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Differential Relationships of Hope and Optimism with Adjustment in Breast Cancer Patients

For the degree of Master of Science

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DIFFERENTIAL RELATIONSHIPS OF HOPE AND OPTIMISM WITH
ADJUSTMENT IN BREAST CANCER PATIENTS

A Thesis

Submitted to the Faculty

of

Purdue University

by

Emily E. Rock

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ABSTRACT

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Psychological and marital adjustment are two important outcomes for patients with breast cancer. Personality traits, such as hope and optimism, may influence adjustment to adversity. It was hypothesized that patient and partner hope and optimism would differentially predict patient marital and psychological adjustment. Measured variable path analysis with 56 patient-partner dyads found that patient and partner hope equally predict patient marital adjustment, while there was a trend for patient optimism predicting patient psychological adjustment. These results suggest that hope and optimism differentially predict adjustment outcomes, and that the partner also has a role in the patients' adjustment. Regression analyses were used to examine the hypothesis that discrepancies in patient and partner personality would result in maladjustment. No interaction effects were found predicting patient psychological adjustment. Three out of six interactions were found for patient marital adjustment. These analyses suggest that complementary personality styles among couples coping with breast cancer may result in optimal patient marital adjustment.

INTRODUCTION

Overview of Breast Cancer and Adjustment

Breast cancer is the most common cancer among American women, who have a one in eight chance of having the disease at some point in their lives (American Cancer Society [ACS], 2008; National Cancer Institute [NCI], 2007). Fortunately, the mortality rate for breast cancer is decreasing. Although it is the second leading cause of cancer death in women, 89% of breast cancer patients live for at least five years with the disease (NCI, 2007). Hence, women with breast cancer are unique in that the majority must learn to live with the uncertainty of their disease. With two and a half million breast cancer survivors currently living in the United States, researchers have become increasingly interested in how these women adjust to a life-threatening disease (ACS, 2008; Kayser & Sormanti, 2002; NCI, 2007).

Despite advancements in medicine, namely in detection capabilities and cure-focused treatment, cancer is life threatening, and receiving this diagnosis can have a profound and long-lasting impact (Gotay, 1984; Gustavvson-Lilius, Julkunen, & Hietanen, 2007; Kayser & Sormanti, 2002; NCI, 2007). Women diagnosed with breast cancer often receive aggressive, cure-focused treatments such as radiation, chemotherapy, or hormonal therapy. They may also undergo a full or partial mastectomy (i.e., the removal of breast tissue). These treatments can have negative physical, psychological, and interpersonal consequences for the patient (Graci, 2001; Kayser & Sormanti, 2002; Kerenyi, 2008; Sormanti, Kayser, & Strainchamps, 1997). In

turn, these negative consequences can influence how the patient recovers or adjusts among the diagnosis and treatment of breast cancer (Graci, 2001; Kerényi, 2008). This has led researchers to investigate factors affecting various domains of well-being of breast cancer patients in order to improve quality of life (Gotay, 1984). Women with breast cancer state that disease-related stressors result in significant changes in their mood and relationships; thus, psychological and marital adjustment have been noted as two important domains of well-being (Kayser, Sormanti, & Strainchamps, 1999).

Patient Psychological Adjustment

Breast cancer can have negative psychological effects for the patient. For example, some breast cancer patients report experiencing high levels of anxiety, depression, hostility, and distress (Epping-Jordan et al., 1999; Kayser et al., 1999; Trunzo & Pinto, 2003; Vinokur, Threath, Vinokur-Kaplan, & Satariano, 1990). Additionally, research suggests that women with breast cancer experience these intense psychological effects at the time of initial diagnosis, through the course of treatment, and into survivorship (Butler et al., 2003; Wai Ming, 2002). To illustrate, a study assessing changes in depression and anxiety from diagnosis to 3- and 6-month follow-up visits found that women with Stage I through Stage IV breast cancer reported experiencing anxiety and depression in clinical ranges three to four times greater than the general population (Epping-Jordan et al., 1999). Although depressive symptoms did not significantly change over the six-month study, with 26% reporting symptoms within the clinical range, anxiety symptoms were significantly reduced by the 6-month follow-up. Despite this reduction, 21% of the patients continued to report symptoms within clinical range (Epping-Jordan et al., 1999).

