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Validation of the Couples' Cancer Communication Scale

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Résumé

Un diagnostic de cancer du sein met la relation d'un couple à l'épreuve. La communication à propos du cancer peut aider les conjoints à s'appuyer mutuellement afin de mieux s'adapter à la maladie. Cependant, dans la documentation existante, peu d'échelles mesurent explicitement cette forme de communication. Ce projet avait pour but de valider l'échelle de communication des couples aux prises avec le cancer (CCC). Les patientes (N = 120) et leurs conjoints (N = 109) ont été interrogés au sujet de leur expérience avec le cancer du sein. Une analyse factorielle performé sur l'ensemble des données a permis de retenir deux facteurs pour l'échelle CCC, l'évitement et l'ouverture à la communication. L'échelle a démontré une bonne validité convergente avec le Primary Communication Inventory (r = .54, p <.01 patientes; r = .55, p <.01 partenaires). Finalement, l'échelle CCC prédit la dépression (Δr^2 = 0.029) et l'ajustement marital (Δr^2 = 0.032) au-delà de la communication générale. Avec plus ample développement, l'échelle actuelle pourrait servir à des fins de recherche ainsi que dans des contextes cliniques où une évaluation après un diagnostic de cancer permettrait, au besoin, la mise en œuvre précoce d'interventions sur la communication conjugale au propos de la maladie.

MOTS-CLÉS : CANCER DU SEIN, COUPLE, COMMUNICATION, VALIDATION, ADAPTATION CONJUGALE

Abstract

A diagnosis of breast cancer powerfully challenges a couple's relationship. Couple illness communication is one way couples offer each other mutual support, allowing for better illness adjustment. However, in the existing literature, few scales explicitly measure couple illness communication. The goals of the present study were to validate the Cou*ple Cancer Communication scale* (CCC) and to examine the association between CCC and cancer-related adjustment outcomes. Patients ($N = 120$) and their spouses ($N = 109$) were interviewed regarding their experience with breast cancer. A two factor solution was retained for the CCC scale, avoidance and openness to communication. It demonstrated good convergent validity with the Primary Communication Inventory ($r = .54$, $p < .01$ for patients; $r = .55$, $p < .01$ for partners). Finally, the CCC scale significantly predicted both depression ($\Delta r^2 = 0.029$) and marital adjustment ($\Delta r^2 = 0.032$) scores above and beyond general communication. With further development, the CCC could be a useful tool as an assessment measure in a life-threatening disease. The present scale, in conjunction with other sources of information, could be used in future research and clinical settings when attempting to assess illness-related communication and related outcomes.

KEYWORDS: BREAST CANCER, COUPLE, COMMUNICATION, VALIDATION, MARITAL ADJUSTMENT.

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List of Abbreviations

CCC	Couple Cancer Communication
CES-D	Centre for Epidemiology Studies Depression Scale
EFA	Exploratory Factor Analysis
GLM	General Linear Model
IES	Impact of Event Scale
MAT	Marital Adjustment Scale
PCI	Primary Communication Inventory
SD	Social Desirability
VIF	Variance Inflation Factor

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To the newest addition of my family, Alex, I say "Here's to being an old couple in the making"!

Dedication

To finally getting my A.

“The dream begins with a teacher who believes in you,
who tugs and pushes and leads you to the next plateau,
sometimes poking you with a sharp stick called "truth."
~Dan Rather

Validation of the Couples Cancer Communication Scale

Breast cancer is the most common malignant disease diagnosed in women. In Canada, 1 in 9 women will be diagnosed with breast cancer during the course of their lifetime and 1 in 28 will die from it, with an estimated 5-year survival rate of 87% (Canadian Cancer Society, 2010). Women diagnosed with breast cancer face considerable challenges which may be coped with more or less successfully.

Among the factors that may contribute to better cancer adjustment is the frequency with which patients communicate with their spouses, particularly in relation to the disease. Illness-specific communication within couples, where the woman is diagnosed with breast cancer, is an understudied research area given the high prevalence of cancer in the general population and the known influence of certain psychosocial factors on the adaptation to this disease. In this thesis, the validation of an illness-specific communication scale will be examined.

Psychological Impact of Breast Cancer

The diagnosis and treatment of breast cancer are associated with many adverse psychological consequences. Patients must deal with the emotional consequences of being diagnosed with a life-threatening illness, as well as cope with worries about disease recurrence. Initial reactions to diagnosis can be intense, akin to an acute stress response (Green et al., 1998). Reactions often involve shock, impaired concentration, emotional numbness, insomnia and nightmares, and heightened arousal (Lindgren et al., 2013; Elklit & Blum, 2011; Johnson Vickberg, Bovbjerg, DuHamel, Currie, & Redd, 2000; Epping-Jordan et al., 1999). Northouse and Swain (1987) found that breast cancer patients reported significantly higher levels of psychological distress than those found in the general population.. Between 7% and 46% of women with early stage breast cancer report clinically significant levels of depressive symptoms

within the first six months of diagnosis, and between 32% and 45% of women report clinically significant levels of anxiety (Stafford, Judd, Gibson, Komiti, Mann & Quinn, 2013; Gérat-Muller, Andronikof, Cousson-Gélie, Grondin & Doron; 2011; Gallagher, Parle, & Cairns, 2002; Omne-Ponten, Holmberg, Burns, Adami, & Bergstrom, 1992). In some women, depression and anxiety symptoms related to their illness, persists up to 10 years after diagnosis (Lam et al., 2010; Zabora, Brintzenhofeszoc, Curbow, Hooker, & Piantadosi, 2001). Furthermore, women who have breast cancer are affected in numerous other ways that can alter their daily lives. For example, family roles may be altered, future plans are challenged, and they may experience changes in physical appearance as well as treatment side effects.

Among the first to evaluate the literature on psychosocial correlates of breast cancer, Meyerowitz (1980) concluded that the emotional trauma that resulted from the diagnosis and treatment of breast cancer could be as potentially damaging as the disease itself. A study conducted by Roberts, Cox, Shannon, & Wells (1994) found a correlation between social support and distress in cancer patients. However, when controlling for social desirability this association diminished considerably. The researchers hypothesized that patients who wish to put the best face on their situation, consciously or unconsciously, minimized their distress and were more likely to rate highly their spouses, family and friends.

Another type of response women may have to the stress associated with a cancer diagnosis is the development of intrusive thoughts about cancer, and efforts to suppress or avoid these thoughts may persist for years (Baider & De-Nour, 1997). According to Horowitz' theory about stress response syndrome (1979), there are two common responses to stressors: 1) intrusion and 2) avoidance. He hypothesized that intrusion and avoidance oscillate during the same time period. Horowitz (1979) believed that avoidant behavior was used to prevent

emotional flooding and functioned to restore emotional equilibrium; however these defensive mechanisms were disrupted by intrusive thoughts. Croyle, Smith, Botkin, Baty, & Nash (1997) reported that women who are carriers of the breast cancer gene manifested higher levels of intrusion and avoidance than non-carriers. The *Impact of Event scale* (IES), developed by Horowitz, Wilner, & Alvarez (1979), is one of the most well-established instruments for evaluating traumatic stress symptoms, especially in psycho-oncology (cf. Bratt *et al.,* 2000; Lerman *et al.,* 1995, 1993; Kornblith *et al.,* 1992; Cella, Mahon, & Donovan, 1990; Cella & Tross, 1986 & Hornsby, Sappington, Mongan, Gullen, Bono, & Altekruse, 1985).

Emotional Support and Breast Cancer

One way women manage this stressful life experience is to obtain emotional support from their spouses both during and after treatment (Manne, Ostoff, Winkel, Grana, & Fox, 2005; Figueiredo, Fries, & Ingram, 2004; Harrison, Maguire, & Pitceathly, 1995; Pistrang & Barker, 1995, 1992). A number of studies have indicated that spousal emotional support is an important predictor of patients' adaptation to breast cancer (Giese-Davis, Hermanson, Koopman, Weibel, & Spiegel, 2000; Pistrang & Barker, 1995). Smith, Redman, Burns, and Sagert (1985) found that the marriage partner was the most important source of social support for married women who had been diagnosed with gender-specific cancers. Furthermore, previous research has strongly suggested that the partner relationship is unique and that support from friends and relatives cannot overcome the negative effect of a distant husband on the female patient's emotional well-being (Cutrona, 1996; Weihs, Enright, Howe, & Simmens, 1999).

