THE BREAST IMPACT OF TREATMENT SCALE: THE ASSESSMENT OF BODY IMAGE DISTRESS FOR BREAST CANCER PATIENTS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in the Graduate School of The Ohio State University

By

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2003

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ABSTRACT

Concerns have been raised regarding the definitions of body image and how it is measured in psychosocial oncology. This study conceptualized the surgical treatment for breast cancer as a potential traumatic stressor on a female’s body image. Body image distress (BID), a body image outcome, is defined as intrusive thoughts and avoidant behaviors reflecting this stressor. The Breast Impact of Treatment Scale (BITS) was theoretically developed to assess this construct. BID was examined in 196 women, initially assessed after breast cancer diagnosis / surgery and then reassessed at 12-months. Psychometric properties of the BITS were examined through studies of reliability, validity, stability (factorial invariance), and change over occasions and between surgical groups (BCT vs. MRM). Findings suggested that the BITS is a reliable and valid measure of BID. Consistent with previous research, women with more extensive surgery reported greater body image problems (i.e., BID) than women with less extensive surgery. Findings provided a framework to mitigate and possibly prevent BID following a breast cancer experience.
Dedication

My dissertation is dedicated to every woman who has been diagnosed with breast cancer and to my parents, sisters, dance and church families, and friends for their continual support during the past five years.
ACKNOWLEDGMENTS

I would like to first thank God for blessing me with the invaluable opportunity to pursue my doctorate in clinical psychology at The Ohio State University under the guidance of Barbara L. Andersen, Ph.D.

I wish to especially thank my advisor, Dr. Andersen, for her constant support, intellectual stimulation, and giving spirit which made my dissertation and previous achievements possible. I would like to sincerely thank her for her aid and patience during the strengthening of my writing skills.

I thank Kris Preacher and Michael Browne for being so generous with their statistical expertise during the completion of my dissertation.

I especially thank Drs. Flores, Stoney, and Vasey for their comments and support during my dissertation.

I wish to thank Drs. Golden-Kreutz, Crespin, and Wells, Kris Preacher, Laura Peterson, Laura Wielonski, and Catherine Craine for their feedback on my dissertation.

I am grateful to all of the staff, 693s, work studies, graduate students, research associates/assistants and post docs at the Stress and Immunity Breast Cancer Project who have been a source of strength, extended family, and resource on this journey in completing my dissertation.

I am thankful for Dr. Tanley, Minnie, Montenique, Kim, Jay, Kristin, Kristen, Wendel, Sherri, Alexandra, Shane, and Kano for their unconditional support during this process.

Finally, my dissertation would not have been possible without the commitment and dedication of each breast cancer participant in the Stress and Immunity Breast Cancer Project - THANK YOU.

This research was supported by a NIH minority fellowship.
VITA

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FIELDS OF STUDY

Major Field: Psychology
Specialization: Clinical Psychology (Health)
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CHAPTER 1

INTRODUCTION AND OVERVIEW

A diagnosis of breast cancer is an unwelcome event for any woman. Breast cancer is the second leading cause of cancer deaths in females (ACS, 2002). For 2002, 203,500 new breast cancer diagnoses and 39,600 deaths are estimated (ACS, 2002). The incidence rate for breast cancer has not changed over the past decade, but there has been a significant decrease in mortality rates at 2% a year since 1990 (NCI, 2000). This decrease can be attributed to the early detection and clinical advances in adjuvant therapies (ACS, 2002). Thus, a woman facing a diagnosis of breast cancer does not necessarily have a foreshortened life expectancy.

However, these promising statistics should not suggest that a breast cancer experience (i.e., diagnosis and treatment) is not plagued with difficulty. Difficulties can include fatigue (Andrykowski et al., 1998), premature menopause / hot flashes (Stein, Jacobsen, Hann, Greenberg, and Lyman, 2000), cognitive deficits attributed to chemotherapy regimens (Bender et al., 2001), infections / low blood counts due to adjuvant chemotherapy (Beisecker et al., 1997) and psychological health / morbidity (depression and anxiety; Jenkins et al., 1995; Northouse et al., 1995; Reifman, 1995). In addition, the one important facet that inevitably changes- the woman’s breast(s) with surgical treatment.
The surgical treatment of breast cancer can affect a woman physically and emotionally. These effects can be illustrated in the following areas. A woman may feel different or become self-conscious around others (e.g., women and / or her partner) because of her new body image. She may not feel comfortable wearing clothing (e.g., bathing suits, shirts) that could potentially expose her new body image. Moreover, a woman’s behaviors such as sexual activity can decrease due to her uncomfortability with her breast changes. The magnitude of these changes is strongly related to the extent of surgical treatment for breast cancer.

The focus of the introduction is to familiarize the reader with the strengths and limitations of the current body image literature in psychosocial oncology. The introduction will begin with a discussion of the stressor, surgical treatment for breast cancer, on one’s quality of life. The variability in definitions and assessment instruments for body image will be reviewed. A new and clearer conceptualization of body image for breast cancer patients will be presented. Specifically, a new construct, body image distress, is hypothesized to capture the body image concerns of surgically treated breast cancer patients. Moreover, the author will delineate a theory behind this new construct and its measure the Breast Impact of Treatment Scale (BITS). Finally, the remainder of the introduction will outline the author’s empirical investigation of body image distress and the BITS with a sample of recently diagnosed and surgically treated breast cancer patients.

1.1 Surgical Treatment of Breast Cancer

With the diagnosis of breast cancer comes the surgical removal of the partial or whole breast or both breasts. While selection of a particular surgery is determined by many factors, there are four common ones: 1) Lumpectomy or Breast Conservative Treatment (BCT), 2) Modified Radical Mastectomy (MRM), 3) Modified
Radical Mastectomy with Immediate or Delayed Breast Reconstruction (MRMI and MRMD, respectively), and 4) Bilateral Mastectomy (see Silen, Matory, & Love, 1996 for a complete review of these surgeries) The first two methods, BCT or MRM, are the most common surgical procedures.

1.2 Psychosocial Outcomes of Surgical Treatments

A person who undergoes one of the previous surgical treatments may experience acute and / or chronic disruptions in her quality of life subsequent to her breast cancer experience (Moyer, 1997). Quality of life (QoL) has been defined by Cella and Tulsky (1993) as “patients appraisal of and satisfaction with their current level of functioning compared to what they perceive to be possible.” The reduction in one’s QoL following breast cancer is supported by the many studies. The majority have addressed psychosocial endpoints, which are affected by the extent of surgery. Psychosocial outcomes have included the following: 1) psychological adjustment, 2) marital-sexual adjustment, 3) social adjustment, 4) body / self-image, 5) cancer-related fears and concerns, and 6) global adjustment (Durlack, 1995). These six endpoints were explored in a meta-analysis conducted by Moyer (1997). Specifically, Moyer explored the consequences from the various surgical treatments for breast cancer (BCT vs. MRM / other extensive surgeries) on each of these six psychosocial outcomes. From this meta-analysis, the largest mean weighted effect size was used for the impact of surgery on body / self-image. In other words, women who received breast conserving techniques compared to other more extensive surgeries (MRM or BM) reported significantly less body disruption and distress. However, any surgical alteration of the breast, regardless of the type, negatively affects a woman with breast cancer (White, 2000).
1.3 Body and Breast Changes

Moyer and colleagues (1996) commented that the “disfigurement” from the surgical treatment of breast cancer could be extremely distressing for a breast cancer survivor. These changes can affect the internal (e.g., psychological health) and external (e.g., physical health) well-being of a person. The disfigurement hypothetically may force a woman to address the cultural connection of the female breast to her femininity, sexuality, and physical intactness (Mock, 1993; Moyer et al., 1996). Also, post surgery physical consequences may include stiffness, swelling, and loss of sensation in the operated side (Moyer 1996). This summary of effects was consistent with prior (e.g., Margolis, Goodman, & Rubin, 1990; Ganz, Schag, Lee, Polinsky, & Tan, 1992; Schain, d’Angelo, Duinn, Lichter, & Pierce, 1994) and current studies (Yurek, Farr, & Andersen, 2000) documenting lesser body image disruption with breast conserving techniques (BCT). These findings in conjunction with results from Moyer’s meta-analysis provided additional support for the conclusion that breast conserving techniques compared to modified radical mastectomy produce less dissatisfaction with one’s body image (Moyer, 1997).

A change in a woman’s physical breast appearance also affects her behaviors and thought processes (White, 2000). Past researchers have explored these areas in how an individual surgically treated for breast cancer may interact (positively or negatively) in social / intimate interactions (e.g., Fallowfield & Hall, 1991) or everyday activities (e.g., Mock, 1993). For example, breast cancer patients may feel socially isolated or purchase clothes that reflect their body self-consciousness (e.g., lose fitting). The psychosocial oncology literature also describes the changes in the daily functioning and well-being of a woman
subsequent to her diagnosis and surgery (see Moyer and Salovey, 1996 and Moyer, 1997; for a review). But, questions still remain.

The major issues are the lack of clarity in the operational definitions of body image and its outcomes in psychosocial oncology. Current conceptualizations of body image may not effectively address the potential body image concerns of women faced with a life-threatening stressor such as breast cancer. Therefore, how would the construct body image include the distress associated with the breast cancer experience? The author proposes that the construct body image and a specific outcome can be defined and quantified for breast cancer patients. Operational definitions of body image will be reviewed to provide the reader with a framework to understand the current body image measures used in psychosocial oncology.

1.4 Current Definitions of Body Image

1.4.1 New Conceptualization of Body Image

The construct body image is multidimensional. Kearney-Cooke and Striegel-Moore (1997) applied the construct of schemas to their work on body image disturbance (i.e., bingeing and compulsive eating) in women with eating disorders. They conceptualized body image disturbance as a negative body schema that contains four areas: 1) negative body perceptions, 2) negative cognitions, 3) negative affect / feelings about the body, and 4) compensatory behaviors. Research from Freedman (1990) outlined three aspects of body image. The first area, body image percept, is the cognitive interpretation of such external sensations as observing one’s reflection, or such internal sensations of hunger. The second aspect, body image affect, is defined as the emotional responses engendered by one’s thoughts about the body. The final aspect, body image attitude, refers to the ideas
and rules that organize the view of the physical self. From this literature and the body image literature in psychosocial oncology (e.g., Andersen & LeGrand, 1991), four aspects have also been identified for body image in breast cancer research.

Body image contains at least four domains which are 1) evaluative, 2) affective, 3) cognitive (thoughts about the body), and 4) behavioral. In addition, each of these aspects contain positive and negative valences (see Figure 1). The first aspect, evaluative, is defined as a person’s evaluation or rating (positive/negative or (dis)satisfied) of her body image. The second aspect, affective, pertains to a person’s feelings (e.g., happy, depressed, angry, or anxious) towards her body image. The third aspect, cognitive, reflects thoughts, core beliefs, or schemas a person may have regarding her body image. The fourth aspect, behavioral, reflects behaviors or actions about or toward the body image. Each of the previous areas may not be mutually exclusive from another area. The author will review how the psychosocial oncology literature defines this multidimensional construct for breast cancer; as surgery is potential trauma to one’s body image.

1.4.2 General Definitions

There are numerous definitions that reflect the evaluative, affective, cognitive, and behavioral aspects of body image. Body image has been described as a mental picture of the physical self and includes attitudes and perceptions regarding one’s physical appearance, state of health, skills, and sexuality (Mock, 1993; Rosen, Srebnik, Saltberg & Wendt, 1991). Slader (1988) defined body image as “the picture we have in our minds of the size, shape, and form of our bodies” and the affect reflecting these characteristics and the constituent body parts. Andersen and LeGrand (1991), for example, conceptualized body image as an attitude with general
and enduring positive aspects. These definitions are reasonable, but do not incorporate the traumatic stressor of breast cancer surgery.

1.4.3 Medical Populations

There are two medical populations where body image has been defined explicitly and measures have been developed that are sensitive to health problems or medical conditions. The first measure assesses behavioral aspects of body image conceptually and clinically relevant for women with eating disorders. Rosen, Srebnik, Saltberg, and Wendt (1991) developed the Body Image Avoidance Questionnaire for women with eating disorders. These authors also defined the construct of body image as multidimensional. Their construct examines the following areas: clothing, avoidance of social interactions that might expose one’s weight, food habits, appearance, eating restraint, grooming, and current weight. The second measure examines the behavioral and evaluative dimensions of body image. Lawrence, Heinberg, Roca, Munster, Spence, & Fauerbach (1998) operationally defined body image and developed a questionnaire that assesses the subjective experience and social/behavioral aspects of body image for individuals with burn injuries. These authors, similar to Rosen and colleagues (1991), conceptualized body image as a multidimensional, subjective construct.

1.4.4 Cancer Body Image definitions

Given the numerous studies on body image and its outcomes following the breast cancer experience, it is perplexing that the construct body image and its outcomes are not more clearly defined (White, 2000). Mock (1997) defined body image as part of a woman’s self concept that can help her explore the body changes she may experience when diagnosed and treated for breast cancer. This definition addresses the evaluative and cognitive dimensions of body image. Andersen and
LeGrand (1991) reviewed previous conceptualizations of body image such as deviant perceptions, psychological morbidity, physical attractiveness, and sexual dysfunction, all of which are plausible. These definitions appear to reflect the affective, evaluative, and behavioral aspects of body image. Given the numerous body image definitions and nebulous operational definitions, these concerns may be the rationale behind Andersen and LeGrand’s (1991) comments that body image has been *ill defined*.

1.5 The Relationship between Body Image and Sexuality

Another concern with the definition of body image in psychosocial oncology is potential overlap of body image with the assessment of self esteem, stigma, or most importantly sexuality. For example, Moyer’s (1997) operational definition of body image includes: feelings about appearance, sexual desirability, shame and embarrassment about one’s body, self-concept, and self-esteem. In the literature, however, body image is usually confounded in its assessment with sexual functioning. Overlap between the constructs of body image and sexual functioning reflect the expected relationship between an attitude of body image and attitudes regarding sexual functioning (Derogatis & Melisaratos, 1979; Andersen et al., 1991; Mock 1993).

The assessment of body image through related constructs such as sexuality highlights the unclear operational definitions of body image. However, this construct relatedness may reflect the similarity between the four general aspects of body image (i.e., 1) evaluative, 2) affective, 3) cognitive, and 4) behavioral). Again, each of these aspects contains positive and negative valences (see Figure 2). Thus, these categories overlap with those for body image, but the content of each is different. Several measures of body image and sexual functioning used in this study have
been organized by these four aspects (See Table 1). Sexual depression (Snell & Papini, 1989) examines reactive depression associated with sexual changes. Globe is a question that assesses the evaluative aspect (positive and negative) of one’s sexual relationship. Intercourse and Kiss are questions that assess the behavioral aspect of sexuality. Sexual Self Schema (Andersen & Cyranowski, 1994) is an individual difference construct that measures the cognitive aspect of sexuality. Sexual Response Scale is a measure that assesses all four aspects of sexuality. Please refer to the Methods section for a full description of each of these measures.

Body image and sexuality are conceptually and theoretically related in psychosocial oncology. Body image can be conceptualized and measured without the inclusion of sexuality, even with similar dimensions between both constructs. This distinction is emphasized as the understanding of body image following breast cancer would only occur indirectly with measures of sexuality, therefore limiting the understanding of body image, per se.

1.6 Literature Review: Previous Assessment Measures of Body Image

1.6.1 Body Image: Evaluation

Traditional and experimenter-derived questions used to explore body image following the surgical treatment of breast cancer will be reviewed within the four conceptual aspects. Studies using these measures are detailed elsewhere. Five measures can be described as evaluative. The first two instruments Body Image Scale (BIS) from the Derogatis Sexual Functioning Inventory (Derogatis and Melisaratos, 1979) and Body Satisfaction Scale short version (BSS; Berscheid, Walster, and Bohmstedt, 1973) measure the content and valence (i.e. evaluation) of female’s body image attitudes. Andersen and LeGrand (1991) commented that these two instruments were commonly used measures of body image. For example, the
BIS contains 15 items with higher scores reflecting greater pessimistic / unfavorable body attitudes. These items (demonstrated through previous factor analytic work from Andersen & LeGrand, 1991) assessed the following areas: 1) positive items regarding body attractiveness (e.g., Men find my body attractive), 2) negatively worded dissatisfaction items, negatively worded (e.g., I have too much body hair), and 3) weight items (e.g., I am too thin).

The BSS short version is a 10-item scale with higher scores reflecting greater body image dissatisfaction. This measure explores body satisfaction through the following three areas: 1) facial and sexual / body satisfaction, 2) lower torso (weight) satisfaction, and 3) general appearance (consist of one item; thus not considered a factor; Andersen & LeGrand (1991). Additional psychometric properties of these two measures have been presented in Andersen & LeGrand (1991). In this paper, they also emphasized the importance of strengthening and developing theories and psychometrically sound measures that assess body image outcomes following a breast cancer diagnosis and surgical treatment.

Mock (1993) assessed body image through the measures Body Satisfaction Scale and the Body Image Visual Analogue Scale (BIVAS; Mock, 1988). The BIVAS measures body satisfaction on a 100-mm scale, ranging from complete dissatisfaction to complete satisfaction. The authors commented that data support the BIVAS as “sensitive” to a female’s satisfaction with her body, however this data was not provided. She also used the Tennessee Self Concept Scale (TSCS; Roid & Fitts, 1988) which was a 100 self-descriptive statement scale that assessed one’s
overall self-concept and aspects of the self-concept. Responses on this scale ranged from completely false to completely true. Higher scores reflect greater positive self-concept and body image.¹

Sanger and colleagues (1981) assessed body image satisfaction with the Body Cathexis Scale (Secord & Jourard, 1958), which consisted of 46 items described as evaluating body parts and their function. Sanger and colleagues (1981) did not evaluate the psychometric properties of this measure in their sample.