Other studies have shown that those experiencing depression at the end of treatment are more likely to also experience increased anxiety, and this trend continues six months post-treatment (Kerenyi, 2008). A qualitative study of breast cancer patients from different ethnic backgrounds indicated that women universally experience fears of death, pain, and loss of autonomy (Ashing-Giwa et al., 2004). Another study found anger to dominate the emotions of women with breast cancer, but that they also felt more depressed than they had before diagnosis (Luoma & Hakamies-Blomqvist, 2004). Hence, breast cancer diagnosis and its treatments can result in varying reactions which can have broad effects on daily life, such as increased insomnia, greater use of alcohol, and thoughts of suicide (Vinokur et al., 1990). Psychological adjustment in breast cancer needs to be better understood, especially given the evidence that well-being may be related to survival in breast cancer (Kerenyi, 2008; Kreitler, Kreitler, Chaitchik, Shaked, & Shaked, 1997).

Research investigating psychological distress, psychological well-being, affective states, or psychological adaptation within breast cancer will be consolidated under the term *psychological adjustment* for the purpose of this study (Dalton, Nelson, Brobst, Lindsay, & Friedman, 2007; Ell, Nishimoto, Morvay, Mantell, & Hamovitch, 1989; McNair, Lorr & Droppelman, 1992). Psychological adjustment is a broad construct incorporating emotional states such as depression, anxiety, and psychological distress (Kerenyi, 2008).

Patient Marital Adjustment

Women with breast cancer state that their relationships with their partners are especially important to them (Ashing-Giwa, 2000; Kerenyi, 2008). Unfortunately, breast cancer often strains these intimate relationships (Kerenyi, 2008; Wai Ming, 2002). For example, breast

cancer can raise concerns about burdening family members, cause changes in household role functions, and make coping difficult for family members. Patients and their partners report that these changes often stress the intimate relationship (Kerenyi, 2008). The life-threatening nature of cancer and its aggressive treatments can influence many aspects of a partnered relationship, including: sexual intimacy, emotional bond, and role identities (Ben-Zur, Gilbar, & Lev, 2001; Dalton et al., 2007; Wai Ming, 2002). Consequently, breast cancer has been called the 'disease of the couple' (Baider & de-Nour, 1988; Wai Ming, 2002).

These effects on partnered relationships have been widely studied under the terms marital satisfaction, marital quality, or relationship distress (Bradbury, Fincham, & Beach, 2000). For this study, the term *marital adjustment* will be used to encompass these concepts. Marital adjustment includes many aspects of a partnered relationship, such as: reconciliation of a disagreement, satisfaction with sexual intimacy, demonstration of affection, communication quality and, involvement in the life of one's partner (Badr & Carmack Taylor, 2008; Locke & Wallace, 1959). Marital adjustment is considered a global indication of distress within a relationship (Bradbury et al., 2000).

Variability in Adjustment

Although some breast cancer patients experience psychological or interpersonal problems, many do not. In fact, a review by Irvine, Brown, Crooks, Roberts, and Browne (1991) suggests that approximately 30% of women with breast cancer experience marked psychological distress, whereas 70% report healthy adjustment one year post-diagnosis. As for long-term adjustment, longitudinal studies suggest that 20-30% of breast cancer patients continue to experience enduring psychological distress two years post-diagnosis (Ell et al.,

1989; Irvine et al., 1991). Ibbodson, Maguire, Selby, Priestman, and Wallace (1994) screened 513 cancer patients for depression and anxiety with the General Health Questionnaire, the HADS, and the Rotterdam Symptom Checklist, and found 17% had either depression or generalized anxiety disorder (Sellick & Crooks, 1999). These rates of psychological distress are higher than is seen in the general population. Angst (1992) reviewed 17 studies and found a 12-month prevalence of major depressive disorder in the general population to be between 2.6% and 6.2%. Additionally, Kessler et al. (1994), using data from the National Comorbidity Survey, reported a 12-month prevalence of major depressive disorder at 10% and a 12-month prevalence of generalized anxiety disorder at 3.1%. Therefore, women with breast cancer experience greater rates of psychological distress than the general population.