There is growing evidence from epidemiological studies that point to a general association between married adults and lowered mortality risk (Robles, Slatcher, Trombello, & McGinn, 2014; Lo, Hals, Braun, Rydall, Zimmermann, & Rodin, 2013; Shor, Roelfs, Bugyi, &

Schwartz, 2012; Kaplan & Kronick, 2006; Campbell, 1986; House, Robbins, & Metzner, 1982; Berkman & Syme, 1979). Marital status and marital quality appear to be important correlates of psychological distress during illness (Burman & Morgolon, 1992; Fuller & Swenson, 1992; Hannun, Giese-Davis, Harding, & Hatfield, 1991). Patients who report a higher quality of marriage also report less illness adjustment problems. There is a strong relation between positive marital relations and more favorable psychological adaptation to living with cancer (Fuller & Swenson, 1993). A diagnosis of breast cancer powerfully challenges a couple's relationship and optimal couple functioning is dependent on them adjusting as a dyad.

Communication and Marital Harmony

Marital communication is considered as a means by which the partners share information and emotions, offering each other mutual support and allowing for better adjustment (Walsh-Burke, 1992). According to Kayser & Scott (2008) marital communication is unique in the sense that each partner not only acknowledges and validates the other's' feelings, but also tend to view a stressful situation as "our" problem, and share the burden and responsibility for managing the problem in a way that balances both individual and relationship needs. Couples research has found communication processes to be crucial in facilitating healthy couples' functioning (Epstein, Bishop, Ryan, & Keitner, 1993; Olson, Russell, & Sprankle, 1989; Noeller & Fitzpatrick, 1988; Jacobson & Holtzworth-Monroe, 1986). Important discussions for couples facing a life-threatening disease include understanding the illness and its psychosocial demands over time, beliefs about what caused the disorder, what can affect its course, how to live with threatened loss, how to maintain a mutual balanced relationship, wills and advanced directives concerning a possible terminal phase, etc (Rolland, 1994). Communication is commonly blocked by tentativeness in exploring new territory, concerns about hurting the partner or worsening the

condition, or fears that the relationship will not survive openness in certain areas (Baucom, Kirby, Pukay-Martin, Porter, Fredman, Gremore et al., 2012).

Given the interdependence that characterizes a couple, mutual influence and similar levels of distress between patients and their partners could be expected. A meta-analysis of 21 studies of cancer patients and their caregivers, (usually a spouse) revealed a high positive correlation between the psychological distress of cancer patients and their caregivers (Hagedoorn, Sanderman, Bolks, Tuinstra, & Coyne, 2008). A woman's cancer diagnosis can often expose her partner to heightened anxiety, depression, feelings of being unprepared to help the woman, fear of losing their partner, and they will often express somatic complaints (Lethborg, Kissane, & Burns, 2003; Northouse & Peters-Golden, 1993; Sabo, 1990). Elevated levels of spousal distress and problems in marital communication have been documented in both cross-sectional and longitudinal studies (Baider, Ever-Hadani, Goldzweig, Wygoda, & Peretz, 2003; Foy & Rose, 2001; Carlson, Bultz, Speca, & St-Pierre, 2000; Toseland, 1995; Ptacek, Ptacek, & Dodge, 1994). According to Carter and Carter (1993), how well husbands adjusted one year post cancer diagnosis had a direct effect on how well their wives adjusted. Patients with partners who demonstrated poor adjustment following treatment had worst psychological outcomes compared to patients whose partners had adjusted well. Couple's communication is crucial in facilitating healthy functioning within the couple (Manne, Sherman, Ross, Ostroff, Heyman, & Fox, 2004; Gordon, Baucom, Epstein, Burnett, & Rankin, 1999; Gottman & Levenson, 1999). Open communication between patients and partners about cancer-related issues is an important resource to cope with the demands of cancer and the side effects of treatment (Lewis, 2010; Northhouse, Mood, & Schafenacker, 2007). More cancer-related open communication has been associated with greater mutual support, higher quality of life, better

psychosocial adjustment, and higher relationship functioning in both partners (Langer, Brown, & Syrjala, 2009; Song, 2009; Porter, Keefe, Hurwitz & Faber, 2005; Rogers & Escudero, 2004). Furthermore, open communication can help partners reconnect with each other in the face of physical and emotional adversity (Song, Northouse, Zhang, Braun, Cimprich, Ronis et al., 2012). On the other hand, some studies suggest that couples may experience the greatest obstacles in adjustment when one member of the couple wishes to discuss cancer-related issues, and this need to communicate is not reciprocated (Boehmer & Clark, 2001; Kornblith, Herr, Ofman, Scher, & Holland, 1994). Lack of open communication about cancer-related issues harms the intimate relationship and psychosocial well-being. Problems communicating are more detrimental when couples have more fulfilling relationships prior to the cancer diagnosis (Langer et al., 2009; Manne, Norton, Ostroff et al., 2006). Couple illness-related communication therefore constitutes an important variable in studies related to cancer adaptation, since it is the channel by which help and support is obtained, but few studies have measured it explicitly.

Literature Review of Couple Cancer Communication

Various studies in the existing literature have investigated the association between couple communication and cancer (Arden-Close et al., 2010; Manne, Badr, Zaider, Nelson, & Kissane, 2010; Paradis, Consoli, Pelicier, Lucas, Andrieu, & Jian, 2009; Manne, Ostroff, Norton, Fox, Goldstein, & Grana, 2006; Manne, Ostroff, Sherman, Heyman, Ross & Fox, 2004).

Population samples within the cancer communication literature are not always consistent. Some studies have used patient data only (Giese-Davis et al., 2000; Ramirez et al., 2000; Lerman et al., 1993; Hannum et al., 1991; Smith et al., 1985; Meyerowitz, 1980), while others use partner data only (Bigatti, Brown, Steiner, & Miller, 2011; Lewis et al., 2008; Lethborge et al., 2003; Bratt et al., 2000). Additionally, some researchers have studied cancer communication from a

family perspective (Bachner & Carmel, 2009; Paradis, Consoli, Pelicier, Lucas, Andrieu, & Jian, 2009; Mesters, van den Borne, McCormick, Pruyn, de Boer, & Imbos, 1997; de Boer, Pruyn, van den Borne, Knegt, Ryckman, & Verwoerd, 1995). As previously mentioned, the marital dyad constitutes a unique source of support for the patient facing the challenges of a breast cancer diagnosis. Given the inter-related nature of couples, specifically the similar levels of distress between patients and their partners, a couple illness communication scale is warranted.

Previous research that examined couples' support-related communication and relationship satisfaction, have used observational methods to collect their data. Thus, to investigate types of marital support that facilitated the communication of breast cancer-related stress, Manne *et al.* (2004) videotaped 148 couples involved in a 10-minute discussion about a cancer-related issue and coded their behaviors with the *Rapid Marital Interaction Coding System*. Although this research provided evidence for relationship satisfaction in couples who suffer from breast cancer, an observational method is susceptible to subjective bias on the part of the observer, thus undermining the reliability and validity of the data gathered. Furthermore, observational methods are at risk of creating the observer effect, which in some way influences the behavior of those being observed. Participants could answer in a socially desirable manner due to the observer's presence, and the researchers did not control for this in their analyses.

Previous research that have examined couple communication during an illness have not used illness-specific scales, but general communication ones such as the *Communication Pattern Questionnaire* (Manne et al., 2010; Manne, Ostroff, Norton, 2006), the *Perceived Self/Partner Disclosure scale* (Manne & Badr, 2010), the *Close Persons Questionnaire* (Weihs et al., 2008), the *Marital Communication Inventory* (Vess et al., 1985a, 1985b), the *Partner Relationship Inventory* (Hoskins et al., 1996a, 1996b) or the *Perceived Social Support Scale*

(Gotcher, 1995, 1993, 1992). Additional research has studied couple communication from an abstract perception that communication is open: for example, the Expression subscale of *Family Environment scale* (Simanoff et al., 2010; Giese-Davis et al., 2000; Spiegel et al., 1983), the Emotional expression subscale of the *Cope Inventory* (Manne, Ostroff, Winkle et al., 2004), or the *Mutuality and Interpersonal Sensitivity Questionnaire* (Lewis et al., 2008). All of these scales are geared towards couples however the items were developed to tap at general communication or perceived expression of coping.

The only study that has elaborated an illness-specific communication scale is that of Arden-Close and colleagues (2010), who've developed the *Couples' Illness Communication Scale* (CICS). The CICS aims to measure illness-related couple communication by using an ultra brief self-report questionnaire consisting of four items for both patients and partners about ease with which they discuss cancer and their perception of what the other feels concerning this topic. Patients reported poorer illness-related communication than their partners. Couples with better general communication also had better illness-related communication and experienced less intrusive thoughts. However, the CICS is comprised of two sets of two questions: two questions pertaining to the patients' ability to communicate about cancer with her partner, and the other two about her perception of how her partner communicates with her about cancer. Furthermore, the second question of the set is a negative form of the first question, rendering this 1-item scale much too short.

Although all of these studies have provided important evidence supporting couple communication, psychological distress and marital satisfaction during a life-threatening illness, none have done so measuring directly the illness-specific communication between the patient and her partner.