1.6.2 Body Image: Affective

Three studies have used measures that examine the affective area of body image. First, Sanger and Reznikoff (1981) assessed body image through the variable “body boundaries”, the degree of demarcation or differentiation an individual feels between the self and non-self objects. They assessed this construct through the Rorschach (Rorschach, 1921). Inkblot responses that contained definite structures, substance, and surface responses indicated positive body boundaries and protective qualities. Conversely, answers that contained penetrability and weakness of an object were considered responses of greater body image vulnerability or poorer body image. Sanger and Reznikoff (1981) commented that this indirect approach in assessing body image was reliable and valid based on data from Fisher and Cleveland (1958,1970).

The Homonyms test (Secord, 1953) was also used by Sanger and colleagues (1981) to assess body image through ‘body anxiety’. Body anxiety was defined as overconcern, preoccupation, or worry about somatic concerns with the

¹Internal consistency data was presented for the BSS and TSCS (r’s = .87 and 81 - .94, respectively). Test-retest reliability data, over a two-week period, was provided for the TSCS (r = .92).
body. The *Homonyms test* (Secord, 1953) consisted of 100 words that highlighted body and non-body associations (e.g., the word “nail” may be associated with the word “hammer” or the word “finger”). In this measure greater bodily paired responses suggest greater levels of body anxiety.

Another measure assessing the affective aspect highlights the unclear operational definitions of body image and the simultaneous examination of body image with sexual aspects. Schover, Yetman, Tuason, Meisler, Esselstyn, Hermann, Grundfest-Broniatowski, & Dowden (1994) assessed body image through the *Sexual Attractiveness* subscale of the *Body Esteem Scale* (BES; Franzoi & Schields, 1984). The BES is a 13-item measure that assesses body esteem through body weight and physical condition. Psychometric data was not provided for this measure.

de Haes, Oostrom, and Welvaart (1986) explored body image through experimenter-derived questions and likert scales (ranging from not at all to very much). Examples of their questions were not provided. The authors’ descriptions of these questionnaires suggested they examined the impact of surgical treatment of breast cancer on one’s body image. de Haes and colleagues (1986) commented that the reliability data for this scale was satisfactory. However, these researchers did not provide the supporting psychometric data. It is unclear where this measures falls within the four aspects of breast cancer due to the missing information.

**1.6.3 Body Image: Cognitive and Behavioral**

There does not appear to be current studies in the general literature of breast cancer that examined the cognitive and behavioral aspects.

**1.7 Measures of Body Image Specifically For Breast Cancer Populations**

Kemeny, Wellisch, and Schain (1988) and Hopwood, Lee, Shenton, Baildam, Brain, Laloo, Evans, and Howell (2000) both created body image measures for
breast cancer patients. The first measure examines the affective and behavioral aspects of body image. Kemeny, Wellisch, and Schain (1988) used the 
*Psychological Reactions to Different Types of Breast Cancer Surgeries* (Schain, Wellisch, Pasnau, Landsverk & 1985; Wellisch, Schain, Noone, & Little, 1985), a 21-page experimenter-derived questionnaire to examine post surgical changes in the following areas: emotional reactions, relationships, body image, and sexual behaviors. Psychometric data also was not provided for the measure, but the authors reported that this measure has been used in two of their prior studies (Schain et al., 1985; Wellisch et al., 1985).

The measure by Hopwood and colleagues (2000) was described as a measure that possibly examined each of the four aspects of body image. However, there was not an example for any of the 10 items. Hopwood and colleagues (2000) developed the *Body Image Scale* that measures body image specifically for breast cancer patients. Higher scores indicate a negative change or dissatisfaction with body image. This scale measures the impact of surgical treatment for breast cancer on one’s self-consciousness (e.g., cognitive aspect), physical and sexual attractiveness (e.g., affective or evaluative aspects), femininity, satisfaction with body and scars (evaluative aspects), body integrity, and avoidance behaviors (e.g., behavioral aspect). These authors reported the following psychometric data for the scale: group differences, internal consistency coefficients, and test-retest reliability.

### 1.8 Summary of Literature Review

The objective of the literature review was to orient the reader to the various conceptualizations and types of body image measures used to assess the four aspects of body image. The majority of the instruments assessed the evaluative aspect of body image (e.g., BSS or BIS). Several measures used did not appear
designed specifically for individuals with breast cancer (e.g., Rorschach or Homonyms). There also appeared to be few measures of the cognitive and behavioral aspects of body image. From the ones reviewed (i.e., Kemeny et al., 1988; Hopwood et al., 2000) it is still unclear if these measures actually conceptualize the surgical treatment as a stressor that affects one's cognitions and behaviors. These limitations should not diminish the research efforts of the previous authors’ work in body image. However, it does highlight the importance for new conceptualizations, theories, and measures of body image to incorporate the stressor of the surgical treatment for breast cancer.

From this literature review, a reader probably is aware of several points. First, there appear to be numerous definitions, but limited theories, of body image and / or body image outcomes in breast cancer. However, the commonly used and psychometrically sound body image measures may not be sensitive to the body image concerns (such as distress) following breast cancer and / or surgery (Andersen & LeGrand 1991; Mock, 1993; Yurek, Farrar, & Andersen, 2000). Second, the constructs sexuality or self-esteem are simultaneously measured when assessing body image. Third, measures used to assess body image may lack or have limited supporting psychometric data. Fourth, many studies use multiple measures to assess body image or any construct (e.g., Sanger et al., 1981). This approach is important in this line of research and for studies of convergent and discriminant validity. This is mentioned with the caveat that findings from multiple measures, grounded in various theories, may create a problem when generalizing the results. Another limitation with generalizing results also can be attributed to the inconsistent time-points across studies when assessing body image outcomes (see Moyer, 1997). Finally, majority of the prior measures on body image did not identify
the breast cancer experience, especially the impact surgical treatment has on a breast cancer patient’s body image.

1.9 Stressor: Breast Cancer Surgery

Breast cancer has been conceptualized as a traumatic stressor in recent investigations that explore PTSD diagnoses and symptomatology in this population (e.g., Cordova, M.J., Andrykowski, M.A., Redd, W.H., Kennedy, D.E., McGrath, P.C., & Sloan, D.A., 1995; Tjempsland, L., Soreide, J.A., & Maltuf, 1996; and Andrykowski, M.A., Cordova, M.J., Studts, J.L., & Miller, T.W.; 1998). Investigations exploring breast cancer as a traumatic stressor commonly have used the Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) to screen for possible PTSD symptomatology. From this line of research, two ideas are posited for body image research in psychosocial oncology. First, the author hypothesizes that psychological consequences (anxiety-like symptoms or PTSD symptomatology) can also accompany surgical treatment. These anxiety-like symptoms can be explored through the construct of body image and a newly defined outcome, which identifies distress within body image following surgery. This body image outcome is defined as Body Image Distress.

Second, the IES, if modified, could be tested to evaluate similar symptomatology experienced from the surgery and the diagnosis of breast cancer. This measure could examine the dimensions of body image (e.g., affect, behavioral, cognitive, and evaluative). This experimenter derived measure should be accompanied with supporting psychometric data. This new measure could also quell raised concerns with traditional measures of body image in the literature. Such measures have used satisfaction or dissatisfaction rating scales which may not be appropriate for individuals diagnosed and surgically treated for breast cancer (Yurek
et al., 2000). A description of the new construct body image distress will be
presented prior to the description of the IES.

1.10 Body Image Distress

Body image distress is conceptualized as a breast cancer patient's
perceptions and behaviors towards her new altered body image following surgical
treatment of breast cancer. It is hypothesized that these cognitions and behaviors will
be anxiety-like responses (worries, intrusive cognitions, and avoidant behaviors).
These responses are the cognitive and behavioral dimensions of the construct body
image. Thus, this construct reflects two dimensions of body image construct
(cognitive and behavioral) which both have a negative valance.

1.11 Nomological Network

The nomological network for body image distress is hypothesized to relate to
the constructs body image, sexuality, stress, distress, and physical health. The
construct body image is selected because body image distress is a body image
outcome that hypothetically reflects the cognitive and behavioral aspects of body
image. The second construct sexuality is proposed to be associated with body image
due to the similarity between their four aspects. The four facets of sexuality are
cognitive, behavioral, affective, and evaluative. All of these aspects are assumed to
relate to body image. In addition, the behavioral component may reflect the opinions
of both the breast cancer patient and her partner / spouse. However, in the present
study the behavioral component was assessed only from the breast cancer patient.
Thus, the ability to completely measure the behavioral component and its
relationship with body image may have been affected (and possibly reduced) by the
exclusion of the partner’s comments and feedback. Third, the operational definition
of body image distress conceptualizes the surgical treatment of breast cancer as a
stressor. Thus, body image distress should associate with measures of stress (which is an indication of a reduction in one's QoL). Fourth, this construct is hypothesized to reflect psychological symptomatology (similar to PTSD or anxiety) engendered from the surgical treatment of breast cancer. Therefore, measures that assess psychological health / morbidity (i.e., distress) are hypothesized to be associated with body image distress. Finally, this construct may be related to one's physical health (e.g., signs and symptoms of their breast cancer and overall physical health) following breast cancer. This rationale is attributed to the sample being a medical population and recently being surgically treated for their breast cancer. In sum, the hypothesized nomological network includes the following: 1) body image, 2) sexuality (due to the relationship between body image and sexual health outcomes), 3) stress (due to the diagnosis and surgical treatment), 4) psychological distress (the psychological response to a trauma), and 5) physical health (due to the stressor surgery).

1.12 Impact of Events Scale

Horowitz's (1976) information processing model of stress is described as a response set between a vacillating pattern of intrusion and avoidance. The information processing model was the premise of his measure (Joseph, 2000). The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) is a self-report measure that assesses subjective distress to a significant life event. The authors initially conceptualized subjective distress as including two types of psychological responses: avoidance and intrusion. Intrusion is characterized by repetitive behavior, intrusive and disturbing thoughts, and images. Avoidance is characterized by denial of the event, behavioral inhibition, and awareness of emotional numbnness (see Horowitz, Wilner, & Alvarez, 1979 for a complete review). The IES is comprised of
15 items that measures avoidance and intrusive responses on a 4-point frequency scale (ranging from 0=not at all, 1=rarely, 3= sometimes, and 5=often). The authors of the IES reported two components (factors) for the scale: Intrusion and Avoidance. These components (factors) have been replicated in subsequent studies (Zilberg, Weiss & Horowitz, 1982; Joseph, Williams, Yule & Walker (1991); Hodgkinson & Joseph, 1995; McDonald, 1996; see Joseph, 2000 for a complete review) that explored the psychometric properties of the IES.

The IES has been widely used to assess subjective responses to traumatic stressors such as wars, natural disasters, unexpected life events, and across various adolescent, adult, and clinical populations. The IES is also a widely used measure to assess PTSD or PTSD symptomotology (see Joseph, 2000 for a review). In sum, the IES is used with individuals that have experienced traumatic stressors, is psychometrically strong, and assessed anxiety responses, intrusive and avoidant behaviors regarding the stressor (Joseph, 2000). The model of the IES is a reasonable one and could fit the assessment of a specific stressor, breast cancer surgery.

1.13 Summary

There are a diversity of theories and methods to assess body image outcomes but most have limited supporting psychometric data (e.g., Kemeny and colleagues (1988) and Hopwood and colleagues, 2000). There are needs for the following: 1) clear definitions and conceptualizations of a body image outcome, and 2) a body image measure specifically for women with breast cancer. The author tests the BITS to assess intrusive thoughts and avoidant behaviors in response to breast cancer and breast cancer surgery stressors.
1.14 Aims and Goals

There are 5 aims of the research. The first aim and goal is to define and articulate the body image construct and one of its outcomes, body image distress, for individuals with breast cancer.

The second goal is to provide a theoretically basis for the measure. Patterned after the IES, the BITS explores body image distress via avoidant and intrusive responses. In brief, the Breast Impact of Treatment Scale (BITS) operationally defines body image distress through the conceptualization that breast cancer and treatment are traumatic stressors.

The third goal is to provide reliability data (internal consistency, Cronbach’s alpha, and test-retest reliability) for the measure. The fourth goal documents test validity. Three areas will be studied. The first, internal structure, will use exploratory factor analysis as the method. The factorial invariance (i.e., stability of the factor loadings examined through confirmatory factor analytic strategies) will be assessed. The third area includes studies of convergent and discriminant validity.

The BITS will be compared to the following constructs: 1) body image [i.e., Body Satisfaction Scale (BSS) Berscheid, Walster, & Bohmstedt, 1973; Andersen & LeGrand, 1991], 2) stress [i.e., The Perceived Stress Scale (PSS) Cohen, Kamarck, & Mermelstein, 1983], 3) distress [i.e., The Center for Epidemiological Studies of Depression Scale (CES-D) Comstock & Helsig, 1976; Radloff, 1977; and The Medical Outcomes Study Short Form-Mental Health (Sf-36) Ware & Sherbourne, 1992], 4) physical health [i.e., Karnofsky Performance Status Scale Karnosky & Burchenal, 1949] and The Medical Outcomes Study Short Form-Physical Health (Sf-36; Ware & Sherbourne, 1992] and 5) sexuality [i.e., The Sexual Responsiveness
Scale (SRS) Andersen, Anderson, & deProsse, 1989]. These previous measures have been selected due to their theoretical association with the construct body image distress.

The hypothesized nomological network for body image distress includes the constructs of body image, stress (due to the diagnosis and surgical treatment), psychological distress (the psychological response to a trauma), physical health (due to the stressor surgery), and sexuality (due to the relationship between body image and sexual health outcomes). The construct of body image distress should converge with measures assessing body image dissatisfaction, situational distress, stress, distress, sexual evaluation, sexual cognitions, and sexual affect (e.g., sexual depression), but discriminate (low or zero correlations) from measures examining greater sexual functioning (behaviors), and greater physical health.

The examination of change over time (i.e., occasions) and difference between groups on the BITS is the fifth goal. A change in body image distress with time should be detectable. The final test of validity is the study of group differences. The author will explore differences in body image distress reported by individuals surgically treated with lesser (BCT) versus more extensive surgery (MRM and other extensive surgeries).

1.15 Analytic Strategy

Hypothesis testing will be completed through SPSS / PC for MS Windows 2000, the Comprehensive Exploratory Factor Analysis (CEFA) program (Browne, Cudeck, Tateneni, & Mels, 1998), and the RAMONA software in SYSTAT 10 (Browne and Mels, 1998). As a review, the analytic strategy will be conceptualized from the articles of Cronbach, Meehl, and others (Campbell & Fiske, 1959; Cronbach & Meehl, 1955). These authors suggested that analyses of a construct explore its
internal structure (e.g., factor solution / structure), convergent and discriminant validity, process, differences between groups, and change over occasions.

Reliability of the BITS will be tested using internal consistency coefficients and test-retest data. Internal consistency coefficients for the BITS, at both time points, will be computed using Cronbach’s alpha. Cronbach’s alpha coefficients are considered appropriate indices of internal consistency of a measure scored on a Likert or frequency scale (Walsh & Betz, 1995). The correlation between the BITS (total scores) at the initial and 12-month assessments will be computed to examine the test-retest reliability of this measure.

Validity of the BITS will be explored in the following areas: content, construct, discriminant and convergent, and change (group differences and change over occasions). Content of the fifteen items (i.e., manifest variables) on the BITS was patterned from the previously referenced Impact of Events Scale (IES; Howoritz, Wilner, & Alvarez, 1979). In other words, the 15 items on the BITS were patterned (i.e., reworded) from the IES to reflect a significant life event and potentially traumatic stressor for individuals recently diagnosed with breast cancer and surgically treated for this disease.

Construct validity (i.e., internal structure) will be tested through exploratory factor analysis (EFA). EFA will be conducted using the CEFA program, which provides the user with (one at a time) 90% confidence intervals on factor loadings. Confidence intervals allow the user to explore the significance of individual factor loadings after a rotation. CEFA also provides the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993; Steiger, 1989) which is a quantitative means of assessing lack of fit of the model per degree of freedom. Maximum likelihood EFA will be conducted for each sample and/or occasion of data
collection. Because previous psychometric studies on the IES suggested a two-factor solution and the BITS was patterned after this scale, the author initially extracted a two-factor solution for each sample and/or occasion. One- and three-factor solutions were also extracted for each sample and occasion to support or refute the hypothesized two-factor solution. Under- (one factor) and over- (three factors) factoring is a strategy that can provide additional support for the hypothesized factor solution (Browne, 1999 personal communication).

Two types of rotations will be applied to the two- and three-factor solutions. First, a direct quartimin rotation (Jennrich & Sampson, 1968) will be applied to the one-, two-, and three-factor solutions. This procedure allows each manifest variable (i.e., items of the BITS or BICS) to maximize high loadings and minimize low loadings by maximizing the sums of squares of factor loadings. The second rotation, a target rotation, is similar to the direct quartimin by allowing the manifest variables to load high or low on the common factors based on the sums of squares of the factor loadings (Browne, 1972). However, there is one difference. The target rotation allows the researcher to hypothesize a priori the pattern of low and high loadings of a tentative factor structure based on the user’s theory or prior theory.

