A TASK ANALYSIS OF THERAPEUTIC ENGAGEMENT IN A PROFESSIONALLY FACILITATED ONLINE INTERVENTION FOR YOUNG COUPLES AFFECTED BY BREAST CANCER

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Abstract

Engagement in online intervention, defined as the extent to which participants are involved in and attentive to the contents of the intervention, has been shown to predict treatment outcome. However, research has found that participants' engagement and completion rates in online interventions are often quite low. Because professional facilitation has been shown to increase intervention participation and effectiveness, the therapeutic alliance that develops between facilitators and participants might be one factor that influences engagement. Thus, in this study a modified task analysis was conducted in order to examine how facilitators develop a therapeutic alliance with participants to increase engagement in an online intervention for couples affected by breast cancer, called *Couplelinks*. Task analysis involves a process of combining rational investigation and empirical observation to create a model of successful task performance, which in the present study is the promotion and maintenance of intervention engagement. In the present analysis, a rational model based on facilitators' experience was first created. Next, an empirical model was created by observing facilitators' communications with three engaged couples and three unengaged couples. The resulting synthesised model suggests that engagement promotion involves three meta-processes, designated as 'friendly and positive yet firm approach,' 'inclusive empathic attitude,' and 'humanizing the technology' (initially identified in the rational model), as well as various behavioural facilitator interventions, or 'techniques.' The latter facilitator techniques were observed in the empirical model, and fall into the following three broad categories, which represent the different interacting relationships in the intervention: 1) fostering the couple-facilitator bond; 2) fostering program adherence (i.e., fostering the couple-program bond); and 3) fostering the within-couple bond. Through the process of creating a composite measure of engagement, we also found that couples could be separated into couple 'engagement-

types' based on varying levels of engagement. The types were: 1) 'keen' couples; 2) 'compliant' couples; 3) 'apologetic' couples; and 4) 'straggling' couples. Implications of these findings are discussed, as well as limitations and suggestions for future research.

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Introduction

In Canada, the lifetime prevalence of cancer for women is 41 percent (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2014). Breast cancer (BC) is the most common, with 1 in 9 women expected to develop it over their lifespan (Canadian Cancer Society, 2014). In 2014, BC represented 26% of all new cancer cases in women (Canadian Cancer Society, 2014). Eighteen percent of all BC diagnoses are in women under the age of 50 and 4% of diagnoses are in women under age 40 (Breast Cancer in Canada, 2013).

Breast Cancer in Young Women

Although young women (usually defined in the literature as women < 50 years of age) are the minority in the BC population, they face significantly greater challenges than older women with BC (Avis, Crawford, & Manuel, 2004; Kroenke et al., 2004). Diagnostically, BC in younger women tends to be more aggressive and can move to advanced stages more quickly (Breast Cancer in Canada, 2013; Stamatakos et al., 2011). As a result of also not being routinely screened, women under the age of 50 often have a poorer 5-year prognosis and tend to receive more intensive treatment (Jankowska, 2013). Nonetheless, survival rates among these women are increasing, creating a larger group of young BC survivors whose needs must be addressed (Jankowska, 2013).

Psychosocially, young BC survivors tend to have poorer adjustment and a more compromised quality of life (e.g., Avis, Crawford, & Manuel, 2005; Wenzel et al., 1999). This outcome is due in part to their stage of life, during which many individuals tend to be highly productive (Jankowska, 2013). For example, these young women are often in the stage of life when they are building a family, career, and attaining numerous other aspirations, and then find these goals suddenly interrupted by the illness. Physical and psychosocial roadblocks related to

BC diagnosis and treatment include loss of fertility due to premature menopause (Thewes et al., 2005), interruptions to early stage careers (Ganz, Rowland, Desmond, Meyerowitz, & Wyatt, 1998), increased decline in sexual interest and engagement (Fobair et al., 2006, Kedde, van de Wiel, Schultz, & Wijsen, 2013), and worry about young children (Walsh, Manuel, & Avis, 2005). Furthermore, because many women at this developmental stage are in committed relationships or are married, many of the stressors associated with BC also apply to their life partners (Jankowska, 2013).

Breast Cancer and Young Couples

Both cancer patients and their partners experience levels of psychosocial distress at significantly higher rates than the general population (McClure, Nezu, Nezu, O'Hea, & McMahon, 2012; Hinnen et al., 2008). Moreover, there appears to be an interdependence between the distress of the patient and partner, where one partner's coping and adjustment influences the other partner, and vice-versa (Hagedoorn, Sanderman, Bolks, Tuinstra, & Coyne, 2008). In fact, breast cancer has been named a "we-disease" because both partners are so strongly affected by it in all aspects of their life together (Kayser, Watson, & Andrade, 2007).

Unfortunately, it has been reported that over one third of families do not cope well with the stress brought on by a cancer diagnosis (Manne, 1998). This finding is not surprising considering that cancer brings on countless hardships that task an entire family's capacity for adaptation, and sometimes results in change in life course altogether. Problems such as loss of fertility and sexual disinterest or dysfunction introduce an added source of potential tension for couples, who might benefit from guidance in working through those issues. In addition to the difficulties facing women with BC described above, partners of women with BC also have their own concerns including caring for and/or possibly losing their spouse to cancer; providing their

partner with adequate social support; worrying about a more uncertain future; dealing with financial setbacks; and coping with disruptions to their own careers and social lives as a result of the intrusion of cancer (Traa, De Vries, Bodenmann, & Den Oudsten, 2015). As with couple coping, partner- and patient-related stressors are often interconnected, and thus may interact in cumulative ways to create or perpetuate a cycle of distress within a BC-affected couple.

In fact, while spousal support and good dyadic coping, where a couple deals with a problem as a unit, have consistently been shown to positively affect women's adjustment to BC (e.g., Pistrang & Barker, 1998; Traa, De Vries, Bodenmann, & Den Oudsten, 2015), dysfunctional dyadic coping can harm relationship functioning and consequently reduce a woman's adjustment to BC (Traa et al., 2015). Younger couples appear to struggle more with dysfunctional dyadic coping. For example, research has shown that younger women with BC struggle more with communicating with their partners than do older women (Ganz et al., 1998). Some problematic topics for young couples include discussing what would happen in the event of the woman's death, fears related to cancer, financial arrangements, parental roles, and difficult feelings in general (Walsh et al., 2005). In the same study, while the majority of couples (75%) reported becoming closer as a result of BC, 12% of couples terminated the relationship post-diagnosis, which in most cases was initiated by the male partner. The main reason for separation, as stated by the women, was the male "partner's inability to cope" (Walsh et al., 2005, p. 86). In the rarer cases where female partners ended the relationship, the most common reason cited was experiencing a lack of emotional support. Also of note are findings from a more recent study showing that young women with BC who were in relationships within which they felt unsupported by their partners experienced more anxiety symptoms than those who were in relationships where they felt supported (Borstelmann et al., 2015).

Another stressor with clear implications for relationships is impaired sexual functioning after diagnosis. Sexual dysfunction and/or distress is a common consequence of BC treatment due to sudden onset of menopause and associated loss of libido, vaginal dryness, and painful intercourse (Fobair et al., 2006), as well as a decrease in sexual contact and satisfaction and an increase in guilt and stress related to sex (Kedde et al., 2013). Further relationship stressors include the need to renegotiate family roles and responsibilities (Hilton, Crawford, & Tarko, 2000), and feelings of inequity between partners based on one member primarily giving, and the other primarily receiving, care (Cutrona, 1996; Thompson & Pitts 1992). In the event of infertility, younger couples also have to cope with the loss of goals related to starting or expanding their families (Fitzgerald & Fergus, 2006). In addition, it is possible that younger couples that have been together for a shorter period of time may not have developed as strong or resilient a foundation as couples that have been together for longer (Skerrett, 1998).

The support of the male partner has been shown to enhance women's coping in several contexts. For instance, women who perceived greater emotional support such as empathy and listening, and greater instrumental or tangible support such as assuming the ill partner's chores, from their partners experienced less sexual difficulties post-surgery and greater relationship satisfaction in general (Kinsinger, Laurenceau, Carver, & Antoni, 2011). Indeed, women with BC who are in long-term relationships report that their most important confidante is their partner (Figueiredo, Fries, & Ingram, 2004). In general, it has been shown that support from the partner can buffer the impact of typical relationship challenges faced by couples with cancer (Manne et al., 2004; Wimberly, Carver, Laurenceau, Harris, & Antoni, 2005). Emotional support is particularly important, as it has been consistently associated with better adjustment to cancer (Helgeson, 2003; Helgeson & Cohen, 1996; Sormanti & Kayser, 2000). Thus, evidence to date

supports the notion that the lives of individuals in committed relationships are intertwined to the point where the status of one's well-being, as well as the quality of the relationship, strongly affect all aspects of both partners' lives. As such, dyadic coping is essential for successful adjustment to cancer for both partners.

Face-to-Face Couple Interventions for Breast Cancer

Because spousal support and dyadic coping are so important to both partners' well-being, numerous face-to-face interventions have been developed for couples affected by cancer. Due to the large number of studies, the present review will draw on several recent meta-analyses conducted in this area in order to provide a more comprehensive picture of the overarching effectiveness of these face-to-face programs. Interventions for couples facing cancer have generally been based on existent couple therapy models for non-health related issues (Baik & Adams, 2011). The most common treatment modalities that have been adapted for cancer populations are Cognitive-Behavioural Couple Therapy (CBCT), which considers communication, conflict resolution, and problem-solving skills to be essential facets of proper relationship functioning (Jacobson & Gurman, 1986), and Emotion-Focused Couple Therapy (EFCT), which focuses on altering interpersonal patterns in order to facilitate partners in experiencing a secure attachment to each other (Johnson & Greenberg, 1995). For example, a CBCT intervention incorporating elements such as perspective-taking, cognitive restructuring, and behavioral exercises increased feelings of equity and overall relationship satisfaction, and decreased psychological distress in patients (Kuijer, Buunk, De Jong, Ybema, & Sanderman, 2004). Also, when compared to standard care, one EFCT-based intervention for advanced-stage cancer led to greater improvements in marital functioning and patients' experience of caregiver empathic care (McLean, Walton, Rodin, Esplen, & Jones, 2013).

A review of 14 couple-based psychosocial interventions for middle-aged and older couples where one spouse has cancer found that the programs did not differ much in content from non-health related interventions, except for including an educational component about cancer that addressed topics such as symptom management, change in sexual function, and fears of recurrence (Baik & Adams, 2011). Most of the interventions were based on one of two theoretical approaches: 1) dyadic theories from social psychology that emphasize the need to address the impact of cancer on both partners (e.g., attachment theory); or 2) individual clinical theories that focus on increasing cancer-related coping and stress management (e.g., stress-coping theory). The authors reported that all programs reviewed shared some similar or common ingredients, mainly "psychoeducation, discussion, exercise, coping skills training, and self-help" (Baik & Adams, 2011, p. 252), and that these interventions were carried out by professionals, most often at the couples' homes. One suggestion for improvement in future studies was for interventions to focus specifically on how life after cancer can change and will continue to change over time, and how partners' support for each other might need to adapt (Baik & Adams, 2011). While the review was not able to conclude which theoretical approach is best – due to the overly broad variation in theoretical bases, treatment approaches, and reported outcomes – they did find two important results: 1) "intervention methods aimed at improving communication, reciprocal understanding, and intimacy in the couple appeared to reduce illness-related distress in one or both partners and to improve dyadic adjustment;" and 2) sex therapy techniques were effective components of breast and prostate cancer interventions (Baik & Adams, 2011, p. 262). In terms of effectiveness, the review found that treatment effects were stronger for patients compared to their partners, and results did not appear to hold up over time (Baik & Adams,

2011). The authors concluded, however, that these interventions show promise and should be tested more rigorously, in the form of RCTs.

A subsequent review by Regan and colleagues (2012) examined the efficacy of 23 psychosocial interventions for couples affected by cancer in more depth. They found that these interventions led to a significant improvement in various psychosocial outcomes such as quality of life, coping skills, relationship functioning, and psychological distress, ranging in effect size from $d \sim 0.35$ to 0.45 (Regan et al., 2012). The interventions had the greatest success in improving couple communication and relationship functioning, and decreasing individual psychological distress (Regan et al., 2012). Another review of couple interventions for BC in particular by Brandão and colleagues (2014) noted that while the interventions they examined had a mostly positive outcome, the effect sizes had a very wide range, from $d = 0.02$ to 1.23. They attributed this finding to the interventions differing on several factors from number and length of sessions, to the training and qualifications of the people delivering the interventions, to the theoretical basis for the intervention. Thus, according to this review there is insufficient evidence to conclusively state what intervention characteristics contribute to couple intervention effectiveness.

A further challenge for face-to-face interventions is outlined in a review by Regan, Lambert, and Kelly (2013), who found that satisfactory levels of uptake (the percentage of eligible couples that end up participating) and attrition (the percentage of couples that drop out of a trial) of these programs were somewhat difficult to achieve. Across the 17 studies they reviewed, an average of 48.8% (45.3% in BC studies specifically) of the couples approached agreed to participate in the interventions, ranging from 13% to 94.1% (Regan, Lambert, & Kelly, 2013). Common barriers to participation were accessibility, competing priorities, and a later

stage of cancer. Attrition rates ranged from 0% to 49.4% (Regan et al., 2013). Specifically, uptake was low and attrition was high in interventions where the patient and partner had to participate simultaneously (Regan et al., 2013). An interesting finding was that uptake was slightly higher for coaching interventions over either individual (where partners completed parts of the intervention separately) or couple interventions (Regan et al., 2013), suggesting that having someone coach couples through an intervention may be helpful in overcoming logistical or motivational issues. Another discovery was that communication-based interventions had a slightly lower uptake, but also slightly lower rate of attrition than coping- and education-based interventions, indicating that while they possibly seem less desirable at the beginning, communication-based interventions were experienced as being beneficial over time (Regan et al., 2013).

While not all of the studies in this review outlined why people declined to participate or dropped out, those that did reported that the main reasons were a long travel distance to the intervention (42.3%) or being too busy to take part (13.2%)(Kayser et al., 2010). Overall, the review suggested that the subgroups most likely to benefit from such an intervention were also the least likely to complete it (Regan et al., 2013). Characteristics of couples who dropped out included patients with shorter disease-free periods, more symptoms and more uncertainty about the illness, and partners with lower reported relationship quality and less positive affect (Regan et al., 2013).

As suggested by Regan et al. (2012), the best way to attain greater uptake and completion of couple interventions might be to make use of the emerging advances in technology and the greater utilization of the Internet, as well as to determine what specific content best addresses the needs of couples facing cancer. In their analysis of face-to-face and telephone interventions, they

determined that face-to-face contact does not appear to be essential for positive intervention outcomes (Regan et al., 2012). Another meta-analysis of couple interventions for cancer suggested that "Creating interventions that can be easily and widely disseminated is critical to advancing this field and providing equal access. Emerging communication technologies (e.g., Internet, mobile health technologies, and social media) may allow for widespread dissemination" (Badr & Krebs, 2013, p. 1700).