Recognizing the lack of research assessing directly marital communication in cancer partients, Normand, Lasry, Margolese, Perry & Fleiszer (2004) endeavored to investigate this issue. Breast cancer couples ($N = 120$) were administered the *Primary Communication Inventory*, to evaluate general communication, and a brief scale elaborated by the authors to measure cancer-related communication, based on the preoccupations of breast cancer patients interviewed in an oncology surgery clinic. Participants were classified as having passable, good and very good communication, based on pre-established cut-off points. When communication about cancer was just passable, patients and partners reported significantly more depressive symptoms than others. The mean levels of depressive symptoms for both patients and partners with this type of communication, clearly categorized them at risk for depression. Although Normand et al. (2004) study concluded that there was a clear relation between couple communication and depressive symptoms, their communication scale was not validated.

Objectives and Hypothesis

In summary, extensive research on couple communication and cancer has demonstrated that communication during these challenging times is an important factor for psychological distress and health outcomes. There is growing evidence from epidemiological studies that point to a general association between married adults and lowered mortality risk (Campbell, 1986; House, Robbins, & Metzner, 1982; Berkman & Syme, 1979). Marital status and marital quality appear to be important correlates of psychological distress during illness (Burman & Morgolon, 1992; Fuller & Swensen, 1992; Hannun, Giese-Davis, Harding, & Hatfield, 1991). Patients who report a higher quality of marriage also report less illness adjustment problems. Thus, cancer-related communication constitutes an important variable in studies related to illness adjustment and risk for depression in particular.

The aim of the present study therefore, is to validate the Couples' Cancer Communication Scale (CCC) used in Normand et al. (2004) study, using their original database. The convergent validity of the CCC scale will be examined in relation to the *Primary Communication inventory* (PCI). It is hypothesized that the CCC will correlate with measures of similar construct, and thus expect to correlate well with the PCI. Based on the preceding review of literature, the predictive validity of the CCC scale will be examined using the *Center for Epidemiological Studies Depression scale* (CES-D**)** and the Locke & Wallace *Marital Adjustment Test* (MAT). The objective is to determine if the Couples' Cancer Communication scale (CCC) will predict depressive symptomatology scores and marital adjustment above and beyond what can be predicted by general communication.

Methods

Participants

The current study was part of a larger psycho-oncology study directed by Dr. Jean-Claude Lasry, funded by the Canadian Breast Cancer Research Alliance. Normand, Lasry, Margolese, Perry & Fleiszer's (2004) sample included 120 women (M = 52 years old) diagnosed with breast cancer (Stage I or II), and 109 of their spouses (M = 55 years old). Couples had been living together on average for 25 years and had an average of two children. The majority of participants (88 %) were recruited from the tumor registry of a Montreal hospital. The other participants were referred by three oncology clinics of Montreal. To be eligible for the study, participants had to be married or living with a spouse for more than one year, never had cancer before, be less than 70 years of age, live in the Greater Montreal Area, and have had surgery (Biopsy, lumpectomy, or mastectomy; See Table 1).

Table 1.

Demographic and illness characteristics of breast cancer patients and their partners

Participant characteristics	Female Patients *N* =120 M (*SD*)	Male Partners *N* = 109 M (*SD*)	t-test	*P*
Age (years)	54.50 (8.22)	53.70 (9.35)	0.61	*n.s*
Education (years)	14.03 (3.46)	14.76 (3.80)	-1.54	*n.s*
Length of time married (years)	25.80 (11.36)	25.20 11.36)	0.38	*n.s*
Marital adjustment	3.81 (0.63)	3.91 (0.53)	-2.07	*n.s*
Type of surgery				
Biopsy	7 (6%)	-		
Lumpectomy	100 (87%)	-		
Mastectomy	8 (7%)	-		
Language (% English)	80 (66.7%)	77 (70.6%)		

Measures

Several well-known scales were completed by the participants and their spouses. All scales administered demonstrated good internal consistency and have been well-established in both research and clinical settings, except the *Couple Cancer Communication scale* which had yet to be validated.

Couples' Cancer Communication **(CCC):** The CCC includes six questions concerning communication about cancer in the couple, elaborated for the overall study and based on interviews with breast cancer couples. The questions deal with the frequency of discussion about doctor visits, preoccupations and feelings elicited by the breast cancer, and the ease with which both partners could talk about cancer among themselves. For example, "Have you and your spouse talked about the worries and the concerns breast cancer causes both of you?" and "Have you and your spouse discussed your recent visits to the doctor?". The items were scored on a five-point Likert scale ranging from (1) never to (5) very often (See Appendix 1).

Primary Communication Inventory **(PCI):** This 25-item scale evaluates communication in the marriage with the frequency of the communication behaviors (verbal and non-verbal) and

the discussion or lack thereof about the marital relationship (Navran ,1967). The scale produces a global communication score for each partner (Baucom & Adams, 1987). The PCI questions are adapted for each respondent (patient and partner) and are scored on a five-point Likert scale: (1) never, (2) rarely, (3) sometimes, (4) often, and (5) very often. The PCI has been used extensively for clinical (O'Leary & Arias, 2013; O'Leary & Turkewitz, 1981) and research purposes (Al-Othman, 2012; Montesi, Fauber, Gordon, & Heimberg, 2011; Ely, Guerney, & Stover, 1973). This inventory has been shown to be sensitive to therapeutic interventions (Beach & Broderick, 1983; Ely *et al*., 1973) and to discriminate between couples seeking marital therapy and non-clinical couples (Arias & O'Leary, 1981; Navran, 1967). According to Ely, Guerney, & Stover (1973) the scale demonstrated good test-retest reliability ($r = 0.86$). Internal consistency in the present study was quite good ($\alpha = .89$).

Center for Epidemiological Studies Depression scale **(CES-D):** The CES-D scale is a 20-item self-report scale designed to measure depressive symptomatology in the general population. The CES-D items were selected from a pool of items from previously validated depression scales (e.g. Raskin, Schulterbrandt, Reatig, & McKeon, 1969; Gardner, 1968; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The major components of the scale include: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. It was found to have very high internal consistency ($\alpha = 0.85$ general population and $\alpha = 0.90$ clinical population). Possible range of scores is zero to 60, with the higher scores indicating more symptoms.

Marital Adjustment Test **(MAT):** Developed by Locke & Wallace (1959), the 15-item MAT measures marital satisfaction and was originally used to differentiate well-adjusted couples from distressed (unsatisfied) couples. This scale contains one global adjustment question, eight

questions measuring areas of possible disagreement, and six questions measuring conflict resolution, cohesion and communication. The instrument is internally consistent (α = .90) and discriminates reliably between distressed and non-distressed couples (Graham, Diebels, & Barnow, 2011; Haque, 2009; Locke & Wallace, 1959). The well-known *Dyadic Adjustment Scale* (Antoine, Christophe, & Nandrino, 2008; Spanier, 1976) includes eleven of these items, and formulas have been established to convert MAT scores into DAS scores, if need be (Crane, Allgood, Larson, & Griffin, 1990). Scores can range from 1 to 151, with scores below 97 indicating relationship distress. According to Cohen & Willis (1985), the MAT has the greatest number of validity and reliability studies of all the self-report measures of marital adjustment. Internal consistency in the present study was similar to that found by the creators of the scale (α = .87).

Impact of Event Scale **(IES):** Developed by Horowitz, Wilner, & Alvarez (1979), the IES measures the subjective distress experienced as a result of any life event. The 15-item scale includes two subscales: *Intrusion* (of unbidden thoughts, images, dreams or feelings), and *avoidance* (of meanings and consequences, numbness of feelings and denial). The IES is one of the most well-established instruments for evaluating traumatic stress symptoms, especially in psycho-oncology (cf. Bratt *et al.,* 2000; Lerman *et al.,* 1995, 1993; Kornblith *et al.,* 1992; Cella, Mahon, & Donovan, 1990; Cella & Tross, 1986; Hornsby, Sappington, Mongan, Gullen, Bono, & Altekruse, 1985).The IES is stable over different types of events and can discriminate between stress reactions at different times after the event (α = .86 for intrusion and α = .82 for avoidance; Sundin & Horowitz, 2002). Despite having been developed before the formal introduction of PTSD in diagnostic literature, Joseph (2000) has concluded that the continued use of this scale is warranted, as it has high reliability and validity in clinical populations. The test-retest reliability

was evaluated at $r = .96$ (Mystakidou, Tsilika, Parpa, Galanos, & Vlahos, 2007). Internal consistency of the whole scale in the current sample, was found to be $\alpha = .91$, and $\alpha = .88$ for the intrusion subscale and $\alpha = .85$ for the avoidance subscale.