Similarly, the effects of breast cancer on relationships are not always negative. Some couples state that coping with cancer together strengthens their relationship (Kayser & Sormanti, 2002; Wai Ming, 2002). In coping with the struggles of breast cancer, some women report positive changes in their relationships with others and with themselves (Manne et al., 2004). Indeed, research suggests that 60-90% of cancer survivors experience some positive change in their relationships during cancer treatment and into survivorship. These studies also report an increase in posttraumatic growth over time and that both the patient and their partner experience these positive effects (Manne et al., 2004). Therefore, breast cancer may strengthen or strain intimate relationships. These findings have raised questions about which breast cancer patients are at greater risk for maladjustment, and have called for a better understanding of the factors associated with these differential responses to breast cancer (Epping-Jordan et al., 1999; Irvine et al., 1991; Kayser & Sormanti, 2002).

Personality and Adjustment

Although cancer-related variables (e.g., physical symptoms, treatment type) are known to account for some differences in adjustment in cancer (Carver, Smith, Petronis, & Antoni, 2006; Ell et al., 1989), researchers are becoming increasingly interested in understanding other factors that can explain differential adjustment among cancer patients. For example, Carver et al. (2006) report that psychosocial factors such as social support and personal resources predict long-term adjustment to cancer.

Within social psychology, one theory that has been used to explain differences in adjustment in the midst of stressors is the theory of self-regulation (Carver & Scheier, 1998). This theory posits that humans are inherently goal-oriented and that differences in adjustment are accounted for by differences in people's ability to reach their goals (Scheier, Carver, & Bridges, 1994). Self-regulation theory includes several constructs, such as expectancies, coping, and personality traits. Several researchers speculate that personality factors play a role in adjustment in breast cancer (Trunzo & Pinto, 2003). For example, better psychological adjustment has been associated with lower neuroticism scores and higher self-esteem (Irvine et al., 1991). Two important traits in self-regulation theory that have been empirically linked with adjustment in the midst of adversity are Snyder's (1991) hope and Scheier and Carver's (1985) optimism. To illustrate, individuals high in either hope or optimism have better adjustment among academic or illness-related stressors than those low in hope or optimism (Snyder, 2002; Stanton et al., 2000). Hence, there is reason to believe that differences in personality (viz., hope and optimism) play a role in adjustment in breast cancer (Carver et al., 1993). Given that the theory of self-regulation focuses on goal achievement, however, it is unclear how applicable the theory is in contexts where goal achievement is largely uncontrollable. In such situations

(i.e., surviving breast cancer), these two traits may be less important in predicting adjustment (Dalton et al., 2007; Rand, 2009).

Hope

According to Snyder (1991, 2002), hope is the trait belief that one is capable of achieving one's goals. Hope comprises two thought processes: pathways and agency. Pathways thinking is the perceived ability to generate one or more viable strategies for achieving one's goal. Pathways thinking is particularly important when one encounters a goal blockage, as it allows the individual to find alternative ways of reaching their goals. Agency is the motivational component of hope. It is the perceived capacity to motivate oneself to use pathways to reach desired goals (Snyder, 2002). As with pathways thinking, agency is particularly important when an individual encounters blockages to their goal pursuits. In the face of these barriers, motivation is needed to pursue alternative routes to goals (Snyder, 2002). Pathways and agency thinking are iterative processes, and both are required for successful goal pursuit (Snyder, 2002).

Research has shown that those high in hope more effectively produce alternative routes (pathways) to their goals and have a greater sense of confidence in their primary and alternative routes compared to those low in hope (Rand & Cheavens, 2009). Additionally, high-hope people will be more determined in their goal pursuit and experience more positive, active feelings about future goal pursuits (Rand & Cheavens, 2009). In contrast, those with low-hope tend to be less determined and have more negative, passive feelings about future goals (Snyder, 2002). Compared to their low-hope counterparts, high-hope individuals experience less distress from goal-related obstacles (Snyder, 2002).

Hope and Adjustment

Situations that create goal-related obstacles and threaten goal attainment produce feelings of stress and can diminish well-being (Snyder, 2002). These effects are often seen in physical illnesses such as cancer because they can interfere with goal pursuits (Snyder, 2002). For example, scarring from a mastectomy can thwart one's goal of appearing physically attractive (Kerenyi, 2008). Recognizing the association between higher hope and less distress in thwarted goal pursuits, researchers have begun to further investigate hope's role in adjustment to a number of illnesses, including pain (Affleck & Tennen, 1996; Snyder, 2002), burn injuries (Barnum, Snyder, Rapoff, Mani, & Thompson, 1998), spinal cord injuries (Elliott, Witty, Herrick, & Hoffman, 1991), arthritis (Laird, 1992), and cancer (Rand & Cheavens, 2009; Stanton et al., 2000). These studies have found that those with higher hope tend to have better psychological adjustment in physical illness (Affleck & Tennen, 1996; Barnum et al., 1998; Elliott et al., 1991; Laird, 1992; Snyder, 2002). For example, Snyder's work (2002) examining experiences of chronic and acute pain found that higher levels of hope helped to blunt the experience of pain and encouraged more efficient use of coping strategies in the face of stressors (Snyder, 1998; Snyder et al., 2005).