Online Couple Interventions

Wider dissemination of couple interventions is likely to be particularly important for young women with BC, considering that they report having more unmet needs in relation to physical, informational, emotional, practical, and social support, after treatment than do older women (Burris, Armeson, & Sterba, 2015). Furthermore, although in-person couple therapy has been shown to reduce relationship distress, few couples seek it out due to reasons such as financial burden and difficulties with scheduling and/or getting to appointments (Cicila, Georgia, & Doss, 2014). Thus, researchers have turned to the Internet to provide interventions that are not limited by face-to-face constraints such as decreased privacy and accessibility, and greater scheduling and transportation issues (Cicila et al., 2014). Furthermore, web-based interventions may be more appealing to younger people because they tend to use the Internet the most (Statistics Canada, 2010). Notably, one study found that many cancer patients made use of the Internet to get information about the disease and its treatment, and that young age was related to greater Internet usage (van de Poll- Franse & van Eenbergen, 2008). Since this data was collected from 2002 to 2004 (van de Poll- Franse & van Eenbergen, 2008), it is likely that an even higher percentage of cancer patients now use the Internet to gather information and support than they did in previous years.

Most web-based interventions involve limited contact with a therapist, mainly through asynchronous e-mail communication (Newman, Erickson, Przeworski & Dzus, 2003). Although this approach has raised skepticism regarding efficacy, when compared to face-to-face therapies in the context of depression and anxiety, web-based interventions have comparable effect sizes (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). In terms of interest, a survey of 1,160 individuals found that people are most likely to consider using a relationship-based website to improve their relationship, followed secondly by face-to-face couple therapy (Georgia & Doss, 2013). Furthermore, partnered individuals who reported distress stated that they would like to have detailed reports of their relationship strengths and problem areas, as well as the ability to get questions answered by relationship experts and to have phone calls with these experts (Georgia & Doss, 2013). This finding suggests that professional facilitation is a key aspect of online interventions that would likely increase people's interest in participating.

More recently, researchers have turned their focus to developing web-based interventions for chronic diseases, including cancer. In a recent review of psychosocial interventions for cancer, 16 studies were identified, half of which targeted breast cancer patients (Bouma et al., in press). Program types included: 1) social support groups, 2) psychosocial and/or physical symptom therapy, and 3) mixed interventions targeting components such as information, support, communication, and coaching services (Bouma et al., in press). All but one of the programs had a facilitator who answered questions, moderated discussions in support groups, or led participants through the program. Quality of life, distress level, and perceived social support were common outcome measures, and nine out of the 16 studies reviewed showed improvements in these areas (Bouma et al., in press). Importantly, of the six studies that assessed social support, three of them (all assessing the Comprehensive Health Enhancement Support System, 'CHESS,'

which provides information, communication training, and coaching for cancer patients and their caregivers) found a positive effect (Bouma et al., in press). The authors concluded that "the majority of the included studies reported positive effects on patient-reported psychosocial and physical symptoms, regardless of the used program type" (Bouma et al., in press, p. 6), thus validating the importance of web-based interventions in the effort to provide easily accessible, reliable support for cancer patients.

Zulman and colleagues (2012) aimed to create a web-based program specific to dyads affected by cancer by adapting the nurse-delivered FOCUS (Family involvement, Optimistic attitude, Coping effectiveness, Uncertainty reduction, and Symptom management) program to an online platform. The program used a "dyadic interface" where nurses asked questions and facilitated discussions between the patients and their caregivers, who were most often their spouses, and provided feedback based on the pairs' responses (Zulman et al., 2012). The interface was designed to accommodate older users and those with limited computer knowledge with features such as large font size. Focus groups were utilized to assess website usability and showed that most participants regarded the program's content highly, citing better communication as a key gain. Even participants who indicated that they had limited experience with the Internet reported having no trouble using the website. One of the features that participants reported feeling somewhat frustrated by was the constraints set by the platform, such as when they had to select only three strengths for their partner (Zulman et al., 2012).

The work by Zulman and colleagues suggests that in-person interventions might be successfully adapted to the online context for fruitful use even with older patients and their caregivers, irrespective of Internet usage experience. A later study examined the feasibility of the online FOCUS intervention with 38 patient-caregiver dyads and found that the pairs experienced

a decrease in emotional distress and an increase in quality of life, and identified more benefits with respect to the illness or caregiving, such as increased family closeness (Northouse et al., 2014). Caregivers in particular experienced an increase in self-efficacy, but there was no change in communication within the dyads (Northouse et al., 2014). However, both of these studies included patients with various types of cancers such as lung, colorectal, breast, and prostate, and involved a range of family member caregivers. To the best of our knowledge, no couple-based online interventions for BC in particular existed prior to the development of *Couplelinks*.

Couplelinks

Given the previous research on effective online caregiver interventions in other settings, as well as the importance of spousal support, *Couplelinks* (Fergus et al., 2014) was created in order to meet the need for dyadic coping enhancement and support for BC in particular. Through the use of informational, experiential, and interactive components, *Couplelinks* aims to enrich couples' relationship bonds and, in turn, their ability to cope with BC. The theoretical basis for the intervention is Reid and Fergus's framework for couple therapy, which aims to bring the main focus away from the stressor, such as an intractable issue intrinsic to the relationship, or a more circumstantial stressor such as illness, and toward the couple's bond (Fergus & Reid, 2001; Fergus & Reid, 2002; Reid, Dalton, Laderoute, Doell, & Nguyen, 2006). Thus the couple brings existing relational strengths to bear on coping with a crisis such as BC, but also may develop new resources and dyadic coping skills through the experience. When a partner is supportive and committed to his caregiving role, for example, the patient will likely feel more secure and less alone in her experience; as a result, the partner will likely feel more efficacious and valued in his role. This type of reciprocal dynamic enhances the relationship bond and is one example of why many couples report feeling stronger after BC (Dorval et al., 2005). In contrast, Fergus (2015)

has suggested that a couple's relationship suffers more as partners become increasingly preoccupied and defined by a stressor such as BC. If this is the case, it can overwhelm the couple and hinder their ability to cope, while those who are able to separate the illness from their identity as a couple are better able to navigate and adapt to the challenges associated with the illness. Thus, *Couplelinks* was designed to bring the couple's relationship to the forefront by helping them bolster their sense of mutuality, intimacy, constructive listening, communication skills, perspective-taking ability, and overall positive affect.

With this in mind, six exercises, called 'Dyadic Learning Modules' (DLMs), and one optional DLM were designed to provide couples with experientially-based psychoeducation around key relationship principles necessary for optimal dyadic coping, such as accurate perspective taking and awareness of one's own enhancing and eroding relationship behaviours. Each module begins with an informational component where couples learn about topics such as the importance of celebrating each other's strengths, adopting a team orientation in relation to BC, and moving past the illness by creating new goals for the future (see Appendix 7 for a description of DLMs). Next, couples complete a dyadic, interactive exercise on the topic they read about. The exercises were designed to provide couples with an opportunity to learn experientially about their relationship and to enhance their insight. Finally, they were asked to reflect on each exercise together and to individually provide feedback about each module.

Because research has demonstrated that web-based interventions without facilitated support have poorer outcomes and higher dropout rates than those with facilitated support (Spek et al., 2007; Andersson & Cuijpers, 2009), a key facet of *Couplelinks*, as well as the focus of the current study, is the guidance provided to each couple as they progress through the program by a facilitator, who is a mental health professional. Each couple begins the program with a

designated facilitator with whom they regularly communicate through the website's "Dialogue Room" (DR; an asynchronous (i.e., not live), text-based communication platform). Partners are able to contact their facilitator through the DR at any time to ask for clarification on the DLMs, to inform the facilitator of occurrences or engagements that may delay completion of the modules, or to bring up any other comments or concerns. In turn, through the DR the facilitator provides answers to any questions the couple might have, checks in with the couple if they miss an agreed upon module completion deadline, occasionally encourages completion of the modules, and offers feedback after each completed module. The facilitator's central role is to provide a sense of structure, care, and support through regular interaction with the couple. They are not meant to act as a couple therapist, but as a knowledgeable guide and motivator who leads the couple through a learning process about each other and their relationship. One of their main goals is to encourage dialogue between the partners about important aspects of their relationship, as well as the ways that BC has affected the relationship.

Engagement in Online Interventions

While web-based interventions such as *Couplelinks* can circumvent numerous issues related to accessibility and cost, and have the potential for widespread dissemination, achieving high engagement with online programs has been shown to be a challenge (Sandaunet, 2008; Melville, Casey, & Kavanagh, 2010). In fact, a review of web-based behavioural interventions suggests that engagement is a problem area common across physical and mental health fields, including cancer support (Danaher & Seeley, 2009). Engagement in the online context, also referred to as 'adherence,' 'exposure,' and 'persistence' in a variety of studies, or 'non-usage attrition' in reference to lack of engagement, can be defined as "the extent to which individuals experience the content of the intervention" (Graham et al., 2013; Christensen, Griffiths, & Farrer,

2009, p. 3). Such treatment compliance in online intervention, sometimes also referred to as 'stickiness,' (M. Golant, personal communication, November 30, 2007) has been measured in a variety of ways, including the number of log-ins to the website, the number of days between registration and last log-in, and the number of modules read (Danaher & Seeley, 2009).

One review of online interventions for depression and anxiety found that completion rates in randomized controlled trials for these programs ranged from about 43% to 99%, and adherence ranged from about 50% to 100 % (Christensen et al., 2009). However, adherence rates for open access sites were much lower, suggesting that individuals who are not participating in research studies do not make full use of the online resources available to them. Interestingly, one factor associated with increased adherence for depression interventions was younger age, along with lower baseline severity and lesser knowledge about psychological treatments (Christensen et al., 2009). For post-traumatic stress disorder interventions, for example, some of the predictors of adherence included being a woman and living with a partner (Christensen et al., 2009). Other studies examining the use of online interventions also show that very few participants complete the entirety of these programs, and engagement declines greatly over time (e.g., Christensen, Griffiths, Korten, Brittliffe, & Groves, 2004; Farvolden, Denisoff, Selby, Bagby, & Rudy, 2005). Moreover, promoting engagement and completion of an online intervention involving couples will likely be even more difficult. Thus, further investigation into this crucial component of online psychosocial service delivery in general, and how engagement may be promoted with couples in particular, is warranted so as to improve the future of online couple interventions (Georgia & Doss, 2013).

Increasing engagement should also be a primary focus in web-based intervention research because it is an underlying mechanism that influences treatment effects (Danaher & Seeley,

2009). As noted by Gorlick, Bantum, and Owen (2014), it is possible that online interventions have the potential to be much more effective than research has shown if engagement could be improved. One explanation for the lower engagement and completion of these programs is that they do not meet the needs and expectations of the participants, in part because the target user demographic is often too large (Gorlick, Bantum, & Owen, 2014). Thus, tailoring online interventions to a specific target audience based on a clear understanding of the issues that are most pertinent to that population would likely increase engagement.

In fact, one qualitative analysis of the barriers to participation in an online BC support group found that problems occurred when there was a mismatch between participant needs and the group's design and contents (i.e., when participants did not find the group helpful or thought it was difficult to participate in)(Lieberman et al., 2003). Another qualitative analysis of a facilitated cancer support group website found that minimally engaged participants (defined as spending anywhere from 10 minutes to 3 hours on the website) preferred to have facilitators who were more involved and more knowledgeable about their cancer (Gorlick et al., 2014). Because the success of online interventions is highly reliant on the level of participants' engagement (Poirier & Cobb, 2012), an important step in maximizing their effectiveness is to examine factors that can help increase engagement. One aspect of web-based programs that may be crucial to enhancing engagement is the therapeutic alliance between participants and facilitators, yet little is known about this relatively new phenomenon and particularly what it would look like between online facilitators and couples (versus individual clients).

Therapeutic Alliance in Couple Therapy

The therapeutic alliance is a well-known common factor in therapy that refers to the collaborative bond between client and therapist, and consists of facets such as agreed upon goals

and tasks, mutual fondness, and trust (Bordin, 1979). The therapeutic or 'working' alliance has been consistently related to outcome across therapy models, sometimes explaining more variance in effect size than other factors (Beutler & Harwood, 2002; Castonguay & Beutler, 2005). Various meta-analyses have been conducted to establish how much outcome variance the working alliance explains, discovering percentages ranging from low to mid-twenties (Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000). While there is less research on the impact of the therapeutic alliance in couple and family therapy, one meta-analysis of 24 studies found an effect size of r = .26, which is very similar to that found in individual therapy (Friedlander, Escudero, Heatherington, & Diamond, 2011). Importantly, as noted by Friedlander and colleagues (2011), "good outcomes depend on attendance, and retention in family therapy is challenging" (p. 29). Interestingly, the interplay between each client's alliance with the therapist, as well as possible imbalances in the various interacting alliances (e.g., therapist with either partner, therapist with the couple, partners with each other), influenced therapy retention (Friedlander et al., 2011). The complexity of these interacting alliances could be expected to mirror the effects of online therapeutic alliance on intervention engagement.

Developing an alliance is a complex process reliant on many different factors, but it is even more multifaceted when involving couples (Bartle-Haring et al., 2012; Knerr et al., 2011). The mere presence of more than one individual in the therapy space introduces extra variability, which in turn may affect treatment outcome. Early conceptualizations of the therapeutic alliance in couple and family therapy suggested that three interpersonal facets, namely self-with-therapist, other-with-therapist, and group-with-therapist, all interact and influence the therapeutic process (Pinsof & Catherall, 1986). Indeed, the multiple alliances that function simultaneously are unique to couple and family therapy and add a substantial amount of complexity (Pinsof,

1994). For example, couple therapists often spend more time creating trust between themselves and the couple, explaining the expectations of therapy, and discussing the goals of therapy (Bartle-Haring et al., 2012). Extra care must be taken to address and negotiate between both partners' needs and to create couple-level goals in order to address the issues within the system as a whole (Bartle-Haring et al., 2012). Furthermore, in addition to the therapist-partner alliance (Johnson & Talitman, 1997), the alliance within the couple also affects therapy success (Symonds & Horvath, 2004). For instance, partners often seek help for different reasons (Doss, Simpson & Christensen, 2004), and their agreement on which problems to address in therapy predicts engagement as well as increased positive outcome (Biesen & Doss, 2013). With this in mind, it is possible that the therapist, or facilitator in an online intervention, might have an important role to play in helping the couple to discuss and consolidate their treatment needs and goals.

The level of marital distress also has a significant effect on the quality of the alliance (Knobloch-Fedders, Pinsof, & Mann, 2004). Unfortunately, it appears that couples who report the lowest relationship satisfaction also have trouble developing a good alliance with the therapist, and thus are more likely to drop out of therapy (Glebova et al., 2011). The therapist's level of experience and gender also likely play a role in the quality of the alliance (Mahaffey & Granello, 2007), but so does the gender of each partner. For example, some research suggests that male partners' ratings of the alliance predict therapy outcomes more than female partners' ratings (Knobloch-Fedders, Pinsof, & Mann, 2007; Symonds & Horvath, 2004). This finding might be in part because it is often the case that male partners are more reluctant to engage in therapy and sometimes hold more power in the relationship (Symonds & Horvath, 2004). There is also evidence that women tend to initiate therapy and sometimes their partners end up going

unwillingly (Porter & Ketring, 2011). Moreover, women on average appear to be more emotionally invested in couple therapy and report higher bond scores than their male partners (Bartle-Haring et al., 2012; Werner-Wilson, & Davenport, 2003). Women may also be more willing to work toward change regardless of their own relationship with the therapist (Symonds & Horvath, 2004). Although there is conflicting evidence regarding how different factors influence the therapeutic alliance, it clearly has an important effect on couple therapy outcome (Garfield, 2004; Knobloch-Fedders, Pinsof, & Mann, 2004), and will thus also expectedly impact the effectiveness of facilitated online interventions.