Social Desirability: The tendency to describe oneself in a favorable light to gain approval of others was first assessed by Crowne & Marlowe (1960), who coined the term social desirability. The measure of social desirability has been used extensively for clinical purposes in colectoral cancer patients (Consedine, Ladwig, Reddig, & Broadbent, 2011) and research purposes in biopsychosocial distress of cancer patients (Lowery, Greenberg, Foster, Clark, Casden, Loscalzo et al., 2012). Hurny, Piasetsky, Bagin, & Holland (1987) recommend taking into account social desirability when assessing quality of life of cancer patients, as patients' social desirability scores are one standard deviation above that of the general population. Patients may distort reality and present a better picture than what the situation is in actuality, in an effort to convince themselves and others that they are handling a crisis well (Hurny et al., 1987). Zook & Sipps (1985) shortened the original scale to 13 items which showed good internal consistency ($\alpha = .88$) and test-retest reliability ($r = .89$). In the current study, internal consistency of the shortened scale was $\alpha = .71$.

Procedure

After receiving a letter presenting the study, eligible participants were contacted by telephone to verify that they met the inclusion criteria, and if so, they were invited, along with their partner to participate in the study. Consenting couples were interviewed at their convenience in their home or in the clinic. If both spouses were interviewed at the same time, it was done by two interviewers. Participants were informed that their responses were confidential

and would only be discussed with their spouses at their request. Participants were interviewed on average 33 days after the surgery of the patient.

Analysis Plan

Data were double-entered, verified, and analyzed with SPSS 18.0 software (SPSS, Inc., Chicago, IL). Prior to assessing reliability and validity of the items of the CCC scale, the data were prepared for analyses. Quality checks of the data were performed via examination of graphic representations of the variables. To validate the CCC scale, three main analyses were performed as outlined below.

Analysis 1

The first analysis was to assess the properties of the CCC scale. To meet the goals of this analysis, three steps were involved: 1) calculating the means and standard deviations of the overall scores of the CCC; 2) calculating the reliability of the CCC scale via Cronbach's alpha; and 3) calculating the correlations between the measured variables in a matrix.

A mean CCC score was obtained by averaging the frequency responses ("never" to "very often") across all six questions for both patients and their partners (Questions 1, 3, and 4 were reversed scored). The mean and standard deviations of patients and partners' scores on the CCC scale are reported. A paired sample t-test was conducted to compare the mean scores of the CCC scale between patients and their respective partners. Alpha coefficients were calculated to test the internal consistency of the items. The CCC scale was considered reliable if they met the criterion level (.60) for alpha coefficients (Howard & Gordon, 1963).

Analysis 2

The second analysis was to identify the underlying factors of the CCC scale. To meet the goals of this analysis, three steps were involved: 1) selection of a factor model and the number of

factors to retain; 2) selection of a method for rotating the factors; and 3) developing a strategy for evaluating the factor solution extracted from steps one and two. The process involved in performing each step is outlined below.

Selection of a factor model

Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are statistical approaches for investigating theoretical constructs that are represented by a set of items. Unlike EFA, use of CFA requires an a priori hypothesis about the latent constructs and their relationship to the scale items (Hirschi & Herrmann, 2013; van Prooijen & van der Kloot, 2001). In contrast, EFA is more exploratory, as its name implies. The decision about the number of factors to retain is made by the statistical software used, and the loadings of specific items of factors do not need to be specified. Thus, EFA will be performed because while the questions elaborated in the CCC scale were developed based upon expertise and preliminary research, the author had no firm theoretical a priori hypotheses about the constructs.

When performing a factor analysis, the communality estimate for an item is the estimate of the proportion of the variance of that item that is both error free and shared with other items in a scale. This estimate can range in value from 0 – 1.00. The higher the value of this estimate, the more variance is explained by that item. The correlation matrix generated by the method for estimating communalities helps the investigator to see which items cluster in further factor analyses and indicates whether the data are appropriate for factor analysis.

In EFA, there are two main options for estimating communalities: principal components analysis (PCA) or common factor analysis. In PCA, the purpose is mainly data reduction, and in common factor analysis the main objective is to understand the relation among a set of measured items as they relate to the latent variables. Unlike PCA, common factor analysis operates on the

assumption that the variance of a variable can be explained by a small number of underlying factors plus variation that is unique to the item, including its error variance. Furthermore, common factor analysis may be more appropriate technique when sources of variance are less understood (Pett, Lackey, & Sullivan, 2003; Preacher & R.C, 2003; Floyd & Widaman, 1995). Because the work of this study involved analysis of variables that contain multiple sources of underlying variance, common factor analysis was used. Since the values for communality estimates aren't held constant in common factor analysis, Principal Axis Factoring (PAF) will be used to determine what values for the communality estimates should be initially placed on the diagonal of the correlation matrix (Pett et al., 2003).

The purpose of selecting the number of factors to retain is to maximize the amount of variance explained in the scale with the least number of items. Often times, researchers will use the default setting included in most statistical software packages, typically the eigenvalues-greater-than-one rule. Others examine the scree plot of the eigenvalues before making their decision about which number of factors to retain. However, O'Connor (2000) cautions researchers from relying solely on these two popular methods, as it sometimes over/under estimates the number of components. Instead, O'Connor endorses the use of parallel analysis, which extracts eigen values from random data sets that parallel the actual data set with regard to the number of cases and variables. Ultimately, this step in factor analysis is subjective, therefore, most experts in the field recommend using a combination of techniques for determining which factors to retain in a model (Pett et al., 2003; Preacher & R.C, 2003).

For the purpose of this study, the decision of the number of factors to retain was made via a combined examination of percent of variance extracted, visual representation of the items on a scree plot, and performing a parallel analysis as outlined by O'Connor (2000). Using parallel

analysis, in concert with rule of thumb, allows the researcher to visually analyze the data to get a better understanding of how the items relate to one another.

Selection of a method for rotating the factors (Orthogonal and oblique rotation)

In order to gain meaningful and easily interpretable cluster of items, it is necessary to first rotate the factors. When selecting a method for rotating factors, there are two choices, orthogonal or oblique. The difference between the two methods lies in their assumptions. Orthogonal rotation operates on the assumption that none of the factors being loaded are correlated with one another, while oblique rotation assumes that at least two of the factors are indeed correlated. According to Pedhauzer and Schmelkin (1991), the assumption of all factors being uncorrelated is very rarely met in healthcare research, and they argue that orthogonal factor solutions are unable to properly characterize sociobehavioral data. For those reasons, oblique rotation will be used.

Evaluating the factor solution

Based on the results from the first two steps, the factor solution gleaned from the exploratory factor analysis will be explored by randomly dividing the dataset in two. The same analyses will be performed on one half of the sample and then confirmed in the other half.

Analysis 3

The third analysis was to assess the validity of the CCC scale. To meet the goals of this analysis, two steps were involved by reporting: 1) convergent validity and 2) predictive validity.

A positive correlation between the CCC scale and the PCI would indicate convergent validity. Predictive validity of the CCC scale was assessed by performing a two-step hierarchical regression to demonstrate that the CCC scale could predict scores on the CES-D and the MAT above and beyond what the PCI could predict. For each dependent variable (CES-D and MAT),

general communication (PCI) was entered at stage one, and illness specific communication (CCC) at stage two (Models were also tested using *Dyadic Adjustment* Scores; results were identical and thus, not shown for parsimony).

Results

Analysis 1: Couple Cancer Communication scale items

The *Couple Cancer Communication scale* (CCC) is comprised of 6 questions intended to evaluate couples' overall ability to communicate with each other about cancer specifically. The questions are geared towards willingness to speak about the subject or the tendency to avoid it. These questions were originally developed by Dr. Lasry from interviews with breast cancer patients and oncology surgeons, and from pertinent literature (Normand et al., 2004). To accommodate the Anglophone participants of the study, these items were translated into English according to the back-translation method, by independent translators (Brislin, 1970).

A frequency of participants' responses on the 5-point likert scale can be seen in Table 2. Sixty to eighty percent of participants declared that they communicate very often about cancer related topics with their partners. These high scores on the CCC scale are true for every item except the last one which has a more heterogeneous distribution, with no clear preference.

The overall mean score on the CCC was 4.39 (SD = .55) out of a maximum score of 5. The mean score for patients was 4.44 (SD = .55) and 4.34 (SD = .54) for their partners, with no significant difference between patients and their partner ($t_{(108)} = 1.69$, $p = .09$). Cronbach's alpha was .64 for patients and .55 for their partners, indicating acceptable reliability. The alpha scores were not affected by removal of any of the items.