Stanton et al. (2000) examined hope in adjustment within breast cancer. Higher levels of hope predicted better psychological adjustment, as measured through a composite of instruments assessing health-related quality of life and positive and negative mood. These findings provide some evidence that personality plays a role in psychological adjustment within cancer. Specifically, they suggest that varying levels of hope in individuals with cancer can result in differing experiences of the same disease.

In addition to better psychological adjustment, individuals with higher hope have better social adjustment and form strong attachments to others. Within these social interactions, high-hope people tend to be as interested in the goals of others as they are in their own goals (Snyder, 2002). That is, high-hope individuals tend to think more about communal or shared goals than low-hope individuals (Snyder & Feldman, 2000). Snyder and Feldman (2000) describe high-hope people as having ‘mental outlooks’ that “are partly for themselves and partly for other people” (p. 407). With this ability to divide goal-oriented thought processes into goals for self and communal goals, theory suggests that higher levels of hope would be beneficial to personal relationships, with the relationship as the common goal between two individuals (Snyder & Feldman, 2000). That is, in addition to better social adjustment, individuals with high hope ought to have more satisfactory relationships. This is likely because high-hope individuals are more likely to seek and receive more social support and also to provide more social support. Additionally, high-hope individuals tend to be better at understanding the perspectives of others (Taylor, 2000). Even though relationships are often central goals in which hopeful thinking may have an important influence, no research has been conducted to identify the role of hope in marital adjustment.

Optimism

According to Scheier and Carver (1985), optimism is the trait belief that good, as opposed to bad, outcomes are likely in the future. Like hope, optimism is considered one element within the self-regulation framework (Carver & Scheier, 1998; Schou, Ekeberg, Sandvik, & Ruland, 2005). Higher levels of optimism relate to better adjustment and coping

(Carver & Scheier, 2001) and greater well-being during hardship (Carver et al., 1993; Rand, 2009).

Optimism and Adjustment

Research has shown that higher levels of optimism are associated with better psychological adjustment among cancer patients (Scheier et al., 1994). For example, Carver et al. (2006) investigated the role of optimism in psychological adjustment in long-term breast cancer survivors. Higher levels of optimism measured at diagnosis of breast cancer were related to better psychological adjustment 5-12 years post-diagnosis, as measured by an index of quality of life. In a similar study by Carver and colleagues (1993), higher levels of optimism at diagnosis were related to less psychological distress, as indicated by an index of mood (e.g., depression, anxiety, anger) 12 months later. Additionally, a study of 80 women newly diagnosed with breast cancer showed that higher levels of optimism were correlated with lower levels of anxiety and depression at six months post-diagnosis (Epping-Jordan et al., 1999). These studies illustrate that optimism may be beneficial in adjusting to cancer. People with higher levels of dispositional optimism tend to have better acute and long-term outcomes than their more pessimistic counterparts. That is, it appears that optimists are better able to cope with challenges and adapt to life transitions (Scheier et al., 1994).

Although the association between optimism and better psychological adjustment has been examined, the relationship between optimism and marital adjustment has received less attention (Srivastava, McGonigal, Richards, Butler, & Gross, 2006). A few studies have demonstrated the relationship between higher optimism and better social functioning generally, but only two have investigated romantic relationships (Srivastava et al., 2006). These

studies found that greater optimism for the relationship is related to long-lasting relationships (Helgeson, 1994; Murray & Holmes, 1997; Srivastava et al., 2006). Furthermore, partners of optimists also evince better marital adjustment, demonstrating the reciprocal nature of optimism in dyads. Indeed, Luo and colleagues (2008) state that, “self and partner personality tend to make independent contributions to the prediction of satisfaction” (p. 1233). These studies provide evidence that optimism plays a role in marital adjustment and provide a foundation to further study the association.

