraisal of an event as threatening and his/her ability to cope with that event make up the stress response. Wheaton (1996) proposed that conceptualization of stress must consider the stressor stimuli, the stress process, and the individual reaction (distress). He classically defined a stressor as any problematic or demanding situation that would be perceived as stressful. Distress was defined as the negative individual response to a problem, which did not leave room for conceptualization of a collective (couple) response to a stressor. Lazarus and Folkman's (1984) transactional definition of stress and coping emphasizes the role of personal appraisal in evaluating and reacting to a potential stressor. This model posits that a situation only becomes stressful if the individual perceives it as a threat that may overwhelm one’s coping resources. Coping is defined as a combination of stabilizing factors that facilitate psychosocial adaptation during stressful times. Lazarus and Folkman (1984) defined resources as things an individual “draws on in order to cope” and noted that these resources “precede and influence coping, which in turn mediates stress.” Coping resources include personal resources, social resources, problem solving strategies and reaction management techniques unique to the individual.

Across theories of marital functioning and in the breast cancer survivorship literature, there seems to be agreement that some individuals and couples are more vulnerable to the negative impact of stressful events than others. In recent years, models of stress have expanded to include conceptualization of distress as a purely dyadic or social phenomenon (Bodenmann, Pihet, Shantinath, Cina, & Widmer, 2006), as opposed to an individual event with perceptions and consequences embedded in a social context. Dyadic stress is now modeled as a distinct form of social stress which encompasses common concerns, shared reactions, emotional intimacy, and maintenance of a tight bond that outlasts exposure to the stressor (Bodenmann, 1995, 1997; Lyons, Mickelson, Sullivan, & Coye, 1998). Bodenmann (2005) defines dyadic stress as “a stressful event or encounter that always concerns both partners, either directly when both partners are confronted by the stressful event or when the stress of one partner spills over to the close relationship and affects both partners (Randall & Bodenmann, 2009).” Dyadic stress elicits joint appraisals, joint coping efforts, and cooperative use of common resources (Bodenmann, et al., 2006). While some theorists still consider stress as primarily an individual phenomenon, many have adopted a systemic view, based on the assumption that one partner's stress always has an impact on the other (Randall & Bodenmann, 2009b).

According to Coyne's interpersonal theory of depression, psychological distress is, in part, a consequence of the response close others give to a distressed person's symptoms and behaviors (Coyne, 1976). Stress generation theory (Hammen, 2006) asserts that an individual prone to depression, if in a supportive relationship, may be protected against psychological distress when confronting future stressors. If the same individual is involved with an unsupportive partner, he or she may be prone to generating greater stress, which can lead to additional depressive symptoms (Trombello, Schoebi, & Bradbury, 2011). In a study of romantically involved women who had been diagnosed with breast cancer in the previous year, satisfaction with amount of support received from their partner was positively associated with overall psychological wellbeing (Pistrang & Barker, 1995). Gremore and colleagues (2011) found that a high level of satisfaction with daily spousal social support, measured daily over a 30-day period, attenuated symptoms of psychological distress in women with early stage breast cancer. Similarly, a study of couples wed within in the past four years found that relationship functioning (measured by behaviors during marital interactions) moderated the association between life stressors and depressive symptoms (Trombello, et al., 2011). Further, among cancer patients, survivors and spouses, studies have consistently found that partners who report higher levels of global and cancer-related intimacy (measured on an adapted Personal Assessment of Intimacy in Relationships [PAIR] scale), also report lower levels of relationship and psychological distress (Manne & Badr, 2009; Manne, Badr, Zaider, Nelson, & Kissane, 2010; Kirby, Baucom, & Peterman, 2005; Manne, Badr, & Kashy, 2011; Manne, et al., 2004). Studies also report a strong positive association between quality of intimate relationships and mental health outcomes in non-cancer populations (Beach, Smith, & Fincham, 1994; Uebelacker & Whisman, 2006).

Karney and Bradbury (1995) developed a framework to explain how, similar to depression, marital distress is the culmination of a) enduring vulnerabilities b) stressful events and c) poor adaptive processes. This vulnerability-stress-adaptation model proposes that relationship distress and dissolution are more likely in relationships where partners enter the commitment with a large amount of vulnerabilities, and form a couple that possesses poor adaptive skills. Subsequently, the couple is more likely to experience high levels of stress, which negatively impacts relationship quality (Karney, et al., 2005).

Bodenmann and colleagues (2007) expanded Karney and Bradbury's vulnerability-stress-adaptation model of relationship distress to more specifically address individual differences and the impact of daily stress processes on relationship functioning. Their model assumes that stressors originating outside the relationship spill over into the relationship, decreasing relationship quality, propagating mutual alienation and increasing likelihood of dissolution in several ways. Stress decreases the time that partners spend together, resulting in fewer shared experiences, reduced feelings of togetherness, decreased self-disclosure, and poor dyadic coping. It decreases the quality of communication because stress elicits more negative interactions and withdrawal behaviors than positive interactions. Stressful events also indirectly impact relationship quality through increased risk for psychological and physical illnesses, such as sexual dysfunction, sleep disorders, substance abuse, mood disturbances, and the emergence of problematic personality traits such as rigidity, hostility, criticism and anxiety. In these conditions, partners become alienated. The likelihood of relationship dissolution increases as partners reveal less about their private thoughts, personal needs, fears, goals and interests. Instead, they engage more in dyadic conflict rather than teamwork (Bodenmann, 2005). Deterioration in relationship quality is likely related to recurrent and /or chronic stress that is poorly negotiated (Randall & Bodenmann, 2009), which may explain why some couples seem to thrive in the face of adversity, whereas others fail.

Intimacy and Stress

Most definitions of intimacy emphasize one or more of the following characteristics: behavioral interdependency, fulfillment of needs, and emotional attachment (Brehm, Miller, Perlman, & Campbell, 1992). Though studies most often emphasize the role of self-disclosure in emotional intimacy, intimacy can occur in a variety of domains. Schaefer and Olson conceptualized intimacy as something that occurs through a variety of behaviors, including spending time with friends together (social), enjoying hobbies together (recreational), sharing ideas and knowledge (intellectual), and engaging in physical displays of passion (sexual). Tolstedt and Stokes (1983) conceptualized intimacy on three domains: verbal, affective and physical, all of which were significantly related to marital satisfaction. The operational definition of verbal intimacy is “a combination of three classic self-disclosure variables:” breadth of topics in which one discloses, depth of disclosure, and valence of disclosure topics. Affective intimacy is defined as feelings of closeness and emotional bonding, which includes intensity of love/like, ability to tolerate each other’s flaws, and moral support.

Physical intimacy combines sex and other bodily expressions of affection.

Schaefer and Olsen (1981) described intimacy as a never-ending process that entails acceptance, understanding, and attending to the true self of the other partner. Although some degree of intimacy is necessary for normal human growth and development, the ideal amount of intimacy varies by individual (Dandeneau & Johnson, 1994). This should be taken into account when assessing intimacy in relationships, Studies have shown that the amount of intimacy in a relationship is not as important as the discrepancy between level desired and level experienced. For instance, a study showed that congruence between sexual intimacy desired and sexual intimacy achieved significantly predicted marital satisfaction and family functioning (Greeff & Malherbe, 2001). Unfortunately, cancer may result in long-term changes, including financial, physical, occupational, social and familial role limitations for both partners. These limitations represent a constraint not only on both partners' individual activities outside the relationship, but also on the couples' engagement in recreational, social, and sexual activities together. Because couples often utilize these domains as a medium for critical bonding, it is likely that relationships may suffer a drop in feelings of intimacy during and after treatment for cancer. Partners' desire for intimacy does not necessarily change with demands and limitations, thereby creating incongruence. This is one way in which lack of intimacy may negatively impact psychosocial adaptation to cancer. Among groups of patients and caregivers, lower social intimacy was positively associated with more mood disturbance and lower emotional quality of life (Rodrigue & Baz, 2007), and lack of recreational intimacy was associated with depressed mood (Moore & Seeney, 2007) .

As previously mentioned, the majority of research on intimacy emphasizes verbal intimacy, or self-disclosure, as a determinant of the level of intimacy between two partners (Greeff & Malherbe, 2001). Generally speaking, relationship intimacy is frequently conceptualized as the process by which one partner expresses self-relevant feelings to the other, and comes to feel understood, valued, and cared for as a result of the other partner's response (Manne & Badr, 2008; Reis & Patrick, 1996). According to Fergus and Gray (2009), "Partner responses that facilitate patient coping include emotional involvement, empathic attunement, and reciprocal self-disclosure. Open communication characterized by acknowledgement of the cancer's presence and the sharing of one's deeper feelings in a discerning manner based on sensitivity to one another's current needs and mood, has consistently been shown to facilitate adaptation (Fergus & Gray, 2009)." Other important facets include the role of reciprocal understanding, vulnerability, affection, validation, trust and commitment.

Partners coping with cancer and its aftermath can manage stress by drawing support from one another, sharing their concerns, bolstering faith and celebrating their triumphs over the disease (Manne et al., 2010). Cancer patients and spouses consistently name each other as their most important source of support through treatment and recovery (Carter & Carter, 1993; Figueiredo, Fries, & Ingram, 2004; O'Mahoney & Carroll, 1997). In a longitudinal study of couples who have faced a breast cancer diagnosis, the spouse reporting that the patient serves as a confidant to them, getting advice from her about coping with breast cancer within the first two weeks after diagnosis, and accompanying her to important medical appointments, and the patient reporting more affection from her spouse at three months predicted both partners reporting an improved relationship twelve months after diagnosis. According to the Relationship Intimacy Model of Couples' Psychosocial Adaptation to Cancer (Manne & Badr, 2008), perceived intimacy within the relationship, which is usually directly related to cancer-specific support-related behaviors, can either improve or compromise a couples' psychosocial adaptation to cancer (Manne & Badr, 2008; Manne, Ostroff, Fox, Grana, & Winkel, 2009, Manne, et al., 2011).

Manne and Badr (2008) suggest that couples facing cancer may engage in either relationship-compromising behaviors such as avoidance, criticism or pressure-withdraw patterns, or relationship-enhancing behaviors such as reciprocal self-disclosure, partner responsiveness, and relationship engagement. Relationship engagement is defined as viewing cancer in relationship terms, and engaging in deliberate behaviors for the purpose of sustaining or enhancing the relationship while coping with cancer. Through these positive and negative processes, couples may experience either increased or diminished intimacy across a number of domains, resulting in either increased or decreased relationship satisfaction (Manne & Badr, 2008). Partners often draw on their relationships as a valuable coping resource in times of distress, but it is believed that the couples that function best also recognize the importance of bonding in the face of adversity. Those who continue to maintain and improve their intimate relationship, despite external demands, may ultimately find greater relationship satisfaction, and even improved quality of life outcomes (Manne & Badr, 2008).

In a preliminary efficacy study (Manne & Badr, 2008), the Relationship Intimacy Model of Couples' Psychosocial Adaptation to Cancer was tested in an intervention for breast cancer patients an average of 6.5 months post-diagnosis and their partners. Researchers reported that by increasing cancer-specific intimacy-enhancing behaviors such as disclosure of worries and emotions (emotional intimacy), post-treatment, asymptomatic patients and their partners improved their perceptions of closeness in their relationship and reduced both relationship and psychological distress (Manne & Badr, 2008).

Factors That Influence Intimacy

Partner Communication and BCS

Approximately seventy percent of women report that communication with a spouse or partner, with the goal of obtaining emotional or practical support, serves as a way to manage worries and concerns following a breast cancer diagnosis (Harrison, Maguire, & Pitceathly, 1995). However, many survivors specifically report changes in their ability to communicate with their partners. Researchers have identified two strategies of coping utilized by partners facing stressful situations: active engagement and protective buffering. Active engagement involves including one's partner in discussions about stressful subjects, eliciting the partner's feelings and opinions, and utilizing other problem- and emotion- focused strategies with the partner. In previous studies of couples facing a cancer diagnosis, active engagement has been associated with a number of beneficial outcomes, including better physical, psychological, and relationship adaptation (Manne et. al., 2011; Manne, Pape, Taylor, & Dougherty, 1999).

Protective buffering is characterized by denying one's own fears and worries and avoiding difficult or upsetting interactions (Hinnen, Hagedoorn, Ranchor, & Sanderman, 2008). In an effort to reduce conflict, a partner may engage in reduced self-disclosure (Lepore, Ragan, & Jones, 2000; Manne & Glassman, 2000). While considered a coping strategy, protective buffering may, in fact, increase the level of distress and conflict for both partners. Regardless of any reduction in verbal conflict, partners may experience greater internal conflict, increased loneliness, and more negative attributions regarding the others' thoughts and intentions (Gremore, et al., 2011; Manne & Badr, 2010). When an individual in a relationship fails to self-disclose important thoughts and feelings following a stressful event, the process of intimacy is compromised (Manne, Badr, Zaider, Nelson, & Kissane, 2010). In a situation as serious as one partner facing a life-threatening illness, there may be an increased expectation for the "sick" partner to share his or her feelings, and for the healthy partner to provide emotional support (Cutrona, 1996). If the BCS engages in protective buffering, the healthy partner is not given the opportunity to respond and fulfill his or her role as a caregiver (Manne, et al., 2007). This represents a "missed opportunity" for intimacy to be built or maintained (Laurenceau, Rivera, Schaffer, & Pietromonaco, 2004), which may increase distress for both partners. In a recent study of relationships in which the female partner had cancer, protective buffering was associated with less relationship satisfaction, and active engagement was associated with more relationship satisfaction (Hinnen, Hagedoorn, et al., 2008).

Problems tend to arise when breast cancer survivors and their partners have divergent views on the importance of cancer-related discussions (Hilton, 1994). In general, relationship communication is classified by three patterns: Mutual constructive communication, which is most likely to occur when both partners find communication important to a healthy relationship, demand-withdrawal, where one partner makes demands (or pushes for communication to address unmet needs) and the other partner avoids the communication, and mutual avoidance, which is most likely to occur when neither partner feels that communication about worries, concerns, or needs will be beneficial (Christensen & Shenk, 1991). Whereas mutual constructive communication is associated with decreased distress and increased marital satisfaction among breast cancer patients and survivors, demand-withdrawal is associated more distress and less relationship satisfaction (Manne, et al., 2006). Further, couples in demand-withdrawal relationships are more likely to participate in four behaviors that Gottman (1994) calls the Four Horsemen of the Apocalypse: criticism, defensiveness, contempt, and stonewalling. Studies have shown that when partners routinely engage in these behaviors, their relationships are more likely to end in divorce (Gottman, 1994).

There are numerous reasons why a partner may engage in unsupportive communication behaviors. According to Coyne's interpersonal theory of depression, distressed individuals seek but then reject reassurance from others, eventually frustrating the partner and eliciting negative responses (Coyne, 1976). Further, partners of cancer patients or survivors often have concerns that focusing on cancer may impede the emotional healing or "moving on" process. To the contrary, avoidant communication styles may result in increased intrusive ideation (Lepore, Silver, Wortman, & Wayment, 1996) for both the breast cancer survivor and partner. Cognitive processing theories of adaptation to stressful life events suggest that unsupportive partner responses and subsequent nondisclosure may interfere with adaptive responses. Breast cancer survivors may feel compelled to prematurely "move on" and stop thinking about cancer, interrupting necessary cognitive processing and increasing risk for psychological distress (Manne, Ostroff, Winkel, Grana, & Fox, 2005).