Table 2.
Frequency of participant answers on the Couples' Cancer Communication scale (N = 229)

Item	**Never** *N (%)*	**Rarely** *N (%)*	**Sometime** *N (%)*	**Often** *N (%)*	**Very Often** *N (%)*	M (*SD*)
***1**. Did you happen to feel you needed to talk about your breast cancer surgery and no one was there to listen to you?*	6(2.7)	12(5.3)	10(4.4)	46(20.4)	151(67.1)	4.44 *(.99)*
2. Have you and your spouse discussed your recent visits to the doctor?	2(0.9)	4(1.8)	10(4.4)	61(26.8)	151(66.2)	4.56 *(.74)*
***3.** When your spouse wanted to discuss this subject with you, did you feel you tended to change the subject and talked about something else?*	5(2.2)	0	13(5.7)	28(12.2)	183(79.9)	4.68 *(.77)*
***4.** When you wanted to discuss this subject with him, did you feel he tended to change the subject and talked about something else?*	2(0.9)	3(1.3)	19(8.3)	34(14.8)	171(74.7)	4.61 *(.77)*
5. Do you feel you can talk freely to him about feelings, concerns or problems related to breast cancer?	5(2.2)	11(14.8)	24(10.5)	51(22.3)	138(60.3)	4.34 *(.99)*
6. Have you and your spouse talked about the worries and the concerns breast cancer causes to both of you?	22(9.6)	12(5.3)	49(21.5)	70(30.7)	75(32.9)	3.72 *(1.25)*

Note. Questions are shortened for parsimony (see Appendix 1 for full scale). Items 1, 3, and 4 in italics are already reversed scored.

Analysis 2: Factorial Analysis

The factorability of the 6 CCC scale items was examined. Several well-recognised criteria for the factorability of a correlation matrix were used (Thompson, 2004; Howard & Gordon, 1963). First, all 6 items correlated .3 or higher with at least one other item, suggesting reasonable factorability. Second, the Kaiser-Meyer-Olkin measure of sampling adequacy was .64, above the recommended value of .6, and Bartlett's test of sphericity was significant ($\chi^2_{(15)}$ = 159.21, $p < .001$). Finally, the communalities were all above .4 further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was conducted with all 6 items. Exploratory factor analysis, using principal axis factoring as an extraction method with an oblique rotation, was used. Based on the initial eigen values in

combination with the 'leveling off' of data points on the scree plot, a two factor solution was retained, accounting for 54% of the variance. A parallel analysis conducted on the raw data supported this two factor solution, as only two factors were above the 95th percentile.

The first factor, avoidance of communication accounted for 34.97% of the variance and was comprised of 3 items: :« *Did you happen to feel you needed to talk about your breast cancer surgery and no one was there to listen to you?; When your spouse wanted to discuss this subject with you, did you feel you tended to change the subject and talked about something else?; and When you wanted to discuss this subject with him, did you feel he tended to change the subject and talked about something else?*» The second factor, openness to communication, accounted for the remaining 19.19% of the variance and was comprised of the remaining 3 items: « *Have you and your spouse discussed your recent visits to the doctor?; Do you feel you can talk freely to him about feelings, concerns or problems related to breast cancer?; and Have you and your spouse talked about the worries and the concerns breast cancer causes to both of you?*». The factor loading matrix for this final solution is presented in Table 3.

Table 3.

Factor loadings and communalities based on principal axis factoring of the 6- item Couples' Cancer Communication scale (N = 229)

Item	Factor loadings	Communality
Factor 1		
… no one was there to listen to you?	-.38	.14
… you tended to change the subject?	-.39	.19
… your spouse tended to change the subject?	-.76	.55
Factor 2		
… discussed your recent visits to the doctor?	.42	.25
…you can talk freely about breast cancer?	.38	.33
… talked about worries/concerns breast cancer causes both of you?	.87	.66

Analysis 3: Validity

Convergent validity. The CCC scale was expected to significantly correlate with measures of related construct. General communication and illness-specific communication are thought to be highly correlated. In this sample, as illness-related communication increased so did general communication, as measured by the PCI ($r = .54$, $p < .01$ for patients, and $r = .55$, $p < .01$ for partners; see Table 4.) The moderate correlations between illness specific communication and general communication are evidence for convergent validity.

The CCC scale has several associations in common with the well-known *Primary Communication Inventory* scale (PCI). The CCC scale is related to depression symptoms in both females and males ($r = -.19$, $p < .05$; $r = -.41$, $p < .01$ respectively) while the PCI is related to depression symptoms in females only ($r = -.27$, $p < .01$). In contrast, the CCC is related to the *Impact of Event Scale* (IES) in males only ($r = -.21$, $p < .05$) while this is true in females only for the PCI ($r = -.26$, $p < .01$). Both the CCC scale and the PCI have a good association with marital adjustment in females ($r = .49$, $p < .01$; $r = .71$, $p < .01$ respectively) and males ($r = .59$, $p < .01$; $r = .63$, $p < .01$ respectively). Finally, neither the CCC scale nor the PCI has a significant relationship with social desirability (see table 4).

Table 4.

Correlation matrix between scales for both patients (bold font) and partners (regular font)

	CCC	PCI	Age	Educ.	Union	CESD	IES	Intru	Avoid	MAT	SD
CCC		**.54****	**-.13**	**.18***	**-.18**	**-.19***	**-.04**	**.06**	**-.13**	**.49****	**.12**
PCI	.55**		**-.04**	**.04**	**-.17**	**-.27****	**-.17**	**-.03**	**-.26****	**.71****	**.13**
Age	-.05	-.07		**.04**	**-.11**	**.00**	**.02**	**.02**	**.01**	**.08**	**-.02**
Educ.	.14	.03	.06		**-.15**	**-.05**	**-.02**	**.01**	**-.05**	**-.01**	**-.33****
Union	-.08	-.18	.03	-.05		**.02**	**-.08**	**-.18***	**.04**	**-.14**	**.15**
CESD	-.41**	-.14	-.10	-.19*	.01		**.59****	**.61****	**.41****	**-.18**	**-.27****
IES	-.21*	-.05	-.12	-.17	-.03	.59**		**.87****	**.87****	**-.16**	**-.02**
Intru	-.11	.05	-.14	-.09	-.05	.61**	.87**		**.51****	**-.05**	**-.03**
Avoid	-.27**	-.13	-.08	-.21*	-.00	.41**	.87**	.51		**-.22****	**-.01**
MAT	.59**	.63**	-.12	-.06	-.07	-.18	-.16	-.05	-.22*		**.18**
SD	.17	-.01	-.05	-.03	.06	-.27**	-.02	-.03	-.01	.18	

Note. CCC = *Couple Cancer Communication*; PCI = *Primary Communication Inventory*; Educ. = Education level; CESD = *Centre for Epidemiologic Studies Depression Scale*; IES= *Impact of Event Scale;* Intru = *Intrusion subscale*; Avoid = *Avoidance subscale*; MAT = *Marital Adjustment Test*; SD = Social Desirability.
** $p < .01$ (2-tailed); * $p < .05$ (2-tailed).

Predictive validity. Prior to conducting the regressions, the continuous data were analyzed for the presence of normality, homoscedasticity, linearity, and multicollinearity. Given the strong association between the CCC and PCI scales, multicollinearity was expected. However, all the variance inflation factors (VIF) were less than 1.5 and the collinearity tolerances were all greater than 0.7. Therefore, all assumptions were met. Two 2-stage hierarchical regressions were conducted to test whether illness-specific communication could predict depression symptoms and marital adjustment (separately) above and beyond what can be predicted by general communication.

In both models (first model conducted with CES-D as dependant variable and second model conducted with MAT as dependant variable), the general communication variable (PCI) was entered at stage one, and illness-specific communication (CCC) at stage two. Intercorrelations between the multiple regression variables were reported in Table 4 and the regression statistics in Table 5 and Table 6.

The hierarchical regression, using the CES-D scale as the dependant variable, revealed that at stage one, general communication contributed significantly to the regression model ($F_{(1, 215)} = 7.44$, $p < .01$) and accounted for 3.3% of the variation in depression symptoms. Finally, the addition of illness-specific communication to the regression model explained an additional 2.9% of the variation of depression symptoms and this change in R^2 was also significant ($F_{(1, 214)} = 7.13$, $p < .01$). When both independent variables were included in stage 2 of the regression model, general communication was no longer a significant predictor of depression symptomology. Together the two independent variables accounted for 6.2% of the variance (See Table 6).

Table 5.

Summary of hierarchical regression analysis for variables predicting depression

Variables	β	*t*	*R*	R^2	Δr^2
	Depression				
Step 1					
General Communication	-.18	-2.73*	.18	.03	.03
Step 2					
General Communication	-.07	-.91			
Illness-specific Communication	-.17	-2.57*	.25	.06	.03

Note. * $p < .01$

The second hierarchical regression, using marital adjustment as the dependent variable, revealed that at stage one, general communication contributed significantly to the regression model ($F_{(1, 219)} = 167.54$, $p < .01$) and accounted for 43.3% of the variation in marital adjustment. The addition of illness-specific communication to the regression model at stage two explained an additional 3.2% of the variation of marital adjustment and this change in R^2 was also significant ($F_{(3, 216)} = 67.24$, $p < .01$). When both independent variables were included in stage 2 of the regression model, all variables were predictive of marital adjustment. Together the two independent variables accounted for 46.5% of the variance (see Table 7).