Due to the exploratory nature of this study, the hypothesized a priori high and low loadings will be obtained from the appropriate direct quartimin rotated factor solutions. For example, the target two-factor solution of the BITS at initial will be based on the direct quartimin rotated two-factor solution of the BITS with the initial data. Similarly, the target rotation for the three-factor solution at initial will be based on the factor loadings obtained from the appropriate direct quartimin rotated factor solution at the initial time point. A target rotation cannot be applied to a one-factor solution. Both of these rotations will be computed by using oblique rather than
orthogonal procedures. Oblique procedures will be conducted to allow the factors to intercorrelate and for additional clarity in detecting patterns of high and low loadings in the rotated factor structure (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The factors for the BITS have not been labeled a priori in the forthcoming analyses due to the exploratory nature of the analysis. The two hypothesized factors will be referred to as Factor 1 or Factor 2.

The factorial invariance of the appropriate (i.e., statistically supported), hypothesized factor structure at the initial time point will be examined at 12-months. Examining the factorial invariance of the model allows one to statistically test the stability of the factor loadings of a measure between samples or across time points. In the present study, the stability (pattern and magnitude) of the relevant factors from the BITS will be examined between the initial and 12-month assessments. This examination will be conducted through confirmatory factor analytic strategies outlined by the LISREL 8 manual (Joreskog & Sorbom, 1996) and Kris Preacher (Preacher 2002, personal communication).

There are three phases in the confirmatory factor analytic strategy that examines factorial invariance within a sample across multiple time points. The fist phase examines the statistical similarity or difference between the covariance matrixes of the model between the initial and the 12-month assessments. Theoretically if the covariance matrixes are statistically analogous, one should be confident that the factor structure of a measure is stable across both time points. Thus, the remaining two phases of this approach are unnecessary and possibly redundant. On the other hand, if the covariance matrixes are not statistically significant the latter two steps are necessary to further examine factorial invariance. For the present study, the first phase will not be statistically addressed because it is
assumed that the covariance matrixes are not statistically the same between both time points. Therefore, the latter two phases will statistically examine the factorial invariance of the BITS- which provides more information than phase one alone.

The second phase of this procedure should statistically demonstrate that the hypothesized factor CFA model holds at both time points with the same pattern of fixed and free loadings. This implies that the hypothesized factor structure should be statistically examined at each time point separately and each model demonstrates adequate fit. In the Results, these data (factor loadings, confidence interval, and fit indexes) will be presented in table format. If the second phase (a precondition for the third phase) is supported, the third phase which is two-fold is pursued. First, this step should demonstrate that the factor loadings are the same between time points for all of the latent variables. In other words, this step examines the cross-time points equality constraints on factor loadings. This is Model A. Second, the third step should demonstrate that the previous CFA model holds at both time points without equality constraints on factor loadings. This is Model B.

The third phase represents a nested model where the constrained CFA model (Model A) is nested within the unconstrained CFA model (Model B). It is understood that overall model fit is usually worse for a model with greater constraints (e.g., equality constraints of factor loadings) or greater fixed parameters (e.g., fewer bi-directional arrows; Model A) than for a model with less constraints and less fixed parameters (more bi-directional arrows; Model B). Thus, changes in model fit between the models will be examined compared to absolute fit of Models A and B. The statistical change between these nested models will be tested through the difference in their $\chi^2$ statistic. A non-statistical difference between both models
support the hypothesis that either model demonstrates adequate model fit. Model A and B both fit the data well, therefore. If either the second or third phases are rejected then the measure will not demonstrated factorial invariance. Again, this factor analytic procedure investigates the stability of the factor structure across both time points.

Discriminant and convergent validity studies will be computed on the BITS. Bivariate correlations will be computed to explore the strength and significance of the relationship between the BITS and measures of distress, body image, sexuality, and physical health. These measures will include the Perceived Stress Scale, Impact of Events, Situational Distress Scale, Body Satisfaction Scale, Sexual Behaviors, Center for Epidemiological Studies of Depression Scale, Karnofsky rating scale, Medical Outcomes Study Short Form, Sexual Self Schema, Sexual Responsiveness Scale, Intercourse, Kiss, and Globe.

Analysis of variance will be conducted to explore changes across time and differences between groups on the BITS. One-way repeated measure ANOVAs will be performed to analyze the main effect for time in body image distress and its subscales across the initial and 12-months assessments. 2 (Surgical Method: BCT vs. MRM) by 2 (Time: Initial vs. 12-month assessment) ANOVAs or ANCOVAs, when appropriate, will explore the group and time effects and group by time interaction term on the BITS and its subscales. 3 (Choice of Surgery: Elected and received conservations vs. Elected conservation but received mastectomy vs. Conservation not elected and received mastectomy) by 2 (Time: Initial vs. 12-months) repeated measure ANOVAs were conducted to explore the main effects of choice and time, and the choice group x time interaction on the BITS.
1.16 Hypotheses

Content Validity

1. The 15 items for the BITS measure is hypothesized to represent two traits of anxiety-like content: Intrusive and Avoidant responses.

Construct Validity

1. The internal structure of the BITS is hypothesized to have a two-factor solution, similar to the IES. The factor loadings or names of the factors will not be hypothesized a priori but are expected to reflect intrusive thoughts and avoidant behaviors. A one-factor solution (under factoring) or three-factor solution (over factoring) will not be supported due to the lack of fit (e.g., large RMSEA values, unstable factor loadings) of the data.

2. The factors of the two-factor solution of the BITS are hypothesized to be moderately to highly correlated. However, these factors are not hypothesized to be conceptually redundant (i.e., equal to \( r = 1.0 \)).

Factorial Invariance

1. The two-factor structure of the BITS at 12-months is hypothesized to be statistically similar (i.e., factorially invariant) to the two-factor structure of the BITS at initial.

Convergent Validity

1. The BITS is hypothesized to demonstrate convergent validity (i.e., positively correlate or negatively correlate) with other measures of stress, distress, body satisfaction, situational distress (a body image outcome), and sexuality (the affective, cognitive, and evaluative aspects). These measures, broadly characterized as stress, distress, body image, and sexuality, are as follows: Impact of Events Scale, Perceived Stress Scale, Situational Distress Scale, Body Satisfaction Scale, Sf-36
Mental Health, Center for Epidemiological Studies of Depression Scale, Sexual Self Schema, Globe, Sexual Responsive Scale, and Sexual Depression Scale.

*Discriminant Validity*

1. The construct of subjective body image distress assessed through the BITS is hypothesized to demonstrate discriminant validity (low or zero correlations) with physical health / medical status and sexuality (the behavioral aspect). These aforementioned measures are as follows: SF-36 Physical Health (level of physical health), Karnofsky (amount of symptoms and signs of breast cancer), Intercourse and Kiss (level of sexual activity).

*Change and between group differences*

1. The BITS is hypothesized to demonstrate a decrease in body image distress over time (i.e., at 12-months vs. initial).

2. The BITS is hypothesized to discriminate between individuals that have received less extensive surgery (BCT) compared to more extensive breast surgery (MRM/other). In other words, breast cancer patients who received MRM should report higher responses of intrusion, avoidance, and overall body image distress compared to individuals who received BCT.

3. The variable choice for breast conserving technique (0: No, Not a candidate, 1: Yes, elected and received conservation, 2: Yes, elected conservation; received mastectomy, 3: Yes, conservation not elected; received mastectomy) is hypothesized to be significantly related to extent of treatment (BCT vs. MRM).

4. Women who have a choice in electing and receiving BCT will report less avoidant behaviors, intrusive thoughts, and overall body image distress than women who have a choice for BCT but 1) did not elect conservation and receive mastectomy or 2) elect conservation but receive mastectomy.
Internal Consistency

1. The BITS (at both occasions) is hypothesized to have item homogeneity with coefficients of internal consistency (e.g., $\alpha = .8$ or higher).

Test Retest

1. Despite the lengthy interval and the likelihood of change (i.e., reduction in the BITS scores), the correlation between the BITS at initial and 12-months is hypothesized to be high (e.g., $r = .60$ or higher). This expectation is based on the sample reporting body image distress at 12-months.
CHAPTER 2

METHODS

2.1 Participants

One hundred and ninety-six breast cancer patients (n = 196), with a mean age of 51 (SD = 11 years, range = 31 to 84) participated in the study. These participants were part of a larger cancer study. Disease and surgery analyses revealed that breast cancer participants were assessed, on average, 36 days (SD = 15, range = 5-101 days) since surgery. Participants were diagnosed and surgically treated for Stage II (88%) or III (12%) breast cancer. The distribution of the participants’ extent of treatment was as follows: 98 (43%) women received Lumpectomy (BCT) and 132 (57%) women received Modified Radical Mastectomy (MRM) or other extensive surgeries (e.g., Bilateral Mastectomy or MRM with reconstruction).

Demographic analyses indicated that the majority of the sample was Caucasian (90%; African-American; 9%, and Latina; 1%). The average level of education was 15 years (SD = 2.75). The majority of the women (81%) in the study were being treated at a National Cancer Institute – designated, university- affiliated Comprehensive Center and the remainder (19%) received treatment at community hospitals within a 90-mi (144-Km) radius of the Cancer Center.
Chi-square or ANOVA’s, when appropriate, were conducted comparing participants (n= 238) versus non-participants (n= 163). Participants (n=196) came from a larger (N= 230) longitudinal study, and these were the first 196 patients accrued. Analyses indicated that participants and non-participants were not statistically different on sociodemographic variables (e.g., race, or marital status) or disease / treatment variables (menopausal status, estrogen receptor, stage, and number of nodes). The most frequently reported reasons for non-participation were as follows: geographical distance from hospitals (31%), busy schedules (29%), and no interest (28%).

2.2. Procedures

Three hundred and ninety three women diagnosed and treated for breast cancer were formally contacted, from mid 1994 to mid 2001, 230 (59%) were accrued. Patients were accrued and followed as part of a study conducted at a large mid-western university. Women eligible for participation were the following: a) age from > 19 to < 86, b) diagnosis of Stage II or III breast cancer, c) no previous cancer diagnosis, and d) no refusal of adjuvant treatment and no severe mental retardation, severe psychopathology (e.g., schizophrenia or non-compliance with bipolar disorder treatment), dementia, or other life threatening conditions (e.g., renal failure). All of the participants were enrolled in a larger parent study, the Stress and Immunity Breast Cancer Project. Data was collected immediately following surgery but prior to adjuvant treatment, initial, and later (12-months). Participants (n= 196) completed the appropriate questionnaire in conjunction with their regularly scheduled assessment materials (for the larger parent study). Women received thirty-four dollars for each assessment.
2.3 Measures

2.3.1 Body Image Distress

Breast Impact of Treatment Scale (BITS). The BITS, a 15-item questionnaire, was modeled after the Impact of Events Scale (IES; Horowitz, Wilner, & William, 1979). The Breast Impact of Treatment Scale (BITS) was developed to assess the intrusive and avoidant responses to the hypothesized traumatic event of surgical treatment for breast cancer patients (Yurek, 1997). Simply, intrusive response questions were worded to evaluate pervasive thoughts (e.g., “Things I see or hear remind me that my body is different.”), troubling images (e.g., “How my body has changed pops into my mind.”), troubled dreams, strong waves of feelings such as “I think about how my body looked before I was treated” or “I think about how my treatments may affect my sex life.” Similarly, avoidant response questions measured limited cognitive experiences (i.e., ideational constriction), subjective awareness of emotions surrounding the event (e.g., “I feel self conscious about letting my partner see my scar”), denial surrounding the event such as “I avoid looking at and / or touching my scar”, and behavioral limitations due to the nature and consequences of the event (e.g., “I turn away when I have to undress in front of my partner,” or “I feel self-conscious about letting my partner, person with whom I am sexually intimate, see my scar”).

As with the scoring of the IES (Horowitz, Wilner, & William, 1979), the items were weighted (0 = not at all, 1 = rarely, 3 = sometimes, and 5 = often). All item were worded in the positive direction (i.e., higher scores reflected higher traumatic stress). Subscale scores were summed as the following: Factor 1: Intrusion (range, 0 - 55), and Factor 2: Avoidance (range, 0 - 20). The BITS total score was the sum of the two
subscales (Factors; range, 0 - 75). See Table 2 for the means and standard deviations of this and forthcoming measures across both time points.

2.3.2 Convergent and Discriminant Validity

2.3.2.1 Stress

Perceived Stress. The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) measures an individual’s appraisal of their life as stressful (i.e., unpredictable, uncontrollable, and overloading). Stress ratings are of particular interest for these women who are undergoing difficult, lengthy therapies in the midst of family, home, and job responsibilities. This measure is hypothesized to be a predictor of symptomatology beyond symptoms due to distress (Cohen & Williamson, 1988). The ten-item version was used as recommend (Cohen and Williamson, 1988). Item examples include, “How often have you felt nervous or stressed?” and “How often have you felt confident about your inability to handle your personal problems?” Patients rate how often they experienced these feelings in the past month on a 5-point likert scale from 0 = never to 4 = very often. Total scores range from 0 to 40, with higher scores indicating greater perceived distress. Internal reliability, calculated using Cronbach's alpha, at initial (.87) and 12-months (.90) were consistent with alphas (.75 to .86) in the literature (Cohen et al., 1983, Hewitt et al., 1992; Martin et al., 1995). Test-retest, between the initial and 12-month assessments, was .58. Means (with standard deviations in parentheses) for the PSS-10 at initial and 12-months were 18.42 (6.97) and 14.75 (6.89), respectively.

Cancer-specific Stress. The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) is a standardized self-report questionnaire used to measure traumatic stress. Items were reworded specifically to assess a cancer diagnosis and treatment. Individuals experiencing involuntary, distress-related ruminations following traumatic
life events also can be those who suffer the greatest negative effects (e.g., Taylor et al., 1984). Intrusive thoughts were assessed by items such as “I had dreams about being a cancer patient” and “Other things kept making me think about cancer.” Avoidant thoughts and behaviors were assessed by items such as “I tried not to talk about it” and “I was aware that I still had a lot of feelings about cancer, but I didn’t deal with them.” Women rate the frequency of these 15 feelings or events “during the past seven days”, using a 4-point likert scale (not at all = 0, rarely = 1, sometimes = 3, and often = 5). Items are summed for a total score, ranging from 0 to 75, with higher scores reflecting greater cancer related stress. Internal reliability, calculated using Cronbach’s alphas, at initial and 12-months was .87 and .89, respectively. These values were consistent with other studies reporting values of .78 to .83 (Cordova et al., 1995, Horowitz et al., 1979, Schwartz, Lerman, Miller, Daley, & Masny, 1995). Two-week test-retest reliability was .79 and .89 (Horowitz et al., 1979). Test-retest, between initial and 12-months, was .45. Means (with standard deviations in parentheses) for the IES at initial and 12-months were 26.07 (14.42) and 14.46 (12.91), respectively.

2.3.2.2 Distress

**Depressive Symptoms.** The Center for Epidemiological Studies of Depression Scale (CES-D; Comstock & Helsig, 1976; Radloff, 1977) identifies current symptoms of depression. Unlike other measures of depressive symptoms, the CES-D is relatively unaffected by physical symptoms and is, therefore, commonly used in research with medical patients (Devins et al., 1988). The Iowa Short Form (Kohout, Kinan, Evans, & Cornoni-Huntley, 1993) used in the present study, consists of 11 items (e.g., “I felt everything I did was an effort” and “I felt sad”) rated on a 4-point Likert scale from 0 = hardly ever or never to 2 = much or most of the time. Breast
cancer patients are asked to respond based on their feelings during the previous week. Following reverse scoring of positively valanced items, all items are summed with total scores ranging from 0 to 22. Higher scores reflect greater depressive symptoms. Internal consistency, calculated using Cronbach’s alpha, at initial and 12-months were .71 and .72, respectively. Test-retest, between the initial and 12-month assessments, was .48. Means (with standard deviations in parentheses) for the CES-D at initial and 12-months were 6.06 (3.69) and 3.96 (3.63), respectively. These data are consistent with prior research (Himmelfarb & Murrell, 1983; Kohout et al., 1993).

**Quality of Life**. The Medical Outcomes Study Short Form, a 36-item questionnaire, is used to assess health-related quality of life (Sf-36; Ware & Sherbourne, 1992). Because of the extensive reliability and validity data (Ware, Snow, & Kosinski, 2000), the SF-36 is frequently used in studies of chronic illness populations (Dexter, Stump, Tierney, & Wolinsky, 1996) and cancer clinical trails. The SF-36 assesses 8 aspects of quality of life including physical functioning, role functioning related to emotional health, bodily pain, general health perceptions, vitality, social functioning, role functioning related to emotional health, and mental health. Scores on these subscales range from 0 to 100 with higher scores reflecting better quality of life. These 8 primary scales are also frequently summarized into two component scores: the Physical Component Summary (PCS) and the Mental Component Summary (MCS; Ware, Kosinski, & Keller, 1994). The PCS is an aggregation of weighted subscales scores which load most heavily on the physical health component subtracting weighted subscale scores loading more heavily on the mental health component. The MCS is constructed in a similar, but opposing fashion. These aggregate scores are then standardized using a linear t-score transformation
to have a mean of 50 and a standard deviation of 10 based on the general U.S.
population of MCS / PCS scores.

Internal consistency, calculated using Cronbach’s alpha, for the PCS at initial
and 12-months were .86 and .92, respectively. For the MCS, internal consistency,
calculated using Cronbach’s alpha, at initial and 12-months were .89 and
.88, respectively. Test-retest of the MCS and PCS, between initial and 12-months,
was .32 and .39, respectively. Means (with standard deviations in parentheses) for
the PCS at initial and 12-months were 40.33 (8.06) and 47.68 (9.90), respectively.
Means (with standard deviations in parentheses) for the MCS at the initial and 12-
months were 42.54 (11.39) and 50.77 (8.98), respectively.