Therapeutic Alliance in Online Interventions

Despite the complexities associated with delivering online therapy and interventions, it is a field that has been and continues to grow rapidly (Hanley & Reynolds, 2009). Rochlen, Zack, and Speyer (2004) outline the unique challenges of this type of therapy, which include the risk of miscommunication due to the lack of 'real' verbal communication, the time delay of responses, the necessity for computer skills, the vulnerability in sending sensitive information over the Internet, and the inability to intervene immediately in the event of a crisis. However, therapists have become increasingly proficient in articulating themselves through the use of 'web-based' techniques such as 'emoticons' and common abbreviations (Hanley & Reynolds, 2009). Indeed, a study examining real-time support group facilitation found that despite initial worries about the lack of verbal and non-verbal bodily communication, facilitators' "confidence and enjoyment increased over time as they learned and adapted skills" (Stephen et al., 2011, p. 836). They reported that with practice, they were able to draw from and convey through text various therapeutic skills such as reframing thoughts and situations, normalizing distressing emotions, and providing emotional support and positive reinforcement (Stephen et al., 2011). In addition,

online communication can even provide advantages such as convenience, increased willingness to share sensitive or embarrassing information due to greater disinhibition, and the therapeutic effects of writing itself (Pennebaker, 1997; Rochlen, Zack, & Speyer, 2004). Participants in an online cancer support group stated that the act of writing instead of talking allowed them to take more time to collect and reflect upon their thoughts and to become more aware of them, and to express intense emotion, for example by crying, while still being able to type and communicate with others (Stephen et al., 2014).

A review of online text-based psychotherapy interventions found them to have moderate effect sizes, namely 0.51 for email and 0.53 for chat therapy, which are comparable to face-to-face therapies (Hanley & Reynolds, 2009). Of particular note from this review was the finding that a good therapeutic alliance can be developed online. Clients rated the alliance to be either moderate or strong in all cases examined, and in fact three out of the four studies that compared face-to-face and online therapy modalities found that the alliance was rated higher in the online context (Hanley & Reynolds, 2009). However, because the studies to date have mainly used self-report measures such as the Working Alliance Inventory, which were developed for use in face-to-face therapy (Hanley & Reynolds, 2009), more needs to be done to elucidate the kinds of therapist behaviours that serve to create a good alliance online. Furthermore, such self-reported measures only indicate the strength of the alliance but do not demonstrate *how* to create an alliance, so it is important to look at therapist behaviours specifically. In fact, research has shown that therapist characteristics such as flexibility, honesty, trustworthiness, warmth, and openness, as well as techniques such as exploration, reflection, and attendance to the client's experience are conducive to developing a better alliance (Ackerman & Hilsenroth, 2003). It remains to be seen how these components can be conveyed through text.

Another variable to consider is whether communication is occurring through an asynchronous (e.g., discussion board postings) or synchronous (e.g., live chat room) platform. It has been suggested that asynchronous therapist-client communication might make it more difficult to maintain the alliance and engagement in online interventions (Georgia & Doss, 2013). However, one study on online therapy for depression found that even minimal, asynchronous therapist contact can lead to improvements in engagement (Titov, 2011). As such, the present analysis seeks to better understand what online therapeutic alliance development looks like, and how it may relate to participant engagement. Moreover, there does not seem to be any work yet on the online therapeutic alliance in the context of working with couples, adding another important layer to the current study.

One of the few, if not only, forays into understanding the unique features of the online therapeutic alliance is a study on computerized cognitive behavioural therapy, which found that these programs were able to "emulate alliance features thought to be intimately tied to human relations" (Barazzone, Cavanagh, & Richards, 2012, p. 409). Some of the 'alliance features' discovered included 'generating belief in the helpfulness of the program,' 'generating belief in recovery,' 'empathy, warmth, genuineness, and unconditional acceptance,' 'feedback,' 'responsiveness,' and 'flexibility.' However, these features mostly relate to the clients' alliance with the program design, not with a person, as most of them did not include a facilitator. For instance, the feedback was mostly standardized, and flexibility referred to providing choices regarding which modules to complete and how much time to spend on them. While this is promising evidence in terms of the text-based development of alliance, it is not clear how facilitators could or should create and maintain a strong alliance with participants, and how this could influence program engagement.

The Present Study

Bolstering participant engagement in couple interventions for cancer (and other illnesses) is particularly important considering their effectiveness in increasing important well-being outcomes such as quality of life, relationship satisfaction, and adjustment to illness for both partners. Moreover, because it appears that engagement is an important predictor of online intervention effectiveness, and that engagement is more likely to occur within the context of a strong therapeutic alliance, it is important to elucidate the ways in which online alliance can be established. Thus, the primary objective of the present analysis is to develop a model that describes how facilitators increase couples' engagement in the *Couplelinks* program, through rational modeling and empirical observation of facilitator behaviours among engaged versus unengaged couples. Particularly, we aim to articulate the specific processes and interventions utilized by facilitators to develop a therapeutic alliance. An underlying assumption in the present investigation is that engagement is indicative of (i.e., is a 'proxy-measure' for) therapeutic alliance. Thus, an intermediary, or secondary objective is to develop a method of measuring engagement in order to (a) be able to select for couples that are both engaged and unengaged in the program, and (b) describe different forms of couple engagement observed in the current sample.

Method

Participants

Couples

With respect to the primary objective of developing a model of engagement, participants were 6 male-female dyads recruited through collaborating institutions across Canada. They were selected from a pool of 24 couples who, at the commencement of the present analysis, had

completed the *Couplelinks* intervention as part of the larger randomized clinical trial (RCT). After engagement in the intervention was assessed for all 24 couples, through a process further explicated below, three couples with high and three couples with low engagement levels were selected (for the total of *n*=6). With respect to the secondary objective of describing the different levels of engagement, 12 dyads were examined (which include the 6 mentioned above). Demographic information for all 12 dyads is provided in Appendix 1.

Couples were considered to have completed the intervention if they finished four or more DLMs. Participants were enrolled in *Couplelinks* based on the following eligibility criteria: (1) the woman was diagnosed with invasive breast carcinoma (non-metastatic) or ductal carcinoma in-situ at or before age 50; (2) the woman was within 36 months of diagnosis and at any stage of treatment or follow-up; (3) the couple was in a committed, heterosexual relationship (e.g., married, cohabitating, dating for at least six months at the onset of participation – a restriction in order to decrease variability that may have potentially been associated with same-sex couples); (4) neither the woman nor her partner suffered from severe mental illness that could hinder the couple from benefitting from the program (e.g., substance abuse, psychotic disorders); (5) both partners were fluent in English and; (6) both partners had access to the Internet in a private setting. There was no age limit for the male partner. In the event that a couple was excluded due to the presence of mental health issues, they were referred to a mental health professional in their community. In order to avoid confounding effects with other interventions, couples who planned on attending couples counselling during the course of participation were excluded from the study. Involvement in other types of individual interventions, such as women's cancer support groups, did not lead to exclusion but these variables were tracked systematically. Couples did not receive any monetary compensation for participating in the study.

Facilitators

The *Couplelinks* facilitators were four mental health professionals with disciplinary backgrounds in psychology, nursing, and social work, and with specific experience in psycho-oncology. In addition to possessing relevant clinical experience, each facilitator received individualized training based on the Couplelinks.ca Program Facilitation Manual (Fergus, Carter, McLeod, & Lewin, 2011). This manual outlines skills that are essential for online, text-based communication and provides guidance for addressing specific facets of each DLM. Facilitators underwent supervision by having their interactions with couples in the DR regularly reviewed by two clinical psychologists on the study team (the principal investigator and another co-investigator), as well as by participating in regular teleconference meetings for peer supervision.

Procedures

This study was reviewed and approved by research ethics boards at all host institutions: Sunnybrook Health Sciences Centre and York University in Toronto; QEII Health Sciences Centre in Halifax; and the British Columbia Cancer Agency. Eligible individuals were approached by their health care providers and asked whether they were interested in participating in the trial. Upon consent from potential participants, the health care providers forwarded their contact information to the study's research coordinator (RC), who then contacted the couples with details about the study. Additional recruitment methods included fliers displayed across various hospitals and cancer agencies, announcements at hospital meetings and workshops for young women with breast cancer, messages on cancer related websites, and social media. These sources directed potential participants to the *Couplelinks* informational webpage, which also provided them with contact information for the RC.

Once the RC and potential participants were in contact, the RC provided further information about what participation in the online intervention would entail and asked the potential participant to discuss the study with her partner. If the couple agreed to participate, the RC scheduled a screening interview with each partner separately, in order to determine eligibility as described above. Screening interviews took 20 to 40 minutes on average and details of these conversations were noted in order to determine eligibility; however no data were collected at this stage as it preceded the informed consent process. If all eligibility criteria were met, the RC mailed consent forms to both partners which they signed and returned. Once consent was obtained, the RC provided the couple with a unique personal login ID and password for the *Couplelinks* website through email. The couple was then able to securely access their account and complete a baseline questionnaire battery that measured variables such as relationship adjustment, dyadic coping, and mood. Although each couple shared a login ID and password for the website, each partner was given a separate user name and password for completion of the questionnaires. Each individual was also informed that their questionnaire responses would not be shared with their partner. The RC then forwarded the contact information of the couple to their facilitator, who proceeded to schedule a phone call with the couple. The purpose of this phone conversation was for the facilitator to introduce him or herself and get acquainted with the couple, to provide an overview of the intervention and the *Couplelinks* website, and to answer any outstanding questions the couple might have. The facilitator also explained how to use the Dialogue Room (DR) and informed the couple that all of the text-based communication between each partner and the facilitator through the DR would be visible to both partners. This conversation lasted approximately 40 to 60 minutes and was not recorded.

Following the initial phone contact with the facilitator, the couple was able to begin the DLMs. Pilot data indicated that most participants spent about one hour on each module and completed all modules within eight weeks, on average. Thus, couples were informed that the approximate time commitment would be one to two hours per module and were expected to complete all six DLMs within eight weeks. Based on disparate pilot study feedback with respect to one of the program modules, called 'Intentional Dialogue' (Hendrix, 2007), where some couples praised the exercise while others felt overly constrained by it, this particular module was deemed optional for the purposes of the RCT. Facilitators made the decision to assign it or not based on their judgement of its potential benefit for each couple, as well as the dyad's expressed interest. Specifically, couples who worked through the program at a more brisk, consistent pace and who responded well to direct guidance and structure were noted to be good candidates for this optional module.

In order to promote timely completion of the DLMs, facilitators gave concrete deadlines by which they wished couples to finish the modules. The DLMs were designed in such a way that subsequent modules would build on previous ones. Therefore, subsequent modules were 'unlocked' by the facilitator only when the couple completed and provided feedback on the previous DLM. Once in receipt of both partners' answers to a given module's short feedback questionnaire, the facilitator provided his or her written feedback in return through the DR. This feedback drew on couples' unique content and responses to the exercise as well as their evaluation of the DLM. It was intended to validate the couple's reflections on the exercise, to offer insight about challenges the couple experienced or strengths that they demonstrated, and to explain the next exercise and its relationship to the previous modules.

Communication between a couple and their facilitator occurred mostly through the website. However, in order to supplement the online contact, in addition to the initial 'welcome' phone call with the couple, facilitators scheduled short phone conversations after the second and fourth modules were completed. Facilitators were responsible for detailing all interactions with the couple that occurred outside of the website, such as phone calls and emails, in the "Contact Notes" page on the administrative interface of the *Couplelinks* website.

The Couplelinks Website

Front End User Interface

Following their initial conversation with the facilitator and once they have their login information, couples could access the website. The website consists of several webpages including a welcome page, orientation to the program page, information on living with breast cancer, a 'lesson tracker' which summarizes the couple's progress, and a webpage housing the Dialogue Room. Throughout the website there are also videos of a couple speaking about themes related to breast cancer and its relationship impacts, as well as instructional and orientation videos.

Back End Administrator Interface

The backend of the *Couplelinks* website is only accessible to facilitators and associated researchers with password verification. This administrative interface contains all baseline and post-treatment surveys, DLM reports, couple progress tracking, contact notes, and the DR portal. Facilitators use this interface for all communication with, and tracking of, their assigned couples. While facilitators have access only to information about the couples with whom they are working, data for *all* couples enrolled in the RCT are accessible to the research team (i.e., the

principal investigator, study co-investigators, and the RC). All interactions between couples and facilitators through the website are encrypted and all data are backed up on secure servers.

Measures

Demographics

Demographic information such as age, gender, ethnicity, level of education, relationship status, and number of children was collected in the baseline questionnaire. Disease and treatment information including stage of cancer, treatments received, and status of treatment were also collected at this time. See Appendix 1 for demographic information.

Engagement

For the purpose of the current study, engagement was defined as the extent to which the couple was involved in and attentive to the program. More specifically, engagement was operationalized as a combination of the following variables (explained further below): (1) completion time, (2) accountability, and (3) attitude toward the program. The latter two variables were included in order to gain a fuller picture of how participants related to the intervention, seeing as website analytic data such as login duration is considered a crude measure of engagement that does not account for contextual factors and is not typically predictive of outcome (Harris, Cleary, & Stanton, 2014). Because the larger RCT study did not include a measure of therapeutic alliance and to the best of our knowledge no objective measure of an online therapeutic alliance exists, we are using engagement as a proxy measure of alliance. In other words, we have made an assumption that higher intervention engagement is related to a stronger alliance, and lower engagement is related to a weaker alliance.

(1) Completion time. First, completion time was calculated in terms of number of days from when the first module was started to when the last module was completed. For modules

where the first and last steps required individual participation (as opposed to the couple working on the step together), start and end times could differ for the male and female partners. Therefore, the earlier time was counted as the start time and the last time was counted as the end time, irrespective of gender. Average time to completion was then calculated by dividing the total days by the total number of modules completed by each couple (ranging from a possible four to seven DLMs). Although time spent on involvement in an intervention is a common tool for assessing engagement (e.g., Couper et al., 2010; Richert, Lippke, & Ziegelmann, 2011), it appeared to be an incomplete measure in the present study because of the vulnerable population at hand. For example, many of the female participants had several unexpected or outstanding commitments occur during their participation in the program, such as medical complications, ongoing treatment-related issues, and/or post-treatment surgical procedures related to breast reconstruction, that could take precedence over completion of certain modules. In addition, some modules required couples to work together simultaneously, thus posing further challenges for meeting the deadlines. As such, we included a measure that aimed to assess the couple's commitment to completing the program, and to some degree their internalization of the program, by taking responsibility for letting their facilitator know about these barriers.

(2) Accountability. "Accountability," was defined as the extent to which the couple took responsibility for delays in completing the modules (by contacting the facilitator and/or providing reasons for the delay). This was assessed by the frequency with which couples posted messages in the DR, particularly in relation to delayed completions. Two independent raters coded for accountability on a scale of 1 to 3 by reading through the DR communication as well as the contact notes (the log of phone call and email correspondence kept by facilitators) based on the following criteria:

1 – Very few or no attempts to contact facilitator when progress was delayed. Rarely provided explanation or excuse/apology for lateness.