Table 6.

Summary of hierarchical regression analysis for variables predicting marital adjustment

Variables	β	*t*	*R*	R^2	Δr^2
	Marital Adjustment				
Step 1					
General Communication	.66	12.94*	.66	.43	.43
Step 2					
General Communication	.54	9.10*			
Illness-specific Communication	.21	3.58*	.68	.47	.031

Note. * $p < .01$

Discussion

Breast cancer is a life-threatening disease that affects 11% of the Canadian population, with even lower survival rates. The diagnosis and treatment of breast cancer is very stressful and can have an adverse effect on interpersonal relationships. There is evidence demonstrating an association between couples' quality of cancer communication and patients' distress levels, and prognosis (Hagedoorn *et al.,* 2008; Manne *et al.,* 2004). Although adjustment to a life-threatening disease is an on-going process, it is important to understand the factors that influence couple illness-related communication. Thus the present study aimed to validate the *Couple Cancer Communication Scale* (CCC) with known and reliable scales.

The CCC is a short 6-item scale which investigates communication in couples where the woman is suffering from breast cancer. The questions are related to the frequency of discussion about doctor visits, preoccupations and feelings elicited by breast cancer, and the ease with which both the patient and the partner feel they can talk to each other about the worries breast cancer instigate in both of them. Like the well-known 5-item *Quality of Life Index* (Spitzer, Dobson, & Hall, 1981) and the 5-item *Satisfaction with Life Scale* (Diener,Emmons, Larsen, & Griffin, 1985), this short measure reduces response burden on patients and their partners.

The current study provides evidence that the CCC has good psychometric properties – it demonstrated good convergent and predictive validity, however, the modest, but acceptable reliability coefficient also indicates that results obtained should be interpreted with care. If the number of items of this short scale was expanded to increase the variance accounted for, especially in depression scores, this would add power to the current findings.

Breast cancer patients and their spouses reported a high frequency of illness-related communication. The CCC scores observed in the present study are not surprising considering

the situation these patients were facing at the time of testing. Testing was done 1-month post-surgery, and in the face of a life threatening disease such as breast cancer, it is expected that patients would communicate more with their partners about possible outcomes with their partners. Furthermore, there was no difference between patients and their partners on illness-related communication, a finding that is not surprising given the interrelated and reciprocal nature of couples who have been together for a long time. Several studies have described breast cancer as an illness of the couple and should be studied as such (Lewis, 2010, 2009; Lewis, Fletcher, Cochraine & Fann, 2008). Skerrett's (1998) research on couple adaptation to breast cancer demonstrated that optimal couple functioning depended on the couple's ability to define the experience as "our problem". Although some issues are certainly heightened for the patient, particularly around diagnosis and early stages of treatment, the spouse shares many of the same illness dilemmas. Dorros, Card, Segrin, & Badger (2010) argued for an interindividual model of distress in breast cancer patients. Researchers found that interdependence in dyads living with breast cancer accounted for patient-partner crossover effects in distress outcomes.

Given that the data are based on self-report, responses may be subject to desirability response bias, in which participants answer in the way they think the interviewer would prefer (Ramirez, Saurez, Laufman, Barroso, & Chalela, 2000). Some researchers theorized that people may distort reality and present a better picture than what the situation is in actuality, in an effort to convince themselves and others that they are handling a crisis well (Crowne & Marlow, 1960; Edwards, 1957). A previous study conducted by Roberts *et al.* (1994) found that social desirability moderated the association between social support and distress in cancer patients. This tendency to describe oneself in a favorable light may serve as a buffering system, to shield

the patient. However, the bias of responding in a socially desirable manner did not affect the scores obtained on the self-report measures.

Evidence for the convergent validity of the CCC scale was examined with the PCI. It was expected that illness-specific communication (CCC) would be correlated with general communication (PCI). For both patients and their partners, the two scales correlated significantly. The better a couple's general communication, the better their illness-related communication was.

The CCC scale demonstrated good predictive validity. It was able to predict both depression and marital adjustment scores above and beyond general communication (PCI). This lends evidence towards illness-specific communication being, if not unique, at least a distinctive subcategory of general communication. Couples, who are facing a life-threatening disease, undergo unique stressors and must continuously cope with numerous challenges that other couples never have to endure and adapt to.

These findings are consistent with those found by Normand et al. (2004) and further complement their findings. Normand *et al.* (2004) had initially studied cancer related communication and depressive symptoms in breast cancer couples. The researchers found that cancer related communication was negatively correlated to depressive symptoms for both patients and partners. The current study was able to validate the CCC scale used in Normand et al. (2004) study and provide evidence that couple illness-specific communication represents an important and separate sub-division of communication than general communication.

Finally, the CCC scale met all of the assumptions for factorability. Exploratory factor analysis using principal axis factoring with an oblique rotation, revealed a two factor solution which explained 54% of the variance. The first factor, lack of communication accounted for 35%

of the variance, while the second factor, openness to communication, accounted for 19% of the variance. This two factor solution was further supported by a parallel analysis and a random split-half of the data to confirm this factor solution.

Strengths and Limitations

Strengths of this study included the back translation method that was used to translate the scale from French to English and has been recommended by Brislin(1970) and by Chapman & Carter (1979). Furthermore, the items in this short scale were derived from a patient perspective and are formulated in words used by patients. As there is an inherent difficulty involved in studying a "real-world" population of medical patients who are dealing with fatigue, side effects, ongoing psychological adjustment and assorted life stressors, brief measures have been advocated in the literature as tools for screening distress in chronic illnesses (Gessler et al., 2008; Mitchell, 2007; Cohen et al., 2002). Similar to the well-known 5-item *Quality of Life Index* (Spitzer et al., 1981) and the 5-item *Satisfaction with Life Scale* (Diener et al., 1985), the present short scale would be useful to reduce psychological burden of patients suffering from breast cancer.

A number of limitations warrant consideration. As in all studies, possible measurement error must be considered. Although Podsakoff, Mackenzie, Lee, & Podsakoff (2003) are concerned with common method variance, particularly when all questionnaires are administered in one session, others caution towards this potential problem (Conway & Lance, 2010; Lance & Vandenberg, 2009; Spector, 2006). This is not to say that common method biases are never a problem, however, proper evidence was provided demonstrating good validity, minimizing this issue.

The illness communication scores were rather high. From a psychometric point of view, this low response dispersion could be problematic as it points to a potential selection bias. But this result is not surprising, given that patients and their partners were married on average for 25 years, thus allowing them to develop better communication skills. In addition, it is unclear if the observed differences between patients and partners were due to gender, gender roles or both; gender differences were completely confounded with role differences as all patients were female and all partners were male. Future research could be conducted with men who suffer from prostate cancer. In this case, gender/patient/caregiver roles would be reversed. Finally, the current sample consisted of heterosexual couples exclusively. Future research could examine the extent to which the CCC generalizes to single-sex couples.

Clinical Implications

Following a breast cancer diagnosis, female patients are faced with numerous challenges, both physical and psychological. Various forms of support are available to these patients, but seldom are better than spousal support (Weihs, Enright, Howe, & Simmens, 1999; Cutrona, 1996). Therefore, communication during a life-threatening disease with a spouse is an important factor for illness adjustment and reducing psychological distress. Obtaining preliminary information about couples' communication about cancer could potentially reduce depression symptoms. In other words, couples who report mutual disclosure about the illness would demonstrate better marital and psychological adjustments. Efforts to help these patients should include interventions that concentrate on the marital dyad and mutual disclosure, particularly to overcome the tendency to avoid communication in this life-threatening situation. Counselors could be able to identify the frequency with which illness related topics are discussed, and further explore barriers to illness communication in the couple.

Future Directions

Interpreting results from the CCC scale should be conducted with caution, incorporating other sources of information to confirm or refute results. Given the evolving nature of any scale development, future refinements are recommended to enhance the reliability and validity of this instrument. Prospective studies should be conducted by resubmitting the CCC scale to a new sample population, followed by a confirmatory factor analysis in order to test the generalizability of the instrument, and to confirm the stability of the emergent factors. A portion of the sample should also be administered a second version of the scale to examine the test-retest reliability. In future studies it may also be interesting to administer the CCC scale with prostate cancer patients and their partners to address the confounding differences between gender and gender-roles.