Comparing Hope and Optimism

Hope and optimism are considered two components of the self-regulation model (Carver & Scheier, 1998). Both are conceptualized as trait-like beliefs that affect thoughts and behaviors concerning goal pursuits. Measures of hope and optimism have been shown to correlate moderately ($r \approx .50$; Rand, 2009). There is evidence that they are similarly related to emotional states, well-being or psychological adjustment, and coping strategies (Aspinwall & Leaf, 2002; Carver & Scheier, 2001; Rand, 2009; Snyder, 2002). However, research has shown that the two constructs are not redundant (Bryant & Cvengros, 2004; Rand, 2009). Hope involves beliefs about one’s capabilities of achieving his or her goals. Consequently, hope may predict thoughts, feelings, and behaviors in situations where one can influence goal outcomes by use of personal attributes and abilities (Rand, 2009). For example, in a marital relationship, higher-hope individuals may be more likely to engage in more activities with their spouse to achieve their goal of a better relationship. Conversely, optimism is a generalized expectancy for positive future outcomes, regardless of how controllable they are. Consequently, optimism may predict thoughts, feelings, and behaviors in both controllable and uncontrollable

situations. When studied concurrently with hope, however, the unique role of optimism may be influencing self-regulation in less controllable situations. Consistent with this conceptualization, Rand (2009) suggested that, “hope and optimism may have differing influences on goal-specific expectancies depending on the extent to which the outcome is within the control of the individual” (p. 236).

These differing influences were examined by Rand and colleagues in two different populations. In a longitudinal study of academic performance and life satisfaction in law students, hope uniquely predicted academic performance, whereas optimism did not. Conversely, both hope and optimism independently predicted life satisfaction (Rand, Martin, & Shea, 2009). This provides evidence that situations largely under the control of personal attributes, such as effort in academics, may be most influenced by hope. In another study, Rand, Cripe, et al. (2009) studied men with advanced cancer to investigate the differences between hope and optimism in predicting coping and psychological adjustment. In this population, patient hope predicted the use of complementary and alternative medicine (CAM; i.e., nonmedical therapies such as acupuncture or exercise), but did not predict psychological adjustment (i.e., symptoms of anxiety and depression). In contrast, optimism was unrelated to controllable coping behaviors (i.e., using CAM), but predicted better psychological adjustment. This finding suggests that optimism may be more beneficial than hope in reducing the impact of intractable situations (Bryant & Cvenegros, 2004; Rand, 2009; Rand, Cripe, et al., 2009).

These differences in hope and optimism identified in studies by Rand and colleagues provide further support that hope and optimism predict the use of different coping mechanisms (Rand, Cripe, et al., 2009). Previous research has found that hope predicts the use of more active, problem-focused coping while optimism predicts adaptive emotion-focused

coping strategies (Chang, 1998; Scheier et al., 1994). These differences in coping mechanisms provide some evidence that the two traits are beneficial in different situations. Problem-focused coping, which often includes active problem-solving, can be thought of as actions one can personally undertake to improve the situation (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Using emotion-focused coping (e.g., benefit finding or mental accommodation), one does not change the situation, but instead changes the way they think about the situation (Scheier et al., 1994). Breast cancer is often characterized by limited control over goal outcomes (e.g., being cured). Self-regulation theory states that when people do not reach their goals, they will experience negative affect. Therefore, when cancer patients cannot reach their goal of health, these patients are likely to become psychologically distressed. Given that optimism may be more helpful in such uncontrollable situations, it is hypothesized that optimism would predict breast cancer patient's psychological adjustment. However, while the goal of survivorship may be out of one's control, other goals, such as good relationships, are more within one's control. The quality of cancer patients' relationships is considered to be within their control because they have the ability to engage in behaviors that can directly improve the quality. Given that hope may be most useful in situations where one's personal efforts help them reach their goals, hope is hypothesized to be predictive of marital adjustment (Rand, 2009).