Unsupportive responses may also be the result of caregiver burden, associated with the demands of emotional and practical support to the BCS. Partners of breast cancer patients and survivors may be required to relinquish social, recreational, and family activities, and may need to reallocate personal time, energy and finances in order to support the partner with a cancer diagnosis (Robinson & Thurnher, 1979; Skaff & Pearlin, 1992). Among spouses of cancer patients, restriction of outside activities frequently accompanies the deterioration of the ill partner's physical functioning (Blood, Simpson, Dineen, Kauffman, & Raimondi, 1994). Care for a health-impaired family member often makes it difficult to engage in social activities with others, and may result in "loss of self" (Stoller & Pugliesi, 1989). Constraint of personal freedom and social activity are associated with psychological distress, including symptoms of depression, resentment, and frustration (Skaff & Pearlin, 1992). These unintended restrictions may leave partners feeling emotionally drained, bitter, and entrapped (Poulshock & Deimling, 1984). Studies have shown that greater restriction on partners' social activities is positively associated with increased negative mood, and support givers' affective states are related to increased negative behavior towards patients (Lobchuk, McClement, McPherson, & Cheang, 2008; Manne, Alfieri, et al., 1999). The greater the physical limitations associated with cancer, the more likely significant others are to respond to the partner in a negative manner (Manne & Zautra, 1989). From this perspective, it seems reasonable that a cancer diagnosis could degrade intimacy in relationships.

Body Image and Sexuality in Breast Cancer Survivors

For many women who have lived through breast cancer treatment, body image, sexuality, and intimacy concerns are a salient issue. Studies report that fears and concerns regarding body image, femininity, sexuality and attractiveness may be associated with psychological distress (Baucom, Porter, Kirby, Gremore, & Keefe, 2005), as long as several years after diagnosis and treatment (Spiegel, 1997). Breast cancer treatment is strongly associated with changes in body integrity following lumpectomies, mastectomies, chemotherapy and radiation (Andersen & Jochimsen, 1985; Fallowfield & Hall, 1991). A recent study reported that 50% of breast cancer survivors report body image difficulties five years after treatment (Fobair & Spiegel, 2009). Even among women who have the least invasive type of surgery, breast conservation therapy, many report that scarring causes them to feel less attractive and to view their body in a less positive manner (Ogden & Lindridge, 2008). Further, in a study of women who had a radical mastectomy, about 25% report significant anxiety or depression (Fallowfield, Baum, & Maguire, 1986; Maguire, 1989; Schain, 1988), and a similar percentage report significant sexual problems. Sexual dysfunction may persist for years following treatment, and may actually get worse over time (Ganz, et al., 1996). Sexual problems are more likely to occur among women who attach a greater importance to the appearance and sensation of their breasts (Northouse, 1994).

According to White's heuristic cognitive behavioral model (2002), body image is significant part of broader self-appraisals, which may be vulnerable in breast cancer survivors (Stice, Hayward, Cameron, Killen, & Taylor, 2000). Role adaptation, physical limitations, occupational changes and altered appearance can all challenge a breast cancer survivor's self-concept. Body image difficulties have been reported to predict poorer psychological adjustment following a breast cancer diagnosis (Carver, et al., 1998; Ganz, et al., 1999). Body image disturbances are reported to be a risk factor in the development of depression in healthy people (Stice, et al., 2000) and women with breast cancer (Andritsch, Dietmaier, Hofmann, Zloklikovits, & Samonigg, 2007).

Early literature on body image and sexuality issues in BCS discussed the breast as a symbol of womanhood and sexuality. Studies indicated that having a mastectomy had a devastating impact on a woman's feelings of attractiveness and sexuality, and suggested that having a mastectomy could result in relationship dissolution (Schover, 1991). One study reported that one year after mastectomy, 100% of women felt unattractive when undressed, 78% felt less attractive overall, 57% felt ashamed of their breasts, 73% felt less desirable sexually, and over 50% reported that they regretted their choice to have a mastectomy rather than a lumpectomy and radiation. By comparison, of BCS who elected to have a lumpectomy and radiation, none of the women reported that they felt unattractive when undressed, 3% felt less attractive overall, 6% felt ashamed of their breasts, 3% felt less desirable sexually, and none of the women reported that they regretted their choice, one year after treatment (Margolis, Goodman, & Rubin, 1990). However, in a study that compared women who were treated with radical mastectomy to women who either had benign findings on a breast biopsy or cholecystectomy, or who had no health problems, no differences were observed in severe psychological symptoms in the year following surgery (Group, 1987). In a similar study that compared survivors of breast cancer to healthy women, no differences in indicators of physical, psychological, or social well-being, including report of sexual difficulties, were reported, a median of five years following invasive treatment (Vinokur, Threatt, Caplan, & Zimmerman, 1989). Further, a review of literature concluded that a survivor's level of psychological distress, time since diagnosis (Ganz, Desmond, Belin, Meyerowitz, &

Rowland, 1999), relationship satisfaction, and premorbid sexual functioning appeared to be stronger predictors of post-surgery body image and sexual satisfaction than the degree of alteration to breast tissue (Burwell, Case, Kaelin, & Avis, 2006; Fobair, et al., 2006). Other studies reported that a woman's age predicted body image outcomes to a greater extent than type of surgery (Baucom, et al., 2005; Rowland, et al., 2000), with younger women reporting a greater likelihood of reconstructive surgery following treatment, and significantly worse adaptation than older women (Kornblith & Ligibel, 2003). However, the latter study also found that severe, premature menopause caused by systemic therapy, which is more likely to occur in younger women, was associated with changes in sexual desire and function (Schover, 1991).

For many breast cancer survivors, it is not until well after finishing treatment that the full impact of cancer is realized. A survivor whose body image and sexual capacity is compromised may worry that she is depriving her partner, and fear that her partner secretly wishes she was different. This may lead to perceptions that the partner is likely to abandon the survivor for someone who is healthy (Anllo, 2000), especially among younger survivors whose fertility is compromised by cancer therapy. Given the common misconception that women breast cancer diagnoses are more likely to be abandoned than other women (Dorval, Maunsell, Deschenes, Brisson, & Masse, 1998; Dorval, et al., 1999; Taylor-Brown, et al., 2000), these issues may create significant worry and distress for the survivor.

Research suggests that addressing body image as part of couple coping mechanisms may be beneficial because in part, a woman's self image is formed within the context of an intimate relationship (Scott, Halford, & Ward, 2004). Some women may find that their partners are uncomfortable talking about cancer-related physical changes, and may perceive this as disinterest or non-support. In reality, some partners may wish to protect their partners' emotions, and may be afraid to reinforce negative thinking by dwelling on their partners' physical changes (Anllo, 2000). Perceived negative or avoidant responses by a partner, coupled with reduced physical and emotional capacity for intimacy, may lead to body image and sexual difficulties that last beyond the period of active treatment (Wimberly, Carver, Laurenceau, Harris, & Antoni, 2005).

Intimate Relationships and Work Productivity

Loss of work productivity is often associated with treatment-related side effects such as cognitive limitations (Calvio, et al., 2010), hot flashes (Lavigne, et al., 2008), fatigue (Lavigne, et al., 2008, Hansen, et al., 2008), and depression (Hansen, et al., 2008), but the possibility that absenteeism and reduced work productivity may be related to lack of relationship intimacy is consistently overlooked. In Lavigne and colleagues' (2008) study, it was noted that marriage was a significant protective factor in the relationship between fatigue, hot flashes, and lost work productivity, though quality of marriage was not specified. Although relatively little research has been conducted with regards to the influence of intimate relationships on job performance, there is some evidence to suggest that family situation is a determinant in work productivity (Friedman, 1991; Moen & Dempster-McClain, 1987). Work-family conflict, defined as the interplay between work demands and personal life, is reported to be significantly associated with impaired ability to avoid distraction at work (Wang et al., 2004). Bolger and colleagues (1989) described two types of "stress contagion" involving work-family conflict: spillover, in which the stressors one partner experiences at either work or home carry over into the other domain, or crossover, in which the stress one partner experiences at work or home causes stresses for the other partner in the other domain (for example, one partner's work stresses cause more stresses at for the other partner at home). Crouter (1984) discussed spillover from family to work, or family-work conflict, as "the neglected side of the work-family interface." Indeed, few studies have been conducted in this area, despite Crouter's findings that "most employees [in a qualitative study] recognized that their family lives influenced them at work." In a longitudinal study, Kinnunen, Geurts and Mauno found evidence of a reverse causal model, in which relationship satisfaction was a predictor of work-family conflict. In their study, low marital satisfaction scores at baseline significantly predicted work-to-family conflict one year later, even after accounting for work-family conflict levels at baseline. However, family to work spillover was not included in the study. In one of the few quantitative studies examining family to work spillover, marital distress was negatively associated with work productivity (Forthofer, Markman, Cox, Stanley, & Kessler, 1996). Work loss related to marital distress translated into approximately 61.9 million work loss days per year, or approximately $6.8 billion per year by 1990 standards. This is the equivalent of $1400 lost per year for each worker who reported marital distress (Forthofer, et al., 1996), not accounting for inflation since the time of the study. More recent studies have found that high marital quality scores are a significant predictor of success in balancing work and family roles (Marks et al., 2001; Milkie & Petola, 1999). Further, Rogers and May (2003) found that increased marital satisfaction was significantly related to increased job satisfaction, and decreased marital quality was significantly related to decreased job satisfaction (Rogers & May, 2003).

Study Purpose and Rationale

Intimacy is often considered a primary psychological need (Manne & Badr, 2009), and breast cancer survivors report that their relationships with significant others are an important source of coping following a breast cancer diagnosis (Figueiredo, et al., 2004). The above findings highlight the inter-relatedness of stress responses, intimacy, mood symptoms, and work productivity. Across theories of relationship functioning and in breast cancer survivorship literature, there seems to be agreement that some couples are more vulnerable to the negative impact of stressful events than others. As previously discussed, vulnerabilities may be related to stress response and coping style factors such as inadequate social support, poor cancer-related communication, or lack of relationship bonding or intimacy (Randall & Bodenmann, 2009). Several models (Karney, et al., 2005; Randall & Bodenmann, 2009) suggest that stress negatively influences relationship communication, couple satisfaction, and the development or maintenance of intimate relationships, and may be detrimental to the longevity of close relationships.

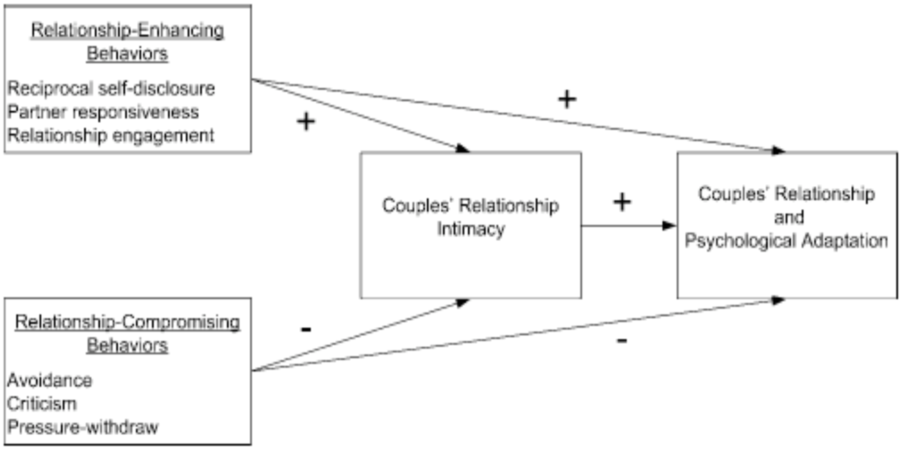


FIGURE 1. The relationship intimacy model of couple adaptation to cancer.

Manne & Badr, 2008

There is ample evidence to suggest that in some couples, stressful situations such as a cancer diagnosis may result in decreased marital intimacy and satisfaction (Ditzen, Hoppmann, & Klumb, 2008; Henry, et al., 2011; Solomon & Dekel, 2008), which may, in turn, be related to poorer psychological (Manne, et al., 2011; Trombello, et al., 2011) and occupational functioning. Alternatively, couples that maintain intimacy in their relationships may be buffered from poor psychological and occupational outcomes, despite facing a major stressor (Galbraith, Arechiga, Ramirez, & Pedro, 2005; O'Mahoney & Carroll, 1997; Zhou, et al., 2010). Further, some studies suggest that BCS may place an added importance on intimacy when compared to other women. Many BCS report that they rely heavily upon their romantic relationships in recovery and transition to survivorship, and that their partners are their greatest source of strength in coping with adversity (Figueiredo, Fries, & Ingram, 2004; O'Mahoney & Carroll, 1997). Therefore, the following model is proposed:

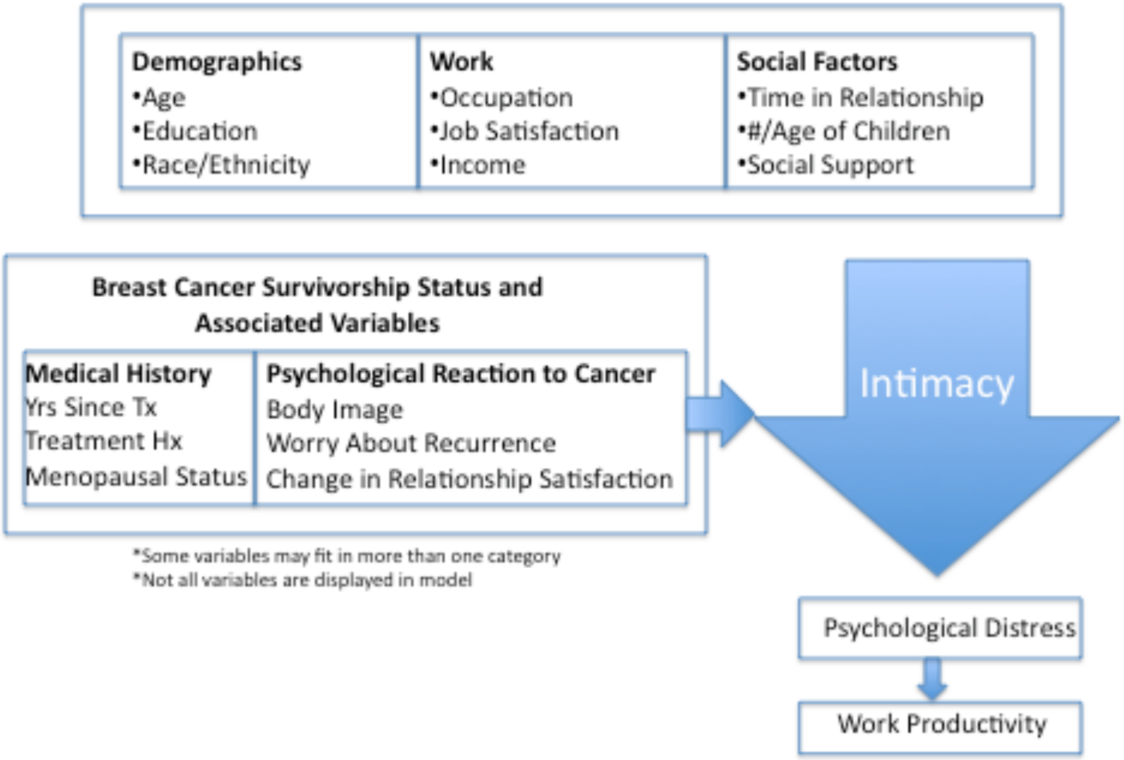


Figure 1: Conceptual model of factors associated with psychological distress and work productivity in breast cancer survivors and non-cancer participants.