2.3.2.3 Sexuality

Evaluative

Sexual History: Prior satisfaction. Participants were asked “thinking about
your sex life two months prior to your diagnosis, how would you rate it overall?” This
single item also was presented to them at the 12-month assessment but reworded to
assess the rating “during the past three months.” Participants rated the item on a
nine-point scale from 0 = “could not be worse” to 8 = “could not be better,” with 4 =
“adequate/average” being the midpoint. Andersen and Jochimsen (1985) reported
that women’s (breast and gynecological cancer and healthy outpatients) rating of
their sex lives is distinct from a current marital adjustment rating. Test-retest,
between the initial and 12-month assessments, was .47. Means (with standard
deviations in parentheses) at the initial and 12-month assessments were 4.17 (2.00)
and 3.69 (1.99), respectively.
Behavioral

Kissing. Participants were asked to estimate the frequency of how often they engaged in kissing or an equivalent activity. For the initial assessment the time interval for the item was “two months prior to your cancer diagnosis,” whereas for 12-months it was “during the past three months.” Frequency of kissing activities was rated on a nine-point scale from 0 = “this activity did not occur” to 9 = “this activity occurred more than 4 times a day,” with twice a week (4) being the midpoint on the KISS scale. Test-retest, between initial and 12-months, was .79. Means (with standard deviations in parentheses) for the Kiss variable at initial and 12-months were 6.41 (2.44) and 6.15 (2.64), respectively.

Intercourse/Intercourse Equivalent. Women were asked to provide an estimate of how often they engaged in sexual intercourse or an equivalent activity “two months prior to your cancer diagnosis,” at initial. At 12-months, this item was reworded to assess the rating “during the past three months.” Participants rated this item on a nine-point scale from “this activity did not occur” = 0 to “this activity occurred more than 4 times a day” = 9, with twice a week = 4 being the midpoint. Test-retest, between the initial and 12-month assessments, was .58. Means (with standard deviations in parentheses) for this variable at initial and 12-months were 2.69 (1.71) and 2.28 (1.62), respectively.

Affective

Sexual Response Cycle. The Sexual Responsiveness Scale (SRS: Andersen, Anderson, & deProsse, 1989) is a 24-item, self-report measure designed to assess the four sexual stages of desire, arousal, orgasm, and resolution. The SRS has been validated in both healthy (Andersen, Anderson, & deProsse, 1989; and Cyranowski & Andersen, 1998) and cancer populations (Andersen, Woods, &
Copeland, 1994). A principal-axis factor analysis (PCA) with an oblique (Harris-Kaiser) rotation indicated three factors: Factor 1: Sexual Desire, Factor 2: Arousal Difficulties, and Factor 3: Orgasm/Resolution (Cyranowski & Andersen 1998). Cyranowski and Andersen (1998) reported internal consistency values, calculated using Cronbach’s alpha, for these factors/subscales as follows: sexual desire, .66; sexual arousal, .68; and orgasm/resolution, .86.

At the initial assessment, women were asked to rate these phase-specific signs and symptoms “two months before being treated for breast cancer.” At 12-months, these ratings were based on “the past three months.” Each of the four phases was described by a set of statements derived from the stage-specific subscales of the SRS (Andersen, Anderson, & deProsse, 1989). Sexual desire phase measured sexual interests (e.g., “How often have you wanted sex more than your partner?”). Sexual arousal assessed the psychological and physiological markers of excitement (e.g., “How often have you been satisfied with your capacity to be aroused?”). The last two phases, orgasm and resolution, measured a sense of climax (e.g., “How often were you dissatisfied with your capacity to have orgasm / climax?”), and general feelings of relaxation post-sexual experience (e.g., “How often did you feel satisfied after sexual activity?”). Finally, four additional questions (general evaluation) assessed one’s overall satisfaction with their sexual intimacy (e.g., “How frequently did you enjoy sexual activity?”).

Participants’ rating were on a five-point scale (0 = never, 1 = rarely, 2 = sometimes, 3 = almost always, 4 = always). Items that were negatively valanced were reverse scored before summing the five, individual sexual responsiveness subscales (possible ranges: sexual desire = 0 - 24; sexual arousal = 0 - 28; orgasm = 0 - 16; resolution = 0 – 24; and general evaluation = 0 – 16). A total
responsiveness score from the summation of the five subscales ranged from 0 to 108. Test-retest of the SRS_I \(^2\) and SRS_II, between initial and 12-months, were .42 and .41, respectively.

For the initial assessment, the means (with standard deviations in parentheses) for partnered women, were as follows: Total responsiveness_I (sexual desire, arousal, orgasm / resolution, and general evaluation) = 55.76 (27.43), Total responsiveness_II (sexual desire, arousal, and orgasm / resolution) = 47.53 (23.19), sexual desire = 12.37 (4.62), sexual arousal= 17.12 (5.93), orgasm / resolution = 27.16 (7.14), and general evaluation = 9.65 (3.36). At 12-months, means (with standard deviations in parentheses) for partnered women were as follows: Total responsiveness_I = 57.36 (22.49), Total responsiveness_II = 49.00 (19.16), sexual desire = 11.99 (4.33), sexual arousal = 15.54 (5.87), orgasm/resolution = 25.93 (6.73), and general evaluation = 8.96 (3.25).

At the initial assessment, internal consistency, calculated using Cronbach’s alpha were: .91 (total scale; SRS_I); .78 (sexual desire); .80 (sexual arousal); .78 (orgasm); .81 (resolution); and .72 (general evaluation). At 12-months, internal consistency, calculated using Cronbach’s alpha, were: .93 (total scale; SRS_I); .73 (sexual desire); .85 (sexual arousal); .82 (orgasm); .84 (resolution); and .78 (general evaluation).

**Sexual Depression.** Reactive depression associated with sexual changes may be significant; reactive depressive responses may also be related to stress reactions and sexuality outcomes. Patients completed the Sexual Depression subscale of the Sexuality Scale (Snell & Papini, 1989). This 10-item scale measures

\(^2\)The first version of the Sexual Responsiveness Scale_I includes all of the phases and general evaluation questions. The second version of the Sexual Responsiveness Scale_II is identical to the previous scale, but it does not include the general evaluation questions.
depression associated with one’s sexual life (e.g., “I feel sad when I think of my current sexual experience”). Scores on sexual depression covary with clinical depression, but are distinct from personality attributes (sexual and anxiety) or sexual guilt in samples of undergraduate females (Snell et al., 1992). Internal consistency, calculated using Cronbach’s alpha, in the undergraduate samples range from .88 to .93, while test-retest reliabilities are .70 to .76. Means (with standard deviations in parentheses) for the subscale range from -6.48 (6.91) to -7.22 (8.62; Snell et al., 1992). The validity of the SDS has not yet been tested in cancer samples.

Women in the present study were asked to rate the degree to which they agreed or disagreed with each statement on the SDS. At the initial assessment these ratings were based on the “two months prior to your breast cancer diagnosis” but at 12-months it was “in the past three months.” Items were rated on a 5 point scale (e.g., 2 = agree, 0 = neutral, -2 = disagree). Positively valanced items (e.g., “I feel good about my sexuality”) were reversed scored prior to summing the Sexual Depression Score. Test-retest, between initial and 12-months, was .48. Internal consistency, using Cronbach’s alphas, at initial and 12-months were .91 and .89, respectively. Means (with standard deviations in parentheses) at initial and 12-months were 3.84 (9.87) and 5.48 (10.69), respectively. These aforementioned data support the potential utility of the SDS with sexuality outcomes in this sample.

**Cognitive Sexual Individual Differences**

**Sexual Self-Schema** The Sexual Self-Schema measure (Andersen & Cyranowski, 1994) is described as a measure of consists of 40-items (adjectives) that were arranged in a checklist and the participants rated the items on a seven-point scale from 0 (not at all descriptive of me) to 6 (very descriptive of me). Previous factor analysis uncovered three factors which were: Factor 1: loving /
romantic, Factor 2: direct-open self views, and Factor 3: embarrassment-conservatism (Andersen & Cyranowski, 1994). Factor 1 and 2 are both positive aspects and Factor 3 is the only negative aspect. A score from the SSS measure consists of the summation of items from Factors 1 and 2 then subtracting Factor 3 items. Thus, a possible schema score could range from -42 to 102, with lower scores indicative of a more negative self-view and higher scores reflecting a more positive SSS. The mean SSS score (total scale) was 58.32 (SD = 13.12). This measure was only administered at the initial assessment. However to establish its test-retest reliability, the SSS scale was administered again at 18-months following the initial assessment. At this assessment, the average was 60.30 (SD= 14.34) and both SSSs (total scale scores) were moderately correlated (r=.555), which was significant (p =.01; two tailed).

2.3.2.4 Body Image

Evaluate

Body Satisfaction Scale. Body image was assessed by an abbreviated form (Andersen & Legrand, 1991) of the 25-item Body Satisfaction Scale (BSS; Berscheid, Walster, & Bohmstedt, 1973). This short form of the BSS contains 10 items, which measures the external (physical) body following surgical procedures. There are two factors (Andersen & LeGrand, 1991) from the BSS. The first factor is characterized as the general body / sexual appearance, which includes facial and genital / breast items (Andersen & LeGrand, 1991). The second factor has been characterized as the lower torso satisfaction (i.e., weight or body correlates of weight: hips, thighs, and buttocks; Andersen & LeGrand, 1991). Further, a single item on the BSS short form measured one’s satisfaction with her general appearance. The ten items were rated separately on a 6-point scale (1 = extremely
satisfied, 3 = satisfied, and 6 = extremely dissatisfied) based on ratings of satisfaction of the external body parts or aspects. Higher scores on the BSS short-form indicate greater body image dissatisfaction.

The three subscales, based on the two factors and one remaining item, scores ranged as follows: 1) General Body / Sexual Appearance (6 - 36), 2) Body Weight (4 - 24), and 3) General Appearance (1 - 6). Previous reports of Cronbach’s alpha values for the BSS scale were as follows: BSS (total), .76, Factor 1, .79, and Factor 2, .83 (Andersen & LeGrand, 1991). The internal consistency, calculated using Cronbach’s alpha, for the BSS total scale and subscales at initial were as follows: BSS (total scale): 84, Factor 1: .73, and Factor 2: .86, and at 12-months: BSS (total scale): .86, Factor 1: .74, and Factor 2: .86. Factor 3 was not reported since it consists of one item. Test-retest, between initial and 12-months, was .60. Means (with standard deviations in parentheses) for the BSS at the initial and 12-month assessments were 34.77 (8.16) and 35.26 (8.21), respectively.

Behavioral

Situational Distress. The Situational Discomfort Scale (Yurek, 1997) consisted of five items based on retrospective psychosocial research on distressing situations following surgeries of breast cancer (Polivy, 1977; Sanger, 1981; Schain et al., 1985; Taylor et al., 1985; deHeas et al., 1986, Wolber, 1989; Lee, 1992, Mock, 1996; Rosenqvist et al., 1996). The aforementioned studies and other validation studies (Bartelink et al., 1986; Beckmann et al., 1983; Kemeny et al. 1988; Margolis et al. 1990; Meyer & Aspergen, 1989) differentiated the surgical modalities of MRM and BCT in the area of sexual responsiveness (i.e., sexual dysfunction). Participants rated their current level of distress across these five situations (i.e., “Looking at your chest in the mirror when you are unclothed”, “Undressing in front of other women”,

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Undressing in front of your partner "Letting other women see the surgical site," and "Letting your partner see the surgical site") using a 5-point scale (1= not at all distressed, 3= somewhat distressed, 5= extremely distressed). Higher scores on the Situational Discomfort Scale represent greater distress. The five situational discomfort items were summed to obtain a total distress score (range, 5-25). The internal reliability values, calculated using Cronbach's alpha, for the SDS at the initial and follow-up assessments were both .89. Test-retest, between the initial and 12-month assessments, was .60. Means (with standard deviations in parentheses) for the SDS at initial and 12-months were 5.97 (4.75) and 5.39 (4.78), respectively.

2.3.2.5 Physical Health

Health-related. The Medical Outcomes Study Short Form, a 36-item questionnaire, is used to assess health-related quality of life (SF-36; Ware & Sherbourne, 1992). Because of the extensive reliability and validity data (Ware, Snow, & Kosinski, 2000), the SF-36 is frequently used in studies of chronic illness populations (Dexter, Stump, Tierney, & Wolinsky, 1996) and cancer clinical trails. The SF-36 assesses 8 aspects of quality of life including physical functioning, role functioning related to emotional health, bodily pain, general health perceptions, vitality, social functioning, role functioning related to emotional health, and mental health. Scores on these subscales range from 0 to 100 with higher scores reflecting better quality of life. These 8 primary scales are also frequently summarized into two component scores: the Physical Component Summary (PCS) and the Mental Component Summary (MCS; Ware, Kosinski, & Keller, 1994). The PCS is an aggregation of weighted subscales scores which load most heavily on the physical health component subtracting weighted subscale scores loading more heavily on the mental health component. The MCS is constructed in a similar, but opposing fashion.
These aggregate scores are then standardized using a linear t-score transformation to have a mean of 50 and a standard deviation of 10 based on the general U.S. population of MCS / PCS scores.

Internal consistency, calculated using Cronbach’s alpha, for the PCS at initial and 12-months were .86 and .92, respectively. For the MCS, internal consistency, calculated using Cronbach’s alpha, at initial and 12-months were .89 and .88, respectively. Test-retest of the MCS and PCS, between initial and 12-months, was .32 and .39, respectively. Means (with standard deviations in parentheses) for the PCS at initial and 12-months were 40.33 (8.06) and 47.68 (9.90), respectively. Means (with standard deviations in parentheses) for the MCS at the initial and 12-months were 42.54 (11.39) and 50.77 (8.98), respectively.

**Functional Performance Status:** Functional performance is assessed using the Karnofsky Performance Status Scale (Karnosky & Burchenal, 1949). This is the most widely used measure of functional status in cancer studies. The scales ranges from 100 (Normal, no complaints, no evidence of disease) to 0 (Dead) with 10 point intervals each containing differential criteria (e.g., 90 = able to carry on normal activity, minor signs/symptoms of disease; 80 = normal activity with effort, some signs, symptoms of disease). The lower the score, the more restricted the patient is in the performance of daily and self-care activities. Across cancer studies interrater reliability for the scale ranged from .70 to .97 (Mor et al., 1984; Yates et al., 1981) and many studies have demonstrated predictive validity with significant high correlations with cancer endpoints (e.g., death, treatment toxicities, etc; Ganz et al., 1988). Project nurses provide Karnofsky ratings following completion of the Southwest Oncology Group interview and evaluation. Cronbach alphas are not provided for this scale because it consists of only one item. Test-retest, between
initial and 12-months, was .22. Means (with standard deviations in parentheses) for the Karnofsky ratings at initial and 12-months were 85.11 (7.94; range 60-100) and 88.27 (8.22; range 40-100), respectively.
CHAPTER 3

RESULTS

3.1 Validity

3.1.1 Content

The content for the BITS items was logically derived from prior breast cancer research (Yurek, 1997). This measure reflects specific post-treatment body image concerns of women with breast cancer as well as women who received modified radical mastectomy compared with breast conserving surgery in the areas of avoiding nudity, looking at the scar, undressing in front of others, thinking about disfigurement, thinking reflecting self consciousness, and worrying about body changes (Beckmann et al., 1983; Carver et al., 1994; Meyer & Aspegren, 1989; Pozo et al., 1992; Schain et al., 1983). Item stems remained the same where as the content was changed to breast cancer specific. For example, intrusive items evaluated a woman's experience of involuntary thoughts or images and strong waves of feelings about body changes (e.g., “How my body has changed pops into my mind”). Items regarding avoidant responses included statements of ideational constriction, behavioral inhibition related to the meanings / consequences of the event (e.g., “I turn away when I have to undress in front of my partner”), and subjective awareness of emotional blunting.

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3.1.2 Internal Structure

Maximum likelihood exploratory factor analyses were conducted with the initial assessment data. Previous factor analytic studies of the IES have suggested two factors Intrusion (Factor 1) and Avoidance (Factor 2; Joseph, Williams, Yule, Walker & McDonald, 1996; Zilberg, Weiss, & Horowitz, 1982). As the BITS was theoretically derived from the IES assessment model of traumatic stress, a two-factor solution was extracted. However, one- and three-factor solutions also were extracted for comparison with the two-factor solution. The two- and three-factor solutions were subjected to oblique direct quartimin rotation (Jennrich & Sampson, 1968). This rotation allows the factors to be correlated, which can improve the clarity of the pattern of individual factor loadings. However, an oblique rotation does not “force” the factors to correlate. In other words, the rotation provides the possibility for factors to correlate. Through this procedure, the author expected the construct validity of the BITS to be high in the present sample. The factor analyses met Nunnally’s (1978) suggested criterion of the ratio of number of items of cases to be at least 1:10. Also the ratio of number of measured variables per expected common factor exceeded three (15:2; Fabrigar et al., 1999).

3.1.2.1 Exploratory Factor Analysis

The Comprehensive Exploratory Factor Analysis (CEFA) program (Browne, Cudeck, Tateneni, & Mels, 1998) was used. CEFA provided the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993; Steiger, 1989) as a quantitative means of assessing the goodness of fit of the model. CEFA also
provides (one at a time) 90% confidence intervals for factor loadings, providing the researcher with a statistical range with which to assess significance of individual factor loadings after rotation.  