Although recent research suggests that hope and optimism are differentially beneficial, little effort has been made to investigate these differences simultaneously (Rand, 2009). This is evident in the cancer literature, which has studied hope and optimism separately rather than comparing their unique contributions. Because of this, many questions about their differential relationships with adjustment in breast cancer are left unanswered (Snyder, 2002). Indeed,

although hope and optimism have been shown to similarly relate to psychological adjustment, it may be that hope is related to psychological adjustment because of the variance that hope shares with optimism. Similarly, optimism may be related to marital adjustment because of the variance optimism shares with hope. Therefore, studying the two constructs conjointly is imperative to better understand their differences and similarities. Accounting for both hope and optimism will provide a better understanding of their unique contributions to adjustment outcomes. Additionally, higher levels of hope or optimism could have deleterious consequences. For example, the uncontrollable nature of cancer may thwart certain goal-pursuits and a trait-like disposition to think positively about these inaccessible goals may become maladaptive (Dalton et al., 2007; Rand, 2009).

Partner Personality

Patient adjustment to physical illness does not occur in isolation. That is, the adjustment of others also influences the adjustment of breast cancer patients (Kayser & Sormanti, 2002). As the partner is most often the primary caregiver for women with cancer, it is the partner who is particularly important to the patient's adjustment process. Given that adjustment is a dyadic process, and personality factors are related to adjustment, researchers hypothesize that the partner's personality could influence the patient's adjustment (Feudtner, 2005; Kayser & Sormanti, 2002; Sormanti et al., 1997). Hence, coupled partners mutually contribute to each other's adjustment, providing a role for the partner's personality on the patient's adjustment as important as the patient's own personality.

Recent research provides evidence of the mutual contribution of personality on marital adjustment. For instance, certain personality traits have been shown to relate to distress in

intimate relationships (Fisher & McNulty, 2008). Indeed, some studies suggest that 60% of the variance in marital adjustment is accounted for by personality traits (Fisher & McNulty, 2008). Neuroticism, “the general tendency to experience negative affects,” is one trait that has been associated with marital adjustment (Costa & McCrae, 1992, p. 14; Fisher & McNulty, 2008). That is, those higher in neuroticism tend to be less satisfied with their intimate relationships. Additionally, several studies suggest that neuroticism in either partner can negatively impact marital adjustment for their spouse (Fisher & McNulty, 2008; Karney & Bradbury, 1997; Russell & Wells, 1994). For example, in a longitudinal study assessing marital adjustment over the first year of marriage, Fisher and McNulty (2008) found that wife’s neuroticism and husband’s neuroticism independently predicted lower levels of marital satisfaction for both partners.

Another study provides further insight into the role of partner personality on patient adjustment. In a study of 111 couples coping with coronary artery bypass surgery, higher levels of partner neuroticism assessed pre-surgery were associated with higher patient depressive symptoms at 18-months post-surgery (Ruiz, Matthews, Scheier, & Schulz, 2006). This study also found that higher patient pre-surgical neuroticism scores were related to higher partner 18-month depressive symptoms. This study provides evidence of the reciprocal nature of patient and partner personality and their relationships with psychological adjustment to illness. No study to date, however, has investigated the differential contributions of patient and partner hope and optimism on adjustment. In fact, there is a paucity of research investigating the role of another’s personality on the psychological and marital adjustment of breast cancer patients (Ben-Zur et al., 2001; Feudtner, 2005; Northouse, Dorris, & Charron-Moore, 1995; Snyder, 2002). Snyder (2002) states that, “people often define their goals as a couple” and

“many of the goals in life are pursued with one’s partner” (p. 263-264). Though hope and optimism have been shown to be beneficial to adjustment to stressors, conflicting expectations for future outcomes and selected goal pursuits between partners may make differing levels of either personality factor maladaptive for couples coping with breast cancer. It is thus important to investigate the role of partner’s personality on patient’s psychological and marital adjustment to breast cancer. In focusing only on the patient and ignoring the role of the partner, we forfeit understanding an important element that may be contributing to both the psychological and marital adjustment of breast cancer patients.

Other Variables Associated with Breast Cancer Adjustment

Age is one important factor in the development of breast cancer and in subsequent adjustment in breast cancer. The risk for breast cancer increases as a woman ages, and two out of three breast cancers are diagnosed in women 55 or older (ACS, 2010). The likelihood of developing breast cancer at age 50 is 10 times greater than at age 30 (Falkenberry & Legare, 2002). Additionally, several studies have found age to be a correlate of psychological adjustment (Bailey & Snyder, 2007; Carver et al., 1993; Epping-Jordan et al., 1999; Helgeson, Snyder, & Seltman, 2004; Kerenyi, 2008; Stanton et al., 2000). Some studies suggest that younger women with breast cancer tend to experience poorer psychological adjustment (Carver et al., 1993; Kerenyi, 2008; Stanton et al., 2000); conversely, others suggest that older women tend to have poorer psychological adjustment (for examples, see Bailey & Snyder, 2007; Helgeson et al., 2004; Kerenyi, 2008).