This model posits that the experience of intimacy may be determined by many variables, including demographics, occupational stressors, and social factors, as well as cancer-related changes and positive or negative experiences associated with dyadic coping, in women who've had a breast cancer diagnosis. Further, the experience of high-quality intimacy is associated with decreased psychological distress and increased work productivity in all women, but especially in women who have survived breast cancer. Breast cancer survivors report that their partners are a major source of coping strength during and after breast cancer, and BCS also report that they may be more sensitive to some interactions with significant others in their lives, compared to the way they were prior to facing breast cancer. Therefore, the relationship between quality of intimacy and psychological distress is expected to be amplified in this subpopulation.

In order to provide further evidence of the associations between breast cancer survivorship, intimacy and functional outcomes in BCS, this study will examine the association between intimacy and functional outcomes in BCS, and compare the associations between intimacy and functional outcomes in BCS to those in women who have not experienced similar stressors.

Specific Aims and Hypotheses

The present study has three specific aims. The first specific aim is *to examine the direct association of intimacy with psychological well being in BCS*. **Hypothesis 1** is that the experience of intimacy will have a direct relationship with psychological distress in breast cancer survivors. The breast cancer survivor's perception of intimacy in her relationship will be negatively associated with report of psychological distress.

The second aim *to examine the direct association of intimacy with work productivity in BCS*. **Hypothesis 2** is that the experience of relationship intimacy will have a direct relationship with work satisfaction and performance in breast cancer survivors. The breast cancer survivor's perception of intimacy in her relationship will be positively associated with report of work productivity.

The third aim is *to determine if breast cancer survivorship status is associated with specific differences in the outcomes described in Hypothesis 1 and 2.* Because previous studies have shown that chronic stressful experiences such as a life-threatening illness may be associated with changes in relationship functioning, it is hypothesized that breast cancer survivorship status will interact with intimacy, in the relationship with both psychological well being and work (**Hypothesis 3**). It is expected that the association between low intimacy and high psychological distress, and the association between low intimacy and low work productivity, will be stronger in BCS than in non-cancer controls.

Method

Participants The sample included female breast cancer survivors at least 18 months but no more than five years post-diagnosis and non-cancer control women between 18 and 70 years old. Women were matched on age, time in relationship, and relationship status to the greatest extent allowed by the pool of potential participants. Inclusion criteria for both groups included: 1) must be occupationally active (25+ hours/week) in a formal work environment (i.e., not as a freelancer or stay-at-home parent) 2) must be involved in a heterosexual or homosexual, monogamous relationship, at least two continuous years in duration. Potential participants were excluded if 1) either they or their partner had ever had a diagnosis of cancer other than breast, 2) if either partner was currently undergoing treatment for breast cancer, 3) if the couple had ever raised, in part or whole, a child/children with a diagnosis of a serious life-threatening or disabling condition such as cancer, HIV, or a pervasive developmental disorder, or 4) if either the potential participant or her partner had (within the past seven years) an unrelated recurrent or chronic disabling condition such as fibromyalgia, Parkinsons disease, cognitive impairment or a seizure disorder, a severe psychological disorder such as a psychotic disorder, substance abuse/dependence, or posttraumatic stress disorder from an event unrelated to the cancer diagnosis.

Procedure This study was an Internet based, self-report study conducted through SurveyMonkey.com, a questionnaire host website. The website was secure, and participants were able to remain anonymous. Participants were recruited through search engine ads, social networking, breast cancer survivor chat rooms, general women's discussion boards, and postings on various professional websites such as LinkedIn and the American PsychoOncology Society website. Announcements were placed on cancer survivor support sites including the American Cancer Society's Cancer Survivorship Network page, Young Cancer Survivors Network, CancerSurvivor-Support.com, and Komen.org. Ads were placed on search engine sites, and in print newspapers including the Los Angeles Times and the Washington Post Health Section. All potential participants were instructed to visit the study's webpage at www.usuhs.mil/mpsstudy, the SurveyMonkey web page, or to contact the PI at bcsdyadstudy@gmail.com. No incentives were offered for completing the survey.

Informed consent was conducted on the SurveyMonkey website prior to potential participants answering any questions about themselves. The consent form was also available in full on the study's webpage. The consent form was written at a 7th grade reading level, and clearly outlines the possible risks and benefits of the study, as well as the time investment that will be required for completion. The form also expressly conveys that there is no penalty for choosing not to continue with the study, and that participation of each partner is voluntary. Instructions on how to contact the study coordinators with questions can be found in several places on the form. In order to continue to the screener, each participant had to click that they read the information and wished to continue with the screening and study.

After initial informed consent, participants completed a short screener survey for eligibility based on our study criteria. If all criteria were met, the participant was then sent to a basic demographics questionnaire and the following measures, in random order. Number of items and approximate time required for completion of each measure is listed in Table 1.

Measures

Demographics, Medical and Work Status. Participants completed questions regarding demographics, medical history, cancer treatment, history of current relationship and work status. Demographic questions include questions on ethnicity and race, age and education. Medical questions ranged from stage of cancer, treatments received (i.e., surgery, radiation, chemotherapy, and drug therapy), and menopausal status for the cancer survivor. Work status questions include income and type of work. Relationship questions include length of time in relationship and number of children together.

The Centers for Epidemiological Studies Depression Scale-7. The Centers for Epidemiological Studies Depression Scale-7 (CESD7; Simpson, Schumaker, Dorahy, & Shrestha, 1996) was created based on a factor analysis of the CES-D. The CES-D (Radloff, 1977) is a well-validated 20-item self-report measure of mood symptoms and distress. Respondents are asked to choose from four possible responses for each item, with zero indicating “rarely or none of the time (less than 1 day)” and four indicating “almost or all of the time (5-7 days). The CES-D has been reported to have very good internal consistency, with alphas of 0.85 for the general population, and 0.90 for a psychiatric population (Radloff, 1977). Cronbach’s alpha for the CESD7 has been reported as 0.72 (Shrestha, 2004). This instrument is available in the public domain.

The World Health Organization Health and Work Performance Questionnaire. The World Health Organization’s Health and Work Performance Questionnaire (HPQ; Kessler et al., 2003), also known as the Health and Productivity Questionnaire, is a self-report measure of unproductive work time, perceived impairment and absenteeism, as well as a comparison of productivity with coworkers and with one’s norm (Mattke, Balakrishnan, Bergamo, & Newberry, 2007). Unlike many other questionnaires of health-related productivity, the HPQ gathers information about work missed for many reasons, including mental health or other reasons This instrument is available in the public domain.

For the purposes of this study, a shorter 11-item version of the HPQ, referred to as “the absenteeism and presenteeism questions of the Heath and Work Performance Questionnaire,” (Kessler, et al., 2004) was used. Based on workers’ report of hours worked compared with hours of work expected by employers, and taking into account workers’ report of their own performance compared to the norm, a single score of productivity is derived. This score may be higher or lower than 1 (the norm), based on hours worked and productivity while working. In previous studies, this version of the HPQ was highly concordant with employee payroll records (Pearson correlations of 0.61 to 0.81) as well as with archival data in community samples (Kessler, et al., 2004; Kessler, et al., 2003). In the same studies, presenteeism scores from the HPQ were found to be highly predictive of supervisor ratings. Scores were stable over time but significantly sensitive to change (estimated stability over two months= 0.59; estimated reliability= 0.89).

Personal Assessment of Intimacy in Relationships. The Personal Assessment of Intimacy in Relationships (PAIR; Schaefer & Olson, 1981) is a 36-item self-report measure that provides information about actual and ideal intimacy in five domains: emotional, social, sexual, intellectual, and recreational intimacy. The instrument does not assume any ideal or absolute degree of intimacy, but rates the members on their expected versus perceived intimacy. The PAIR has shown good reliability in diverse populations, with all scales having a Cronbach's alpha of 0.70 or above (Schaefer & Olson, 1981). This measurement has previously been used to assess intimacy in dyads facing a cancer diagnosis (Manne & Badr, 2009; Manne et al., 2010). In previous studies, significant correlations were observed among all domains of intimacy and relationship satisfaction (Greeff & Malherbe, 2001). When compared to the Locke-Wallace Marital Adjustment Scale and Moo's Family Environment Scale, correlation coefficients for each of the subscales were consistently significant (r= 0.13 to 0.77). In the same study, Cronbach's alphas for each of the subscales of the PAIR exceeded 0.70 (Schaefer & Olson, 1981).

The Relationship Assessment Scale. The Relationship Assessment Scale (RAS; Hendrick, 1988) is a 7-item self-report measure of global relationship satisfaction. It is a unifactorial measure that focuses on how well each partner feels the other meets their needs, how well the relationship compares to others, regrets about the relationship, how well the individual's expectations have been met, love for the partner, and problems in the relationship (Schneider, 2007). The RAS is a five-point Likert scale that measures relationship satisfaction as a continuum, without cutoff scores. Scores on the measure range from one to five. In previous studies, Cronbach's alpha for this measure was 0.86 for women (Renshaw, Rodrigues, & Jones, 2008), and total scores were highly correlated (r=0.80 to 0.84) with a well-normed measure of relationship satisfaction, the Dyadic Adjustment Scale (Hendrick, 1988; Vaughn & Baier, 1999). For this study, use of the RAS was preferable to the more commonly used Dyadic Adjustment Scale (DAS), because it does not confound attitudes and behaviors (which may be highly correlated with the PAIR assessment). Because the RAS does not include self-reported behaviors as an indicator of attitudes, it possesses better divergent validity than the DAS when used in conjunction with the PAIR (Hendrick, 1988; Vaughn & Baier, 1999).

The Abbreviated Work-Family Conflict Questionnaire. The Abbreviated Work-Family Conflict Questionnaire (Matthews, Kath, & Barnes-Farrell) is a 6-item short form of the Multidimensional Measure of Work-Family Conflict (Carlson & Kacmar, 2000). Respondents rate statements about work and family life on 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). It includes items to measure work-to-family (WTF) conflict, or spillover of work demands into family life, and family-to-work (FTW) conflict, or spillover of family demands into work. This measure provides information regarding the directionality of strain and demand. It was developed using confirmatory factor analysis of items that were highly correlated with Carlson and colleagues' 18-item measure. It was validated in two studies conducted by the authors (Matthews, et al.). The abbreviated measure exhibited concurrent and predictive validity that replicated results found with the full-scale measure. The measure was found to have good construct validity, internally consistency, (alpha= 0.70), and test–retest reliability (work-to-family conflict alpha= 0.75, family-to work conflict alpha= 0.61). It was also systematically related to measures of role stressors, work–family balance, and well-being outcomes (Matthews, et al.).

Additional Items. In conjunction with demographics, participants were asked to rate their current satisfaction with job, family support, social support, and body image on a 7-item scale, from "Completely Satisfied" to "Completely Unsatisfied." Breast cancer survivors were also asked to rate their level of relationship satisfaction prior to cancer diagnosis, and their fear of a breast cancer recurrence. Each of these were measured via single-item measures. The decision to do so was based on two studies by Ironson and colleagues (Ironson, Brannick, Smith, Gibson, & Paul, 1989) and Nagy (Nagy, 2002), which stated that in certain circumstances such as work satisfaction, a single-item measure may be just as effective as multi-item, faceted scales. Within the current sample, all single-item measures were examined and were found to have a normative distribution similar to those found on longer measures of body image, relationship satisfaction, work satisfaction, and social support in the general population (Assari, Moghani Lankarani, & Tavallaii, 2009; Jewett, et al., 2010; Johnson & Sarason, 1979; van Saane, Sluiter, Verbeek, & Frings-Dresen, 2003) and in breast cancer survivors (Baxter, et al., 1998; Hinnen, Hagedoorn, et al., 2008).

Statistical Analysis

Power analysis. Based on Green's (1991) analysis of sample sizes required for regression analysis, it was determined that, given an alpha of 0.05 and between 10 and

15 predictor variables, to assume adequate power (0.80) to detect a medium effect size, a sample size of between 112 and 138 subjects would be necessary. This calculation was based on Cohen's recommendation of $R^2 = 0.13$ based on $f^2 = R^2/(1-R^2)$ (Cohen, 1992). This calculation was for a single group study. In order to test Hypothesis 3 (including the control group), approximately 112-138 additional control participants were necessary.

Data Analytic Strategy. During the study, demographics were monitored and participants were recruited in a manner that allowed for a matched sample (i.e., recruiting from young cancer survivors networks and other websites targeted at specific demographics). Once the appropriate sample size was obtained, all responses were downloaded directly from SurveyMonkey.com into an SPSS 20.0 file. Participation was analyzed and attrition points were recorded, as shown in Table 1. All data that were given by ineligible participants, or that were missing critical items necessary for this analysis, were removed and placed in a separate file. Descriptive statistics were calculated for all survey variables. Between-group comparisons were analyzed using chi-square or ANOVA techniques (as appropriate). Variables were examined for normal distribution, outliers, collinearity and missing data that could impact analysis, and the decision was made to exclude two problematic variables (Relationship Assessment Scale score and average child age, for missing data and collinearity with other variables, respectively) from analyses. Primary occupation was recoded into fewer categories as follows: clerical/sales/services category: clerical, sales, retail, food services, civil services; business category: business/finance, marketing/advertising; technical category: computers/IT, mechanical/electrical, construction; and professional category: healthcare, politics/law, education.

Hypothesis 1 and 2 were tested using two univariate multiple regression analyses with psychological distress score and work productivity score as outcome variables in separate models. Covariates for each regression were determined using a variable reduction technique (Hosmer & Lemeshow, 2000; Tabachnick & Fidell, 1996). This method is employed to reduce the number of potential confounding factors relative to the sample size. The result is a model that is more likely to be numerically stable, and more easily generalized. By using a less conservative estimate of significance ($p<0.25$ rather than $p<0.05$ or $p<0.01$), it is possible to predict variables likely to reach significance in the final model using a statistical "filter" method. Each possible covariate was examined in a separate univariate regression for significant association with each outcome variable (psychological distress and work productivity). The results of these univariate regressions can be seen in Tables 10 and 13.

Any variable that reached a significance of $p<0.25$ or greater for an outcome measure was retained for entry into a multiple regression for that outcome variable. In addition, some variables were retained based on theoretical significance in the proposed model, regardless of statistical non-significance. For Hypothesis 1, these variables were age, primary occupation, chemotherapy history, social support, retrospective rating of relationship satisfaction prior to diagnosis, body image and intimacy score. For Hypothesis 2, forced variables included age, primary occupation, chemotherapy history, social support, intimacy, and CESD7. These variables were determined in part based on the model described above, and in part by examining previous literature to determine which variable in each category was most often or most likely to be statistically significant. These variables are annotated in Tables 10 and 13 as well.

A similar method was used to test Hypothesis 3. Each possible variable was tested in a univariate analysis for each outcome variable (psychological distress and work productivity). Testing of individual covariates for Hypothesis 3a and 3b can be seen in Tables 16 and 19. Variables that reached a significance of $p<0.25$, and theoretically important variables (BCS status, age, primary occupation, PAIR, PAIR and BCS Status Interaction, plus CESD for 3b) were entered into models for each outcome variable.