RMSEA values for the three solutions were examined and are provided in Table 3. Reviewing the one-factor solution, the RMSEA values indicated unsatisfactory fit of the data at the initial time point. Inspection of the residual matrix for the one-factor solution (data not provided), revealed a pattern of unacceptably large residuals ranging from .01 to .39. The one-factor loadings and confidence intervals for the direct quartimin rotation for single factor solution was not supported.

The RMSEA values for the three-factor solution suggested reasonable fit (refer to Table 3). In contrast, the factor loadings of both the direct quartimin and target rotated three-factor solutions were not clear and uninformative. The third factor of the rotated direct quartimin solution consisted of two items: 15 and 14 (listed in descending order of factor loadings). These two items demonstrated high loadings (i.e., .5 to .8) on Factor 3. However, the third factor of the target solution consisted of only item 15. As stated in the analytic strategy, the preferred solution was the target solution due to clarity of the factor loadings. Thus, the target solution would imply that the third factor actually reflected a unique factor instead of a common

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3 For additional interpretation of these data, a confidence interval that overlaps zero indicates that the associated significance test for a non-zero population loading will not be significant at the 10% level; if the confidence interval does not overlap zero, the associated test will yield a significant result.

4 The bolded factor loadings in tables reflect the largest loading or hypothesized loading (when appropriate) for that specific item.
factor. Also, a comparison between the loadings on Factor 3 of both solutions indicated instability in the Factor 3 item. However, the RMSEA values of the rotated solutions suggested that Factor 3 should be retained.

The RMSEA values for the two-factor solution at the initial time point are provided in Table 3. These values indicate that a two-factor solution has “reasonable fit.” In both rotated factor solutions, Factor 1 consisted of eleven items that reflected intrusive content and Factor 2 consisted of 4 items that reflected avoidance content. At the initial time point, the hypothesized factor loadings for each factor were mostly large, especially for Factor 1. Item 1 and to a lesser extent item 2 had moderate loadings on both the direct quartimin and target solutions. Comparing the three solutions, the one- and three-factor solutions were not supported. However, the RMSEA values, magnitude of the factor loadings, and associated confidence intervals suggested that the two-factor solution was the most appropriate at the initial time point. The two-factor solution was additionally supported by the eigen values and factor correlations which are described below.

A review of the eigen values from the one-, two-, and three-factor solutions supported a two factor solution. There were only two eigen values (7.10 and 1.30) that exceeds the Kaiser-Guttman criterion of 1.0 when selecting eigen values to identify factors (Guttman, 1954). This data provides additional support for a 2-factor model at the initial time point.

3.1.2.2 Factor correlations

Correlations of Factors 1 and 2, from both rotations, were conducted and found to be correlated (r’s = .59 to .70; see Table 4). These correlation coefficients allowed the exploration of construct relatedness, or lack thereof, between the two factors (subscales). These results revealed some homogeneity between the factors,
but they are representing two similar but not redundant constructs. However, these correlations suggest less homogeneity between the subscales than the magnitude of the internal consistency coefficient for the BITS at initial ($\alpha = .93$). A reader could assume that the BITS is unidimensional because the items “hang together” noticeably well. However, Cortina (1993) commented that correlations between factors provide a better representation of the relationship between the factors compared to Cronbach’s alpha values. Therefore, the correlations between both factors are used to support the two-factor structure compared to Cronbach’s alpha which implies a unidimensional scale.

The three-factor solution did not demonstrate a similar pattern of correlations (see Table 4). Factors 1 and 2 were correlated ($r = .57$ to .69) in both the direct quartimin and target rotated solutions. Factor 3 was correlated with Factor 1 ($r = .629$) and Factor 2 ($r = .429$) in the direct quartimin rotation. However, the magnitude of the correlations between Factor 3 with either Factor 1 ($r = .094$) or Factor 2 ($r = .119$) in the target rotation demonstrated that Factor 3 did not contribute additional variance to the three-factor solution. The reader should be aware that the amount of variance accounted for by the factor correlations in the two-factor solution did not vary across both rotations. This was not true for the three-factor solution; the amount of variance was reduced among the factor correlations for the target rotation. These results in conjunction with the previous results suggest a two-factor model is most appropriate for the BITS and theory.

3.1.2.3 Confirmatory Factor Analysis (CFA) Method
The confirmatory factor analyses examined the overall model fit of the hypothesized 2-factor solution of the BITS at the initial and 12-month assessments. Also, the
change in model fit between the constrained (Model A) and unconstrained (Model B) models was tested. Again Model A (with constraints) is nested in Model B (with few constraints). If model fit for the second phase is satisfactory and the third phase demonstrates a nonsignificant difference between the constrained and unconstrained models, the data support a stable 2-factor solution. Invariance of the factor structure can be supported only if 1) the model fit of the 2-factor solution at time 1 and time 2 are reasonable and 2) there are no statistical difference between Model A and Model B.\(^5\)

Using the RAMONA software package in SYSTAT 10 (Browne & Mels, 1998), the previous two phases were evaluated. There were four models contained in these phases. However, one of the models was nested within another (phase 3). Thus, three models will only be reviewed.

The literature on confirmatory factor analysis commented that normality and is associated with sample size (Windle & Miller-Tutzauer, 1992). For example, large sample sizes increase the possibility to reject one’s hypothesis when conducting the \(\chi^2\) likelihood ratio test statistic. Also, the \(\chi^2\) likelihood ratio test statistic assumes that the sample is normally distributed and non-normal distributions can alter this statistic. Therefore, multiple descriptive fit the \(\chi^2\) likelihood ratio test statistic is sensitive to deviations from multivariate indexes were examined to determine adequate model fit. Data for phase two of this CFA supported factorial

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\(^5\)The error terms in neither model, especially at the 12-month assessment, were allowed to covary. This is a common approach (i.e., Correlated Uniqueness) in confirmatory factor analysis when exploring the factor loadings of a measure over occasions (see Yeung & Lee, 1999; MacDonald & Ho, 2002 for examples). This approach was not possible in this study because of limitations in the design (e.g., limited occasions, one measurement). These limitations will be reviewed in full within the discussion.
invariance, but with limitations. The 2-factor model demonstrates satisfactory fit at the initial assessment but less satisfactory fit at the 12-month assessment.

The third phase of the CFA allowed the author to look at the 2-factor model at the initial and 12-month assessment simultaneously. This is the unconstrained model. We also examined this model by constraining corresponding factor loadings across time points equally. Again, Model A is nested within Model B. The nested model allows the examination of changes in model fit compared to overall model fit. The fit indexes for the constrained and unconstrained models suggested mediocre fit. However, in the present phase overall model fit was not a concern, but the focus was on changes between models to determine stability of the factor structure. If changes are not significant, the stability of the 2-factor model will be supported. The resulting $\chi^2$ difference test between both models was not statistically significant ($\chi^2 = 25, df=15, p < .05$). Absolute fit of each model was not tested in the hypothesis of stability between models. The findings from Phase III suggest absolute fit for each model appears poor. Absolute fit of each model is poor probably due to absent paths in the model which were excluded and not relevant to the hypothesis of stability. However, absolute fit of each model does not reduce the significant findings of factorial stability of the present factor structure. Thus the data from phases 2 and 3 supports the factorial invariance of the 2-factor model with the limitations noted above.

3.1.3 Convergent and Discriminant Validity

Five domains of similar and dissimilar constructs (i.e. stress, distress, body image/outcomes, sexuality, and physical health) were compared to the BITS at both the initial and 12-month time points. These comparisons were conducted for the BITS score and each measure at the same point in time (e.g., BITS at the initial
assessment with the PSS at the initial assessment). The results from the initial and 12-month assessments will be reviewed together.

The first domain was body image and outcomes assessed from the Situational Distress Scale and Body Satisfaction Scale. Body image ratings and body-related situational distress were hypothesized to be positively related with the BITS. The BITS and its two factors converged with the body image / outcome measures. As hypothesized, the magnitude of the correlations between the body image distress and situational distress constructs should be large. This hypothesis was supported across both time points. There was a belief that the BSS and BITS are related but at a negligible level; this was supported across both time points (r = .18 to .36). The correlations between the BITS and BSS provide additional support of the BITS assessing body image distress vs. body image dissatisfaction.

The second domain was sexuality. The sexual behavior measures (i.e., Intercourse and Kiss) assessed greater or positive sexual activity. These measures should not be related to or minimally related (r = -.10 or lower) with the body image distress construct (i.e., BITS). As hypothesized, these measures when correlated with the BITS verified no or minimal relationships - divergent validity. This hypothesis was supported at the 12-month assessment. The sexual evaluation measure Globe and the sexual individual difference construct SSS were hypothesized to converge with the BITS and this was supported at both time points (r= -.10 to -.20). The correlation between the BITS and Globe suggested higher body image distress was related to less positive evaluation of sexual activities. Also the correlation between SSS (a woman’s view of herself as a sexual person) and the BITS revealed greater body image distress was related to lower SSS scores. As hypothesized, the sexual affect measure Sexual Depression converged with the BITS. Sexual depression was
significantly correlated with the BITS at the initial and 12-month assessments. This relationship suggested greater reports of sexual depression were related to greater body image distress. However, the relationship between the BITS and the Sexual Responsiveness Scale (SRS) was minimal but significant at both time points. These correlations support the hypothesis of convergent validity for the SRS.

The measures that assessed stress were the IES (total score) and the PSS (total score) and the measures of distress were the CES-D and SF-36 Mental Health. These were the third and fourth domains, respectively. The BITS theoretically should converge, though not completely overlap, with measures of distress and stress. In addition, the BITS was hypothesized to be inversely related to measures of distress (besides the CES-D) but positively related to measures of stress. These hypotheses were supported at both time points. At the initial assessment, these significant correlations ranged from (-).38 to .48. A similar pattern of significant correlations (-.31 to .40) was found for the 12-month assessment.

The fifth and final area was physical health which included the SF-36 Physical Health and medical status. The measure SF-36 was hypothesized to demonstrate discriminant validity. The correlations between the BITS and this measure demonstrated significant negative relationships but small in magnitude (i.e., r’s of -.16 to -.24). This pattern of correlations also was demonstrated at the 12-month assessment. The magnitude of the correlations suggested that body image distress is not related to one’s physical health. In sum, these correlations were in the expected direction and demonstrated discriminant validity.

Medical status was assessed by the Karnofsky Performance Status Scale. This rating was important to examine in the body image literature because it assessed potential physical consequences from adjuvant and especially surgical
treatment of breast cancer. Since, the BITS assessed anxiety-like responses from 
the surgical treatment, it could also be assumed that a person with greater physical 
limitations might have greater body image distress concerns. Thus, both of these 
measures theoretically assessed the consequences of a breast cancer diagnosis and 
surgical/adjuvant treatments. However, the relationships between these two 
measures were hypothesized to demonstrate discriminant validity. This was believed 
because they examined the consequences of surgery in either physical limitations or 
anxiety-like responses. This hypothesis was supported across both time points. At 
the initial time point, body image distress and the Karnofsky ratings were significantly 
correlated (p < .05) but the magnitude of their relationship was low (r = -.11 to -.19). A 
similar trend in the correlations was demonstrated between these constructs at the 
12-month assessment. However, these correlations were not significant at 12- 
months, which again demonstrates discriminant validity.

3.1.4 Change over time

One-way repeated measures ANOVAs were conducted on the BITS and its 
subscales between the initial and 12-month assessments. This analysis tested the 
hypothesized decrease in overall body image distress, intrusive thoughts, and 
avoidant behavior over time. Means and standard deviations for these analyses are 
presented on Table 5. As predicted, there was a significant main effect for time 
(F(1,153) = 11.03, p = .001; partial eta = .259), with overall body image distress 
decreasing from the initial to the 12-month assessment. For Factor 1 (Intrusion) there 
was also a significant effect for time (F(1,153) = 16.533, p = .001; partial eta = .313). 
This finding supported the hypothesis that intrusive thoughts decreased over time. 
However, Factor 2 (Avoidance) did not statistically change across time; there was 
not a main effect for time (F(1,153) = 2.629, p = .107; partial eta = .130).
3.1.5 Differences between Surgical Groups

T-tests and Chi-square analyses (when appropriate) were calculated to assess baseline differences between the surgical method variable (BCT vs. MRM) and relevant sociodemographic and disease/treatment variables. Surgical method was significantly different on family income ($F(1, 176) = 2.642; p = .009$), stage ($F(1,193) = 4.279; p = .001$), menopause ($\chi^2(1, N=191) = 3.996, p = .046$), and education ($F(1,189) = 2.181; p = .023$). Menopause has been selected as a proxy for age because it is strongly associated with age and it also reflects the effects of adjuvant therapy. The majority of variables will be considered covariates and appropriately controlled for in the forthcoming analyses. However, stage will not be controlled for in the ANCOVAs due to its meaningful relationship with extent of surgical treatment.

The statistically ability to control for the baseline difference in stage of disease in surgical group (a non-randomly assigned variable) may be an inappropriate use of ANCOVA (Miller & Chapman, 2001). This rationale is based on baseline differences in surgical method (i.e., stage of disease) possibly reflects “some meaningful substantive differences that are attributable to group membership” (Miller & Chapman, 2001). In other words, controlling for baseline differences in non-randomly assigned groups such as surgical method may change the essential properties of this variable. Thus, the examination of surgical group, with stage controlled, in an ANCOVA may not represent the true surgical group characteristics.

2 (Surgery: BCT vs. MRM) by 2 (Time: Initial vs. 12-months) repeated measure ANCOVAs were conducted to explore the main effects of surgical method and time, and the group x time interaction on the BITs. Family income, menopause, and stage were controlled for in the analyses. Means and standard deviations for
these analyses are presented on Table 6. The 2 x 2 repeated measures ANCOVA for the BITS produced a main effect for surgical group (F(1,136) = 39.170, p = .001; partial eta² = .224). As predicted, women surgically treated with MRM reported greater overall body image distress compared to BCT, even though the main effect for time was not significant (F(1,136) = .247, p = .620; partial eta² = .002) in this analysis. Follow-up analyses (pairwise comparisons) illustrated a significant decrease (p = .002) in overall distress between the initial (M = 24.46; SD= 16.40) and 12-month assessments (M = 20.86, SD=15.38). The group x time interaction was not significant.

Inconsistent with previous univariate analyses, there was not a decrease in intrusive thoughts (Factor 1) between the initial (M = 14.66; SD = 8.41) and 12-month assessments (M = 11.95; SD = 8.97). The main effect for time was not significant (F(1,136) = 1.473, p = .227; partial eta² = .011). As hypothesized, there was a main effect for surgical method (F(1,136) = 46.778, p = .001; partial eta² = .256). The BCT group reported less intrusive thoughts compared to the MRM group. Means and standard deviations for these analyses are presented on Table 5. The group x time interaction term was not significant. For avoidant behaviors (Factor 2), the 2 X 2 repeated measure ANCOVA illustrated only a main effect for surgical method F(1,136) = 22.639, p = .001; partial eta² = .143. As predicted, the BCT surgical group compared to the MRM surgical group reported fewer avoidant behaviors. See Table 18 for the means and standard deviations. The main effect for time and the group x time interaction was not significant.

3.1.6 The Relationship between Surgical Group and Choice for Surgical method

The association between a breast cancer patient’s choice in selecting a lesser extensive surgical treatment (BCT) and the surgical method received has
been investigated through Chi-square analyses. The variable choice for breast conserving technique was examined through a four point likert scale (0 = No, not a candidate, 1= Yes, elected and received conservation, 2 = Yes, elected conservation; received mastectomy, and 3 = Yes, conservation not elected; received mastectomy). There was a significant association between women who had a choice for BCT and the surgical method they received. Ninety-three percent of women (n = 77) in the surgical method group BCT answered “1= Yes, elected and received conservation ” to the choice variable. However, 7% of this surgical group (n=6) responded “ 0 = No, not a candidate” to the choice variable yet received BCT. For the MRM / other surgical group, 44% (n = 49) answered “ 0= No, not a candidate”, 13% of the women (n =14) answered “2 = Yes, elected conservation; received mastectomy”, 43% (n = 48) answered “3 = Yes, conservation not elected; received  mastectomy”. No women in the MRM / other surgical method group responded “1= Yes, elected conservation and received conservation.”

3.1.7 Differences between Choice of Surgical Method

T-tests and Chi-square analyses (when appropriate) were calculated to assess baseline differences between the choice variable (response previously described) and relevant sociodemographic and disease/treatment variables. The variable Choice was significantly different on stage (F (1, 195) = 2.944; p = .004). However, stage will not be controlled for in the ANCOVAs due to its meaningful relationship with one’s potential choice or options for surgery. As stated, stage of disease was significantly related to surgical group. Thus, the statistically ability to control for this baseline difference with choice of surgical method (a nonrandomly assigned variable) may be an inappropriate use of ANCOVA (Miller & Chapman, 2001). Again, this rationale is based on baseline differences in choice (i.e., stage of
disease) may possibly reflects “some meaningful substantive differences that are attributable to group membership” (Miller & Chapman, 2001).

3 (Choice of Surgery: Elected and received conservations vs. Elected conservation but received mastectomy vs. Conservation not elected and received mastectomy) by 2 (Time: Initial vs. 12-months) repeated measure ANOVAs were conducted to explore the main effects of choice and time, and the choice x time interaction on the BITS. The 3 x 2 repeated measures ANOVA for the BITS produced a main effect for choice (F(1,114) = 13.351, p = .001; partial \( \eta^2 = .190 \)). As predicted, women who elected and received conservation demonstrated significantly less body image distress than women who 1) elected conservation but received a mastectomy and 2) did not elect conservation and received a mastectomy. These latter two groups of choice did not significantly differ between each other on overall body image distress. Consistent with the one-way ANOVAS, there was a main effect for time (F(1,114) = 10.059, p = .002; partial \( \eta^2 = .081 \)) in this analysis. The group x time interaction was not significant.