- E.g., Wrote back only after facilitator queried multiple times
- E.g., Never provided reason for delay

2 – Some attempts to contact facilitator when progress was delayed. Sometimes provided explanation or excuse/apology for lateness.

- E.g., Wrote back after facilitator contacted them first

3 – Regular attempts to contact facilitator when progress was delayed. Almost always provided explanation or excuse/apology for lateness. Rating also applies if progress was never delayed.

- E.g., Couple almost always responded to queries from facilitator and even initiated contact to warn of lateness
- E.g., Almost always provided reason for delay

Couples that completed the program on time, and therefore did not need to contact their facilitator for delays/updates, were automatically given a rating of three. The inter-rater reliability, measured using Cohen's kappa coefficient (in order to account for agreement occurring by chance) for the accountability measure, was in the excellent range, $\kappa = .862$, $p < .000$. The final accountability scores used for the analysis were consensus scores between the two raters.

Next, in order to capture couples who were compliant and timely with module completion but perhaps not as committed to or enthused about the program, a third variable, “attitude,” was included.

(3) Attitude. Attitude was defined as an expression of favour, disfavour, or mixed opinion toward the module. Couples' feedback for each module (to open-ended questions such as, "What was your reaction to the exercise?") was coded by two independent raters based on the following criteria:

1 – Mostly negative attitude toward the module (unfavourable evaluation).

2 – Mixed negative and positive attitude toward the module (varied evaluation).

3 – Mostly positive attitude toward the module (favourable evaluation).

Male and female partners' respective feedback was rated for each module, and an average across gender and modules was taken to create a single attitude score for each couple. The inter-rater reliability for the attitude measure was again excellent, $\kappa = .868$, $p < .000$. Couples' final attitude scores were based on a consensus between the two raters. A summary of the engagement indices data is provided in Appendix 2.

Combining the Engagement Indices

To address this study's intermediary, or secondary objective of developing a way of discerning between different levels of engagement (which is a necessary step in the sample selection for our task analysis), we combined the above measures in the following way. Couples were primarily sorted by average completion time, followed by accountability and attitude ratings. Average completion time was utilized in order to account for the variability in the number of modules completed (i.e., from 4 (considered minimum adequate 'dose') to 7 (depending on whether couple elected to do the optional module)). However, because there were many causes of variation in completion time, such as unexpected health problems or planned trips, this measure did not seem to capture the concept of engagement fully. Thus, we created the two other indices in an attempt to gain a more complete picture of engagement. Because an

accountability rating of three was given to couples who completed the modules by the assigned deadlines, this rating alone did not help to discern between engagement levels for couples that completed the modules on time. However, we found that accountability ratings differed significantly among couples who did not meet the deadlines, so it was used to distinguish between those couples' engagement levels.

On the other hand, the attitude rating appeared to be particularly relevant for couples who completed the program quickly, playing an important role in differentiating among them because even if they completed the programs in a timely manner, couples may or may not have truly internalized the program components. Indeed, some timely completers' feedback was reliably coded as less positive than other timely completers (i.e., some couples went through the program quickly but were not very enthused about its content). In other words, for couples who were timely completers, *attitude* was the key differentiating variable, and for couples who were delayed completers, *accountability* was the key differentiating variable.

Based on this method, we identified different groups of couples representing varying levels of engagement, which will be described in the results section below. The research coordinator, who had extensive contact with all couples that completed the trial, was asked to corroborate the groups based on her impression of the couples themselves and her impression of their level of engagement in the program. The RC agreed with our engagement classification for all couples. It should be noted that despite being carried out in an empirical manner, our sample selection method entailed explicit assumptions regarding what the concept of engagement is. This method of case selection is divergent from the task analytic method in the sense that the concept of engagement itself became more richly defined as we attempted to select the subsample to be used for empirical observation. However, it was necessary in this instance

because the larger *Couplelinks* RCT did not include a standardized measure of engagement, and, moreover, to our knowledge, there is no single validated measure of engagement for this type of intervention.

Analysis

Model of Promoting Engagement

To develop a model that demonstrates how facilitators strive to increase and retain couples' engagement in the online intervention *Couplelinks*, we modified the task analysis method outlined by Les Greenberg (2007). Task analysis was developed as a way to identify the steps required to successfully complete a goal, or task, and has been used to study diverse therapeutic constructs such as alliance rupture and repair in cognitive behaviour therapy (Aspland, Llewelyn, Hardy, Barkham, & Stiles, 2008), alliance rupture repair in emotion focused couple therapy (Swank & Wittenborn, 2013), emotional processing in experiential therapy (Pascual-Leone & Greenberg, 2007), dealing with infidelity in couple therapy (Williams, Galick, Knudson-Martin, & Huenergardt, 2013), and therapeutic presence (Colosimo, 2013). According to Greenberg (2007), other ways of modeling change such as sequential analysis do not capture all aspects of the process, especially some of the more "qualitative and contextually significant aspects" (p. 16) that are difficult to measure. As such, task analysis employs a dialectical interchange between rational modeling and empirical investigation that, in addition to client and therapist factors, takes into account the context of the task at hand.

A classically performed task analysis consists of two phases. The first phase is a discovery-oriented phase that involves three main parts: 1) developing a rational (i.e., hypothesized) model of the task based on what the researcher knows; 2) developing an empirical model based on observation of 'good' and 'bad' performance cases of the task; and 3) integrating

any new discoveries from the empirical observation into the rational model to yield a synthesized rational-empirical model. The second, validation-oriented phase of task analysis serves to validate these models through hypothesis testing. The current study focuses on the first, discovery-oriented phase of task analysis, consisting of six steps outlined below.

Step 1: Specifying the task. In the present study, the 'task' of interest is how a facilitator promotes engagement in and completion of the online intervention *Couplelinks*. Task analysis posits that in order to create a process model of the performance of a particular task, empirical observation of three successful cases of a construct – in this case, high intervention engagement, must be contrasted with empirical observation of three unsuccessful cases – in this case, low intervention engagement. According to this method, a small number of contrasting cases are chosen to be examined in great detail in order to be able to see more clearly the differences between 'good' and 'bad' performance. Thus, an important first step is choosing these contrasting cases. For the present study, six dyads were selected based on their level of engagement, by combining the measures as described above. Engaged couples (n=3) were signified by a short average completion time (where accountability was assumed), and a high attitude rating. Unengaged couples (n=3) were categorized as those with a long average completion time and a low accountability score. The attitude scores among couples with long completion times did not vary enough for us to formulate an unengaged group based on this measure.

Step 2: Explaining the researcher's cognitive map. A cognitive map refers to one's existing perceptions and assumptions of a given construct and must be made explicit in order to provide a context for their research (Greenberg, 2007). This step is intended to help the researcher identify and become cognizant of any factors that might influence their creation of the

rational and empirical models. Regarding the current analysis, the lead investigator of the *Couplelinks* RCT has extensive experience working with women affected by breast cancer in the context of face-to-face therapy and also assisted in creating the initial therapeutic alliance codes utilized in this study. On the other hand, I (the author) have not had any experience working with breast cancer survivors or couples in a face-to-face or online environment, which provided a fresh outlook while creating the empirical model of engagement.

Step 3: Explaining the task environment. This step serves to explain the environment in which the task occurs. According to Greenberg (2007), one way to do this is to write a manual describing the environment, such as the one created for *Couplelinks* (Fergus et al., 2011). Most obviously, the current environment entails a web-based, assisted intervention, thus involving various peripheral participant factors, such as motivation and technological adeptness. Also of importance to the current environment is the interaction between the couple and the *Couplelinks* online interface. The website and its constituent applications were designed to be user-friendly even for participants with minimal technological proficiency.

Step 4: Constructing the rational model. In task analysis, the rational model serves as a hypothetical model of a specific process based on a clinician-researcher's theoretical understanding of that process (Greenberg, 2007). Importantly, this hypothesis generation model is used as a record against which to compare one's empirical observations. Furthermore, it allows the researcher to identify what they 'think they know' and in turn to elucidate assumptions, biases, and intuitions that they hold which might influence how they observe data in the empirical stage (Greenberg, 2007).

In the present study, the rational model was created by the lead investigator of the *Couplelinks* trial based on her knowledge of and experience in psychosocial oncology and online

intervention specifically, supplemented by an open-ended survey completed by all four facilitators (see Appendix 8). The survey included questions such as "What do you see as essential facilitator factors (types of activities or messages) in relation to helping your couple become engaged or remain engaged in the program?" and "What specifically do you do when you find that a couple is not motivated or engaged (i.e., is not completing the modules on time; is not informing you about delays; and/or is not responding to the your DR messages)?" The facilitators' responses were analyzed through a qualitative content analysis focusing specifically on "the objective, systematic and quantitative description of the manifest content of communication" (Berelson, 1952, p. 18; Graneheim & Lundman, 2004). This method follows Greenberg's (2007) suggestion to utilize one's first-hand experience with working in the specified context.

Step 5: Constructing the empirical model. The primary data source for the present study was the text-based DR communication between the facilitators and couples. Based on a previous sample of six couples from the trial, a thematic analysis (Fergus et al., 2014) was implemented to identify common therapeutic alliance techniques utilized by the facilitators throughout their communication with the couples. The empirical model for the current analysis was created by contrasting the therapeutic alliance techniques utilized for engaged versus unengaged couples, as selected in *Step 1 – Specifying the task*, in order to expand on the thematic analysis previously carried out. As suggested by Greenberg (2007), the three successful cases were coded first, followed by the three unsuccessful cases. Primary coding was completed by the principal investigator for this analysis (I.I.), and secondary coding was completed by another member of the research team, in order to derive consensus on the coding as well as to modify and refine the

pre-existing categories and definitions as deemed necessary. Based on the current sample, new categories that incorporated novel elements were added.

Step 6: Combining the rational and empirical models – The emergent synthesized model. As per task analysis, once the empirical model was finalized, it was compared with the rational model in order to elaborate and modify the rational model to reflect actual facilitator performance. The final model integrates the hypothesis of what was expected and what was actually observed. In addition to categorizing the types of therapeutic alliance techniques used among the groups, we focused on meta-processes such as facilitator responsiveness (i.e., length of time it took for facilitator to reply to couple after receipt of email notification that a module was completed) and degree of personalization of each response. In short, the raters met periodically to synthesize the rational and empirical models in order to create an overarching model of facilitators' promotion of couples' intervention engagement.

Results

Rational Model of Engagement Promotion

The rational model of promoting engagement, based on the facilitators' survey responses and the principal investigator's knowledge and experience in the field of online psychosocial-oncological support, is presented in Appendix 3. It includes the factors that facilitators believe are most important in their efforts to increase and maintain couples' online engagement. In short, it represents what the facilitators 'think they are doing' in their DR messages. It consists of three categories, each containing three sub-categories, as described below.

1. Friendly and Positive yet Firm Approach

This category refers to the facilitators' intended way of relating to the couples through their messages, namely by being welcoming and kind, but also resolute.

1a. Fostering a positive attitude toward the program. This subcategory refers to the facilitators' role in orienting the couple to the *Couplelinks* program, while keeping in mind that it may be a new way of relating to each other, as well as the fact that it is a novel method of relationship support in general. The first important aspect of this orientation process is setting clear expectations regarding the facilitator's role, mainly by emphasizing that they are not serving as a therapist, but instead as a well-informed guide to the program. This sentiment is both explicitly and indirectly expressed though the content and style of communication. For example, facilitators stated that they aim to reflect and summarize information from the DLMs, rather than to offer deeper interpretations about the couple's relationship dynamics or intervene as they might in couple therapy. Next, facilitators aimed to instil hope in the program, for example by highlighting the couple's gains or framing the program in a positive light, while at the same time being realistic about the extent of benefit achievable through a pre-designed, primarily 'self-managed' intervention. Importantly, the messages aimed to be tentative, so as to not give false hope of unattainable goals. Facilitators also aimed to help participants keep an open mind about the program, for instance by promoting it as an opportunity to learn something new about themselves and their relationship. Another important aspect of this category was the acknowledgement and validation of distress. In the event that a particular module created distress or tension between the couple or within one of the partners, facilitators thought it was extremely important to validate that experience, even if that meant recognizing that the program or exercise may have had a role to play in creating the negative experience.

1b. Providing structure. Considering the lack of boundaries and structure resulting from the more limited form of contact between facilitators and couples in this virtual context, creating structure was an important consideration outlined by facilitators. As one facilitator mentioned,

“Encouraging specific behaviours (e.g., ‘When you get this message, hit reply and let me know that you've got it... then we know everything is working.’)” is vital. Firstly, they achieved this by being directive in the sense of providing clear expectations and guidelines in the form of deadlines for completion of modules, for example. They also aimed to be concrete and specific in their requests and expectations of couples regarding their online behaviour. For example, if a couple was late in submitting a module, the facilitator would remind them of the passed deadline, and would then suggest a new deadline to accommodate them. Facilitators named one of their key tasks as encouraging the couple to stay on track, by sending reminders but also validating scheduling challenges and unexpected delays. Of particular importance was maintaining a balance between being understanding and firm.

1c. Angling toward the positive. Facilitators thought that it was important to focus on positive experiences rather than problems, whether they were related to the couple’s life or to the program specifically. Even with couples who were struggling or relationally distressed, facilitators aimed to underscore their strengths. Instead of taking the role of a therapist who aims to help them solve problems, facilitators tried to ensure that couples felt good about themselves, in the hopes that this would create a safe space in which they could explore new experiences together. As one facilitator stated:

> I read my responses out loud and try to write as I want it to be listened to - I try to sound present, informal, no 'psycholog-ese'. I am not wanting to sound like a therapist or advisor, but an encouraging coach who trusts that they [the couple] are already winning. I try to use a lot of positive affect.

2. Inclusive and Empathic Attitude

This category captures the facilitators' overall air of being with the couples. They noted that it was of utmost importance to provide empathy in this text-based style of communication and to treat both partners as a unit (i.e., with "belief and emphasis on their we-ness"), with equal respect.

2a. Recognizing that the program asks for 'something extra.' It was essential for facilitators to acknowledge the fact that the program requires a significant amount of time and commitment of couples, and that they will benefit from it only based on how much effort they put into it. One aspect of this recognition was empathizing with barriers, both planned and unexpected, that the couples face, while at the same time showing an appreciation for their commitment. Second, facilitators tried to normalize scheduling challenges, such as having to set aside time for both partners to complete some exercises simultaneously.

2b. Engaging both partners equally and evenly. This subcategory refers to facilitators' efforts to acknowledge both members of the couple by addressing them evenly, and never pointing to one partner as the source of contention. While validating areas where partners differed, facilitators aimed to focus on their commonalities. The example one facilitator gave was:

> Use "joining" communications - acknowledging each person specifically, stating what I know to be their motivation for taking the program: 'Sally,' I know you are hoping the program will help you to "get on the same page" with each other; 'Joe' I know you really want to support 'Sally.'

Similarly, another facilitator underscored the importance of "Using both names and replying to responses of both individuals, as well as addressing them as a couple."