For Hypotheses 1, 2, 3a and 3b, retained variables were run in a multiple regression for each outcome variable (see Tables 11, 14, 17 and 20). Categorical variables were entered as fixed factors and continuous variables were entered as covariates. Then, in order to obtain the best explanatory model, variables were then dropped in sequence, starting with the least significant, until the statistics indicated that "all of the important variables were included in the model, and those excluded were either biologically (theoretically) or statistically unimportant" (Hosmer & Lemeshow, 2000). The final model was accepted based on retaining the most explanatory power (R^2) without including variables that were neither theoretically nor statistically significant. The retained models are shown in Tables 12, 15, 18, and 21.

Results

Participant Characteristics and Demographics

In total, 615 participants accessed the SurveyMonkey study website. After screening for eligibility, 341 participants began the study. Table 1 shows the attrition rates and number of participants who did not complete each section of the study. Because the four pages of the study were presented in random order, non-completion of one part of the study does not necessarily indicate non-completion of others. Table 3 presents demographic information for both groups. Analyses of variance indicated that the groups were closely matched in terms of age. Overall, this was a relatively young group; the average age for the BCS group was 41.54 and the average age for the NC group was almost 38 years old. Both groups were primarily Caucasian and highly educated, with 81.9% of the BCS group and 91.2% of the NC group having received at least some higher education. There were significant between groups differences in education (χ^2 (df=5)= 17.81, p=0.003) and race (χ^2 (df=3)= 12.11, p=0.007).

Table 4 presents the job characteristics of participants in the study. The breast cancer survivors had an average annual income of approximately $74,000, and the non-cancer control women reported an average individual income of $67,000. For both groups, the majority of participants were in non-managerial jobs, but a difference between the groups did exist (χ^2 (df=2)= 4.16, p=0.040). There were also significant between-group differences in the types of jobs held (χ^2 (df=4)= 10.82, p=0.029) and job satisfaction. The BCS group mean for job satisfaction was 2.4(1.67) and the non-cancer group mean was 2.93(1.83; p=0.020), with lower numbers indicating better satisfaction.

Table 5 presents the family/relationship characteristics of participants in this study. The majority of women in each group were married or cohabitating (81% for BCS and 92% for NC women), but there was a significant difference in relationship status (χ^2 (df=2)= 13.91, p=0.001). Eighty seven percent of the BCS group was involved in a heterosexual relationship, as were 95% of the women in the NC group. Average length of time in current relationship was 149 months for BCS, and 153.6 months among non-cancer controls. Roughly 40% of women in each group did not have children, and mode number of children was two. There was a between-groups difference in number of children (χ^2=13.50, p=0.009) but not age of children. Average age of children, among those who did have children, was 15.7 for the breast cancer survivors and 18.1 for the non-cancer controls.

A summary of cancer and treatment characteristics for the BCS group is included in Table 6. BCS participants were an average of 3.08 (SD=1.3) years since primary treatment. The majority of participants had had multiple treatments for cancer, with chemotherapy (50.3%), endocrine therapy (29%), lumpectomy (26.5%) and mastectomy with reconstruction (22.6%) being the most common. Almost three quarters of the BCS were premenopausal at diagnosis, and almost one-half were premenopausal at the time of the study, indicating that they were a rather young group for BCS. The vast majority of women (70%) indicated that they had at least some worries about recurrence. More than half (56%) indicated that they were at least “somewhat comfortable” with the way their bodies looked.

Between Groups Differences: BCS and Controls As shown in Table 7 and 8, no significant between-groups differences were found in social support, relationship satisfaction, distress, or intimacy. As seen in Table 9, some significant between-groups differences were found in work-family conflict, intimacy, and work productivity. Non-cancer women reported significantly more work-to-family spillover. The mean for BCS was 6.13 (SD=3.66) and the mean for NC women was 7.16 (SD=3.51; p=0.033). Breast cancer survivors reported a significant difference in days of work missed due to partner health issues (0.11 days per month for BCS v. 0.01 days per month in non-cancer women; p=0.005). BCS did not miss significantly more days for their own health than did other women (0.49 v. 0.33 for controls). BCS reported significantly fewer days when they came in early, left late, or worked on their days off (1.47 days per month for BCS v. 4.28 for other women; $p<0.001$). Overall, breast cancer survivors reported significantly lower job performance than non-cancer women, over the course of 28 days (self-rated as 7.20 out of 10 for BCS v. 7.75 for other women; $p=0.034$) and two years (self-rated as 6.79 out of 10 for BCS v. 7.86 for other women; $p<0.001$). The groups were very similar in total relative productivity, a combination of time worked and productivity while on the job. Both BCS and controls worked similar hours, with an average of about 43 hours per week.

Relationship Intimacy and Distress Based on the variable reduction technique, it was determined that age, social support, job satisfaction, chemotherapy history, radiation history, body image, menopausal status, relationship satisfaction prior to cancer, number of children, work to family spillover, family to work spillover, primary occupation and non-white race should be entered into the regression model for distress in breast cancer survivors, based on a significance threshold of $p<0.25$. As shown in Table 11, these variables accounted for 55.1% of the variance in the model ($R^2 = 0.55$, $p<0.001$). When non-significant variables were removed by backward elimination, the remaining model accounted for 51.1% of the variance in CESD7 (Center for Epidemiological Studies Depression Scale- 7) scores ($R^2= 0.51$, $p<0.001$). PAIR score alone was not significant in association with CESD7, but Work to Family Conflict ($B=0.40$; $p<0.001$) and Social Support ($B=0.06$; $p= 0.042$) were significantly associated.

Relationship Intimacy and Work Outcomes The following variables were entered into the preliminary analysis for work productivity: age, type of work, income, job satisfaction, family-to-work spillover, relationship satisfaction prior to cancer diagnosis, years since treatment, chemotherapy history, stage of cancer, CESD7 total, PAIR total, and social support. As shown in Table 14, only family-to-work spillover was found to be significant when all of these variables were considered; however, observed power was low. Using backwards elimination to remove variables that were not theoretically or statistically important, a stable model was achieved. The overall model accounted for 45.4% of the variance in productivity scores ($p<0.001$). Intimacy was not related to the outcome, but Primary Occupation was ($p=0.030$).

Breast Cancer Survivorship, Intimacy, Distress and Work Productivity Table 16 displays the univariate statistics for all factors considered in relationship to psychological distress in BCS and non-cancer participants. Factors included based on either theoretical or statistical significance include BCS status, age, social support, sexual orientation, months in relationship, job satisfaction, work-to-family spillover, family-to-work spillover, income, primary occupation, PAIR total, and interaction between PAIR and being a breast cancer survivor. As seen in Table 17, when all of these factors were considered only work-to-family spillover was significant. After backwards elimination of non-significant variables (Table 18), the final model, which included intimacy, BCS status, interaction between intimacy and cancer survivorship, primary occupation, age, and work-to-family spillover, accounted for 23.3% of the variance in CESD7 scores in all participants ($R^2=0.23$, $p<0.001$). Work-to-family spillover was significantly associated with distress in all participants ($B=0.23$, $p<0.001$). Neither being a breast cancer survivor nor intimacy (nor the interaction between the two) was a significant predictor of distress after for controlling for other significant variables.

Table 19 displays the univariate statistics for all factors considered in relationship to work productivity in BCS and non-cancer participants. Factors included based on either theoretical or statistical significance include BCS status, age, social support, job satisfaction, education, family-to-work spillover, income, primary occupation, distress score, PAIR intimacy total, and interaction between PAIR and being a breast cancer survivor. As seen in Table 20, PAIR score, social support, and family to work spillover were significant when all factors were considered. After backwards elimination of non-significant variables (Table 21), the final model which included PAIR intimacy, BCS status, interaction between intimacy and cancer survivorship, CESD7 distress score, age, social support, education, primary occupation, and family-to-work spillover, accounted for 21.3% of the variance in work productivity scores in all participants ($R^2=0.21$, $p<0.001$). Intimacy score had a significant negative association with work productivity in all participants ($B=-0.67$, $p=0.010$), indicating that better intimacy scores were associated with poorer work productivity. Being a BCS or non-cancer participant had no association with work productivity. Social support, education level, and family-to-work spillover were all significantly associated with total work productivity after accounting for other variables.

Discussion

Findings This study produced a number of interesting and unexpected results, including several key findings: 1) that breast cancer survivors differ from non-cancer control women on several work-related outcomes 2) that breast cancer survivors do not differ from non-cancer control women on measures of relationship intimacy 3) that intimacy is not significantly related to psychological adaptation in breast cancer survivors, 4) that intimacy is not significantly related to work productivity in breast cancer survivors after controlling for significant factors; but that 5) work-family conflict is significantly related to both distress and work productivity in both BCS and controls; and 6) intimacy accounts for a significant amount of variance in work productivity scores in all participants, but in the opposite direction than what was predicted.

Chi-square analysis showed that breast cancer survivors and non-cancer women had significantly different occupations, managerial responsibilities, and education. Compared to breast cancer survivors, the non-cancer group reported significantly more upper management roles, more higher education, more overtime worked, better performance over the past 28 days and two years, more work-to-family spillover, and fewer days missed for health of significant others. While it is impossible to determine if these findings are the result of an unforeseen sampling error or true differences, it gives the appearance that women who have not faced breast cancer are more consumed with their jobs, and have different priorities in terms of work and family. However, BCS had significantly higher work satisfaction, even when accounting for age and types of occupation. In combination, these results seem to give further evidence to Frazier and colleagues' (2009) posit that breast cancer survivors take great satisfaction from return to work, but that they return with renewed priorities and values. Their roles at home and work are easily distinct from each other, and they do not equate working more hours with greater quality of life. This similar to what is suggested by Tiedtke and colleagues (2010) and Maunsell and colleagues (2004): women re-evaluate the role of work in their life following a breast cancer diagnosis, and may decide to limit the role of work in favor of family caregiving and newly revisited priorities. It appears that this may be true in the current study as well.

Results of this study suggest that there is no difference between BCS and non-cancer participants in terms of intimacy. These results are similar to what has been reported in other studies of the general population (Greeff & Malherbe, 2001; Schaefer & Olson, 1981). This finding also supports the Relationship Intimacy Model of Couple Adaptation to Cancer (Manne & Badr, 2008), which posits that there is an association between intimacy and relationship satisfaction, and suggests that a change in relationship processes (intimacy) is the precursor to a change in relationship satisfaction and quality. These results also support the conceptualization of widespread post-traumatic growth amongst BCS and their partners. Similar to other studies, this research indicates that relationship quality in cancer survivors is the similar to that of non-cancer controls (Ganz et. al., 2006, Fuller & Swensen, 1992) and that it may even improve after one partner faces a breast cancer diagnosis (Dorval, et al., 2005).

Unlike what was predicted, intimacy was not significantly related to distress or work productivity in BCS, after controlling for other variables. There was a significant difference prior to controlling for 15 other variables in each model, suggesting that these differences can be better explained by other variables, or that more power is required to detect an association. Additionally, there was no difference in distress scores or total relative productivity between BCS and non-cancer women. There was a between groups difference in work-to-family spillover, which was a significant factor in distress in BCS, and in all participants. There was not a between groups difference in family-to-work spillover, but family-to-work spillover was a significant factor in work productivity in BCS, and in all participants. Higher conflict scores were associated with worse work productivity in both samples.

Considering that breast cancer survivors endorsed more frequent days of work missed due to partner health issues, it makes sense that family-to-work spillover would be related to productivity. It appears that breast cancer survivors, in some circumstances, may have more difficulty in that they allow their home lives to impact their work, whereas results suggest that non-cancer controls have more difficulty with work-to-family spillover. Overall, the pattern of results suggests that work-family conflict is a greater predictor of functional outcomes than is intimacy; however, more research is necessary.

With regard to the third hypothesis, intimacy was related to work productivity (but not psychological distress) in all participants. There was not a difference in the relationship based on whether or not the participant was a breast cancer survivor, and being a breast cancer survivor did not have a significant association with psychological distress and work productivity after accounting for other variables. In association with psychological distress in all participants, only work-to-family spillover was significant. In association with work productivity, intimacy, social support, education, and family-to-work spillover were all significant. However, what is most important to note is the direction of these associations. For instance, higher intimacy scores were associated with lower productivity scores, as were higher social support scores. These results suggest that people who feel well supported by their partner and friends are actually less productive at work. This supports the hypothesis that people who make relationships a higher priority are less concerned with performance at work. Also, family-to-work spillover is negatively associated with productivity, indicating that women with more conflicts that spill from family into the work environment have poorer performance. It should be noted that the family-to-work scale asks questions about how often family commitments interfere with work, but does not make judgments about whether or not the participant finds this conflict burdensome. Again, this supports the idea that women who are making their family a higher priority are more often impaired in their work performance.

Limitations This study faced several limitations, including the use of self-report and a convenience sample, the possibility of response bias, inability to determine causality, and lack of a "true" control group. The current study was reliant upon self-report of both medical history and treatment, as well as perception of social support, relationship intimacy, work productivity and psychological distress. There was no requirement for proof that what women were reporting (as far as medical or relationship status) was factual. While the chance that women would purposely and unknowingly report inaccurate information was low, a few safeguards were put in place. All self-report data regarding cancer diagnosis and treatment was reviewed for internal consistency. The review indicated that participants reported their cancer history and treatment in a way that was not only consistent with a breast cancer diagnosis, but also that participants were able to recount their treatment at least fairly accurately to what would seem plausible. This is consistent with research by Maunsell and colleagues (2005), which indicated that BCS could accurately report their medical history including cancer treatment, three or more years post-diagnosis. In addition, the SurveyMonkey design was set up so that with the exception of the PI's computer (in kiosk mode), no computer could access the survey twice. Time spent taking the survey and IP address were also recorded and monitored for signs of tampering with the survey.

Regarding the accuracy of self-report, several concerns remained. First, the majority of instruments in the study were reliant upon self-perception. The question of accuracy and realistic perception must be addressed. However, two points should be considered. First, for many of the instruments, the participant's perception is more important than is reality. For instance, one's perception of intimacy and social support is more likely to impact mood state than is a more quantitative value, such as how many friends one has or the amount of time the participant's spouse dedicates to them. Second, the instruments used for outcome measures were carefully chosen for their reliability in other studies. For instance, the absenteeism and presenteeism questions of the Heath and Work Performance Questionnaire were highly concordant with employee payroll records (Pearson correlations of 0.61 to 0.81) and supervisor ratings, as well as with archival data in community samples (Kessler, et al., 2004; Kessler, et al., 2003). Previous literature as well as a careful review of the results in this study suggest that there was not a trend in over or under-reporting, and ranges were restricted to reduce the impact of gross exaggeration or misperception in either direction.

Special consideration was given to the possibility of response bias, in which participants answer questions in the way other than how they truly feel. They may respond in the way that they think the surveyor wants them to answer, the way that they believe is socially acceptable, or in a manner that they think will influence results. For instance, women may be reticent to admit that they don't feel socially supported or that they don't feel sexually attracted to their partner, or may feel that they should always answer to the extreme "in order to make their response count." Response bias is of particular concern when participants are not compensated for their responses, because it must be assumed that the participants have some intrinsic motivation (strong opinions, vested interest, need to feel heard and accepted) for completing the survey. Results from each measure were analyzed for skewedness in the data, and groups were compared to one another for differences in response pattern. However, it is impossible to be certain that some respondents are not answering in such a way.