Consistent with previous univariate analyses, there was a significant decrease in intrusive thoughts (Factor 1) between the initial (M = 16.27; SE = 1.051) and 12-month assessments (M = 12.70; SE = 1.050; F(1,136) = 1.473, p = .227; partial \( \eta^2 = .011 \)). As hypothesized, there was a main effect for choice (F(1,114) = 14.535, p = .001; partial \( \eta^2 = .203 \)). As predicted, women who elected and received conservation demonstrated significantly less intrusive thoughts than women who 1) elected conservation but received a mastectomy and 2) did not elect conservation and received a mastectomy. These latter two groups of choice did not significantly differ between each other on intrusive thoughts. The group x time interaction term was not significant. For avoidant behaviors (Factor 2), the 3 X 2
repeated measure ANOVA illustrated only a main effect for choice $F(1,114) = 9.824, p = .001$; partial $\eta^2 = .147$. As predicted, women who elected and received conservation demonstrated significantly less avoidant behaviors than women who 1) elected conservation but received a mastectomy and 2) did not elect conservation and received a mastectomy. These latter two groups of choice did not significantly differ between each other on avoidant behaviors.

3.2 Reliability

3.2.1 Internal Consistency

The internal consistency values (calculated by Cronbach’s alpha) for the BITS at the initial assessment were as follows: BITS (total scale): .93, Factor 1: .91, and Factor 2: .81. At the 12-month assessment, the coefficients were as follows: BITS (total scale): .93, Factor 1: .92, and Factor 2: .81.

3.2.2 Test-Retest

Test-retest values of the BITS and subscales, between the initial and 12-month assessment, were as follows: BITS, .93; Intrusion, 70; and Avoidance, .80. These coefficients were consistent with previous Cronbach’s alphas for the IES and subscales that ranged from .79 -.89 (Horowitz, Wilner, & William, 1979).
CHAPTER 4

DISCUSSION

There is an abundance of literature on the consequences of breast cancer surgery on body image. This literature is saturated with numerous measures that assess post surgical body image outcomes. Findings demonstrate that women who receive less extensive surgery (BCT) compared to women operated with more extensive surgery (MRM etc) report greater satisfactory or less disrupted body image outcomes. However, concerns have been raised with this line of research. The assessment of body image and its outcomes have been conducted with measures with limited or non-existent psychometric data. More importantly, the theories driving these measures are limited, unclear, and / or do not incorporate the breast cancer experience. In other words, a measure that assesses body image in a breast cancer sample should theoretically incorporate the traumatic stressor breast cancer surgery. To date, there does not appear to be one universal definition for body image or for a body image outcome examining distress responses to the traumatic stressor – breast cancer surgery. This study attempts to resolve this dilemma through defining the construct of body image distress and developing a measure for its assessment.

In the present study, one of the primary objectives of the author was to clarify the dimensions of the construct body image. The author also wanted to define a body image outcome that is clinically relevant to individuals with breast cancer. This
body image outcome is body image distress. Body image distress is defined as intrusive thoughts and avoidant behaviors a breast cancer patient may experience post surgery regarding her body image. In conjunction with this outcome, an experimenter-derived and theory driven measure was developed to examine these anxiety-like responses, which is the Breast Impact of Treatment Scale (BITS).

4.1 Body Image

The first goal of the study was to clearly articulate the body image construct and one of its outcomes specific to a breast cancer sample. This perspective was supported by White’s (2000) comment that researchers use the term body image and examine body image with the assumption “they are using it according to a commonly agreed definition.” However, this assumption is one of the issues with this endpoint. To achieve this first goal, the body image literature in the current medical population and others (i.e., eating disorders and burn victims) and the current literature on body image (Freedman, 1991; Kearney-Cooke and Striegel-Moore, 1997) were reviewed. The readings suggested that body image was a universal construct examined in various populations addressing similar aspects of body image. Thus, body image was defined as a subjective multidimensional construct that included the following four dimensions: 1) evaluative, 2) cognitive, 3) behavioral, and 4) affective. Each aspect contains positive and negative valances.

It is believed that not only the construct body image should be defined but so should the examined body image outcomes. This distinction is an important one because one could easily make assumptions about the investigated body image outcome in conjunction with its higher order construct (i.e., body image). Body image and body image distress were operationally defined, therefore, reducing the possibility of construct overlap with sexual health, body-esteem, self-esteem, and
femininity. These latter areas are important to explore post-surgery, but possibly not within measures of body image. Moreover, these constructs do not necessarily reflect the traumatic stressor of breast cancer surgery, which can produce the anxiety-like response demonstrated by body image distress.

As stated, the assessment of body image has been confounded with other constructs. However, body image typically is confounded with the construct sexual functioning or sexual health subsequent to a breast cancer experience (see Yurek, Farrar, & Andersen, 2000). Researchers have measured body image by assessing a person’s sexual functioning post-surgical treatment for breast cancer (e.g., see Fallowfield & Hall, 1991). The similarity between both constructs could be attributed to the overlap in their four dimensions and valances (previously described). The present author understands that body image and sexual functioning are related, but still purports that body image can be rigorously explored and operationally defined separately from sexual functioning.

4.2 The BITS

The second goal of the study was to develop an experimenter-derived measure that assesses body image distress following a traumatic stressor – breast cancer surgery. The 15 items for the Breast Impact of Treatment Scale (BITS) were derived from past breast cancer research and logically patterned after the IES. Thus, body image distress is defined as anxiety-like responses (intrusive thoughts and avoidant behaviors) regarding one’s body image following breast cancer surgery. The third and fourth goals examined the psychometric properties of the BITS. These goals were studies of reliability and validity, respectively. In accordance with measurement development, a measure must demonstrate reliability before it can be considered valid (Anastasi & Urbina, 1997; Kerlinger, 1986; Walsh & Betz, 1995).
Thus, the internal consistency and test-retest of the BITS total score were initially examined. The reliability of the subscales was examined only after being determined from the study of construct validity (EFA). The findings from the reliability analyses on the total and subscale scores will be briefly summarized.

The BITS and its subscale demonstrate high internal consistency or item homogeneity ($\alpha$’s = .80 and higher) across both time points. These internal consistency coefficients suggest that the items for the complete scale and for each subscale suggest substantial overlap or homogeneity. For example, the high Cronbach alpha’s for the total scale at initial ($\alpha = .93$) and 12-months ($\alpha = .93$) may suggest that the two subscales hang together “too well” or that the measure is unidimensional (Cortina, 1993). However, research from Cortina (1993) suggested exploring the correlations between factors to counter such findings. Cortina also mentioned that the interfactor correlations might be more informative than Cronbach’s alpha regarding the relationship between factors. Thus, the factor correlations were examined of the hypothesized two-factor solution, of the BITS at the initial assessment. These correlations at initial ($r$’s = .58 to .70) suggest that the subscales are similar but are not redundant. The high internal consistency coefficients of the BITS total scale may not be that surprising based on the number of items for each subscale and the large sample size (n=196). These two conditions could inflate internal consistency coefficients. In addition, previous correlational research on the IES and its subscales’ factor correlations further supports the strong association vs. construct redundancy between the subscales (e.g., Zilberg et al., 1982).

The test retest of the BITS and its subscales between initial and 12-months demonstrated adequate reliability ($r$’s = .70 -.93). However, these results should be
interpreted in conjunction with the findings from the 1-way repeated measure
ANOVA. These ANOVAs demonstrated an effect for time for the BITS (total score)
and the Intrusion subscale. Thus, the results of the test-retest values could be
affected by the duration of time between assessments (12-months) and the change
in mean levels of overall body image distress and Intrusion.

Tests of validity will be briefly reviewed. The content of the 15 items of the
BITS were logically derived from previous research. These 15 items were examined
in exploratory factor analytic strategies to investigate the construct validity of the
BITS. The review of the 1-, 2-, and 3-factor solutions supported a two-factor solution
of the BITS at the initial assessment. Factor one contained 11 items representing
intrusive content and factor two contained 4 items representing avoidant content.
The stability of this 2-factor solution was examined at 12-months. Thus, a three-
phase confirmatory factor analytic approach was conducted to examine the factorial
invariance of the BITS.

The first phase of the CFA approach was not required or examined, but the
two remaining phases were investigated. In this approach, the second phase was a
pre-existing condition for the third phase. The second phase separately examined
the fit indexes of a 2-factor solution that was identical at each time point separately. If
the second phase was not statistically supported than one should not continue onto
the third phase. The rationale for this is simple, if the 2-factor solution does not fit
well at either of the time points then it does not make sense to compare them any
further in the third phase. The third phase examined the hypothesis that there is no
statistical difference between models that 1) constrains the factor loadings of the
appropriate item and factor across time points (Model A), and 2) does not constrain
the factor loadings between the appropriate item and factor across time points
(Model B). The findings suggested factorial invariance but with limitations. What if the third phase was statistically supported (p < .05) but the second phase was only moderately supported? In other words, the fit index for the 2-factor solution at 12-months was large (RMSEA = .10) suggesting unacceptable fit, but model fit was acceptable at initial (RMSEA = .07). However, the lower bounds of the confidence intervals for both RMSEAs revealed reasonable fit (see Table 4); this information can be used in support of the 2-factor solution demonstrating reasonable fit at both time points. Nevertheless, the point estimate of RMSEA is commonly used to examine fit of the model. Answers to the previous question will be presented due to such a finding in the study.

There appears to be several plausible reasons for a large RMSEA value at 12-months. First, few constraints (i.e. (bi)directional arrows) between variables can be viewed as absent paths. These missing paths can lead to poor model fit. Factor analytic strategies assume a linear relationship between the manifest variable and the latent variables. However, poor model fit may appear if this assumption is violated. These reasons may not be easily remedy through increasing the sample size, examining the prior factor solutions with a new sample, or removing constraints. For example, a larger sample size may not increase overall fit (i.e., absolute RMSEA value) but it would tighten the confidence interval around the RMSEA for the 12-month data.

4.3 Correlated Errors Approach

There are two other concerns when exploring a factor solution of a measure across several time points. These concerns are the influence of method factors and replicability vs. stability of a measure. The first concern will be addressed at this time. The latter point will be addressed in the methodological section. A method factor
(e.g., raters, time points, measures, etc) can affect findings on the observed measurement (Millsap, 1995). In this study, the method factor could be either 1) the raters answering the same questions across the two time points or 2) the repeated variable of time. One approach commonly used to address a method factor in confirmatory factor analysis is the correlated errors approach.

The correlated errors approach is a confirmatory factor analytic strategy that examines method factors on traits in multitrait-multimethod (MTMM) research. In brief, the MTMM matrix was developed by Campbell and Fiske (1959) to investigate the similarities between trait influences across methods and the saliency of method influences across traits. As mentioned, the present study examines the traits (latent - common factor) of the BITS across two time points. In MTMM research there are two types of common factors. First, a trait factor describes the correlations between measures of a single trait that use different methods. Second, the method factor explains the relationship among measures of different traits that use a single method. Also, in this approach it is assumed that method factors increase the variance of the measured variables and increase the correlations between variables measured with the same method. Finally to examine these effects, the method factor has to be included in the factor analytic strategy or the model assesses “no method influences” (Millsap, 1995). There is a realistic concern that the two latent factors of the BITS may be correlated across time due to the effects of the method factors of raters or the variable time. However, these issues could not be statistically examined in this study.

The design of this study is a monomethod multitrait (i.e., one measure with two traits) with two time points. Moreover, the design of the study did not include a method factor in the model because of limitations. Millsap delineated several
recommendations to statistically look at a method factor in a factor analytic strategy. First, sample sizes less than 150 may cause negative variances and produce Heywood cases (unidentifiable models). In this study, there was data on 148 patients at both time points compared to 196 subjects at initial. Second, at least four traits and four methods are suggested to produce a proper model. As stated, this study only has one method (BITS) with two traits (Intrusion and Avoidance). There are two other limitations to finding a proper solution with the correlated errors method. First, a model should be identifiable and past research suggest (Kenney & Kashy, 1992; Millsap, 1992; Wothke, 1984) that correlated trait method models (i.e., correlated errors approach) are not identifiable under certain conditions. Second, the hypothesized model may be wrong and does not fit the data well. Millsap (1995) also reported that method factors could be investigated through ANOVAs to examine a method factor’s influence on mean differences in scores. The computed analyses of variance could address the influence of ratings from breast cancer patients in the two surgical groups on the mean scores on the BITS. However, these analyses do not address the concern with a method factor influencing the correlation between the traits on the BITS. At this time, the author assumes the traits are correlated only due to the theory of the measure.

The remaining validity analyses (convergent and discriminant) will be briefly summarized. The BITS demonstrated discriminant validity with the sexuality measures in the dimension of behavioral (Intercourse and Kiss). At initial, the BITS also demonstrated discriminant validity with measures of physical health. These significant relationships were demonstrated at 12-months besides for the Karnofsky ratings (a physical health measure). These hypotheses were supported for these measures and an assumption that changes in the significance levels reflect a
decrease in body image distress over time. At initial and 12-months, the BITS demonstrated convergent validity with measures of distress (IES; PSS), body image (BIS, SDS), stress (SF-36; CES-D), sexual affect (Sexual Depression), sexual evaluation (Globe), and sexual cognitions (Sexual Self Schema) at initial and 12-months. However, the significant relationships between the Globe and Sexual Responsiveness Scale on the Intrusion and Avoidance subscales at initial were not significant at 12-months. However, these correlations were in the same direction. In addition, this measure evidenced incremental validity in the prediction of body image distress over other measures of body image (e.g., Body Image Satisfaction). To date, the BITS is the first measure of body image distress and reflects strong validity properties and incremental utility for the explanation and prediction of body image distress.

The fifth goal of the study examined changes in overall body image distress, intrusion, and avoidance over time and between surgical groups. There was a significant decrease in overall body image distress and intrusion between initial and 12-months. These results were consistent with the literature that distress or stress reactions from a life–threatening event decreases over time (Moyer, 1997). More specifically, these results replicate findings that stress responses to the breast cancer experience significantly decrease the first year post surgery (Moyer, 1997). Since this is the first study on the BITS, it is unclear why the Avoidance subscale did not significantly decrease over time. The reasons for this nonsignificant result may reflect the following: 1) the sample initially reported higher levels of intrusion and lower levels of avoidance, 2) a clinical intervention is necessary to reduce avoidance over time, and 3) sampling error. A future study could investigate these phenomena.
Comparison between the two surgical groups on body image distress across time revealed a similar pattern of results. First, the time effect for overall body image distress and intrusion between initial and 12-months was not replicated in these analyses. Second, women surgically treated with BCT compared to MRM reported less overall body image distress, intrusive thoughts, and avoidant behaviors. These results were consistent with prior studies (Moyer, 1997) indicating greater body image concerns for the MRM than the BCT surgical group. There were not any significant group by time interactions.

Comparisons among the three level of choices for surgical method on body image distress across time revealed several findings. First, the time effect for overall body image distress and intrusion between initial and 12-months was replicated in these analyses. Second, women who chose conservation and received conservation reported significantly less overall body image distress, intrusive thoughts, and avoidant behaviors compared to women who either 1) chose conservation but received mastectomy or 2) did not elect conservation (but could have) and received mastectomy. Third, the latter two groups did not significantly differ from each other. These results were consistent with prior studies (Moyer, 1997) suggesting greater body image concerns for women who receive MRM (even when they chose this surgical method or not) than the BCT surgical group. Future studies are warranted to examine all of the factors the contribute to the “choice” of surgical treatment besides stage of disease. Fourth, six women received BCT but reported they were not a candidate for BCT. Additional research is required to examine the disease characteristics of these women or why they received BCT when the choice was not possible. However, these women were not included in the reported analysis of variances. Finally, there were not any significant group by time interactions.
4.4 Methodological Strengths and Limitations

There were several methodologic areas of the study that should be noted. This was the first study to examine body image distress through tests of reliability and validity. Thus, future studies are needed to replicate these findings with the BITS, which can provide additional support for this measure and the novel conceptualization of body image distress. The sample size was large (n=196) and sufficient to conduct the exploratory factor analysis. However, the sample size decreased over time. Thus, the author a priori chose to examine the factorial invariance (stability) of the 2-factor solution over time compared to “replicating” the 2-factor solution by splitting the sample at both or either time point(s). This latter approach would have violated several “rules of thumb” (e.g., 10 person per manifest variable or large sample sizes of 200) suggested for factor analytic studies. Moreover, a hypothesized factor solution examined with a small sample size can reduce power increasing the possibility of an unidentifiable model. Another breast cancer sample of sufficient size should be used to replicate the present exploratory and confirmatory factor analytic results. As mentioned this study could not examine the influence of method effects (time or rater) on the common factors (Intrusion and Avoidance). This study was designed as a monomethod multitrait examining the reliability and validity of the BITS at two time points. A future MTMM study using the BITS that includes several measures of body image or anxiety (behavioral and cognitive) and additional time points (≥4) could address the effects of method factors.

The participants in this study were predominantly Caucasian, and so generalizability of these findings to other ethnic / race groups may be limited. This study also contained a homogenous sample that was assessed at two, controlled
time points. Collecting data during the early surgical recovery period is important and at additional time points demonstrates the reliability of the results. To date, this study is one of the first longitudinal studies to examine body image distress, which was recommend by Yurek et al. (2000). These two points were important design features.