2c. Conveying genuine interest, concern, and availability. This subcategory includes facilitators' efforts to respond promptly once they receive notification that a couple has written a message in the DR, or has completed a module. Timely responding was seen as a way to mimic the heightened intimacy of face-to-face communication as much as possible, in the sense that people are used to receiving immediate feedback when they're interacting with another individual, to help structure the couple's participation and to model responsiveness. In other words, responsiveness may be seen as denoting presence. Next, facilitators thought it was important to check in with the couple after a deadline or other agreed-upon task was missed, in a way that shows concern for them. Following up with couples was an essential way to keep them on track with the program. In their messages, facilitators strived to convey that they are monitoring the couple because they are genuinely interested in them, and not solely because they are trying to make sure the modules are completed. Facilitators also made sure to emphasize that they are available for consultation and support at any time. However, facilitators noted that their responsiveness and efforts to check-in and convey interest noticeably decreased for couples who were disengaged. Indeed, having to 'chase' couples who were seemingly uninterested in participating and/or maintaining a relationship with the facilitator became discouraging.

3. Humanizing the Technology

This category speaks to the importance of forming a genuine human connection, despite the detached online setting, as well as making the environment as non-robotic as possible.

3a. Tailoring program and feedback to each couple. As a way of making sure the program did not come across as prefabricated (to the extent possible within a pre-existing format), facilitators aimed to make program content unique to each couple. One method they used was to refer back to themes that had appeared in earlier modules, and to link these to

current and future facets of the program. This was also a way for the facilitator to demonstrate care and thoughtfulness toward the couple and their experience. Next, facilitators often tried to use humour as a way of connecting with the couple on a more genuine level. As one facilitator conveyed, "Integrating humour as appropriate (e.g., "'Steve'--you're a man of few words but the ones that come are pretty darn good!")" was often effective. Facilitators also noted the importance of relating the modules back to the couple and their relationship, by underscoring its benefit for them specifically. Highlighting the couple's impetus for participating in the intervention was also vital, especially when motivation seemed to be wavering.

3b. Personalizing the content. One facilitator stated that, "I like to draw specific content from their responses without quoting directly and personalize responses so that they don't appear 'canned.'" By paraphrasing and not repeating content, facilitators were able to craft messages unique to each couple, in order to show a greater level of thoughtfulness. In another example, one facilitator highlighted the importance of "Really personalizing the process so they know we're genuinely interested (e.g., "After hearing all that, I think that you're really going to enjoy Module 5 that will focus on reclaiming intimacy")." Such personalization seemed to be particularly important in this online context, where dropping out might be easier due to a decreased sense of responsibility or obligation. These strategies helped avoid the risk of the online program seeming too automated or robotic (i.e., not human). Facilitators also thought it was important to use conversational and casual language to connect with the couples on a genuine level, and also to not sound like therapists. As one facilitator put it, "…casual language mixed with some professional expertise makes the process feel more worthwhile, I think."

3c. 'Dimensionalizing' text though verbal connection. Facilitators noted that supplementary verbal communication through phone conversations was extremely helpful for

connecting with the couples in order to enhance the alliance. For example, they used phone calls to gauge each couple's interest in and commitment to the program, because a number of couples did not write any messages through the DR. This helped the facilitators take action and try to reach the couple before they strayed too far. Facilitators stated that they were also more able to read the couple over the phone: "It allows me to get a better read on what is going on for the couple. In one case I recall realizing that the wife was very angry, far more than I realized via text. That allowed us to talk about that." It also appeared helpful to be able to switch between communication modalities, particularly in the event that a couple was falling behind in the program. Again, this allowed the facilitators to reach them faster and to avoid having the couple fall through the cracks. Verbal communication also ensured that "all three people were in the room" (as opposed to the asynchronous nature of communication through the DR), allowing the conversation to be more inclusive and cohesive. For example, this decreased the possibility of one partner assuming responsibility for the couple, and allowed everyone to respond to concerns in real-time. Lastly, facilitators believed that the phone communication was more conducive to alliance formation, as explained here: "I can build the alliance more rapidly and gain some intimacy through the phone, I believe. I feel that we get to know each other as real people through the phone calls." This category is the only one that directly points to the shortcomings of web-based intervention and therefore the importance of having compensatory strategies or modes of connection and contact between therapist and couple.

Empirical Model of Engagement Promotion

The empirical model of engagement promotion is presented in Appendix 4. It consists of three main categories, including various subcategories, which are described in detail in Appendix 5. The empirical observation of the three engaged and three unengaged cases led to the discovery

of three categories, which reflect the different types of relationships that are at play in the text-based communication platform of *Couplelinks*. First, there is the couple-facilitator bond, which approximates the therapeutic alliance that develops in in-person therapy. Next, there is the relationship between the couple and the program, and lastly there is the relationship within the couple. While the second category, 'fostering program adherence,' seemed to be most closely related to promoting engagement, all three relationship domains appeared to be essential for making sure couples were dedicated to completing and benefitting from the program. While the rational model incorporated more conceptually articulated general processes, or 'meta-processes,' such as the importance of being empathic in their communication, the empirical model captured the specific 'techniques,' or behaviours, that facilitators implemented in order to create an alliance and increase engagement in the program. The empirical model is therefore perhaps more 'accessible,' in the sense that it provides concrete examples of how facilitators relate to participants through text.

1. Fostering Couple-Facilitator Bond

This category encompasses the strategies used by facilitators to develop and maintain an alliance with the couple. This alliance was the main factor that allowed the facilitator to bond and communicate with the couple about other aspects of the program and about the couple's relationship. Common techniques used were validation of negative experiences both in the couple's life and in relation to the program, expressing genuine concern for the couple, and promoting communication and collaboration with the facilitator. Aside from minor changes to some definitions crafted through a thematic analysis of the original six couples, no subcategories were removed based on the current sample. Only one new subcategory, 'autonomy support,' was added, which referred to facilitators' efforts to provide the couples with choices regarding how to

proceed in the program, when possible. This was most prominent in instances where couples had missed a deadline, so the facilitators tried to provide options to avoid pressuring couples to conform to a schedule that they could not follow or to do an exercise that they were not comfortable with. For example, facilitators offered different timelines that might fit the couple's schedule better, and sometimes even gave the option to skip a module, especially when they sensed that the couple was not keen on completing it.

2. Fostering Program Adherence

This category relates more directly to the facilitators' efforts to increase intervention engagement. For example, they made 'motivational check-ins,' to remind the couple of an upcoming deadline or in the case of a missed deadline, to gently nudge the couple to get back on track. These types of messages were more frequently used for unengaged couples who often delayed module completion. Another example is 'suggesting plausible gain,' when the couple did not enjoy a module or did not report gaining any new insights. Facilitators always tried to frame such occurrences in a positive light, for example by saying, "I know that at times, you may have felt that you had less to offer since the program did not result in new learning, but often served to confirm the strength of your bond and your attunement to each other."

Based on the current analysis of the six couples' DR data, three new categories were added: 1) setting positive expectations; 2) clarifying module aims/structure; and 3) reinforcing and/or encouraging accountability. 'Setting positive expectations' had to do with instilling an optimistic future orientation toward an upcoming module, or about the couple's future in general. This was especially important for maintaining engagement – if a couple rated a certain module poorly, the facilitator would make sure that they maintained a positive attitude toward the program as a whole. 'Clarifying module aims and structure' helped the couple understand the

intention behind the exercise, as well as how to complete it efficiently, for example by warning them about possible website quirks. For instance, the *Facing Cancer as a Unified Front* module asks couples to create a visual representation of cancer through a virtual whiteboard. In several early instances, couples created an image but did not click the 'save' button, so the image got deleted. Unsurprisingly, they became frustrated with the module, and in some cases with the program altogether, so facilitators learned from this experience and made sure to explain to couples in more detail how to save their work.

'Reinforcing and/or encouraging accountability' referred to facilitators' expressions of appreciation for a couple's responsiveness. For example, it could have been a brief thank you message after the couple responded to a previous 'motivational check-in,' or after the couple initiated communication regarding barriers to meeting a deadline. It also included messages conveying an apology or explanation for the facilitator's own tardiness in providing feedback to the couple, as a way of modeling the type of DR 'behaviour' that they would like in return. While no subcategories were deleted from the broader theme of 'fostering program adherence,' it should be noted that the subcategory 'emphasizing couple's intrinsic motivation toward the program' was only coded once in the present sample.

3. Fostering Within-Couple Bond

This category speaks to facilitators' efforts to address the relationship between both members of the participating couple. In addition to highlighting positive aspects of the couple's relationship, they also validated and reframed negative facets. Because some modules called for a discussion of difficult topics, contention within a couple occasionally arose. In such cases, facilitators had to make sure that the couple remained a unified team, and were able to use the program as a tool to work on their issues. Again, the aim was to focus on the positive, for

example by ‘accentuating intrinsic couple strengths’ and ‘emphasizing mutual valuing.’ Except for some minor tweaks of the definitions or subcategory names, no subcategories were added to or removed from the original framework. However, it should be noted that the ‘pointing out partner similarities’ subcategory was only coded once among the six new couples analyzed.

Synthesized Model of Engagement Promotion

The aim of the present analysis was to develop a model that demonstrates how facilitators develop and utilize their alliance with couples in order to keep them engaged in the online intervention *Couplelinks*. Appendix 6 presents the culmination of this effort in the form of a synthesized model consisting of facets identified by facilitators as being vital to promoting engagement (identified in the rational model), as well as empirically observed techniques actually carried out by facilitators (outlined in the empirical model). The rational model focused mainly on ‘meta-processes,’ which can be defined as higher-level facilitator functions that seem to cut across specific techniques used by facilitators. In other words, these processes signify a ‘way of being’, such as having an air of empathy, friendliness, and firmness. However, facilitators did list some examples of actual techniques such as use of humour, setting clear expectations, and deliberate use of participants’ names. On the other hand, the subcategories identified in the empirical model exclusively point to more concrete techniques, or facilitative ‘eBehaviours,’ that could be straightforwardly implemented in text-based feedback to participants. The latter can potentially lend themselves more easily to replication and behavioural coding, while the former meta-processes draw more directly from the facilitator’s clinical acumen as experienced facilitators and psychotherapists.

Considered in combination – for example, if a couple did not enjoy a particular module, the facilitator could ‘suggest a plausible gain’ in order to subtly propose that completing the

exercise was not a waste of time, but the message would have to be conveyed in a positive and friendly way so as to not sound defensive or dismissive. Another example of integrating meta-process and technique would be when there is discord between the partners in a couple – which might threaten their continued participation in the intervention – the facilitator could validate their negative experience and try to stimulate communication within the couple. However, this would have to be done in an empathic, inclusive way so that both partners feel heard. Similarly, in the event of a website malfunction, the responsibility falls on the facilitator to use various techniques such as keeping the couple in the loop about efforts to fix the problem and conveying appreciation for the couple's continued effort. The overarching meta-process here would be 'humanizing the technology.' In other words, the connection between the facilitator and the couple must surpass the technological barrier imposed by the intervention.

The synthesized model presented in Appendix 6 consists of the meta-processes and facilitator techniques identified in the rational and empirical models. Importantly, the numbers next to each technique correspond to a meta-process, thus indicating how a facilitator might be able to concretely convey specific concepts, as demonstrated in the examples above. To demonstrate further, one way of exhibiting empathy might be to 'validate the couple's experience with cancer,' and one way of showing firmness might be to 'structure couple participation.' One notable trend, corresponding to what facilitators mentioned in their survey responses, is that many of the techniques relate to the process of 'humanizing the technology,' further suggesting that this is one of the facilitators' main responsibilities. 'Inclusive empathic attitude' was also connected to most techniques, indicating that an air of empathy is vital even in this online intervention context. It also points to the notion that both partners' needs and perspectives should be addressed equally.

While there were not many observed instances of negative facilitator behaviours, likely in part because they had time to consider and construct the messages before sending them to participants, it was clear that facilitators had a more difficult time managing their communication with unengaged couples. For example, upon observation of the unengaged couples' transcripts, sometimes facilitators appeared to become less responsive, indicating that they had become frustrated and/or avoidant themselves (which is also consistent with the rational model). While facilitators tried multiple times to reach couples after they missed set deadlines, for example by sending 'motivational check-in' messages or calling them after particularly long delays, eventually they seemed to give up. This was especially the case for couples who were unresponsive (i.e., unaccountable) themselves. According to the facilitators, they sometimes felt like they were intruding or 'nagging' couples to stay on track. This response (or better, lack of response) had the reciprocal effect of reducing facilitators' motivation to connect with the couple and sometimes even led to an avoidance of communication. Sometimes a nonresponsive couple also led the facilitator to doubt their competence. In working with unengaged couples, it appears that there was a fine line between being friendly and positive versus being firm. Facilitators were not always sure whether to 'push' couples (e.g., give more structure) or to focus more on being friendly/positive (e.g., emphasize couple's progress and/or potential future benefit). In fact, it appeared as though some messages were almost too positive (perhaps reactively so), and thus were not effective in enforcing accountability and commitment to the program.

Another potentially problematic aspect of some facilitators' messages to unengaged couples is that sometimes they tended to focus on the couple-program relationship, closely followed by the facilitator-couple relationship, more than they focused on the within-couple bond. Considering that at its core *Couplelinks* is a relationship enhancement intervention,

couples might have been more interested in professional input aimed at helping them connect with each other and cope with the challenges imposed by BC. Another somewhat negative behaviour involved 'suggesting plausible gain' with regards to a particular module without validating the couple's negative experience with it first (it should be noted, however, that this was a rare observation). Lastly, sometimes facilitators did not always remember to warn couples of known website quirks (such as the need to save artwork before moving onto feedback in Module 4 - *Facing Cancer as a Unified Front*), and thus might have failed to mitigate a potential area of frustration for the couple.

The Emergent Couple Engagement-Types

While searching for the 'most contrasting' dyads in terms of engagement level to be used in the empirical observation step of the task analysis, an interesting finding arose. We found that couples actually fit into four different groups, or 'couple engagement-types,' representing varying levels of engagement. The identified types were: 1) "keen" couples, defined as timely and enthusiastic (short completion time and high attitude rating); 2) "compliant" couples, defined as timely yet unenthusiastic (short completion time and lower attitude rating); 3) "apologetic" couples, defined as untimely but enthusiastic and accountable (longer completion time, high attitude rating, and high accountability rating); and 4) "straggling" couples, defined as untimely and unaccountable (longer completion time and lower accountability rating). All of the groups are comprised of three couples that were considered to best exemplify the characteristics that define each of our 'types.' Furthermore, three is the recommended number of cases per group when conducting a task analysis "...because this is the minimum number in which one can begin to have some confidence that observed commonalities [and differences] are unlikely to be due to chance" (Greenberg, 2007, p. 17). Thus, we adopted this rationale, for coding these groups' DR

transcripts with future research in mind, in order to investigate whether facilitator performance differs amongst these seemingly unique types of couples.

The keen and straggling designations correspond to the engaged and unengaged couple 'extremes,' respectively, that were observed in the task analysis. In addition to these two extremes, the first interesting variation in engagement level was the compliant group, which consisted of couples that completed the program quickly (i.e., met all facilitator deadlines) but were relatively less enthusiastic about the various exercises, as indicated by their attitude scores. One couple, for example, consistently reported that they did not derive new learning from the various exercises, which appeared to contribute to their somewhat negative view of the intervention. Apologetic couples, on the other hand, seemed to enjoy the intervention but had trouble staying on track. They often missed set deadlines, but still took the time to communicate with their facilitator, for example to explain and/or apologize for delays. Despite going through the intervention quickly, it appears that the compliant couples were actually less engaged than the apologetic couples.