The current study's participants were relatively young, more likely to be childless than most women of similar age, mostly Caucasian, well educated, and of higher-than-average income. The intent of this study was to focus on younger breast cancer survivors, who are often not well represented in the literature. Compared to recent cancer statistics (Jemal et. al., 2008), women of color, older women, and women of lower socioeconomic status are under-represented in this study. Because the study was Internet-based, it may have been subject to some unintended selection bias. Participants recruited via the Internet are likely younger, of higher income, more educated and better functioning than those who do not have access to the Internet (Pereira et. al., 2000). However, a recent study indicated that over 75% of cancer survivors from various demographic group access the Internet for health-related information (Simon & Schramm, 2008) suggesting that selection bias in Internet studies may not be influential as it was once considered (Whitehead, 2007). Nonetheless, our sample was relatively young, predominantly Caucasian and of high socioeconomic status, limiting the generalizability of our results.

Further, there were several interesting findings regarding between groups differences (education, types of job, hours worked, number of children) but this study was not designed in a way that could determine whether these differences were a result of being a breast cancer survivor, or if there was a non-cancer-related difference in the sample. Erring on the side of caution, these differences were accounted for in all analyses, but it should be noted that if a cancer-related impact did exist, these variables could be indirectly related with the outcome variables (i.e., if a previous cancer diagnosis resulted a difference in work satisfaction, that relationship could then be related to between groups difference in psychological distress).

Additionally, this study employed a non-cancer comparison group rather than another chronic disease group. This decision was made based on the rationale that breast cancer survivors, after a certain period post-diagnosis, are often considered "normal again" by their physicians. By comparing the two groups it is possible to say that BCS continue to have special needs that require additional consideration. However, it could be argued that comparison to another chronic disease group, to assess the impact of breast cancer as a specific disease, could also be important.

Implications and Future Directions This study highlights several positive findings that may be helpful to build on, in treating both young and older breast cancer survivors. Specifically, it is noteworthy that breast cancer survivors in this study had less work-to-family spillover than non-cancer participants, worked less during their time off, dedicated more time to sick loved ones, and rated themselves as all-around poorer performers than non-cancer participants, but got significantly more satisfaction from work. It is also remarkable that higher social support and intimacy were associated with lower work productivity in all women. From one perspective, BCS's decreased work productivity and increased family-to-work spillover might be seen as purely a limitation. However, it should be noted that the questionnaires used in this study do not measure the personal burden associated with poorer performance and family to work conflict. Other findings, such as the lack of association between distress and work productivity, suggest that the survivors may not be bothered by their perceived decrease in work productivity. These results suggest that perhaps many breast cancer survivors have different priorities in life, and that family, not work productivity, is the center of focus for them. However, investigation of that hypothesis is beyond the scope of this study.

Rather, the results of this study suggest that further research into BCS's priorities, work-family conflict, and work productivity is warranted. Keeping in mind that perceptions play an important role in distress and work productivity, future research should use multiple measures, including employer report and quantitative evaluation of actual work output. Given findings regarding the significance of work-family conflict in both distress and work productivity, research in this area could be extremely valuable in helping to improve functioning for breast cancer survivors. Additionally, given the conceptualization that a chronic stressor can change relationship intimacy, social support needs and priorities of living, this study could be expanded to include other chronically stressed populations. Future research could include other chronic stressor control groups including chronic pain, disability, and substance dependence or posttraumatic stress disorder, as well as couples who face illness in children.

The results of this study are helpful in informing clinical decisions about what to focus on in quality of life interventions for breast cancer survivors. Results suggest that intimacy in relationships is important for psychosocial adaptation following cancer, but that psychosocial adaptation (distress) and intimacy are not related to work productivity. While BCS report more days missed taking care of family and lower work productivity, women who haven't had cancer report that they work more on their days off and allow their work to spill over into their family life, leaving one to wonder if it is worth it for the slight increase in work productivity. From an occupational perspective, it is important to focus on family-to-work spillover in breast cancer survivors who wish to increase work productivity. However, amongst women who wish to increase quality of life overall, interventions should focus on relationship intimacy, renewed priorities of life, and posttraumatic growth.

Appendix

Table 1. Study Participation and Attrition

PAGE		**Drop**	**n**	**% of Orig**
Access Point	Accessed survey	■	615	100.00%
	Disengaged	187	428	69.59%
Informed Consent	Declined informed consent	17	411	66.83%
	Reported that they did not meet criteria	4	407	66.18%
	Disengaged	15	392	63.74%
Screening	Did not meet screener criteria	51	341	55.45%
		BCS n	**Controls n**	**Total n**
		165	176	341
				% Drop
Measures	Did not complete cancer info*	55	NA	33.33%
	Did not complete demographics*	49	62	32.55%
	Did not complete CES-D or PAIR*	52	65	34.31%

* Because these measures were presented in random order, the total n included in each analysis is dependent upon variables of interest. For instance, a participant may have completed the WHO-HPQ but not the CES-D, or vice versa.

Among those who did not meet screening criteria, the following qualifications were not met:		
	n	%
Not in a committed relationship of 2+ continuous years	20	6.00%
Not working 25+ hours a week in a formal environment	46	7.50%
Self or partner has had another chronic disabling or life-threatening condition w/in the past 7 years	23	3.70%
Self or partner has had a severe mental illness or cognitive disorder (unrelated to BC and treatment) w/in the past 7 years	19	3.10%
Couple has had to make decisions regarding a child with a chronic disabling or life-threatening condition w/in the past 7 years	8	1.30%
Not a female 21-75 who has either never had cancer or is not a BCS 18 mo-5years post-diagnosis	40	6.6%

**These groups are not mutually exclusive

Table 2. Sources of Participant Recruitment

	BCS Group		**Non Cancer Group**	
	n	% of Grp	n	% of Grp
Newspaper	7	4.76%	10	9.26%
Web Search Ad	57	38.78%	13	12.04%
Discussion Board or Social Networking Site	77	52.38%	79	73.05%
Email	3	2.04%	1	0.93%
Word of Mouth	2	1.36%	4	3.70%
Flyer at University or Medical Facility	1	0.68%	1	0.93%
	147		**108**	
$\chi 2$ (df=5)=3.544, p=0.06 (based on combined categories)				

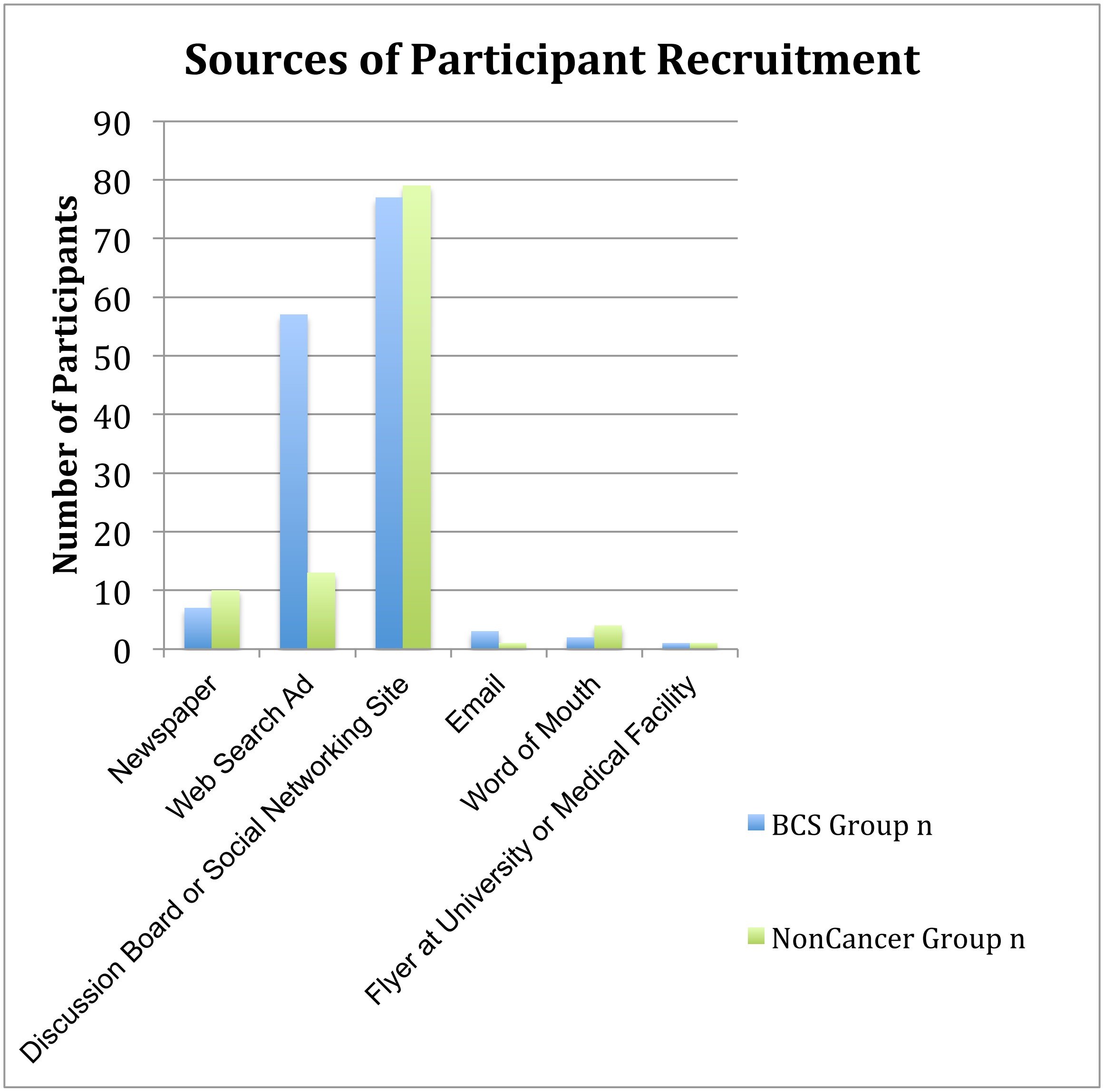

Sources of Participant Recruitment
Number of Participants
90
80
70
60
50
40
30
20
10
0
Newspaper
Web Search Ad
Discussion Board or Social Networking Site
Email
Word of Mouth
Flyer at University or Medical Facility
BCS Group n
NonCancer Group n

Table 3. Participant Demographics

	Breast Cancer Survivors Group		Non-Cancer Group		
	n	**%**	**n**	**%**	
Age					
19-30 years old	22	18.80%	48	42.11%	
31-40 years old	36	30.77%	33	28.95%	
41-50 years old	27	23.08%	8	7.02%	
51-60 years old	23	19.66%	12	10.53%	
61-71 years old	9	7.69%	13	11.40%	
Total n	117		114		
Mean Age (SD)	41.54(12.09)		37.54(13.47)		F(1,228)=3.98, p=0.354
Race/Ethnicity					
White Caucasian	73	62.93%	91	79.82%	
Black/African American	16	13.79%	6	5.26%	
Asian/ Asian American	8	6.90%	6	5.26%	
Pacific Islander	6	5.17%	2	1.75%	
Hispanic White	10	8.62%	10	8.77%	
Hispanic Non-white	9	7.76%	5	4.39%	
Native American/Alaskan	5	4.31%	1	0.88%	
Other	3	2.59%	1	0.88%	
Total n	130		122		
Race, Combined					
White Caucasian	73	62.93%	91	79.82%	
Black/African American	16	13.79%	6	5.26%	
Hispanic	19	16.93%	15	13.16%	
Other	22	18.97%	10	8.77%	χ^2 (df=3)= 12.11, p=0.007**

Education					
Less than High School	6	5.17%	1	0.88%	
High School Graduate	15	12.93%	9	7.89%	
Some College	21	18.10%	9	7.89%	
Associates/Bachelors	46	39.66%	42	36.84%	
Masters Degree	21	18.10%	42	36.84%	
Doctoral Degree	7	6.03%	11	9.65%	χ^2 (df=5)= 17.81, p=0.003**
Total n	116		114		

Table 4. Job Characteristics

	Breast Cancer Survivors		Non-Cancer Group		
	n	**%**	**n**	**%**	
Current Job Characteristics					
Upper level management	14	9.03%	13	10.66%	
Middle management	37	23.87%	27	22.13%	
Non-managerial	104	67.10%	82	67.21%	χ^2 (df=2)=4.16, p=0.040*
Total n	155		122		
Primary Occupation					
Clerical/Sales/Service	17	13.71%	29	27.36%	
Business	12	9.68%	11	10.38%	
Technical	7	5.65%	6	5.66%	
Professional	66	53.23%	36	33.96%	
Other	22	17.74%	24	22.64%	
Total n	124		106		χ^2(df=4)=10.82, p= 0.029*
Annual Income					
$10-19,000	7	8.14%	2	1.87%	
$20-39,000	17	19.77%	31	28.97%	
$40-59,000	11	12.79%	25	23.36%	
$60-79,000	25	29.07%	18	16.82%	
$80-99,000	11	12.79%	13	12.15%	
$100,000+	15	17.44%	16	14.95%	
Total n	86		105		
Mean (SD)	$74,025(69,324)		$66,923(48,979)		F(1,191)=0.69 p=0.406
Work Satisfaction					
(1) Completely Satisfied	40	39.60%	29	24.58%	
(2) Very Satisfied	27	26.73%	31	26.27%	
(3) Somewhat Satisfied	14	13.86%	29	24.58%	
(4) Neither Sat/Unsat	5	4.95%	1	0.85%	
(5) Somewhat Unsatisfied	9	8.91%	11	9.32%	
(6) Very Unsatisfied	1	0.99%	10	8.47%	
(7) Completely Unsatisfied	5	4.95%	7	5.93%	
Total n	101		118		
Mean (SD)	2.40(1.67)		2.93(1.83)		F(1,219)=5.04 p=0.02*

Table 5. Family Characteristics

	Breast Cancer Survivor Group		Non-Cancer Group	
	n	**%**	**n**	**%**
Relationship Status				
Married/Civil Union	75	64.66%	103	83.74%
Not Married, Cohabiting	19	16.38%	11	8.94%
All Other	22	18.97%	10	8.13%
Total n	116		124	
χ^2(df=2)=13.91, p= 0.001*				
Sexual Orientation of Relationship				
Heterosexual	91	86.67%	104	95.41%
Homosexual	14	13.33%	5	4.59%
Total n	105		109	
χ^2(df=1)= 5.30, p= 0.061				
Children				
No Children	43	37.07%	49	42.98%
1 Child	20	17.24%	13	11.40%
2 Children	26	22.41%	27	23.68%
3 Children	20	17.24%	11	9.65%
4+Children	7	6.03%	4	3.85%
Total n	116		104	
Mean Age of Children	15.68(9.60)		18.16(13.26)	
Average Age F(1,126)=0.73, p=0.393				
Number of Children χ^2(df=4)= 13.50, p= 0.009*				
Months in Relationship				
24-60	33	31.43%	35	28.46%
61-120	25	23.81%	44	35.77%
121-180	19	18.10%	18	14.63%
181-240	4	3.81%	2	1.63%
241+	25	23.81%	30	24.39%
Total n	106		129	
Mean Number of Months (SD)	149.03(124.84)		153.67(144.52)	
F(1,226)=0.07, p=0.998				