The BITS an experimenter-derived measure provides several advantages over other conceptualizations of body image and body image outcomes in a female breast cancer population. First, this construct addresses the concerns of assessing body image without vague terminology such as positive and negative (Burt, 1995), secure and insecure (Bello and McIntire, 1995), or conceptualizing body image as a unidimensional construct (White 2000). Second, body image distress is operationally defined which clearly identifies and defines the stressor (surgical treatment of breast cancer). This construct provides a rationale for examining anxiety-like responses regarding one’s body image. Thus, the assessment of body image distress reduces the possibility of construct overlap (e.g., body image distress and sexual functioning or satisfaction with various body image parts) or implied assumptions about the construct, body image, being used. Moreover, Yurek et al. (2000) commented that measures of “satisfaction” used to examine body image have been inconsistent in their ability to document change following cancer treatments. One could infer these types of measures are not the most appropriate for conceptualizing or examining this endpoint (Yurek et al., 2000).

Third, this newly defined construct addresses more than the changes in breast cancer patients’ appearance and physical integrity following surgery, which has been termed ‘body image changes’ (White, 2000). This area is of importance but does not necessarily address the traumatic stressor of breast cancer surgery and subsequent anxiety-like responses (White, 2000). Most importantly, body image
distress creates a model by which a theoretically driven assessment measure (BITS) can strengthen clinical interventions for breast cancer patients with greater body image distress. Such psychological interventions could be anxiety-reduction techniques (progressive muscle relaxation) for avoidant behaviors or cognitive behavioral strategies for intrusive thoughts.

The BITS was model after the IES and questions could be raised about the present factor structure of the BITS compared to the original factor structure of the IES (see Horowitz et al., 1979). Horowitz’s measure reflected eight items for avoidant behaviors and seven items for Intrusive thoughts. However, recent studies reviewed by Joseph (2000) have suggested this 2-factor structure may under-represent the traits of the IES (i.e., the IES may have a 3- or 4-factor structure). Nevertheless, a common question that may be asked is the following: Does the factor structure of the IES fit the present data of the BITS at initial?

The present author examined this question by conducting a target two-factor solution based on the original IES factor solution findings (Horowitz et al., 1979) on the initial data of the BITS. The RMSEA (.066) suggested reasonable fit. However, this fit index is based on how well the model fits the data in EFA regardless of the type of rotation used (i.e., Target matrix). However, this fit index does not provide a reader with the information needed to discern how the factor loadings represent Horowitz’s Target. Moreover, the previous RMSEA value is consistent and actually identical with the RMSEA values reported on Table 4 for the 2-factor solution of the BITS. These RMSEA values are parallel regardless of the use of a Direct Quartimin or Target rotation. However, findings (factor loadings) from the 2-factor structure based on Horowitz’s Target suggested this Target may not be appropriate for Body Image Distress at initial in the present breast cancer sample.
There are several reasons why the factor loadings of the BITS items appear inconsistent with Howoritz’s Target. First, the BITS was modeled after the IES with majority of the item stems remaining consistent with Howoritz’s original measure. However, the items have been reworded to assess body image distress vs. cancer specific stress or stress responses to a traumatic stressor (e.g., war, rape). Second, the IES was developed in 1979 with a sample of 66 participants who sought psychotherapy at the University California. The reported serious life events for this sample were bereavement, accidents, violence, illness, and surgery (unspecified). This sample and their responses to the IES items may not replicate or generalize to the current breast cancer sample’s responses on the BITS possibly due the variety of life traumatic experiences. Hence, the factor structure of both measures may not be parallel.

Third, the 2-factor structure has been critiqued and reanalyzed by various researchers (Jospeh, 2000). Overall, there appears to be concern with the 2-factor structure not representing all of the traits of the IES such as a numbing and/or denial factor (McDonald, 1997). Fourth, the methodology used to analyze the factor-structure of the original data of the IES may have been limited due to less sophisticated factor analytic strategies twenty years ago compared to now. Specifically, the 2-factor structure of the IES was created from Howoritz’s et al., (1979) cluster analysis on the original 20 items of the IES. From their findings, only 15 items were selected that empirically clustered and “had significant item-to-subscale correlations beyond the .001 level of significance” (Horowitz et al., 1979). Zilberg and colleagues (1982) conducted a Principal Components Analysis with Varimax rotation on a sample of 72 patients who have experienced a parental bereavement. One of the goals of this paper was to replicate the findings from
Howoritz’s et al. (1979) research. Zilberg and colleagues (1982) reported that they used the 4:1 rule for the number of subjects to variables. As stated, the previous authors methodology for factor analyzing the internal structure of the IES may have limited and presently are not commonly used to conduct EFA (see Frabrigar et al., 1999 for a review on current factor analytic approaches). Given the present concerns, the ability to replicate the 2-factor structure of the IES on the initial data of the BITS appears limited.

4.5 Conclusions and Future Directions

These data suggest that women at risk for overall body image distress, avoidance, and intrusion can be identified early (at time of surgery) and clinical interventions can be made accessible to reduce or prevent the magnitude of body image distress experienced in a breast cancer sample. This information is essential for the mental health and medical communities by providing a framework to mitigate or prevent the body image distress following the breast cancer experience.
Appendix A
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<td>Situational Distress Scale</td>
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<td>BITS-Intrusion</td>
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<td>Sexual Responsive Scale</td>
</tr>
<tr>
<td>Evaluative</td>
<td>Globe</td>
<td>Globe</td>
</tr>
</tbody>
</table>

Table 1: The Four Aspects of Body Image and Sexuality

Note. For a full description of these measures please refer to the Methods chapter. A blank row implies that a measure for that aspect and / or valence is not represented by any relevant measures in the study.
<table>
<thead>
<tr>
<th>Measures</th>
<th>Initial</th>
<th>12-months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M(SD)</td>
</tr>
<tr>
<td><strong>Body Image</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSS</td>
<td>34.77 (8.16)</td>
<td>35.26 (8.21)</td>
</tr>
<tr>
<td>SDS</td>
<td>34.77 (8.16)</td>
<td>35.26 (8.21)</td>
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<tr>
<td>(Situational Distress)</td>
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<td></td>
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<tr>
<td><strong>Sexuality</strong></td>
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<td></td>
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<tr>
<td>Evaluation</td>
<td>4.17 (2.00)</td>
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<tr>
<td>KISS</td>
<td>6.41 (2.44)</td>
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<tr>
<td>Intercourse</td>
<td>2.69 (1.71)</td>
<td>2.28 (1.62)</td>
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<tr>
<td>SRC</td>
<td>55.76 (27.43)</td>
<td>57.36 (22.49)</td>
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<td>SDS (Sexual Depression)</td>
<td>3.84 (9.87)</td>
<td>5.48 (10.69)</td>
</tr>
<tr>
<td>SSS</td>
<td>58.32 (13.12)</td>
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</tr>
<tr>
<td><strong>Stress</strong></td>
<td></td>
<td></td>
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<tr>
<td>PSS</td>
<td>18.42 (6.97)</td>
<td>14.75 (6.89)</td>
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<tr>
<td>IES</td>
<td>26.07 (14.42)</td>
<td>14.46 (12.91)</td>
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<tr>
<td><strong>Distress</strong></td>
<td></td>
<td></td>
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<tr>
<td>CES-D</td>
<td>6.06 (3.69)</td>
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</tr>
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<td>SF36-MH</td>
<td>42.54 (11.39)</td>
<td>50.77 (8.98)</td>
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<td><strong>Physical Health</strong></td>
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<td></td>
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<td>SF36-PH</td>
<td>40.33 (8.06)</td>
<td>47.68 (9.90)</td>
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<tr>
<td>Karnofsky</td>
<td>85.11 (7.94)</td>
<td>88.27 (8.22)</td>
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Table 2: Means and Standard Deviations for Convergent and Discriminant Measures
<table>
<thead>
<tr>
<th></th>
<th>1 factor&lt;sup&gt;a&lt;/sup&gt;</th>
<th>2 factor</th>
<th>3 factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Assessment</td>
<td>.105 (0.091; 0.119)</td>
<td>.066 (0.049; 0.083)</td>
<td>.051 (0.028; 0.071)</td>
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Table 3: RMSEAs values for the Direct Quartirmin and Target Rotations

Note: < .05 indicates close fit; .05-.08 indicates reasonable fit; .08-.10 indicates mediocre fit; and > .10 indicates unacceptable fit (Steiger, 1989 Browne & Cudeck, 1993).<sup>a</sup> An one-factor solution can not be specified by a Target rotation because it contains only one factor- the least amount of factors possible for a factor solution. All items will load highly on the one factor.
### Two Factor Solution - Direct Quartimin

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
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<tr>
<td>Factor 2</td>
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### Two-Factor Solution - Target

<table>
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</thead>
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<td></td>
</tr>
<tr>
<td>Factor 2</td>
<td>.698</td>
<td>1</td>
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### Three-Factor Solution - Direct Quartimin

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Factor 2</td>
<td>.574</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Factor 3</td>
<td>.629</td>
<td>.429</td>
<td>1</td>
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</table>

### Three-Factor Solution - Target

<table>
<thead>
<tr>
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<th>Factor 2</th>
<th>Factor 3</th>
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<td></td>
<td></td>
</tr>
<tr>
<td>Factor 2</td>
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<td></td>
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<tr>
<td>Factor 3</td>
<td>.094</td>
<td>.119</td>
<td>1</td>
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Table 4: Factor Correlations for the Two- and Three-Factor Solutions at Initial
<table>
<thead>
<tr>
<th>BITS scores</th>
<th>Initial Mean (SD)</th>
<th>12-months Mean (SD)</th>
<th>BCT Mean (SD)</th>
<th>MRM Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>25.05 (16.65)</td>
<td>21.52 (17.42)</td>
<td>15.285 (13.30)</td>
<td>30.045 (16.255)</td>
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<tr>
<td>Factor 1 (Intrusion)</td>
<td>14.97 (10.18)</td>
<td>12.37 (10.32)</td>
<td>8.647 (7.621)</td>
<td>17.857 (9.78)</td>
</tr>
<tr>
<td>Factor 2 (Avoidance)</td>
<td>10.08 (7.63)</td>
<td>9.15 (7.99)</td>
<td>6.63 (6.65)</td>
<td>11.955 (7.75)</td>
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Table 5: Grand Means and Standard Deviations for Assessments and Surgical Groups

Note: superscript a denotes a main effect for time in the 1-way repeated measure ANOVAs. Superscript b denotes a main effect for surgical method in the 2 x 2 repeated measure ANCOVAs. N=154 for the 1-way repeated measure ANOVAs.
<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th></th>
<th>12-months</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BCT</td>
<td>MRM</td>
<td>BCT</td>
<td>MRM</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>BITS</td>
<td>16.68 (13.42)</td>
<td>32.25 (14.60)</td>
<td>13.89 (13.15)</td>
<td>27.82 (17.92)</td>
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<tr>
<td>Factor 1 (Intrusion)</td>
<td>9.70 (7.97)</td>
<td>19.63 (8.96)</td>
<td>7.59 (7.27)</td>
<td>16.31 (10.60)</td>
</tr>
<tr>
<td>Factor 2 (Avoidance)</td>
<td>6.57 (6.59)</td>
<td>12.63 (7.11)</td>
<td>6.30 (6.73)</td>
<td>11.51 (8.39)</td>
</tr>
</tbody>
</table>

Table 6: Means and Standard Deviations for Surgical Groups at Initial and 12-months

Note. N=144. * Means with subscripts indicates a main effect for group (surgical method) in the 2 x 2 repeated measure ANCOVAs.
Appendix B
Figure 1. The Four Aspects of Body Image
Figure 2. The Four Aspects of Body image and Sexuality
Appendix C
View of My Body
(Body Satisfaction Scale)

Instructions: Pick the Description which best describes how you CURRENTLY regard your body. Try not to be too critical, but be honest.

Code:  1 = Extremely Satisfied
       2 = Moderately Satisfied
       3 = Satisfied
       4 = Dissatisfied
       5 = Moderately Dissatisfied
       6 = Extremely Dissatisfied

___ Face
___ The shape/ form of your breast(s)
___ Hips
___ The size of your breast(s)
___ Genitals
___ Hair
___ Abdomen
___ Buttocks
___ Complexion
___ Weight
___ Your general appearance
Situational Discomfort Scale

Listed below are some situations in which women who have been treated for breast cancer often describe feeling discomfort. Please indicate your current level of distress associated with each situation.

Code: 0= Not at all Distressed
       1= A Little Distressed
       2= Somewhat Distressed
       3= Moderately Distressed
       4= Extremely Distressed

___ Looking at your chest in the mirror when you are unclothed.

___ Undressing in front of your partner (person with whom you are sexually intimate). Even if you do not have a partner now, rate how you believe you would feel.

___ Letting your partner (person with whom you are sexually intimate) see the surgical site. Even if you do not have a partner now, rate how you believe you would feel.

___ Undressing in front of other women. Please rate how you believe you would feel, even if this situation has not occurred.

___ Letting other women see the surgical site. Please rate how you believe you would feel, even if this situation has not occurred.
Breast Impact of Treatment Scale

Below is a list of comments made by women following treatment for breast cancer. Using the scale provided, please indicate how frequently these comments have been true in describing you experience.

Code: 0 = Not at All
      1 = Rarely
      3 = Sometimes
      5 = Often

___ I feel uncomfortable about being seen naked.
___ I avoid looking at and / or touching my scar.
___ I am bothered by feeling or thoughts of bodily disfigurement.
___ I think about how my treatments may affect my sex life.
___ I feel self-conscious about letting my partner (person I am sexually intimate) see my scar. **Even if you do not have a partner now, rate how you believe you would feel.**
___ When I see other women, I think my body appears different than theirs.
___ I have waves of strong feeling about the way my body looks.
___ I think about how my body looked before I was treated.
___ I am reminded of my scar when I pick out clothes to wear.
___ Things I see or hear remind me that my body is different now.
___ I avoid letting myself get emotional when I think of how my body has changed.
___ I turn away when I have to undress in front of my partner (person with whom I am sexually intimate). **Even if you do not have a partner now, rate how you believe you would feel.**
___ How my body has changed pops into my mind.
___ I don’t want to deal with how my body looks.
___ I try not to think about my breasts being different.
Your Sexual Life
(Initial Assessment)

Instructions: Think about the frequency of these activities in the TWO MONTHS PRIOR TO YOUR CANCER DIAGNOSIS. Give the best estimate of how often or how many times each activity has occurred.

Code: 0 = This activity did not occur at all
       1 = Activity occurred once
       2 = 1-2 times per month
       3 = Once a week
       4 = Twice a week
       5 = Three times a week
       6 = 4-6 times a week
       7 = Once a day
       8 = 2-3 times a day
       9 = This activity occurred more than 4 times a day

___ Sexual intercourse (or an equivalent activity) SEX

___ Kissing your partner. KISS

(GLOBE)

Thinking about your sex life TWO MONTHS PRIOR TO YOUR CANCER DIAGNOSIS, how would you rate it overall? Pick one number from below:

Code: 0 = Could not be worse
       1 = Highly inadequate
       2 = Poor
       3 = Somewhat inadequate
       4 = Average
       5 = Above Average
       6 = Good
       7 = Excellent
       8 = Could not be better
Your Sexual Life
(Follow up Assessment)

Instructions: Think about the frequency of these activities in the LAST THREE MONTHS. Give the best estimate of how often or how many times each activity has occurred.

Code: 0= This activity did not occur at all  
1= Activity occurred once  
2= 1-2 times per month  
3= Once a week  
4= Twice a week  
5= Three times a week  
6= 4-6 times a week  
7= Once a day  
8= 2-3 times a day  
9= This activity occurred more than 4 times a day

___ Sexual intercourse (or an equivalent activity)  SEX

___ Kissing your partner.  KISS

---

(GLOBE)

Thinking about your sex life, how would you currently rate it? Pick one number from below:

Code: 0= Could not be worse  
1= Highly inadequate  
2= Poor  
3= Somewhat inadequate  
4= Average  
5= Above Average  
6= Good  
7= Excellent  
8= Could not be better
Your Current Sexual life: Part 1
(Initial Assessment)

Have you resumed sexual intercourse (or equivalent intimate activity)?  ___ Yes
___ No

Do you feel desire and/or interest in sexual activity?  ___ Yes
___ No

Please indicate how often the following activities have occurred (on average) since being treated.

Code:  0 = This activity did not occur at all
      1 = Activity occurred once
      2 = 1-2 times per month
      3 = Once a week
      4 = Twice a week
      5 = Three times a week
      6 = 4-6 times a week
      7 = Once a day
      8 = 2-3 times a day
      9 = This activity occurred more than 4 times a day

___ Kissing on the lips.
___ Deep kissing.
___ Erotic embrace while dressed.
___ Kissing of sensitive (non-genital) areas.
___ How often have you avoided or declined sexual intercourse (or an equivalent intimate activity)?
Your Current Sexual life: Part 1  
(Follow up Assessment)

Have you resumed sexual intercourse (or equivalent intimate activity)? ___ Yes ___ No

Do you feel desire and/or interest in sexual activity? ___ Yes ___ No

Please indicate how often the following activities have occurred (on average) in the last three months.