Conclusion

In conclusion, the CCC is a short, easy to administer scale that could be easily adapted to routine care. The findings of this study contribute new knowledge to the extant literature. A diagnosis of breast cancer powerfully challenges a couple's relationship. The very meaning of a couple's relationship is thus redefined and affected by each member's capacity to communicate their concerns and worries. The data presented here suggests that illness-related communication as measured with the CCC scale is a small but significant predictor of depression and marital adjustment, and ultimately adjustment to breast cancer. This scale is useful considering previous research has demonstrated a link between distress levels in patients and their partners' willingness to discuss the illness, how often they do so, and how their worries concerning breast cancer affects both of them (Manne *et al.,* 2006; Manne, 1999). These results provide support for the importance of couple illness-related communication in breast cancer patients. Counselors who assist breast cancer patients adjust to the illness must address the issue of illness-related

discussions with their partners to improve patients' and partners' illness communication skills and help reduce the stress associated with breast cancer.

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Appendix 1
Couple Cancer Communication Scale

Couple Cancer Communication Scale

THE ANSWERS TO THE FOLLOWING QUESTIONS RANGE FROM:

1	2	3	4	5
NEVER	**RARELY**	**SOMETIMES**	**OFTEN**	**VERY OFTEN**

Did you happen to feel you needed to talk about your breast cancer surgery and no one was there to listen to you?	1	2	3	4	5
Have you and your spouse discussed your recent visits to the doctor?	1	2	3	4	5
When your spouse wanted to discuss this subject with you, did you feel you tended to change the subject and talked about something else?	1	2	3	4	5
When you wanted to discuss this subject with him, did you feel he tended to change the subject and talked about something else?	1	2	3	4	5
Do you feel you can talk freely to him about feelings, concerns or problems related to breast cancer?	1	2	3	4	5
Have you and your spouse talked about the worries and the concerns breast cancer causes to both of you?	1	2	3	4	5

APPENDIX 2
ENTIRE QUESTIONNAIRE

JEWISH GENERAL HOSPITAL - SMBD
COMMUNICATION AND QUALITY OF LIFE IN BREAST CANCER COUPLES

Name of interviewer :..... ID# : .....

A1 Date questionnaire is filled: ....
year month day

A2 Date of Birth: ....
year month day

A3 Place of birth: (non au Fup2) ....
City Country

A4 Place of birth of parents:(non au Fup1-2) ....
Mother Father

A5 **IF YOU ARE NOT BORN IN CANADA,** in what year did you immigrate here ?
19.....

A6 Mother tongue:
1 ⑥ English 2 ⑥ French 3 ⑥ Other
.....(specify)

A8 Marital Status:
1 ⑥ Single 3 ⑥ Divorced 4 ⑥ Separated
2 ⑥ Married / Living with a companion 5 ⑥ Widowed

IF YOU ARE PRESENTLY MARRIED / LIVING WITH A COMPANION
A9 How long have you been married or living together ? ..... years

(FUP2) IF YOU ARE DIVORCED/SEPARATED/WIDOWED SINCE THE LAST INTERVIEW
A9 Since when are you divorced, separated or widowed ? .....
months

A10 How many children do you have ? 0 1 2 3 4 5 6 & more

IF YOU HAVE HAD CHILDREN
A11 Age of youngest child ? ..... years old
A12 Age of oldest child ? ..... years old

A13 How many years of formal education did you have ? .....
A14 Please list your educational degrees or diplomas:
.....

A15 What is your CURRENT occupational status ?

1 ⑥ working full-time 3 ⑥ housewife 5 ⑥ retired 7 ⑥ on sick leave
2 ⑥ working part-time 4 ⑥ student 6 ⑥ unemployed

IF YOU EVER HAVE HAD A PAYING JOB

A16 What is/ What was your occupation ? (please be specific and describe your functions)

.....

A17 If you are **UNEMPLOYED OR ON SICK LEAVE**

indicate since when : ⑥ surgery **OR**

.....

weeks / months / years

THE FOLLOWING QUESTIONS DEAL WITH WAYS OF COMMUNICATING

C1 How would you rate the overall communication with your spouse/partner? Would you say

1⑥ excellent 2⑥ very good 3⑥ good 4⑥ fair 5⑥ poor

C2 How satisfied are you with the overall quality of your communication with him?

1⑥ not satisfied at all 2⑥ a little satisfied 3⑥ quite satisfied 4⑥ very satisfied

C3 On a scale of 0 to 10, 10 being excellent, how would you rate the overall quality of your communication with him?

0 1 2 3 4 5 6 7 8 9 10=excellent

C4 Are there some persons you can talk to if you are worried about your health and need support?

0⑥ no 1⑥ Yes.

C5 **IF YES** Please give the persons' initials and their relationships to you:

A⑥ .... D⑥ .... G⑥ .....

.....

B⑥ .... E⑥ .... H⑥ .....

.....

C⑥ .... F⑥ .... I ⑥ .....

.....

C6 How satisfied are you with their help? Would you say

1⑥ not satisfied at all 2⑥ a little satisfied 3⑥ quite satisfied 4⑥ very satisfied

THE ANSWERS TO THE FOLLOWING QUESTIONS RANGE FROM
Never (1), Rarely (2), Sometimes (3), Often (4) to Very often (5).

C7	How often do you and your spouse talk over pleasant things that happen during the day?	1	2	3	4	5
C8	How often do you and your spouse talk over unpleasant things that happen during the day?	1	2	3	4	5
C9	Do you and your spouse talk over things you disagree about or have difficulties about?	1	2	3	4	5
C10	Do you and your spouse talk about things in which you are both interested?	1	2	3	4	5
C11	Does your spouse adjust what he says and how he says it to the way you seem to feel at the moment ?	1	2	3	4	5
C12	When you start to ask a question, does your spouse know what it is before you ask it?	1	2	3	4	5
C13	Do you know the feelings of your spouse from his facial or bodily gesture ?	1	2	3	4	5
C14	Do you and your spouse avoid certain subjects in conversation?	1	2	3	4	5
C15	Does your spouse explain or express himself to you through a glance or gesture?	1	2	3	4	5
C16	Do you and your spouse discuss things together before making an important decision?	1	2	3	4	5
C17	Can your spouse tell what kind of day you have had without asking?	1	2	3	4	5
C18	Your spouse wants to visit some close friends or relatives. You don't particulary enjoy their company. Would you tell him this?	1	2	3	4	5
C19	Does your spouse discuss matters of sex with you?	1	2	3	4	5
C20	Do you and your spouse use words which have a special meaning not understood by outsiders?	1	2	3	4	5
C21	How often does your spouse sulk or pout?	1	2	3	4	5
C22	Can you and your spouse discuss most sacred, most important beliefs without feelings of restraint or embarrassment?	1	2	3	4	5
C23	Do you avoid telling your spouse things which put you in a bad light?	1	2	3	4	5

C24	You and your spouse are visiting friends. Something is said by the friends that causes you to glance at each other. Would you understand each other?	1	2	3	4	5
C25	How often can you tell as much from the tone of voice of your spouse as from what he actually says?	1	2	3	4	5
C26	How often do you and your spouse talk with each other about personal problems?	1	2	3	4	5
C27	Do you feel that in most matters your spouse knows what you are trying to say ?	1	2	3	4	5
C28	Would you rather talk about intimate matters with your spouse than with some other person?	1	2	3	4	5
C29	Do you understand the meaning of your spouse's facial expression?	1	2	3	4	5
C30	If you and your spouse are visiting friends or relatives and one of you starts to say something, does the other take over the conversation without the feeling he is interrupting?	1	2	3	4	5
C31	In general, do you and your spouse talk most things over together?	1	2	3	4	5
C32	Did you happen to feel you needed to talk about your breast cancer surgery and no one was there to listen to you?	1	2	3	4	5
C33	Have you and your spouse discussed your recent visits to the doctor?	1	2	3	4	5
C34	When your spouse wanted to discuss this subject with you, did you feel you tended to change the subject and talked about something else?	1	2	3	4	5
C35	When you wanted to discuss this subject with him, did you feel he tended to change the subject and talked about something else?	1	2	3	4	5
C36	Do you feel you can talk freely to him about feelings, concerns or problems related to breast cancer?	1	2	3	4	5
C37	Have you and your spouse talked about the worries and the concerns breast cancer causes to both of you?	1	2	3	4	5

IF YOU HAVE DISCUSSED THESE WORRIES OR CONCERNS **SOMETIMES**, **RARELY OR NEVER,** WAS IT BECAUSE						
C38	... you were too anxious or too fearful	1	2	3	4	5
C39	... you did not want to overstress him?	1	2	3	4	5
C40	... he was too busy with other things	1	2	3	4	5
C41	... you tend to keep things inside	1	2	3	4	5
C42	... this problem is yours only	1	2	3	4	5
C43	... he would not let you	1	2	3	4	5

DURING THE PAST WEEK, HOW OFTEN DID YOU EXPERIENCE THE FOLLOWING ITEMS?
The answers go from NEVER (1), RARELY (2), OFTEN (3) to VERY OFTEN (4).