Table 6. Cancer Statistics, Menopausal Status, and Cancer-Specific Psychological Variables

	N	%
Time Since Primary Treatment		
1 year	16	14.55%
2 years	24	21.82%
3 years	21	19.09%
4 years	33	30.00%
5 years	16	14.55%
Total n	110	
Mean (S.D.)	3.08(1.3)	
Tumor Stage		
0	19	12.30%
I	20	12.90%
II	42	27.10%
III	26	16.80%
IV	3	1.90%
Total n	110	
Treatment (at any time since cancer diagnosis)		
Radiation Therapy	34	21.94%
Chemotherapy	78	50.32%
Endocrine Drug Therapy	45	29.03%
Lumpectomy	41	26.45%
Partial Mastectomy	10	6.45%
Full Mastectomy	22	14.19%
Double Full Mastectomy	30	19.35%
Mastectomy with Reconstruction	35	22.58%
Mastectomy without Reconstruction	11	7.10%
Other	12	7.74%

	N	%
Menopausal Status at Diagnosis		
Premenopausal	76	71.03%
Undergoing	22	20.56%
Postmenopausal	9	8.41%
Total n	107	
Current Menopausal Status		
Premenopausal	49	44.95%
Undergoing	32	29.36%
Postmenopausal	28	25.69%
Total n	109	

"I do not worry about a recurrence of breast cancer"		
Completely True	1	0.92%
Very True	2	1.83%
Somewhat True	25	22.94%
Not True or Untrue	5	4.59%
Somewhat Untrue	24	22.02%
Very Untrue	33	30.28%
Completely Untrue	19	17.43%
Total n	109	

"I am comfortable with the way my body looks"		
Completely True	7	6.48%
Very True	19	17.59%
Somewhat True	36	33.33%
Not True or Untrue	11	10.19%
Somewhat Untrue	21	19.44%
Very Untrue	10	9.26%
Completely Untrue	4	3.70%
Total n	108	

Table 7. Social Support, Relationship Satisfaction, and Psychological Distress Scores

	Breast Cancer Survivor Group	Non-cancer Group		
	Mean (SD)	Mean (SD)		
Social Support Questionnaire				
“Please rate your level of satisfaction with…” (1=worst, 5=best)				
Tangible Support from Friends (not partner)	2.33(1.65)	2.46(1.63)	F(1,216)=0.33	p=0.567
Emotional Support from Friends (not partner)	2.29(1.58)	2.49(1.61)	F(1,217)=0.90	p=0.345
Tangible Support from Family (not partner)	2.81(1.96)	2.47(1.57)	F(1,217)=2.10	p=0.149
Emotional Support from Family (not partner)	2.95(1.97)	2.51(1.64)	F(1,213)=3.14	p=0.078
TOTAL SUPPORT	10.39(6.56)	9.97(5.58)	F(1,212)=0.26	p=0.608
Relationship Assessment Scale Score				
	3.42(0.63)	3.7(0.53)	F(1,56)=2.65	p=0.109
CESD7 Score				
	8.0(2.81)	7.78(2.20)	F(1,216)=0.37	p=0.540

Table 8. Personal Assessment of Intimacy Scores

	Breast Cancer Survivor Group	Non-cancer Group		
	Mean (SD)	Mean (SD)		
PAIR Scores				
Emotional Intimacy	16.48(6.82)	17.66(5.75)	F(1,212)=1.88	p=0.171
Social Intimacy	16.93(6.56)	16.17(4.49)	F(1,205)=0.98	p=0.323
Sexual Intimacy	16.64(6.70)	18.11(4.92)	F(1,212)=3.44	p=0.065
Intellectual Intimacy	16.64(6.70)	18.11(4.92)	F(1,212)=3.44	p=0.065
Recreational Intimacy	18.60(5.04)	18.47(4.30)	F(1,207)=0.04	p=0.845
TOTAL PAIR	84.07(28.27)	89.00(20.33)	F(1,188)=1.96	p=0.164

Table 9. Work-Related Assessment Scores

	Breast Cancer Survivor Group	Non-Cancer Group		
	Mean (SD)	Mean (SD)		
Abbreviated Work-Family Conflict Questionnaire				
Work to Family Spillover	6.13(3.66)	7.16(3.51)	F (1,223)=4.62	p=0.033*
Family to Work Spillover	5.46(3.46)	5.30(2.64)	F (1,221)=0.15	p=0.703
WHO HPQ Absenteeism and Presenteeism Questions				
Hours Worked, 7 days	43.24(15.41)	43.31(14.49)	F(1,213)=0.00	p=0.976
Hours Worked 28 days	169.44(52.23)	162.65(39.72)	F(1,217)=1.19	p=0.277
Expected # of Hours/Wk	45.50(17.88)	42.64(14.33)	F(1,217)=1.74	p=-0.189
Days Missed Hlth	0.49(1.90)	0.33(0.76)	F(1,217)=0.66	p=0.418
Days Missed Partner Hlth	0.11(0.37)	0.01(0.09)	F(1,217)=8.05	p=0.005**
Days Missed Other	1.37(2.94)	1.25(1.98)	F(1,217)=0.11	p=0.738
Days Worked Extra	1.47(3.31)	4.28(7.01)	F(1,217)=13.65	P<0.001**
Performance Others	6.33(1.88)	6.87(1.98)	F(1,216)=4.27	p=0.040*
Performance in Past 2 yrs	6.79(2.20)	7.86(1.60)	F(1,217)=16.02	P<0.001**
Performance in Past 28 days	7.20(2.15)	7.75(1.59)	F(1,217)=4.20	p=0.034*
Relative Time Absent, 1mo	0.00(0.14)	-0.01(0.22)	F(1,213)=0.38	p=0.538
Absolute Presenteeism	1.26(0.64)	1.23(0.54)	F(1,217)=0.10	p=0.753
Relative Presenteeism	1.18(0.43)	1.18(0.36)	F(1,212)=0.00	p=1.000
Total Relative Productivity	1.19(0.47)	1.20(0.43)	F(1,208)=0.02	p=0.876

Table 10. Univariate Statistics, Factors Related to Psychological Distress (CESD7) in BCS

	Df	F	p	Included
Age	1,97	2.37	0.127	*
Social Support	1,91	32.68	0.000	*
Relationship Satisf. PreDiagnos	1,96	2.03	0.160	*
Sexual Orientation	1,97	0.06	0.800	
Months in Relationship	1,96	0.32	0.580	
Number of Children	1,97	4.69	0.033	*
Years Since Treatment	1,96	0.11	0.740	
Chemotherapy	1,97	1.70	0.200	*
Endocrine Therapy	1,97	0.81	0.370	
Mastectomy w/o Reconstruct	1,97	0.54	0.465	
Radiation	1,97	2.01	0.160	*
Stage of Cancer	4,93	1.19	0.320	
Body Image	1,94	1.34	0.250	*
Menopausal Status	2,97	2.23	0.113	*
Worry of Recurrence	1,95	1.23	0.270	
Job Satisfaction	1,95	42.56	0.000	*
Education	5,93	0.72	0.610	
Work to Family Spillover	1,97	33.50	0.000	*
Family to Work Spillover	1,97	20.40	0.000	*
Income	1,79	0.64	0.430	
Primary Occupation	4,94	2.32	0.063	*
Non-White Race	1,97	4.51	0.036	*
PAIR Intimacy	1,75	20.73	0.000	*
*=included				
**=forced for theoretical importance				

Table 11. Simultaneous Forced Entry Regression: Factors Related to Psychological Distress (CESD7) in BCS

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	5.68	4.41	0.204	
Chemotherapy	0.80	0.81	0.327	
Radiation	-0.20	0.85	0.815	
Non-White Race	0.68	0.66	0.306	
Occupation (v. Other)			0.384	
Clerical/Sales/Service	0.20	0.98	0.840	
Business	1.06	1.16	0.364	
Technical	1.43	1.29	0.276	
Professional	1.63	0.87	0.068	
Menopausal Status (v. Post-Menopausal)			0.360	
Premenopausal	-0.78	1.09	0.477	
Undergoing	-1.19	0.84	0.163	
PAIR Intimacy	**-0.01**	**0.02**	**0.515**	
Age	0.00	0.04	0.991	
Social Support	0.03	0.09	0.764	
Number of Children	0.28	0.23	0.233	
Relationship Satisf. PreDiagnos	-0.44	0.33	0.191	
Body Image	0.16	0.22	0.460	
Work-to-Family Spillover	0.33	0.11	0.006	**
Family-to-Work Spillover	-0.01	0.13	0.926	
Job Satisfaction	0.50	0.36	0.162	
R^2=0.551, p<0.001***				
$^{*}P$ <0.05; $^{**}P$ <0.01; $^{***}P$ <0.001.				

Table 12. Simultaneous Forced Entry Regression: Factors Related to Psychological Distress (CESD7) in BCS, Final Reduced Model

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	3.78	2.78	0.179	
PAIR Intimacy	**-0.01**	**0.02**	**0.526**	
Social Support	0.13	0.06	0.042	*
Chemotherapy	-0.96	0.72	0.188	
Work-to-Family Spillover	0.40	0.09	0.000	***
Relationship Satisf. PreDiagnos	-0.31	0.27	0.256	
Age	0.03	0.03	0.285	
Occupation (v. Other)			0.315	
Clerical/Sales/Service	1.04	0.85	0.229	
Business	1.14	1.07	0.291	
Technical	1.26	1.12	0.266	
Professional	1.70	0.78	0.033	*
R^2=0.511, p<0.001***				
*P <0.05; **P <0.01; ***P <0.001.				

Table 13. Univariate Statistics, Factors Related to Work Productivity (WHO HPQ Total Relative Productivity) in BCS

	Df	F	p	Included
Age	1,98	0.60	0.440	**
Social Support	1,94	12.06	0.001	*
Relationship Satisf. PreDiagnos	1,97	5.84	0.018	*
Sexual Orientation	1,97	1.00	0.320	
Months in Relationship	1,97	0.26	0.610	
Number of Children	1,98	0.23	0.630	
Years Since Treatment	1,97	0.26	0.610	
Chemotherapy	1,98	3.23	0.076	*
Endocrine Therapy	1,98	0.05	0.820	
Mastectomy w/o Reconstruct	1,98	0.79	0.378	
Radiation	1,98	0.98	0.320	
Cancer Stage	4,94	1.91	0.116	*
Body Image	1,95	1.69	0.197	*
Menopausal Status	2,95	0.67	0.513	
Worry of Recurrence	1,96	0.12	0.730	
Job Satisfaction	1,98	30.99	0.000	*
Education	5,94	0.34	0.891	
Work to Family Spillover	1,98	0.96	0.330	
Family to Work Spillover	1,98	23.07	0.000	*
Income	1,81	2.04	0.157	*
Primary Occupation	4,95	5.16	0.001	*
Non-White Race	1,98	0.37	0.550	
CESD	1,94	13.13	0.000	*
PAIR Intimay	1,78	22.30	0.000	*
*=included				
**=included and forced for theoretical importance				

Table 14. Simultaneous Forced Entry Regression: Factors Related to Work Productivity (WHO HPQ Total Relative Productivity) in BCS

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	100.61	33.85	0.005	**
PAIR Intimacy	**-0.31**	**0.18**	**0.102**	
CESD (Psych Distress)	1.24	1.04	0.239	
Social Support	0.20	0.83	0.815	
Relationship Satisf. PreDiagnos	2.07	2.66	0.441	
Age	0.18	0.26	0.487	
Chemotherapy	8.36	7.13	0.248	
Cancer Stage (vs. Stage IV)			0.319	
0	2.49	16.95	0.884	
1	15.88	14.84	0.291	
2	1.61	13.37	0.905	
3	9.11	13.50	0.504	
Body Image	0.54	1.86	0.774	
Family to Work Spillover	-3.57	1.22	0.006	**
Job Satisfaction	-6.67	3.13	0.039	
Income (per $10,000)	0.00	0.58	0.046	
Primary occupation (vs. Other)			0.101	
Clerical/Sales/Service	-19.65	8.49	0.026	*
Business	-17.13	10.00	0.095	
Technical	-0.72	10.95	0.948	
Professional	-12.71	7.11	0.082	
R^2=0.628, p<0.001***				
*P <0.05; **P <0.01; ***P <0.001.				

Table 15. Simultaneous Forced Entry Regression: Factors Related to Work Productivity (WHO HPQ Total Relative Productivity) in BCS, Final Reduced Model

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	94.13	23.18	0.000	***
PAIR Intimacy	**0.01**	**0.14**	**0.935**	
CESD7 (Psych Distress)	-0.21	0.94	0.822	
Social Support	-0.80	0.54	0.147	
Age	0.13	0.60	0.554	
Chemotherapy	-8.57	5.81	0.146	
Family to Work Spillover	-1.80	0.92	0.053	
Primary occupation (vs. Other)			0.030	*
Clerical/Sales/Service	-22.86	6.98	0.002	**
Business	-14.37	8.44	0.094	
Technical	-10.64	9.35	0.260	
Professional	-9.87	6.80	0.152	
R^2=0.454, p<0.001***				
$^{*}P$ <0.05; $^{**}P$ <0.01; $^{***}P$ <0.001.				

Table 16. Univariate Statistics, Factors Related to Psychological Distress (CESD7) in BCS and Non-Cancer Participants

Univariate Statistics from Data Reduction Technique, CESD in All Subjects				
	Df	F	p	Included
BCS Status	1,216	0.38	0.540	**
Age	1,216	0.93	0.335	**
Social Support	1,205	42.94	0.000	*
Sexual Orientation	1,215	0.06	0.810	
Months in Relationship	1,214	1.32	0.250	*
Number of Children	1,216	0.77	0.720	
Job Satisfaction	1,210	37.13	0.000	*
Education	5,212	0.20	0.980	
Non-White Race	1,216	0.96	0.333	
Work to Family Spillover	1,216	35.59	0.000	*
Family to Work Spillover	1,214	25.93	0.000	*
Income	1,182	7.07	0.009	*
Primary Occupation	4,213	1.45	0.219	*
PAIR Intimacy	1,182	23.58	0.000	*
*=included				
**=forced for theoretical importance				

Table 17. Simultaneous Forced Entry Regression: Factors Related to Psychological Distress (CESD7) in BCS and Non-Cancer Participants

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	9.14	2.08	0.000	**
PAIR Intimacy	**-0.01**	**0.01**	**0.701**	
BCS Status (v. non-BCS)	**-1.88**	**1.66**	**0.258**	
PAIR*BCS Interaction	**-0.02**	**0.02**	**0.372**	
Primary occupation (vs. Other)			0.665	
Clerical/Sales/Service	-0.46	0.65	0.484	
Business	-0.79	0.72	0.271	
Technical	-0.99	0.84	0.240	
Professional	-0.23	0.54	0.674	
Age	-0.01	0.03	0.604	
Social Support	0.03	0.05	0.528	
Work to Family Spillover	0.23	0.07	0.001	**
Family to Work Spillover	0.01	0.09	0.923	
Job Satisfaction	0.14	0.15	0.337	
Income (per $10,000)	-0.06	0.05	0.209	
Months in Relationship	0.00	0.00	0.897	
$R^2=0.286$, $p<0.001$***				
$^{*}P<0.05$; $^{**}P<0.01$; $^{***}P<0.001$.				