Code: 0= This activity did not occur at all
1= Activity occurred once
2= 1-2 times per month
3= Once a week
4= Twice a week
5= Three times a week
6= 4-6 times a week
7= Once a day
8= 2-3 times a day
9= This activity occurred more than 4 times a day

___ Kissing on the lips.
___ Deep kissing.
___ Erotic embrace while dressed.
___ Kissing of sensitive (non-genital) areas.
___ How often have you avoided or declined sexual intercourse (or an equivalent intimate activity)?
Sexual Feeling and Responses  
(Current Relationship Status)

Please answer the following question, which pertains to your current relationship status. If you have a significant other, please complete the remaining sexual feeling and responses items (on following page). However, if you are not in a relationship at this time, please discontinue after the following question.

What below best describes your current relationship status?

____ Living with significant other (marital or non-marital relationship)

____ Have a significant other, but not living together

____ Not in a relationship at this time
Sexual Feeling and Responses (partnered women)
(Initial Assessment)

Listed below are several different feeling or responses that women may experience regarding their sexual activities. For the questions below, try to recall your sexual feelings and responses in general, and your feelings and responses regarding intercourse in particular. Read each item carefully and think about how frequently you have felt or responded in the described manner TWO MONTHS PRIOR TO YOUR CANCER DIAGNOSIS for breast cancer. *Please try to answer each question. If you have any problems or questions, please ask the interviewer for assistance.*

Code: 0 = Never
1 = Rarely
2 = Sometimes
3 = Almost Always
4 = Always

___ How often have you had desire for sex?
___ How often were you not interested in your partner’s suggestion for sex?
___ How often has your partner wanted sex more than you?
___ How often have you said “no” or avoided having sex?
___ How often have you wanted sex more than your partner?
___ How often have you been dissatisfied with your interest in sexual activity?
___ If you have resumed sexual activity: How often have you become aroused or excited during sexual activities?
___ Were you aware of a natural lubrication or moisture (wetness) in your vagina as you became sexually excited?
___ How often has your partner wanted to engage in sexual activity more than you?
___ Does it take a long time for your vagina to become naturally lubricated (wet or slippery) as you become sexually excited?
___ How often did your vagina feel “too tight” for penetration?
___ During sexual relations, how frequently did you notice dryness of your vagina?
___ How often have you felt pain or discomfort with penetration or intercourse?
___ How often have you been satisfied with your capacity to become aroused?
Sexual Feeling and Responses (partnered women)
(Initial Assessment con’t)

___ How often have you been able to reach climax (orgasm)?

___ As sexual activity became more intense, how often were you aware of throbbing sensations in your pelvis or vagina (sensations of orgasm or climax)?

___ During sexual activity, how often were you aware of your own feelings of body warmth, sweating, heavy breathing, or a fast heart beat?

___ How often were you dissatisfied with your capacity to have a orgasm / climax?

___ How often did you feel satisfied after sexual activity?

___ How often did you feel pain after sexual activity?

___ How often did your body feel relaxed after sexual activity?

___ How often did you feel a release of sexual tension after sexual activity?

___ How often did you feel tense or nervous after intercourse or an intense sexual experience?

___ How often did you feel dissatisfied after sexual activity ended?

___ How often were you satisfied with the frequency of sexual activity?

___ How frequently did you enjoy sexual activity?

___ How often did you feel like a sexual women?

___ All things considered, how often is your sexual desire or functioning a source of concern or difficulty in your relationship with your partner?
Sexual Feeling and Responses (partnered women)
(Follow up Assessment)

Listed below are several different feeling or responses that women may experience regarding their sexual activities. For the questions below, try to recall your sexual feelings and responses in general, and your feelings and responses regarding intercourse in particular. Read each item carefully and think about how frequently you have felt or responded in the described manner in the last three months. Please try to answer each question. If you have any problems or questions, please ask the interviewer for assistance.

Code: 0= Never
       1= Rarely
       2= Sometimes
       3= Almost Always
       4= Always

___ How often have you had desire for sex?
___ How often were you not interested in your partner's suggestion for sex?
___ How often has your wanted sex more than you?
___ How often have you said “no” or avoided having sex?
___ How often have you wanted sex more than your partner?
___ How often have you been dissatisfied with your interest in sexual activity?
___ If you have resumed sexual activity: How often have you become aroused or excited during sexual activities?
___ Were you aware of a natural lubrication or moisture (wetness) in your vagina as you became sexually excited?
___ How often has your partner wanted to engage in sexual activity more than you?
___ Does it take a long time for your vagina to become naturally lubricated (wet or slippery) as you become sexually excited?
___ How often did your vagina feel “too tight” for penetration?
___ During sexual relations, how frequently did you notice dryness of your vagina?
___ How often have you felt pain or discomfort with penetration or intercourse?
___ How often have you been satisfied with your capacity to become aroused?
Sexual Feeling and Responses (partnered women)  
(Follow-up Assessment)

___ How often have you been able to reach climax (orgasm)?

___ As sexual activity became more intense, how often were you aware of throbbing sensations in your pelvis or vagina (sensations of orgasm or climax)?

___ During sexual activity, how often were you aware of your own feelings of body warmth, sweating, heavy breathing, or a fast heart beat?

___ How often were you dissatisfied with your capacity to have a orgasm / climax?

___ How often did you feel satisfied after sexual activity?

___ How often did you feel pain after sexual activity?

___ How often did your body feel relaxed after sexual activity?

___ How often did you feel a release of sexual tension after sexual activity?

___ How often did you feel tense or nervous after intercourse or an intense sexual experience?

___ How often did you feel dissatisfied after sexual activity ended?

___ How often were you satisfied with the frequency of sexual activity?

___ How frequently did you enjoy sexual activity?

___ How often did you feel like a sexual women?

___ All things considered, how often is your sexual desire or functioning a source of concern or difficulty in your relationship with your partner?
Describe Yourself
(Sexual Self Schema Measure)

Instructions: Choose a number for each adjective to indicate how accurately the adjective describes you as you are generally or typically.

To what extent does the item _____________ describe me?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all Descriptive</td>
<td></td>
<td></td>
<td></td>
<td>Very Much Descriptive</td>
<td></td>
</tr>
</tbody>
</table>

___ Agreeable  ___ Rude
___ Uninhibited  ___ Straight-Forward
___ Cautious  ___ Casual
___ Cold  ___ Broad-Minded
___ Loving  ___ Direct

___ Open-Minded  ___ Prudent
___ Considerate  ___ Selfish
___ Timid  ___ Revealing
___ Frank  ___ Embarrassed
___ Stimulating  ___ Outspoken

___ Cooperative  ___ Uncooperative
___ Feeling  ___ Trusting
___ Experienced  ___ Romantic
___ Demanding  ___ Unkind
___ Generous  ___ Sympathetic

___ Distrustful  ___ Conservative
___ Harsh  ___ Passionate
___ Helpful  ___ Unsympathetic
___ Kind  ___ Inexperienced
___ Arousable  ___ Warm
___ Pleasant  ___ Unromantic
___ Self-Conscious
Karnofsky

- Normal, no complaints, and/or no evidence of disease
- Able to carry on normal activity, minor signs/symptoms of disease
- Normal activity with effort, some signs/symptoms of disease
- Cares for self; unable to carry on normal activity or do active work
- Requires occasional assistance, but is able to care for most of her needs
- Requires considerable assistance and frequent medical care
- Disabled, requires special care and assistance
- Severely, disabled, hospitalization indicated; death not imminent
- Hospitalization necessary; very sick; active supportive treatment necessary
- Moribund, fatal processes progressing rapidly
- Dead
Feeling in the Last Week
(CES-D)

Instructions: Rate how often you felt this way during the Past Week

0 = Hardly ever or never
1 = some of the time
2 = Much or most of the time

1. I did not feel like eating; my appetite was poor.
2. I felt depressed.
3. I felt like everything was an effort.
4. My sleep was restless.
5. I was happy.
6. I felt lonely.
7. People were unfriendly.
8. I enjoyed life.
9. I felt sad.
10. I felt that people disliked me.
11. I could not get going.
Quality of Life
(Sf-36)

Instructions: For each item, give an accurate evaluation of your quality of life AT THIS TIME.

In general, would you say your health is:

5 = Excellent
4 = Very good
3 = Good
2 = Fair
1 = Poor

Compared to one year ago, how would you rate your health in general now?

5 = Much better now than one year ago
4 = Somewhat better now than one year ago
3 = About the same
2 = Somewhat worse now than one year ago
1 = Much worse now than one year ago
Quality of Life
(Sf-36)

Instructions: For each item, give an accurate evaluation of your quality of life AT THIS TIME.

In general, would you say your health is:

5 = Excellent
4 = Very good
3 = Good
2 = Fair
1 = Poor

Compared to one year ago, how would you rate your health in general now?

5 = Much better now than one year ago
4 = Somewhat better now than one year ago
3 = About the same
2 = Somewhat worse now than one year ago
1 = Much worse now than one year ago
Health and Daily Activities
(SF-36)

Instructions: Does your health limit you in these activities? If so, how much?

Code: 1 = Yes, limited a lot
      2 = Yes, limited a little
      3 = No, Not limited at all.

1. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.

2. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.

3. Lifting or carrying groceries.

4. Climbing several flights of stairs.

5. Climbing one flight of stairs.

6. Bending, kneeling, or stooping.

7. Walking more than a mile.

8. Walking several blocks.

9. Walking one block.

10. Bathing and dressing yourself.
Activity Limit by Health
(SF-36)

Instructions: During the Past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

1 = Yes
0 = No

1. Cut down on the amount of time you spent on work or other activities.
2. Accomplished less than you would like.
3. Were limited in the kind of work or other activities.
4. Had difficulty performing the work or other activities (for example, it took extra effort).
Activities Limit by Emotions
(SF-36)

Instructions: During the Past 4 Weeks, have you had any of the following problems with your work or other regular daily activities as a result of any EMOTIONAL problems (such as feeling depressed or anxious)?

1 = Yes
0 = No

1. Cut down on the amount of time you spent on work or other activities.

2. Accomplished less than you would like.

3. Did not work or other activities as carefully as usual.

4. During the Past 4 Weeks, to what extent has your Physical Health or Emotional Problems interfered with your normal social activities with family, friends, neighbors, or groups?

5 = Not at all
4 = Slightly
3 = Moderately
2 = Quite a bit
1 = Extremely

5. How much bodily pain have you had during the Past 4 Weeks?

6 = None
5 = Very mild
4 = Mild
3 = Moderate
2 = Severe
1 = Very Severe

6. During the Past 4 Weeks, how much dud pain interfered with your normal work (including work both outside the home and housework)?

5 = Not at all
4 = Slightly
3 = Moderately
2 = Quite a bit
1 = Extremely
Feelings in the Last Month
(SF-36)

Instructions: For each question, please indicate the one answer that comes closest to the way you have been feeling in the Last Month.

Code: 1 = All of the time
     2 = Most of the time
     3 = A good bit of the time
     4 = Some of the time
     5 = A little of the time
     6 = None of the time

How much of the time during the past month…

1. did you feel full of pep?
2. have you been a very nervous person?
3. have you felt so down in the dumps nothing could cheer you up?
4. have you felt calm and peaceful?
5. did you have a lot of energy?
6. have you felt downhearted and blue?
7. did you feel worn out?
8. have you been a happy person?
9. did you feel tired?
10. has you health limited your social activities (like visiting with friends or close relatives)?
Health Evaluation
(SF-36)

Instructions: Please chose how true or false these statements are for you:

Code: 1 = Definitely
      2 = Mostly true
      3 = Not sure
      4 = Mostly false
      5 = Definitely false

1. I seem to get sick a little easier than other people.
2. I am a healthy as anybody I know.
3. I expect my health to get worse.
4. My health is excellent.
CES-D

Instructions: Rate how often you felt this way during the PAST WEEK.

Code: 0 = Hardly ever or never
       1 = Some of the time
       2 = Much or most of the time

1. I did not feel like eating; my appetite was poor.
2. I felt depressed.
3. I felt everything I did was an effort.
4. My sleep was restless.
5. I was happy.
6. I felt lonely.
7. People were unfriendly.
8. I enjoyed life.
9. I felt sad.
10. I felt that people disliked me.
11. I could not get going.
Impact of Events Scale  
(IES)

**Instructions:** Indicating how frequently these comments have been true in describing your feelings about having cancer During the Past Seven Days. If they did not occur during that time, please indicate “not at all.”

Code: 0 = Not at all  
1 = Rarely  
3 = Sometimes  
5 = Often

1. My feelings about it were kind of numb.

2. I thought about having cancer when I didn’t mean to.

3. I avoided letting myself get upset when I thought about it or was reminded of having cancer.

4. I tried to remove cancer from my memory.

5. I had trouble falling asleep or staying asleep, because pictures or thoughts about cancer or having cancer treatment came into my mind.

6. I had waves of strong feelings about this disease.

7. I had dreams about being a cancer patient.

8. I stayed away from reminders of cancer.

9. I felt as if my diagnosis / treatments hadn’t happened or they weren’t real.

10. I tried not to talk about it.

11. Pictures about having cancer or undergoing cancer treatment popped into my mind.

12. Other things kept making me think about cancer.

13. I was aware that I still had a lot of feelings about cancer, but I didn’t deal with them.

14. I tried not to think about it.

15. Any reminder brought back feelings about having cancer.
Feelings of Stress
(PSS-10)

Instructions: We are interested in your feelings and thoughts for the Last Month. Indicate how often you felt or thought a certain way by choosing the appropriate number for each question.

Code: 0 = Never
     1 = Almost Never
     2 = Sometimes
     3 = Fairly Often
     4 = Very often

In the last month, how often have you

1. been upset because of something that happened unexpectedly?
2. felt you were unable to control the important things in your life?
3. felt nervous and “stressed”?
4. felt confident about your ability to handle your personal problems?
5. felt that things were going your way?
6. felt that you could not cope with all the things that you had to do?
7. been able to control irritations in your life?
8. felt that you were on top of things?
9. been angered because of things that happened that were outside of your control?
10. felt difficulties piling up so high that you could not overcome them?
Sexual Depression Scale  
(SDS)

Instructions: Please rate the degree to which you agree or disagree with following statements. 
Code:  -2 = Disagree  
   -1 = Slightly Disagree  
    0 = Neutral  
    1 = Slightly Agree  
    2 = Agree  

1. I am depressed about the sexual aspects of my life.  
2. I feel good about my sexuality.  
3. I am disappointed about the quality of my sex life.  
4. Thinking about sex makes me happy.  
5. I derive pleasure and enjoyment from sex.  
6. I feel down about my sex life.  
7. I feel unhappy about my current sexual relationship.  

(Omit only if you currently do not have a sexual relationship)  
8. I feel pleased with my sex life.  
9. I feel sad when I think about my current sexual experience.  
10. I am not discouraged about sex.
<table>
<thead>
<tr>
<th><strong>Sociodemographics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>How many years of schooling have you completed?</td>
</tr>
<tr>
<td>In what year were you born?</td>
</tr>
</tbody>
</table>
| What is your Racial/Ethnic group? | ____ Caucasian / White  
| | ____ African American / Black  
| | ____ Hispanic / Latino  
| | ____ Asian American  
| | ____ Native American  
| | ____ Other |
| Have you ever been or are you currently married? | ____ Single, Never Married  
| | ____ Currently Married  
| | ____ Not Married, but Live with Significant Other  
| | ____ Separated/Divorced  
<p>| | ____ No longer Married; Widowed |
| How long have you been married? | ____ |
| What are / were your total annual gross wages or income (pre tax)? | ____ |
| Are you currently employed for pay on a full or part-time basis? | ____ Yes  ____ No |</p>
<table>
<thead>
<tr>
<th>Occupation</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Homemaker</td>
<td></td>
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<tr>
<td>Major professional, executive</td>
<td></td>
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<tr>
<td>Lesser professional, manager</td>
<td></td>
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<tr>
<td>Administrative personnel (large company); Semiprofessional</td>
<td></td>
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<tr>
<td>Assistant manager; own small business</td>
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<tr>
<td>Technician (High Tech)</td>
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<tr>
<td>Clerical/Sales worker</td>
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<tr>
<td>Skilled crafts person</td>
<td></td>
</tr>
<tr>
<td>Semiskilled operatives</td>
<td></td>
</tr>
<tr>
<td>Unskilled labor</td>
<td></td>
</tr>
</tbody>
</table>

If employed, what is your current occupation? If not currently employed, what was your last full-time job?
Medical Chart Review

Disease Site: _____ Unilateral _____ Bilateral

Was reconstruction performed at the initial treatment (surgery)? _____ Yes _____ No

Was nipple reconstruction done at initial treatment (surgery)? _____ Yes _____ No

Type of surgical procedure:

- _____ None
- _____ Lumpectomy
- _____ Simple Mastectomy
- _____ Modified Radical Mastectomy
- _____ Radical Mastectomy
- _____ Extended Mastectomy
- _____ Bilateral Mastectomy

Was breast-conserving treatment an option?

- _____ No, not a candidate
- _____ Yes, elected and received conservation
- _____ Yes, elected conservation; but received mastectomy
- _____ Yes, elected and received mastectomy

Reconstruction at initial surgery?

- _____ None
- _____ Immediate, with implant
- _____ Immediate, with tissue expander
- _____ Immediate, with skin flap

Tumor size (cm x cm x cm):

- _____ x _____ x _____

Tumor size (greatest dimension):

- _____

Stage of Tumor:

- _____ Stage 0: Tis N0 M0
- _____ Stage 1: T1 N0 M0
- _____ Stage 2: T2-3 N0 M0 / T3 N0 M0 / T4 any N any M
- _____ Stage 2: T4 N1 M0 / T3 N1 M0 / T4 N2 M0 / T4 N3 M0
- _____ Stage 3: T4 N1-3 M0 / T4 N4 M1
- _____ Unstaged
REFERENCES