Discussion

Previous research has shown that high engagement in online interventions is difficult to attain (Sandaunet, 2008; Melville, Casey, & Kavanagh, 2010), but also has a significant influence on intervention effects (Danaher & Seeley, 2009). It has also been demonstrated that professional facilitation increases engagement in online programs (Spek et al., 2007; Andersson & Cuijpers, 2009), thus warranting an investigation into the relationship between the therapeutic alliance and participant engagement in such programs. In order to address this need, the present study aimed to gain a better understanding of *how* facilitators in an online intervention for couples affected by breast cancer develop a therapeutic alliance in order to increase participants'

engagement in and completion of the program. Through an iterative exchange between rational hypothetical modeling and empirical observation, we developed a synthesized model that incorporates techniques and meta-processes important to establishing a therapeutic alliance in the online context that may help to increase and/or maintain engagement in the *Couplelinks* intervention.

According to Greenberg (2007), one of the advantages of task analysis is that it can capture contextual processes that are often difficult to measure. Interestingly, our rational model did in fact consist mainly of meta-processes that may be particularly difficult to measure in a text-based format. However, they are still logically suggestive of essential components of the task at hand, and through which relevant eBehaviours may be inferred. Key components of engagement promotion identified in the rational model included a friendly and positive yet simultaneously firm demeanor, an inclusive and empathic attitude, and an effort to humanize the automated and somewhat more distanced nature of a computerized intervention format. While the first two categories mirror processes that are also important in face-to-face therapy, the third component of our rational model speaks specifically to the challenges of an online, text-based form of communication. As with the computerized CBT program previously described by Barazzone and colleagues (2012), which was designed to imitate the 'alliance features' which individuals experience in therapy, the *Couplelinks* facilitators also aimed to achieve a more human connection with participants despite the barriers imposed by the virtual modality. One of the facilitators' main goals was to make their feedback, as well as the intervention itself, seem as least computerized as possible by tailoring their responses to each couple and personalizing the standard content. Contrary to evidence that an alliance can be formed through text alone (Barazzone et al., 2012), our facilitators stipulated that the additional phone calls were beneficial,

and even necessary, for establishing and particularly for judging the strength of their alliance with couples. This finding indicates that even experienced professional facilitators were aware of the limitations of relying exclusively on text-based communication as a means to developing as strong an alliance as possible with their clients. Indeed, other research has suggested that more direct, synchronous communication (e.g., face-to-face or telephone versus email communication) increases the effect of online interventions and decreases attrition rates (Halford et al., 2010; Larson, Vatter, Galbraith, Holman, & Stahmann, 2007; Spek et al., 2007). As pointed out by our facilitators, the supplemental verbal communication was especially important for reaching out to participants that were straying. For example, while communication through the Dialogue Room was easy to ignore, particularly because couples could simply stop logging on to the website to check their messages, receiving a phone call from the facilitator likely helped to enforce greater accountability on the part of non-responsive couples. Reaching out in this way also simultaneously conveys to couples that they have not been forgotten and that the facilitator is honouring his or her commitment to them.

Interestingly, our rational model did not elucidate many behavioural interventions that could be used to actually convey the identified meta-processes, which could also be seen as a limitation of this study. In contrast, various self-report, observational, and physiological measures of the components of empathy, such as attunement, communication, and accuracy, have been developed in the context of face-to-face communication and therapy specifically (Gerdes, Segal, & Lietz, 2010). This is an important stage that leads to a better understanding of the concept and ultimately to an ability to teach therapists how to develop this vital therapeutic skill. For example, the Measure of Expressed Empathy provides an observational way of measuring therapists' verbal and non-verbal empathic behaviours such as vocal concern, look of

concern, and responsiveness/following, and could be used to identify specific behaviours as they relate to therapy outcomes (Malin & Pos, 2015; Watson & Prosser, 1999/2002). Such a tool could also help therapists to identify behaviours that they can incorporate into their practice in order to express greater empathy. Using this literature may have helped better operationalize the rational model so that it could have been used as more of a guide in the empirical observational phase. As such, our empirical phase was in fact less influenced or biased by the rational model than might have normally occurred in a classical task analysis. So, while our experienced facilitators identified meta-processes that are indeed likely central to developing an alliance, a next step would be to develop a way of measuring concepts such as empathy in text-based interventions in order to explicate their role in this unique context (i.e., textual and non-face-to-face communication).

It is interesting that when asked to identify the essential components of maintaining engagement according to their professional judgement and experience, facilitators largely identified these more global, intangible 'ways-of-being,' rather than specific techniques. Perhaps with therapeutic and facilitative experience comes a general 'knowing' of how to communicate with clients/participants, but it is more difficult to identify specific interventions that one utilizes. This makes sense according to the literature on declarative and procedural knowledge/memory. Declarative memory refers to the storage of facts and events (ten Berge & van Hezewijk, 1999). However, declarative knowledge is not accessible consciously, and can only be retrieved based on clues, such as explicit questions. In fact, "an individual can only become aware of the products of this process" and "a given cue will lead to the retrieval of only a very small amount of potentially available information" (ten Berge & van Hezewijk, 1999, p. 608). On the other hand, procedural memory refers to knowledge about how to do things and guides one's ability to

perform both physical and cognitive skills. Importantly, the steps involved in performing these skills are difficult to verbalize (ten Berge & van Hezewijk, 1999), thus partly explaining why our facilitators were more readily able to express which concepts are important to increasing engagement, but less likely to speak to precisely *how* they exercise these skills. Another possibility could be that the way in which the survey questions, that yielded the data upon which the rational model was based, were formulated generated more abstract types of responses. Conversely, an empirical observation of the facilitators' actual communication with participants yielded more concrete interventions, or eBehaviours, that facilitators implemented to communicate their thoughts and expectations to couples. These eBehaviours were linked to the related meta-processes in the synthesized model.

The empirical analysis yielded three broad categories representing an organizational structure of different relationships at play in *Couplelinks* facilitation, much like the different types of alliances that exist in couple therapy. Specifically, the couple-facilitator bond and the within-couple bond echo the face-to-face relationships between the therapist with the couple and the partners with each other (Friedlander et al., 2011). The third category discovered, namely fostering program adherence, adds another layer of complexity that would perhaps be akin to a therapist 'selling' their particular brand of therapy. In other words, the facilitators aim to make sure that the couples are enjoying and benefitting from, but also buying into, the intervention. This relates to research that demonstrates a link between clients' acceptance of the treatment rationale (i.e., the model of etiology and treatment) and positive therapy outcome (e.g., Addis & Jacobson, 2000). For instance, the subcategory (i.e., facilitator technique) of 'instilling confidence' in relation to a particular module might be similar to a cognitive behavioural therapist providing a rationale for homework assignments. In the online context, however, it is

possible that the couples' relationship with the program and website itself critically influences engagement as well as any benefits derived from the intervention in general. Because participants and facilitators are interacting indirectly through a computer interface, it is possible that the participants' relationship to the technological aspects of the program is actually mediating their relationship with the facilitator. This variable of participants' experience of the website (i.e., its 'look and feel', informational content, and/or functionality) may range from finding it 'user friendly,' interesting, and/or illuminating to experiencing it as dull, or at worst frustrating (for example, in the case of 'glitches'). Moreover, because of the structure of the intervention (which is part and parcel with the website design), the facilitator cannot alter its contents if a couple is not enjoying or benefiting from it (beyond altering the sequence of the modules, or allowing the couple to skip a module or two as per the treatment manual guidelines). This is unlike a therapist's capacity to change the course of therapy by incorporating new types of interventions, for example. However, these ideas are not currently substantiated by evidence so more research is required in order to elucidate what role each of the three relationships identified in the present analysis play in terms of engagement and intervention effects.

Nonetheless, facilitators and the alliance which they developed with participants seemed to have a noteworthy impact on program engagement. For example, as captured in the rational model, the rigidity imposed by the nature of the online intervention had to be overcome through non-computerized means – which is a responsibility that befalls the facilitators. For instance, they rephrased module instructions and rationales in a way that might relate more to a particular couple, and apologized for website malfunctions. In fact, it appeared that much of the facilitators' communication with couples aimed to ensure that the intervention did not seem automated and impersonal. Adopting this humanizing (in contrast to stock/technical) style of

communication seemed to be an instinctive choice across the participating professionals. Even more so when there were problems with the website, facilitators had to show that there was a person behind the screen that would work with the couple to fix the problem and address their concerns regardless of whether the website was working properly or not.

Upon reflection on the empirical model, it appeared that facilitators were very skilled in using a wide range of techniques to maintain a balance between the three interplaying relationships. For example, while they would focus on ensuring that a couple was following a timely schedule (i.e., program adherence), they also paid attention to the couple and their struggles outside of the intervention (i.e., couple-facilitator bond and within-couple bond). Because these are difficult abilities to master, the empirical model derived through the current analysis adds to the existing online intervention engagement literature by providing guidance, as well as examples of specific techniques, or eBehaviours, that can be utilized by facilitators in future text-based interventions. Additionally, the synthesized model provides a more comprehensive look at the components that appear to be central to maintaining online engagement by linking meta-processes with interventions that convey these concepts.

Study Limitations and Future Directions

Several limitations of this study may have affected our findings and should be addressed in future research. First, as mentioned above, our rational model would have provided even more beneficial information if expressly behavioural components were incorporated in addition to the meta-processes. Instead of surveying our facilitators, which could be seen as an empirical analysis in and of itself (due to the need to conduct a qualitative content analysis of their responses), the rational model may have been more detailed if it were based on a literature review of therapist behaviour, as well as on clinical judgement, which is more consistent with

previous studies (e.g., Colosimo, 2013; Williams et al., 2013). Our surveying method was a deviation from the task analytic method, and may have been part of the reason that our rational and empirical models were so different. However, this choice is also a reflection of the fact that research on asynchronous text-based therapy/intervention facilitation is in its infancy, so there is a paucity of relevant literature in this area to draw upon.

Second, during the empirical model construction phase in task analysis, differences in task performance often emerge between the successful and unsuccessful cases. However, in the present analysis we did not find a great number of obvious differences between facilitators' messages for engaged (keen) versus non-engaged (straggling) couples. Some differences that did arise are that messages to keen couples appeared to be shorter in length and contained a smaller variety of techniques. The simplest example is that there were no 'motivational check-in' messages to keen couples because they always completed the modules on time. One reason for this lack of differentiation could also be that there were only three dyads per group, due to the fact that task analysis calls for a rich observation of a small number of cases. Despite few cases being examined, however, the transcripts for each dyad consisted of numerous facilitator messages (at the very least, as many messages as there were modules completed) that were systematically coded, indicating that there is likely another explanation for the minimal differentiation. Another possible explanation is that, unlike spontaneous face-to-face interaction, the asynchronous nature of the DR communication allows facilitators to monitor or self-regulate instincts or unconscious reactions that could harm the alliance with the couple. In other words, because they do not have to reply on the spot as one would in the context of live therapy, facilitators are able to craft messages that do not reflect any negative thoughts or feelings toward the participants (e.g., being annoyed at the lack of responsiveness from the couple).

Additionally, we did not observe many instances of negative engagement techniques, even in the straggling group. This finding is contrary to what one would expect under the assumption that poor facilitator performance leads to low engagement. One of the few negative aspects of some facilitators' messages was when they became increasingly less responsive after multiple efforts to contact unengaged couples. This finding is indicative of a reciprocal relationship where the way in which couples behave in turn influences how facilitators interact with them. Indeed, research based on the Structural Analysis of Social Behaviour model has shown that there is an interpersonal interaction in therapy, wherein therapist behaviours affect client behaviours, and vice versa (Benjamin, 1974; Henry, Schacht, & Strupp, 1986). For example, straggling couples who were not engaging with their facilitator and the intervention in general were inadvertently promoting avoidant behaviour in the facilitator as well, which might ultimately have led to disengagement from the relationship on both accounts.

Other negative facilitator behaviours such as neglecting to validate a couple's negative experience with a module or typing the wrong participant's name in their message, could also be seen as alliance ruptures. There is extensive research on this concept, defined as the "breakdown in the collaborative relationship between patient and therapist" in the context of face-to-face therapy (Safran, Muran, & Eubanks-Carter, 2011, p.80), and would thus likely be an important factor in online alliance formation and intervention effectiveness as well. Future research, for example, could pinpoint existing alliance ruptures and examine their influence on program engagement. Alliance ruptures in the *Couplelinks* intervention tended to be of a withdrawal nature, where the couple becoming more remote and unaccountable rather than hostile or confrontational. Nonetheless, the overall lack of negative occurrences/eBehaviours in our sample perhaps points to a strength of asynchronous, text-based communication, in that facilitators have

more time to consider their messages and how they may be received. Thus, as mentioned above, the likelihood of spontaneous and/or impulsive therapist responses that could lead to alliance ruptures (i.e., therapeutic 'mistakes') may be reduced.

A more rigorous investigation of the differences in facilitator performance between the four groups that we identified might also help to devise guidelines for facilitators in dealing with different types of couples. Going back to the reciprocal relationship of the interactions between the facilitators and couples, it could help to identify when facilitators might want to stop 'chasing' some couples. For example, we found that sometimes, despite obviously insightful, empathic messages, some dyads (e.g., couples in the straggling group) could not be swayed into being more engaged in the program. According to facilitators, this type of interaction made them frustrated and critical of their effectiveness as a facilitator. This finding relates to research on client factors in therapy, which suggests that factors largely out of the therapist's control such as age, personality, and ethnic background have a significant impact on therapy outcomes (Wampold, 2001). The observation that facilitators were sometimes actually more active in messaging non-engaged couples (but still made no progress in increasing engagement) might further support the notion that engagement in the program may be more dependent on client factors rather than on input from the facilitators. Future research could also focus on therapist factors, such as frustration or self-efficacy, which may influence online alliance building.

The consideration of client factors points to another limitation of the present study – because the RCT was ongoing at the time of the analysis, I did not have access to information on client characteristics and ratings that might have influenced the alliance, as well as engagement in the program. For instance, it would have been beneficial to know how clients self-rated the intervention as a whole, aside from our own ratings of their attitude toward each module.

Furthermore, we did not take into account instances where one partner liked the intervention while the other did not. Perhaps facilitators had no chance of significantly enhancing engagement for couples that did not like the intervention in general (according to ratings in the post-treatment questionnaires that couples knew facilitators would not see), or when there was a divergence between the two partners' attitudes toward it, no matter what the contents of the facilitator's messages were. It is thus not clear how much of an effect facilitators actually have on intervention engagement compared to the effect of the intervention itself.

Moreover, we had no way of knowing how carefully participants actually read the DR messages. It is possible that less interested participants did not pay close attention to facilitators' messages, and it is also possible that only one partner in the dyad read them. In fact, in some cases only one of the partners responded to DR messages, and in other cases neither of the partners wrote back. This somewhat one-sided conversation also likely limited the quality of alliance that was able to develop. Indeed, building a therapeutic alliance involves an interaction between the professional and the client(s) (Bordin, 1979), so the alliance in the *Couplelinks* program may be of a different quality than that which exists in face-to-face therapy.