Table 18. Simultaneous Forced Entry Regression: Factors Related to Psychological Distress (CESD7) in BCS and Non-Cancer Participants, Final Reduced Model

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	9.39	1.40	0.000	***
PAIR Intimacy	**-0.01**	**0.01**	**0.459**	
BCS Status (v. non-BCS)	**-2.06**	**1.35**	**0.129**	
PAIR*BCS Interaction	**-0.02**	**0.02**	**0.190**	
Primary Occupation (vs. Other)			0.870	
Clerical/Sales/Service	0.39	0.55	0.480	
Business	-0.23	0.63	0.718	
Technical	-0.25	0.74	0.732	
Professional	0.10	0.46	0.834	
Age	-0.01	0.01	0.356	
Work to Family Spillover	0.23	0.05	0.000	***
R^2=0.233, p<0.001***				
$^{*}P$ <0.05; $^{**}P$ <0.01; $^{***}P$ <0.001.				

Table 19. Univariate Statistics, Factors Related to Work Productivity (WHO HPQ Total Relative Productivity) in BCS and Non-Cancer Participants

	Df	F	p	Included
BCS Status	**1,213**	**3.56**	**0.060**	*
Age	1,208	0.65	0.421	**
Social Support	1,203	1.95	0.164	*
Sexual Orientation	1,207	0.14	0.712	
Months in Relationship	1,207	0.62	0.430	
Number of Children	1,208	0.02	0.888	
Job Satisfaction	1,208	9.84	0.002	*
Education	5,204	1.53	0.182	*
Non-White Race	1,208	0.01	0.905	
Work to Family Spillover	1,208	0.08	0.777	
Family to Work Spillover	1,206	1.37	0.244	*
Income	1,178	1.34	0.248	*
Primary Occupation	4,210	0.49	0.745	**
CESD	1,201	5.00	0.027	**
PAIR Intimacy	**1,181**	**1.89**	**0.171**	*
=*=included				
**=included and forced for theoretical importance				

Table 20. Simultaneous Forced Entry Regression: Factors Related to Work Productivity (WHO HPQ Total Relative Productivity) in BCS and Non-Cancer Participants

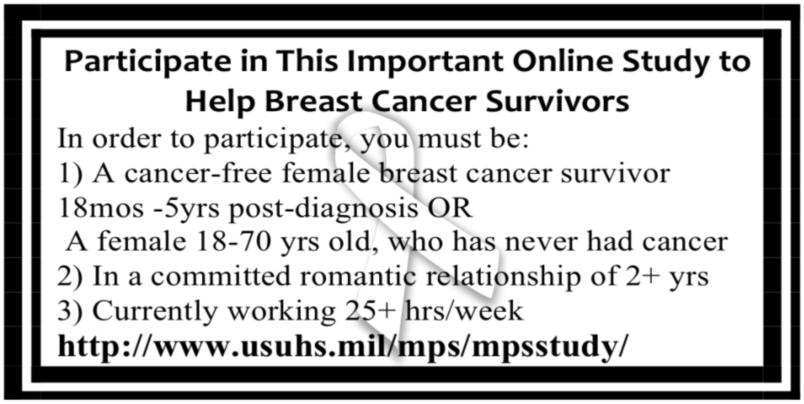
Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	217.09	47.88	0.000	***
PAIR Intimacy	**0.77**	**0.31**	**0.014**	*
BCS Status (vs. Non-BCS)	**17.79**	**10.28**	**0.086**	
PAIR*BCS Interaction	**0.28**	**0.44**	**0.530**	
CESD (Psych Distress)	2.57	2.01	0.203	
Age	0.10	0.44	0.815	
Social Support	-2.70	1.20	0.027	*
Education (v. Doctorate)			0.064	
Below High School	-26.08	61.33	0.671	
High School Grad	-64.71	26.81	0.017	*
Some College	-59.98	22.67	0.009	**
College Grad	-42.94	20.05	0.034	*
Master's Degree	-56.20	19.22	0.004	**
Family to Work Spillover	-4.75	2.05	0.022	*
Income	0.00	0.00	0.404	
Primary Occupation (v. Other)			0.917	
Clerical/Sales/Service	-4.82	15.91	0.762	
Business	-11.73	17.423	0.502	
Technical	-13.78	21.70	0.526	
Professional	-11.37	13.00	0.384	
Job Satisfaction	-1.18	3.46	-0.341	
R^2=0.217, p=0.016*				
$^{*}P$ <0.05; $^{**}P$ <0.01; $^{***}P$ <0.001.				

Table 21. Simultaneous Forced Entry Regression: Factors Related to Work Productivity (WHO HPQ Total Relative Productivity) in BCS and Non-Cancer Participants, Final Reduced Model

Factor	Un-standardized Coefficients (B)	SE	p	Sig.
Intercept	210.45	40.88	0.000	***
PAIR Intimacy	**-0.67**	**0.26**	**0.010**	**
BCS Status (vs. Non-BCS)	**14.61**	**8.34**	**0.082**	
PAIR*BCS Interaction	**0.40**	**0.36**	**0.271**	
CESD (Psych Distress)	2.33	1.70	0.172	
Age	0.09	0.35	0.791	
Social Support	-2.63	0.86	0.003	**
Education (v. Doctorate)			0.016	**
Below High School	-46.62	29.71	0.119	
High School Grad	-68.05	20.84	0.001	***
Some College	-59.24	19.09	0.002	**
College Grad	-44.35	16.64	0.009	**
Master’s Degree	-54.83	16.49	0.001	***
Family to Work Spillover	-4.43	1.62	0.007	**
Primary Occupation (v. Other)			0.909	
Clerical/Sales/Service	-3.07	12.99	0.814	
Business	-8.15	14.37	0.571	
Technical	-5.64	16.74	0.737	
Professional	-10.07	10.68	0.347	
R^2=0.213, p=0.001***				

$^{*}P$ <0.05; $^{**}P$ <0.01; $^{***}P$ <0.001. **n=172**

Advertisements and Flyers



Participate in This Important Online Study to Help Breast Cancer Survivors

In order to participate, you must be:

1) A cancer-free female breast cancer survivor 18mos -5yrs post-diagnosis OR

A female 18-70 yrs old, who has never had cancer

2) In a committed romantic relationship of 2+ yrs

3) Currently working 25+ hrs/week

http://www.usuhs.mil/mps/mpsstudy/

Are You a Working Woman in a Committed Relationship?

Please join us in a study to learn more about romantic relationships and their impact on quality of life, in women who have or have not had breast cancer

In order to participate, you must be:

1) A female breast cancer survivor 18 to year years old, who is between 18 months and five years after initial diagnosis, and who is currently cancer-free
OR A female between 18 and 70 years of age, who has never had cancer

2) In a committed, monogamous relationship of 2 or more continuous years

3) Be currently working (25+ hours per week, in a formal work environment, i.e., not as a freelancer or stay at home parent)

4) In the past seven years, both you and your partner must be without a history of life-threatening or chronic disabling condition. For more information and specifics, please visit us at https://www.surveymonkey.com/s/romanceandwork

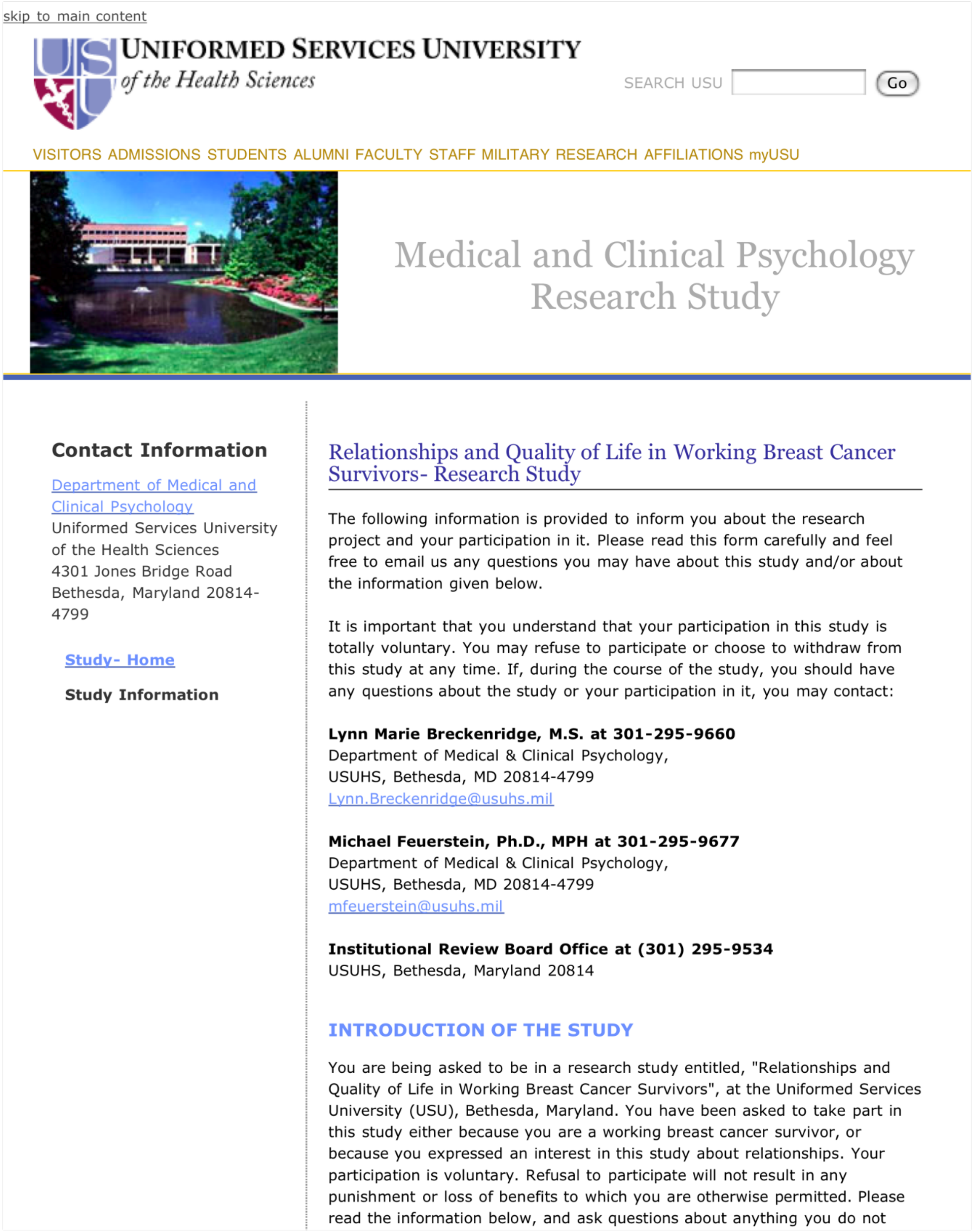
We will ask you to complete a short online questionnaire that will require approximately 30 minutes of your time**.** The study is 100% online, completely private, and can be completed from any computer with an internet connection.

To see if you are eligible for our study, please go to:
https://www.surveymonkey.com/s/romanceandwork

For more information, you may contact Lynn Breckenridge at (301) 295-9660 or via email at: bcsdyadstudy@gmail.com

This research project is being run by the Uniformed Services University of Health Sciences, Bethesda, MD

Study Webpage (Including Informed Consent)



Contact Information

Department of Medical and Clinical Psychology
Uniformed Services University of the Health Sciences
4301 Jones Bridge Road
Bethesda, Maryland 20814-4799

Study- Home

Study Information

Relationships and Quality of Life in Working Breast Cancer Survivors- Research Study

The following information is provided to inform you about the research project and your participation in it. Please read this form carefully and feel free to email us any questions you may have about this study and/or about the information given below.

It is important that you understand that your participation in this study is totally voluntary. You may refuse to participate or choose to withdraw from this study at any time. If, during the course of the study, you should have any questions about the study or your participation in it, you may contact:

Lynn Marie Breckenridge, M.S. at 301-295-9660
Department of Medical & Clinical Psychology,
USUHS, Bethesda, MD 20814-4799
Lynn.Breckenridge@usuhs.mil

Michael Feuerstein, Ph.D., MPH at 301-295-9677
Department of Medical & Clinical Psychology,
USUHS, Bethesda, MD 20814-4799
mfeuerstein@usuhs.mil

Institutional Review Board Office at (301) 295-9534
USUHS, Bethesda, Maryland 20814

INTRODUCTION OF THE STUDY

You are being asked to be in a research study entitled, "Relationships and Quality of Life in Working Breast Cancer Survivors", at the Uniformed Services University (USU), Bethesda, Maryland. You have been asked to take part in this study either because you are a working breast cancer survivor, or because you expressed an interest in this study about relationships. Your participation is voluntary. Refusal to participate will not result in any punishment or loss of benefits to which you are otherwise permitted. Please read the information below, and ask questions about anything you do not understand, before deciding whether to take part in the study.

THE PURPOSE OF THIS STUDY

- This study will look at how your romantic relationship functioning might relate to your psychological functioning and performance at work.
- Sometimes stressful events such as a breast cancer diagnosis can change the way a couple functions. By comparing women who have never had breast cancer to breast cancer survivors, this study will help us understand how women function in their relationships and at work following a stressful event.
- If you agree to participate in this study, you will be asked to take an online questionnaire regarding your recent quality of life. The study will take approximately one half hour to 40 minutes to complete.

THE PROCEDURES TO BE FOLLOWED

Individuals meeting qualifications below may be asked to participate in the study.

You may qualify for this study if you are:

- A female breast cancer survivor between 18 months and 5 years post-diagnosis, OR if you are a female between the ages of 18 and 70
- Currently in a romantic relationship of 2 or more continuous years
- Currently working 25+ hours per week in a formal work environment

You may not be qualified if you or your partner have or have had any of the following, within the past seven years:

- Metastasized Cancer
- Cancer other than breast cancer
- Current breast cancer diagnosis
- HIV/AIDs
- Pervasive Developmental Disorder
- Fibromyalgia, Parkinsons disease, or other chronic disabling condition
- Severe psychological disorder (such as a psychotic disorder, substance dependence, or PTSD unrelated to cancer) within the past five years
- If you've been caregiver/guardian for a child with a chronic disabling or life-threatening condition (such as any of the previously listed diseases)

Participation in this study includes completing an online questionnaire about your recent quality of life, as well as basic demographics and personal history. All information will be kept confidential and will not contain personal identification.

We ask that you NOT share your answers with your partner while completing the questionnaires.

In order to ensure accuracy in our study, it is very important that you do your best to answer every question as accurately and honestly as possible. Your answers will be kept confidential.

DURATION OF THE STUDY

Approximately one half hour to 40 minutes

THIS STUDY IS BEING DONE SOLELY FOR THE PURPOSES OF RESEARCH

The goal of this research is to help breast cancer survivors by gaining a better understanding of relationships and quality of life at work and home, following a significant life stressor. This understanding will help develop interventions to improve relationships and quality of life in breast cancer survivors.