G1	**DURING THE PAST WEEK**, did you have trouble remembering things?	1	2	3	4
G2	...did you have your mind go blank?	1	2	3	4
G3	...did you feel nervous or shaky inside?	1	2	3	4
G4	...did you feel tense or keyed up?	1	2	3	4
G5	...did you feel fearful or afraid?	1	2	3	4
G6	...did you feel lonely?	1	2	3	4
G7	...did you feel bored or have little interest in things?	1	2	3	4
G8	...did you cry easily or feel like crying?	1	2	3	4
G9	...did you feel downhearted or blue?	1	2	3	4
G10	...did you feel hopeless about the future?	1	2	3	4
G11	...did you lose your temper?	1	2	3	4
G12	...did you feel easily annoyed or irritated?	1	2	3	4
G13	...did you feel critical of others?	1	2	3	4
G14	...did you get angry over things that are not too important?	1	2	3	4

THE FOLLOWING QUESTIONS ARE ABOUT WAYS YOU MIGHT HAVE FELT OR BEHAVED
DURING THE PAST WEEK

The answers go from Never, rarely or less than 1 Day (1), Sometimes or 1-2 Days (2), Moderately or 3-4 Days (3) and Most of the time or 5-7 Days (4).

		Never, rarely less 1 Day 1	Sometimes 1-2 Days 2	Moderately 3-4 Days 3	Most of the time 5-7 Days 4
G15	**DURING THE PAST WEEK**, I was bothered by things that usually don't bother me			1	2 3 4
G16	...I did not feel like eating: my appetite was poor			1	2 3 4
G17	...I felt that I could not shake off the blues, even with help from my family or friends			1	2 3 4
G18	...I felt that I was just as good as other people			1	2 3 4
G19	...I had trouble keeping my mind on what I was doing			1	2 3 4
G20	DURING THE PAST WEEK, I felt depressed			1	2 3 4
G21	...I felt that everything I did was an effort			1	2 3 4
G22	...I felt hopeful about the future			1	2 3 4
G23	...I thought my life had been a failure			1	2 3 4
G24	...I felt fearful			1	2 3 4
G25	...my sleep was restless			1	2 3 4
G26	...I was happy			1	2 3 4
G27	...I talked less than usual			1	2 3 4
G28	...I felt lonely			1	2 3 4
G29	...people were unfriendly			1	2 3 4
G30	...I enjoyed life			1	2 3 4
G31	...I had crying spells			1	2 3 4
G32	...I felt sad			1	2 3 4

G33 ...I felt that people disliked me 1 2 3 4

G34 ...I could not get "going" 1 2 3 4

G35 Have you EVER wished you were not living anymore?

1⑥ never 2⑥ once 3⑥ twice 4⑥ a few times 5⑥ many times

G36 Have you EVER thought seriously about committing suicide, about ending your life?

1⑥ never 2⑥ once 3⑥ twice 4⑥ a few times 5⑥ many times

IF THE IDEA OF ENDING YOUR LIFE EVER ENTERED YOUR MIND

G37 When was the last time this idea happened to you ?

1⑥ less than 1 week ago 3⑥ 2 - 5 months ago 5⑥ more than 1 year ago

2⑥ less than 1 month ago 4⑥ 6-12 months ago 6⑥ more than 10 years ago

G38 Have you ever made a suicide attempt? 0⑥ No 1⑥ Yes

G38 **IF YES** Did it happen within the last year? 1⑥ No 2⑥ Yes

NOW SOME ITEMS ABOUT YOUR THOUGHTS ON CANCER, BREAST SURGERY, RADIOTHERAPY OR CHEMOTHERAPY TREATMENTS.

NOW SOME ITEMS ABOUT YOUR THOUGHTS ABOUT THIS LUMP IN YOUR BREAST

HOW FREQUENTLY WAS EACH STATEMENT TRUE FOR YOU, *DURING THE PAST SEVEN DAYS*, **The answers go from NOT AT ALL (1), RARELY (2), SOMETIMES (3) to OFTEN (4).**

		Not at all 1	Rarely 2	Sometimes 3	Often 4
H1	**DURING THE PAST SEVEN DAYS**, I thought about it when I didn't mean to (cancer, surgery, radio or chemotherapy)	1	2	3	4
H2	...I avoided letting myself get upset when I thought about it or was reminded of it.	1	2	3	4
H3	...I tried to remove it from memory	1	2	3	4
H4	...I had trouble falling asleep, because of pictures or thoughts about it that came into my mind	1	2	3	4
H5	...I had waves of strong feelings about it.	1	2	3	4
H6	...I had dreams about it.	1	2	3	4

H7	...I stayed away from reminders of it.	1	2	3	4
H8	...I felt as if it hadn't happened or it wasn't real.	1	2	3	4
H9	...I tried not to talk about it.	1	2	3	4
H10	...pictures about it popped into my mind.	1	2	3	4
H11	...other things kept making me think about it.	1	2	3	4
H12	...I was aware that I still had a lot of feelings about it, but I didn't deal with them	1	2	3	4
H13	...I tried not to think about it.	1	2	3	4
H14	...any reminder brought back feelings about it.	1	2	3	4
H15	...my feelings about it were kind of numb.	1	2	3	4

NOW SOME QUESTIONS ABOUT YOUR RELATIONSHIP WITH YOUR SPOUSE OR PARTNER

The following scale represents the degree of happiness in a relationship or a marriage. The middle point "happy" (4) represents the degree of happiness which most people experience. The scale ranges from those few who experience extreme joy (7) to those few who are very unhappy (1).

K1 Please circle the number which describes best your degree of happiness in your marriage/relation.

1	2	3	4	5	6	7
very unhappy			happy			perfectly happy

K1A Since your breast lump, has the degree of happiness in your relationship changed?

1⑥ decreased a lot 3⑥ did not change 4⑥ increased somewhat
2⑥ decreased somewhat 6⑥ increased a lot

K2 Did you ever wish you had not married or were not cohabiting with your spouse/partner?

1⑥ never 2⑥ rarely 3⑥ occasionally
4⑥ frequently

K3 If you had your life to live over, would you marry or cohabit with ?

1⑥ the same person 2⑥ a different person 3⑥ not marry or cohabit at all

K4 Do you confide in your spouse/partner ?

1⑥ never 2⑥ rarely 3⑥ occasionally 4⑥ frequently

K5 When disagreements with your spouse/partner arise, they usually result in:
1⑥ him giving in 2⑥ you giving in 3⑥ mutual give and take 4⑥ neither giving in

K6 How many outside activities or interests do you and your spouse/partner engage in together ?
1⑥ all of them 2⑥ some of them 3⑥ few
4⑥ none

WHAT IS THE APPROXIMATE DEGREE OF AGREEMENT OR DISAGREEMENT BETWEEN YOU AND YOUR SPOUSE/PARTNER ON THE FOLLOWING ISSUES

	AGREE ALWAYS	AGREE FREQUENTLY	AGREE DISAGREE AT TIMES	DISAGREE FREQUENTLY	DISAGREE ALWAYS
K7 Handling of family finances	1	2	3	4	5
K8 Matters of recreation	1	2	3	4	5
K9 Demonstration of affection	1	2	3	4	5
K10 Choice of friends	1	2	3	4	5
K11 Sexual relations	1	2	3	4	5
K12 Ways of dealing with in-laws	1	2	3	4	5
K13 Conventions, social behaviors	1	2	3	4	5
K14 Goals, things important in life	1	2	3	4	5

AND NOW THE LAST QUESTIONS OF THE QUESTIONNAIRE,

		TRUE	FALSE
N1	It is SOMETIMES hard for me to go on with my work if I am not encouraged	1	2
N2	I SOMETIMES feel resentful when I don't get my way	1	2
N3	On a FEW OCCASIONS, I have given up doing something because I thought too little of my ability	1	2
N4	There have been TIMES when I felt like rebelling against people in authority, even though I knew they were right	1	2
N5	No matter who I am talking to, I'm ALWAYS a good listener	1	2
N6	There have been OCCASIONS when I took advantage of someone	1	2
N7	I'm ALWAYS willing to admit it when I make a mistake	1	2

N8	I SOMETIMES try to get even rather then forgive and forget	1	2
N9	I am ALWAYS courteous, even to people who are disagreable	1	2
N10	I have NEVER been irked when people expressed ideas very different from from my own	1	2
N11	There have been TIMES when I was quite jealous of the good fortune of others	1	2
N12	I am SOMETIMES irritated by people who ask favors of me	1	2
N13	I have NEVER deliberately said something that hurt someone's feelings	1	2

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