Another limitation is that we had incomplete information about the phone calls between facilitators and couples, because not all facilitators consistently detailed them in the Contact Notes. As such, we do not know how these important interactions really impacted the alliance. Furthermore, we did not have actual measures of alliance, so it is unclear whether our method of characterizing engagement is actually related to alliance. Instead, we made the assumption that therapeutic alliance is inherently related to engagement (i.e., that level of engagement is a 'proxy' or indirect indication of alliance – higher engagement indicates stronger alliance). Future research should include both therapist and client rated measures of alliance as well as

observational methods in order to determine whether the markers of alliance (i.e., the eBehaviours identified in our model) are valid. More work should also be done to validate our composite measure of engagement. Because the separate engagement measures, and the way in which we combined them, were generated specifically for this study, at present it is not certain that the four groups we identified really do represent entirely different levels of engagement.

The second validation phase of task analysis, which focuses on hypothesis testing and statistical evaluation to determine how well the process model predicts outcome (Greenberg, 2007), should be carried out in order to validate our model of engagement promotion. For example, a study can be carried out to examine the effect of the presence of facilitator techniques on intervention success, while controlling for other variables such as participant attitudes toward the program. Another important line of research that can be conducted once the RCT is concluded is to examine the influence of engagement on intervention effects. It would be worthwhile to determine whether highly engaged couples benefitted more from the intervention when compared to non-engaged couples. This is an assumption underlying the rationale for the current analysis, but has yet to be supported. If this were the case, it would bolster the notion that engagement predicts outcome, and that facilitators should indeed strive to enhance couples' engagement in the intervention.

Implications

Despite these limitations, the present research provides an in depth examination, or type of 'intervention case study,' that adds to the effort of understanding the mechanisms by which professional facilitation can increase participant engagement in online interventions. While research has shown that facilitated interventions are more effective and have lower drop-out rates than non-facilitated interventions (Spek et al., 2007; Andersson & Cuijpers, 2009), it has

remained largely unclear what facilitators are doing to drive these positive outcomes. Because of growing evidence for the effectiveness of online interventions in general and those which may be of benefit to couples in particular, it is important to elucidate facilitator tasks and processes underlying successful outcomes. As a first step, the synthesized model of engagement promotion presented in this study provides an initial look into the components of successful online facilitation and alliance building with couples.

Specifically, in addition to elements common in couple therapy (e.g., empathy, forging a supportive relationship between the dyad), we found that there are elements unique to the online modality – a relatively novel, but burgeoning field of intervention. Firstly, there was a pervasive effort on the facilitators' part to 'humanize the technology' – to overcome the barriers imposed by the otherwise pre-designed online intervention, by developing a genuine connection with the participants. Facilitators, on their own accord and seemingly quite instinctively, made an effort *to not* come across as 'expert' or 'therapist-like.' They accomplished this by using casual language so as to counter the potential for their responses to seem stock, automated, or robotic, which is a risk with a computer mediated intervention. In a sense, facilitators de-professionalized an aspect of their communication in order to transcend an inherent drawback associated with online interaction, and to connect with the couple on as human a level as possible. Our model also enriches the existing research in the field of online facilitation by describing concrete techniques that facilitators utilize to achieve this goal, as well as the other components of alliance building, such as validating the couple's experience, using humour, or stimulating conversation between the couple. This finding provides insights that, with further research, could be used towards the development of facilitation guidelines for online couple work. In particular, the 'fostering

program adherence' category provides techniques directly related to increasing intervention engagement.

In terms of guidelines, for example, our findings point to the possible benefit of facilitators having a conversation with participants at the beginning of their work together around how the couple would like the facilitator to approach them should they fall behind. Important to this conversation would be informing the couple of the sometimes demanding nature of the intervention and the possibility for a given task to 'slip off of the couple's radar,' or for life to interfere with accomplishing the modules – the facilitator should essentially proactively normalize this possibility. Engaging in this collaborative, problem-solving discussion in advance could also help to establish the facilitator-couple bond early on. Furthermore, it might help facilitators to determine which couples prefer more of a 'push' to help keep them on track. The couple-engagement typology derived through the present analysis suggests that facilitators may have to modify their approach to fostering adherence depending on whether the couple is, for example, more of the straggling or apologetic variety. Once they identify a straggling couple, for instance, facilitators might want to contact them by phone instead of continuing to write messages that may be getting ignored. They could discuss frankly the reasons underlying the couple's lack of engagement, possibly revisiting their earlier 'contract' regarding the type of support they need and how the facilitator may best engage with them.

Concluding Remarks

This study presents a model of the components of therapeutic alliance formation in an online, couple-based program as it relates to intervention engagement promotion. The synthesized model demonstrates the complexity of this task, which relies on facilitators' experience in and use of a multitude of meta-processes and concrete interventions. The present

research contributes to the efforts in making online support for couples affected by cancer, as well as for online interventions in fields outside of oncology, more successful, by helping us to understand how professional facilitators can develop an alliance with participants to guide and encourage them in order to increase intervention engagement.

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Appendix 1

Demographic Information

Variable	**Female M*(SD)***	**Male M*(SD)***
Age	39.58(5.20)	40.50(5.84)
Age at Diagnosis	37.83(5.51)	
Length of Relationship	14.08(7.22)	
Number of Children	0.92(0.51)	
Variable	**Female N*(%)***	**Male N*(%)***
Ethnic Background		
Anglo-Saxon	9(75)	9(75)
Latin-American	1(8)	1(8)
Asian	1(8)	0
French-Canadian	1(8)	0
French	0	1(8)
Jewish	0	1(8)
Employment Status		
Employed	11(92)	10(83)
Unemployed	1(8)	0
Student	0	2(17)
Education Level		
High-school	1(8)	2(17)
College Program	4(33)	3(25)
Undergraduate Degree	5(42)	7(58)
Graduate Degree	2(17)	0
Marital Status		
Married	11(92)	
Common Law	1(8)	
Living Situation		
With partner and child(ren)	9(75)	
With partner	3(25)	
Cancer Stage		
1	6(50)	
2	1(8)	
3	5(42)	
Illness Point		
Recently diagnosed	1(8)	
About to start treatment	1(8)	
Just completed active treatment	3(25)	
Receiving follow-up care	6(50)	
Type of Surgery		
Single lumpectomy	3(25)	
Single mastectomy	3(25)	
Single mastectomy and reconstruction	2(17)	

Bilateral mastectomy and reconstruction	4(33)
Type of Therapy/ Treatment	
Chemo	10(83)
Radiation	9(75)
Hormonal	5(42)
Herceptin	2(17)

Appendix 2

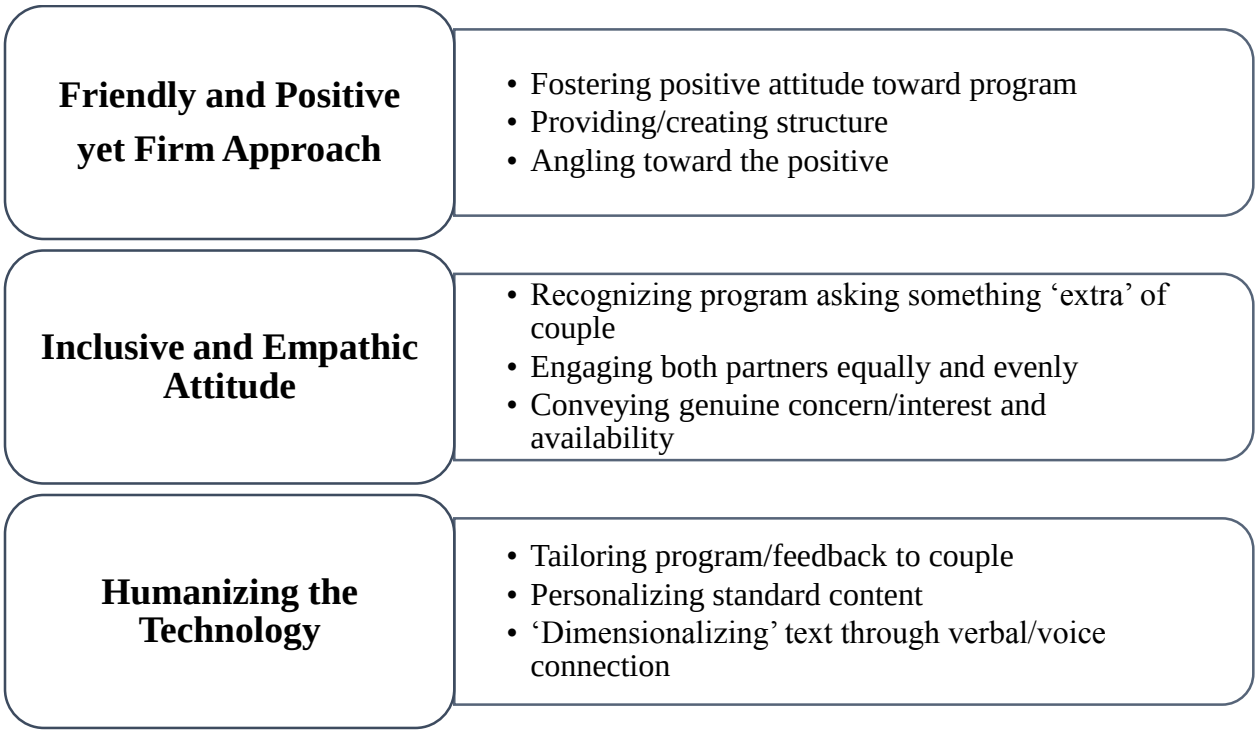
Engagement Measures

Couple ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Completion Time (days)	42	44	52	44	67	67	81	91	168	100	194	209
Average Completion Time (days)	7.00	6.29	7.43	7.33	9.57	13.60	20.25	13.00	28.00	16.67	32.33	41.80
Accountability	3	3	3	3	3	3	3	3	3	1	1	1
Attitude												
Female	3.00	2.86	2.86	2.00	2.43	2.40	3.00	3.00	2.83	2.67	2.50	2.60
Male	2.50	3.00	2.57	2.17	1.29	2.00	3.00	2.86	2.67	2.50	2.67	3.00
Combined Average	2.75	2.93	2.71	2.08	1.86	2.20	3.00	2.93	2.75	2.58	2.58	2.80
Modules Completed	6	7	7	6	7	5	4	7	6	6	6	5
Facilitator	2	3	3	2	4	3	3	4	4	2	1	3

* Keen couples: 1, 2, 3
Compliant couples: 4, 5, 6
Apologetic couples: 7, 8, 9
Straggling couples: 10, 11, 12

Appendix 3

Rational Model of Engagement Promotion



Appendix 4

Empirical Model of Engagement Promotion

1. Fostering Couple-Facilitator Bond	**2. Fostering Program Adherence**	**3. Fostering Within-Couple Bond**
Validating couple's experience with cancer	Encouraging communication in the DR	Accentuating intrinsic couple strengths
Inspiring communication and collaborative effort with facilitator	Motivational check-in	Building mutual understanding
Capturing key concerns	Suggesting plausible gain • Providing rationale for module	Reinforcing how 'in-tune' with each other
Validating negative feelings stirred up in the exercise/program	Noting positive take-away	Emphasizing mutual valuing
Bringing self and experience into conversation • Facilitator disclosing personal experience • Joining through humour	Instilling confidence [in relation to the program] Subcategories: • Expressing enthusiasm • Encouraging progress • Reassuring on the right path	Stimulating communication and/or connection within the couple
Expressing concern for couple	Appreciation of effort	Pointing out partner similarities
Offering advice	Structuring couple participation	
Keeping couple in the loop • Apologizing for delay in response	Emphasizing couple's intrinsic motivation toward the program	
Small talk	Acknowledging barriers to completion	
Autonomy support	Setting positive expectations	
	Clarifying module aims/structure	
	Reinforcing and/or encouraging accountability	

Appendix 5

Empirical Model of Engagement Promotion, with Subcategory Descriptions

1. FOSTERING COUPLE-FACILITATOR BOND		
CODE	**DEFINITION**	**DATA EXTRACT**
Validating couple's experience with cancer	The facilitator validates and understands the experience the couple has had with cancer either on a broad, possibly existential level, or on a specific day-to-day level.	"The images of cancer as the "guest from hell" and your descriptions about the way it seeps into every aspect of your lives, stealing your carefree feelings and your dreams were powerful - the image you created really captures that. It is difficult to move on after a cancer experience for most couples and fear is often a part of that; I hope some of the conversations you are having help in that way" "…as you progressively layered meaning onto this powerful image of the single dark cloud – a ominous presence that is sitting on the horizon; not powerful enough to destroy anything but nevertheless an interfering presence requiring your attention and patience."
Inspiring communication and collaborative effort with facilitator	Facilitator encourages the couple to communicate and collaborate with the facilitator as they work through the program.	"We can make this work" "Please let me know if you need any more direction or support!"
Capturing key concerns	The facilitator paraphrases the key issues/concerns raised by the couple as a whole, or by each member of the couple. Facilitator is also directing the couple's attention to what the facilitator considers important for the couple to recognize/understand about each other and their relationship.	"D, it sounds like J's worries about recurrence are difficult for you, and you have a hard time not being able to solve that (and maybe get cranky when worried?). J you recognize you've lost an innocence and carefree-ness after getting through so much, its not 'back to normal' because now you are dealing with fear (and when its in mind, you need to express it). These are helpful things to remember about each other." "S I hear the hope and desire to bring sex back into your relationship, but also too empathy and openness to L being ready. S I hear that you especially enjoyed the intimacy and closeness of giving L a massage." "This is true for many couples. Sometimes we can slip into autopilot mode and miss the important step of acknowledging / thanking our partner for caring. Or we can miss an opportunity to clear the air about something that is challenging. I think this is what you were talking about, A, when you said,

		little things matter and it's important to acknowledge when L does little things as well as the big things."
Validating negative feelings stirred up in the exercise/program	The facilitator demonstrates an understanding of negative feelings that are brought up as a result of the module. These negative feelings can be either towards to the module itself (i.e., The couple did not enjoy the module) or negative memories/feelings that the particular exercise stirred up.	"M. I hear your struggle about balancing fear and living life, the cancer diagnosis generates a lot of fear for both of you and yet you don't want to let it consume living life. In a way the exercise really highlighted that struggle for you."
Bringing self and experience into conversation	The facilitator tries to connect with the couple by disclosing personal information or by using humour. Something the couple has said has significantly impacted or emotionally affected the facilitator and he/she chooses to share this with the couple. This is a form of emotional self-disclosure on the part of the facilitator – in relation to the couple. The facilitator may also use humour as a means of relating to couple and entering into their unique world/culture.	"It's been a pleasure getting to know you, and I have so enjoyed your enjoyment of each other." "M, I was touched by your comment that A still likes me. I also found myself chuckling at your comment A that you learned you were romantic…" "I did laugh out loud and again I was struck by the affection and warmth and humour you share together. I will not look at frying pans the same way again"
Expressing concern for couple	Concern the facilitator has for the couple that is unrelated to the program – in relation to the couple's personal lives, often pertaining to the couple's or partners' general well-being.	"I am really sorry to hear you are worrying - certainly understandable with unusual pain. I hope you can get it checked out soon so that you can put your mind at rest… Do keep in touch and let me know how you are doing"
Offering advice	The facilitator provides the couple with a suggestion as a solution for one of the key concerns the couple has. This may entail psychoeducation about relationships and/or normal interpersonal processes or reactions or experiences.	"This is very tough for most couples to talk about but there are some communication exercises later in the program where you may want to try this a bit. I can talk with you about how to do that if you want."
Keeping couple in the loop	The facilitator is keeping the couple informed about his or her accessibility particularly if	"As I mentioned I am travelling this week but I will check for your feedback when I am next able to access email, which I expect to be Feb 11th."