DISCOMFORTS AND/OR RISKS THAT CAN BE REASONABLY EXPECTED

- The risks associated with this study are minor
    - You may find that the questionnaires ask questions that could make you uncomfortable
    - You may skip questions at any time. However, please be aware that your information may not be helpful if not complete.
    - Also, you may decline to participate at any time and/or withdraw your participation at any time
- You may experience discomfort or fatigue while completing the questionnaires
    - You may elect to complete the questionnaire in multiple segments
- If you have any questions or concerns, you can reach the principle investigators:
    - By telephone (301) 295-9660
    - By email: Lynn.Breckenridge@usuhs.mil
    - If not immediately available, a researcher will get back to you within one business day

POSSIBLE BENEFITS TO YOU THAT MAY BE REASONABLY EXPECTED ARE

- You may gain a better understanding of the impact that your relationship functioning has had on your occupational and psychological quality of life.
- Through completing this study, you will be providing information that will be helpful in expanding scientific knowledge about intimacy and relationship functioning, occupational, and psychological quality of life for breast cancer survivors.
- Our long-term goal is to gain a better understanding of these factors and ultimately, to work towards improving quality of life for breast cancer survivors and their families.

PRIVACY AND CONFIDENTIALITY

- All information you provide as part of this study will be confidential and will be protected to the fullest extent provided by law.
- Information that you provide and other records related to this study will be accessible to those persons directly involved in conducting this study and members of the Uniformed Services University of the Health Sciences Institutional Review Board (IRB), which provides oversight for protection of human research volunteers. In addition to the IRB at USUHS, other federal agencies that help protect people who are involved in research studies may need to see the information you give us.
- All questionnaires, results and forms will not have identifying

information and will be kept in a restricted access, password protected computer, in a locked office. Data from questionnaires will be entered into a database in which individual responses are not identified.

- Paper copies of the data will not be kept.
- If you are a military member, please be advised that under Federal Law, a military member's confidentiality cannot be strictly guaranteed.

Note: PARTICIPATION IS VOLUNTARY AND YOU ARE FREE TO WITHDRAW THIS CONSENT AND TO STOP PARTICIPATING IN THIS STUDY OR ANY ACTIVITY AT ANY TIME FOR ANY REASON.

RECOURSE IN THE EVENT OF INJURY

COMPENSATION TO YOU IF YOU ARE INJURED AND LIMITS TO YOUR MEDICAL CARE: This study should not entail any physical or mental risk beyond those described above. It is believed that complications arising from participation should not occur. If, for any reason, you feel that continuing this study would constitute a hardship for you, you may end your participation in the study at any time.

If at any time you believe you have suffered an injury or illness as a result of participating in this research project, contact the Director of Human Subjects Protection Program at the Uniformed Services University of the Health Sciences, Bethesda, Maryland 20814-4799 at (301) 295-9534. This office can review the matter with you. They can provide information about your rights as a research volunteer. They may also be able to identify resources available to you. If you believe the government or one of the government's employees (such as a military doctor) has injured you, a claim for damages (money) against the federal government (including the military) may be filed under the Federal Torts Claims Act. Information about judicial avenues of compensation is available from the University's General Counsel at (301) 295-3028.

Should you have any questions at anytime about the study you may contact the principal investigator, **Lynn Marie Breckenridge, M.S., Department of Medical and Clinical Psychology, USUHS, Bethesda, Maryland 20814-4799, at 301-295-9660**.

Measures

Factor	**Measure**	**Items**	**Time**	**Comments**
Work-Family Conflict	Abbreviated Work-Family Conflict Scale	6	3	
Psych Distress	Centers for Epidemiological Studies-Depression Scale (CES-D7)	7	3	
Work Productivity	Health and Performance Questionnaire (HPQ)	11	7	absentee/presentee questions only
Intimacy	Personal Assessment of Intimacy in Relationships	36	13	
Dyad Satisfaction	Relationship Assessment Scale (RAS)	8	4	
Demographics		14/11	8/4	
		82/77	**38/34**	

Center for Epidemiologic Studies Depression Scale-7

CESD7: Items 6, 7, 11, 12, 16, 18, 20

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	During the Past Week			
	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.	☐	☐	☐	☐
2. I did not feel like eating; my appetite was poor.	☐	☐	☐	☐
3. I felt that I could not shake off the blues even with help from my family or friends.	☐	☐	☐	☐
4. I felt I was just as good as other people.	☐	☐	☐	☐
5. I had trouble keeping my mind on what I was doing.	☐	☐	☐	☐
6. I felt depressed.	☐	☐	☐	☐
7. I felt that everything I did was an effort.	☐	☐	☐	☐
8. I felt hopeful about the future.	☐	☐	☐	☐
9. I thought my life had been a failure.	☐	☐	☐	☐
10. I felt fearful.	☐	☐	☐	☐
11. My sleep was restless.	☐	☐	☐	☐
12. I was happy.	☐	☐	☐	☐
13. I talked less than usual.	☐	☐	☐	☐
14. I felt lonely.	☐	☐	☐	☐
15. People were unfriendly.	☐	☐	☐	☐
16. I enjoyed life.	☐	☐	☐	☐
17. I had crying spells.	☐	☐	☐	☐
18. I felt sad.	☐	☐	☐	☐
19. I felt that people dislike me.	☐	☐	☐	☐
20. I could not get "going."	☐	☐	☐	☐

SCORING: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

The World Health Organization Health and Work Performance Questionnaire

II. The absenteeism and presenteeism questions

B3. About how many hours altogether did you work in the past 7 days?
(If more than 97, enter 97.)

☐ ☐ Number of hours (00-97)

B4. How many hours does your employer expect you to work in a typical 7-day week?
(If it varies, estimate the average. If more than 97, enter 97.)

☐ ☐ Number of hours (00-97)

B5. Now please think of your work experiences over the past 4 weeks (28 days). In the spaces provided below, write the number of days you spent in each of the following work situations.

In the past 4 weeks (28 days), how many days did you...

	Number of days (00-28)
B5a. ...miss an **entire** work day because of problems with your physical or mental health? (Please include only days missed for your **own** health, not someone else's health.)	☐ ☐
B5b. ...miss an **entire** work day for any other reason (including vacation)?	☐ ☐
B5c. ...miss **part** of a work day because of problems with your physical or mental health? (Please include only days missed for your **own** health, not someone else's health.)	☐ ☐
B5d. ...miss **part** of a work day for any other reason (including vacation)?	☐ ☐
B5e. ...come in early, go home late, or work on your day off?	☐ ☐

B6. About how many hours altogether did you work in the past 4 weeks (28 days)? (See examples below.)

☐☐☐ Number of hours in the past 4 weeks (28 days)

Examples for Calculating Hours Worked in the Past 4 Weeks

40 hours per week for 4 weeks = 160 hours
35 hours per week for 4 weeks = 140 hours
40 hours per week for 4 weeks with 2 8-hour days missed = 144 hours
40 hours per week for 4 weeks with 3 4-hour partial days missed = 148 hours
35 hours per week for 4 weeks with 2 8-hour days missed and 3 4-hour partial days missed = 112 hours

B9. On a scale from 0 to 10 where 0 is the worst job performance anyone could have at your job and 10 is the performance of a top worker, how would you rate the usual performance of most workers in a job similar to yours?

***Worst* Performance**										***Top* Performance**
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

B10. Using the same 0-to-10 scale, how would you rate your usual job performance over the past year or two?

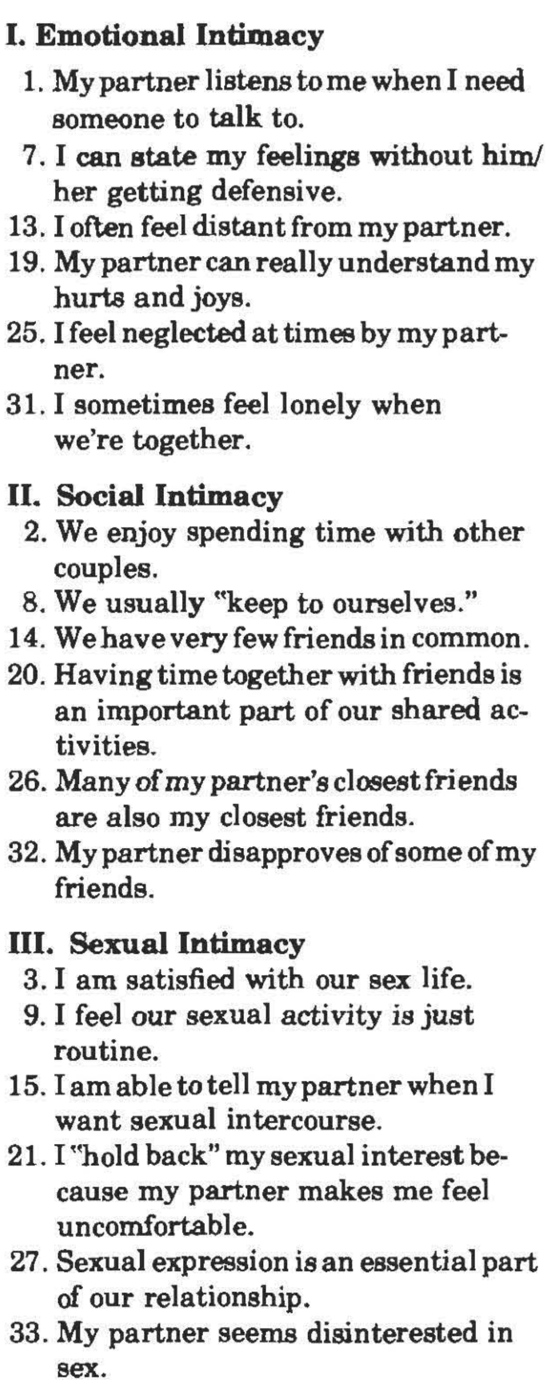
***Worst* Performance**										***Top* Performance**
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

B11. Using the same 0-to-10 scale, how would you rate your overall job performance on the days you worked during the past 4 weeks (28 days)?

***Worst* Performance**										***Top* Performance**
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Personal Assessment of Intimacy in Relationships (PAIR)

Statements are evaluated on a five-point Likert scale of Agreement-Disagreement



I. Emotional Intimacy

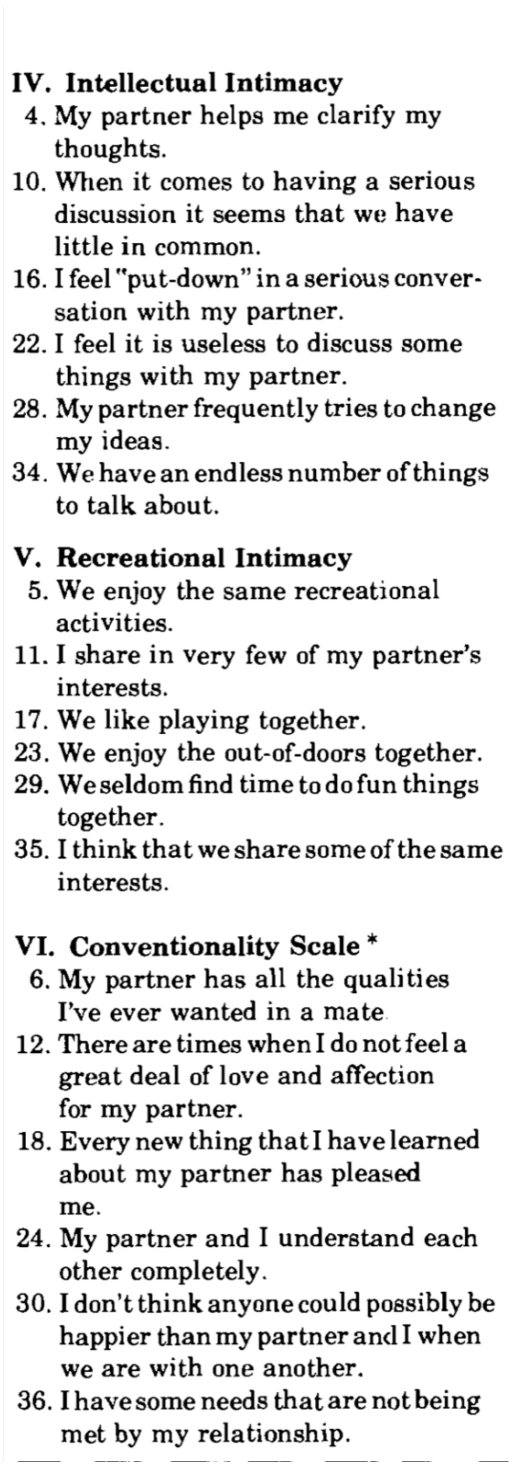
1. My partner listens to me when I need someone to talk to.
7. I can state my feelings without him/her getting defensive.
13. I often feel distant from my partner.
19. My partner can really understand my hurts and joys.
25. I feel neglected at times by my partner.
31. I sometimes feel lonely when we're together.

II. Social Intimacy

2. We enjoy spending time with other couples.
8. We usually "keep to ourselves."
14. We have very few friends in common.
20. Having time together with friends is an important part of our shared activities.
26. Many of my partner's closest friends are also my closest friends.
32. My partner disapproves of some of my friends.

III. Sexual Intimacy

3. I am satisfied with our sex life.
9. I feel our sexual activity is just routine.
15. I am able to tell my partner when I want sexual intercourse.
21. I "hold back" my sexual interest because my partner makes me feel uncomfortable.
27. Sexual expression is an essential part of our relationship.
33. My partner seems disinterested in sex.



IV. Intellectual Intimacy

4. My partner helps me clarify my thoughts.
10. When it comes to having a serious discussion it seems that we have little in common.
16. I feel "put-down" in a serious conversation with my partner.
22. I feel it is useless to discuss some things with my partner.
28. My partner frequently tries to change my ideas.
34. We have an endless number of things to talk about.

V. Recreational Intimacy

5. We enjoy the same recreational activities.
11. I share in very few of my partner's interests.
17. We like playing together.
23. We enjoy the out-of-doors together.
29. We seldom find time to do fun things together.
35. I think that we share some of the same interests.

VI. Conventionality Scale *

6. My partner has all the qualities I've ever wanted in a mate
12. There are times when I do not feel a great deal of love and affection for my partner.
18. Every new thing that I have learned about my partner has pleased me.
24. My partner and I understand each other completely.
30. I don't think anyone could possibly be happier than my partner and I when we are with one another.
36. I have some needs that are not being met by my relationship.

Relationship Assessment Scale

Please mark on the answer sheet the letter for each item that best answers that item for you.

How well does your partner meet your needs?

A B C D E

Poorly Average Extremely well

In general, how satisfied are you with your relationship?

A B C D E

Unsatisfied Average Extremely satisfied

How good is your relationship compared to most?

A B C D E

Poor Average Excellent

How often do you wish you hadn’t gotten in this relationship?

A B C D E

Never Average Very often

To what extent has your relationship met your original expectations?

A B C D E

Hardly at all Average Completely

How much do you love your partner?

A B C D E

Not much Average Very much

How many problems are there in your relationship?

A B C D E

Very few Average Very many

NOTE: Items 4 and 7 are reverse scored. A=1, B=2, C=3, D=4, E=5. You add up the items and divide by 7 to get a mean score.

Abbreviated Work–Family Conflict Measure

Strongly Agree **Strongly Disagree**

5 4 3 2 1

Work-to-family

I have to miss family (relationship) activities due to the amount of time I must spend on work responsibilities.

I am often so emotionally drained when I get home from work that it prevents me from contributing to my family (partner).

The behaviors I perform that make me effective at work do not help me to be a better parent and partner.

Family-to-work

I have to miss work activities due to the amount of time I must spend on family (relationship) responsibilities.

Because I am often stressed from family (relationship) responsibilities, I have a hard time concentrating on my work.

Behavior that is effective and necessary for me at home would be counterproductive at work.

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