	they will be off line for a period, and other aspects of the program, such as technical problems. They may also apologize for delays in responding.	
Small talk	Appropriate sharing of personal information or information not related to program.	"hi there - thanks I did have a good holiday!"
Autonomy support	Providing the couple with choices in how to proceed in the program. For example, once a completion date is missed, offering two or three new dates for the couple to pick from, or offering the possibility of moving onto a new module.	"I have a sense that the two of you are typically quite open in your communication with each other so I'll leave it up to you whether or not to pursue the additional module."
2. FOSTERING PROGRAM ADHERENCE		
CODE	**DEFINITION**	**EXTRACT**
Encouraging communication in the DR	Facilitator encouraging the couple to make use of the site's discussion board in order to communicate/correspond with the facilitator, and more generally to engage with the website and the facilitator *through the website*.	"I look forward to hearing how this has been for your both" "We'll touch base again next week through the dialogue room." "As always, I can be reached by email or through this Dialogue Room as needed"
Motivational check-in	Facilitator inquires with the couple of how they are progressing with the module in an effort to keep them motivated and on track, when the module has not been completed according to schedule.	"hello A and D, I see you've made progress on the intimacy module which is wonderful (and you seemed to enjoy which is even better ;-)). I'm keen to hear your complete feedback and how the discussion part of your 'homework' went. Perhaps you could have another go this week, and I can move you to the next and last module?" "I'm looking forward to receiving your work on Module 4 and your feedback. I was hoping to review today but have not yet received it. Can you let me know when you can have it in? …Trusting all is well..."
Suggesting plausible gain	Facilitator suggesting what can be learned or gained from a given module if the couple has not found this for themselves. This may	"I also found myself chuckling at your comment A that you learned you were romantic you may be just kidding (I see you both love to joke) but maybe it got you thinking about what M experiences as romantic moments."

	include an explanation of the rationale behind the module and its purpose.	"Your feedback that the 'intentional dialogue' felt overly structured and a bit awkward is completely understandable, and though you don't feel like it illuminated anything in particular about your relationship, it sounds like it may have a tiny space in your 'communication toolbox'" "It is a different kind of communicating, not the usual exchange and flow, but I wonder if sometimes we just need to tell? That can occasionally be hard to do and needs encouragement and empathy and also 'space' to get it all out (hence putting 'walls' around a piece of conversation)." "Knowing each other well is certainly a huge source of strength for couples and one of the reasons that we use the Understanding your partner's inner world module in the program."
Noting positive take-away	The facilitator is highlighting a positive experience the couple had with a module and what its benefit was. Includes when the couple exercised one of their strengths, or demonstrated positive qualities about themselves as a team while doing the exercise.	"It sounds like the module was helpful in raising your awareness of how you both tend to deal with stress (move away from each other into 'lock down' down mode)." "Overall it sounds like it was fun and that's good." "What a nice experience you describe and what a loving and connected couple you are... It sounds like you fully entered into the spirit of this module, and drew good benefit. Cancer has taken a toll on your physical connection and you both welcomed the opportunity to connect physically without having to worry or think through the complications of sex. It gave you a way to focus tenderly on the other person"
Instilling confidence [in relation to the program] **Subcategories:** • Expressing enthusiasm • Encouraging progress • Reassuring on the right path	Positive feedback following a couple's response to a specific module that conveys they are 'on the right path' and indirectly encourages their continued participation. These responses are intended to help build the couple's confidence in their ability to complete the program.	"I'm so pleased that you are both embracing the intent of the exercise and I trust that you'll continue to enjoy the modules ahead." "It sounds as though you enjoyed the exercise and the conversation that came out of it, which is excellent and makes for a great start" "Hopefully the next modules will get to more of what you are hoping for" "The tree is a great image for your marriage! Happy co-incidence!"
Appreciation of effort	Facilitator acknowledges and expresses his or her appreciation of the effort the couple is putting into the program, often despite facing	"First off, I'd like to acknowledge the effort that you put into this exercise. Even though it was a chore, given the long weekend, and March Break, and

	challenges to completion (e.g., busy schedules).	company, and treatment, you took the process seriously and were rewarded with some insights" "I appreciate that you are trying to keep our schedule despite this and keeping me in the loop too. If it takes a few extra days not to worry" "Thanks for being so diligent and timely!" "The whole Couplelinks team is truly thankful and appreciative of your commitment to the program"
Structuring couple participation	Motivating the couple to stay on track with the program proactively by setting deadlines for module completion and establishing expectations between facilitator and couple. This is particularly important in a 'virtual world' where structure is always more of a challenge than in face-to-face interventions.	"I am not sure exactly when you are back but just guessing that if you are back the end of next week perhaps the week after would be a good target for completion (August 31st)? Please let me know if that works."
Emphasizing couple's intrinsic motivation toward the program	Facilitator is emphasizing couple's motivation in relation to adhering to the program.	"I'm delighted that you are feeling so positive about Couplelinks, it is a great program and your high motivation will ensure you get the most out of it"
Acknowledging barriers to completion	Acknowledging barriers or challenges that might interfere with a couple completing a module by the 'deadline.'	"You took this module as another opportunity to completely focus on your feelings and responses to each other in a planned kind of way. I can hear how hard it is to create the time and space in your lives to do this and how positive it is for you when you do! "hello T and R, I'm so sorry you are having to deal with pneumonia! I hope you are beginning to feel a bit better A although I expect it will take quite awhile before you feel yourself."
Setting positive expectations	When facilitator alludes to a specific gain that the couple might derive out of the next module – or moving forward in the program more generally. It has a future orientation.	"I hope that you will find this a good way to wind down your involvement in the program - and look toward the future" "In our experience, much benefit can be gained by providing just one example of each type of response." "I do think, from our previous discussions, if you can carve out some 'private time' for this, you will enjoy the process."

Clarifying module aims/ structure	The facilitator is introducing the next module and explaining its purpose and organization. May also provide useful tips to make practical requirements of the module clearer.	"The next module focuses on perspective-taking and seeing how accurate you are about your partner's history, and current thoughts and feelings. The first step of Module 2 is done independent of one another, and the second step is completed as a couple. This module is best approached in two sittings—by completing the individual component first and then setting a date for the joint component later on to view the "Reveal" together and for discussion." To ensure your imagery is saved properly, make sure you click both the Save button AND the Continue button after you have completed your imagery and are ready to submit. Clicking only the Save button will temporarily save your image, and will not advance you to the next step in the Module. Clicking only the Continue button will advance you to the next step, however your imagery will not be saved."
Reinforcing and/or encouraging accountability	Facilitator expresses appreciation to the couple for responding to motivational check-in messages or providing an apology/explanation for their own tardiness in providing feedback.	"Thank you for letting me know; I'm glad we're picking up again." "Thanks for the update MF!" "I am sorry I missed that you had finished last night!"
3. FOSTERING WITHIN-COUPLE BOND		
CODE	**DEFINITION**	**EXTRACT**
Accentuating intrinsic couple strengths	Highlighting a couple-strength, specifically a strength that pre-exists for the couple and that is demonstrating itself through the process of completing the module.	"What a nice experience you describe and what a loving and connected couple you are..." "I'm struck by the positive energy in your relationship and the playful intimacy that you share. I suspect that this has given you a resiliency as a couple that has helped you to remain positive and focused on the most important parts of your relationship and your family life despite the challenges of breast cancer" "Some couples are already very conscious of the positive qualities in each other and in their relationship sounds like you are one of those couples. Lots of couples struggle to name positive qualities. It says something about your relationship that you are so clear about those."

Building mutual understanding	Facilitator highlights the importance of what the couple has learned from a module and how this will benefit their relationship. The module, for example, may have helped the couple to realize a gap in their understanding of the other's experience.	"It sounds like the module was helpful in raising your awareness of how you both tend to deal with stress (move away from each other into 'lock down' down mode). And more importantly, what you both need to move forward out of lock down and gain strength from being a couple (leave room for an opening, make the extra effort to reach out to the other who has withdrawn)." "It seemed that you both enjoyed the module and made a few new discoveries also. Isn't it so interesting that you both assumed the other wants to be alone when feeling anxious or down, yet you both would prefer for the other to reach out, listen and show affection"
Reinforcing how 'in-tune' with each other	Reinforcing that the couple knows one another well in terms of one another's thoughts, feelings, needs, etc.	"C. you mentioned it provided nothing new - you two do seem to know each other very well" "Your feedback really highlights for me how in tune you are with each other and how much you have talked about everything, not something all couples are so successful with"
Emphasizing mutual valuing	Highlighting positive feelings the couple has for one another.	"Your warmth and enjoyment of each other really shone through" "I have to say, it's been a pleasure getting to know you, and I have so enjoyed your enjoyment of each other"
Stimulating communication and/or connection within the couple	Facilitator is encouraging the couple to open up with one another – generally verbally but can also be in relation to sexuality/intimacy.	"I'm glad too that you now have a time and place to consider your experience and to share with K." "D. you could see this happening and appreciated the opportunity to express your feelings and concerns openly, which made you feel better (better than expected it sounds like - that's a great discovery D.!)" "I could hear in your responses that you both whole-heartedly engaged in the exercise – in recalling memories and in the sensual massage itself. I'm glad you enjoyed it so much, and that the massage was a novel experience. It sounds like N's idea that it become a weekly event is a good one!"
Pointing out partner similarities	Emphasizing thoughts, feelings and/or experiences common to both partners. Both partners reacted in the same way or felt the same way in a particular instance.	"Both of you share a great sense of humour"

Appendix 6

Synthesized Model of Engagement Promotion

Facilitative Meta-Processes

1. Friendly and Positive yet Firm Approach

- Fostering positive attitude toward program
- Providing/creating structure
- Angling toward the positive

2. Humanizing the Technology

- Tailoring program/feedback to couple
- Personalizing standard content
- 'Dimensionalizing' text through verbal/voice connection

3. Inclusive Empathic Attitude

- Recognizing program asking something 'extra' of couple
- Engaging partners equally and evenly
- Conveying genuine concern/interest and availability

Facilitative 'eBehaviours'

Fostering Couple-Facilitator Bond

- Validating couple's experience with cancer 2,3
- Inspiring communication and collaborative effort with facilitator 2,3
- Capturing key concerns 2,3
- Validating negative feelings stirred up in the exercise/program 1, 3
- Bringing self and experience into conversation 1,2,3
  - Facilitator disclosing personal experience
  - Joining through humour
- Expressing concern for couple 2,3
- Offering advice 2
- Keeping couple in the loop 2
  - Apologizing for delay in response
- Small talk 1,2,3
- Autonomy support 2,3

Fostering Program Adherence

- Encouraging communication in the DR 2,3
- Motivational check-in 1,2,3
- Suggesting plausible gain 1,2
  - Providing rationale for module
- Noting positive take-away 1,2
- Instilling confidence [in relation to the program] 1,2,3
  Subcategories:
  - Expressing enthusiasm
  - Encouraging progress
  - Reassuring on the right path
- Appreciation of effort 1,2,3
- Structuring couple participation 1,2
- Emphasizing couple's intrinsic motivation toward the program 1,2
- Acknowledging barriers to completion 1,2,3
- Setting positive expectations 1,2
- Clarifying module aims/structure 2
- Reinforcing and/or encouraging accountability 1,2

Fostering Within-Couple Bond

- Accentuating intrinsic couple strengths 2,3
- Building mutual understanding 2,3
- Reinforcing how 'in-tune' with each other 2,3
- Emphasizing mutual valuing 2,3
- Stimulating communication and/or connection within the couple 2,3
- Pointing out partner similarities 2,3

Appendix 7

Summary of Dyadic Learning Modules

DLM	Theme	Purpose	Activity
1	*Celebrating our Strengths*	To create an opportunity for partners to reflect upon and communicate about their individual and shared strengths.	Each partner enters 10 positive qualities about the other online. Together, the couple brainstorms about the strengths they share as a couple in general, and specifically, those that they bring to bear on their experience with breast cancer. The data is transformed into an image which the couple reviews and discusses.
2	*Understanding your Partner's Inner World*	To help partners more accurately understand the other's thoughts and feelings in relation to breast cancer.	Independently, each partner answers a series of questions about their own and their partner's preferences and experiences progressing from trivial to serious topics (including cancer). These lists are then reviewed together in order to stimulate discussion and clarification.
3	*Creating Connection* (Gottman, 1999)	To help partners become more aware of the other person's 'bids' for interaction and support and to pay attention to their own 'turning toward' and 'turning away' behaviors on a day-to-day basis.	Each partner, over the course of the week is asked to attend to his or her own turning-toward and away behaviours. These are tracked and recorded online. At week's end, the couple reviews and discusses their entries that appear in chart format.
4	*Facing Cancer as a Unified Front* (Skerrett, 2003)	To assist couple in adopting a team orientation in relation to breast cancer (i.e., a sense of 'us' versus 'it'). Also, to foster the attitude that the illness is a shared experience.	Couple guided through an exercise designed to get them thinking metaphorically about cancer, and then to create a visual representation of the illness in order to fortify sense of 'we-ness' in relation to cancer.
5	*Getting Physical*	To assist couple in communicating around sexuality and in reconnecting on a physical level as a step toward greater sexual intimacy after treatment.	Couple is guided through series of questions regarding past satisfying sexual experiences and what made them so. They then participate in a sensate focusing exercise as a means

			to reconnecting on a physical level (with no sexual expectation).
6	*Looking Back and Moving Forward*	To assist couple with moving forward after breast cancer by situating the illness in the context of the larger relationship history and by having the couple consider new goals and directions for themselves.	Together partners co-construct a relationship line illustrating pivotal events/periods in their shared history (i.e., high and low points). The online program transforms relationship events and phases inputted by the couple into a relationship line. This forms a basis for discussion.
7 Optional Module	*Intentional Dialogue* (Hendrix, 2007)	To learn a communication skill that partners can use to share their concerns more effectively and increase their understanding of the other person's perspective.	Couple watches instructional video clip of another couple demonstrating an Intentional Dialogue. Couple attempts this on own around neutral and more meaningful topics.

Appendix 8

Fluid Survey – Rational Model of Fostering Couple Engagement with Couplelinks Program

We are interested in learning about things that you do in your communication with couples that you think helps to foster your working relationship with them, and/or their engagement with the program.

The following questions apply mainly to your text-based communication with couples, and specifically, how you respond to the couple module content and feedback through the Dialogue Room (DR):

I - What do you see as essential facilitator factors (types of activities or messages) in relation to helping your couple become engaged or remain engaged in the program? E.g., type of comment(s); facilitator attitude; text-based behaviours etc. Please try to list a minimum of 5 specific things you do (with a brief example where one comes to mind):

(1)

(2)

(3)

(4)

(5)

Other:

II - Is there anything more that you consciously do in your DR communications with couples in order to create a good working alliance with the couple? Please specify:

III – What specifically do you do when you find that a couple is not motivated or engaged (i.e., is not completing the modules on time; is not informing you about delays; and/or is not responding to your DR messages).

IV – What are you able to achieve through your telephone communications with couples that you aren't able to achieve through the DR? Please provide examples if possible.

V - What other elements (including or outside of your text-based communication with the couples) are important in your view to maintaining couple engagement?