In addition, some researchers (McGee, Williams, & Elwood, 1994) suggest that psychiatric illnesses, especially mood disorders, are risk factors for cancer and may influence

subsequent mood post-diagnosis (ACS, 2010; Cohen & Herbert, 1996). Some longitudinal studies suggest that depressed individuals are at a greater risk for cancer. However, several other prospective studies (see Hahn & Petitti, 1988; Kaplan & Reynolds, 1988) have failed to find an increase in cancer incidence or mortality in depressed individuals (Cohen & Herbert, 1996). Because of these inconsistencies, ever having a mood disorder was included as a covariate.

Several other correlates of adjustment in breast cancer have been identified in the literature. For example, treatment type has been suggested to play a role in adjustment to breast cancer. Although some researchers (e.g., Epping-Jordan et al., 1999; Wai-Ming, 2002) posit treatment type to be unrelated to adjustment outcomes, others suggest that different types of treatment (e.g., chemotherapy vs. radiation) are related to psychological adjustment (Alferi, Carver, Antoni, Weiss, & Duran, 2001; Carver et al., 1993; Kerenyi, 2008). Treatment causes many physiological or bodily changes and because of this, many experience acute stress from cancer treatment (Andersen et al., 1998; Carver et al., 1993; Kerenyi, 2008; Moyer & Salovey, 1996). Additionally, women with breast cancer who have had a mastectomy have been shown to have poorer adjustment, likely due to the resulting changes in self-esteem and body image (Alferi et al., 2001; Kerenyi, 2008). Because of these inconsistencies, treatment type was included as a covariate in this study.

Other potential covariates shown to relate to adjustment in breast cancer are cancer stage, patient ethnicity, marital status, gender, education, and income (Kerenyi, 2008). Marital status and gender are considered constants in this study of female, partnered breast cancer patients. Additionally, income level was not assessed in this study. Therefore, age, history of mood disorders, treatment type, and education were included as potential covariates.

Current Study

Although some women with breast cancer experience difficulties adjusting psychologically and interpersonally, others do not. Therefore, it is important to understand who is at higher risk for maladjustment. The purpose of this study was to better understand how patient personality is related to their psychological and marital adjustment in breast cancer. In addition, I investigated how the partner's personality is related to patient psychological and marital adjustment.

Primary Research Questions

Question I: In women diagnosed with breast cancer, do patient hope and optimism have differential relationships with patient marital and psychological adjustment?

Question II: In women diagnosed with breast cancer, do their partner's hope and optimism have independent relationships with patient marital and psychological adjustment?

Exploratory Research Question

Question III: In women diagnosed with breast cancer, do certain combinations of patient-partner hope and optimism differentially predict patient marital and psychological adjustment?

Hypotheses

I predicted that *patient* hope and optimism would differentially relate to patient psychological and marital adjustment. Additionally, I predicted that *partner* hope and optimism would independently predict patient psychological and marital adjustment. Finally, I predicted

that discrepancies between patient and partner hope and optimism would be associated with poorer patient psychological and marital adjustment. My specific hypotheses are listed below.

Hypothesis 1

- a) Patient hope will positively predict patient marital adjustment. Patient hope will also more strongly predict patient marital adjustment than patient optimism.
- b) Patient optimism will positively predict patient psychological adjustment. Patient optimism will also more strongly predict patient psychological adjustment than patient hope.

Hypothesis 2

- a) Partner hope will positively predict patient marital adjustment. Partner hope will also more strongly predict patient marital adjustment than partner optimism.
- b) Partner optimism will positively predict patient psychological adjustment. Partner optimism will also more strongly predict patient psychological adjustment than partner hope.

Exploratory Hypothesis 3

- a) Any discrepancy in patient and partner hope (e.g., high patient hope and low partner hope) will be associated with poorer patient marital adjustment.
- b) Any discrepancy in patient and partner optimism (e.g., low patient optimism and high partner optimism) will be associated with poorer patient psychological adjustment.

METHOD

Design

This study utilized a cross-sectional, correlational design. The outcome variables were patient's psychological and marital adjustment, with patient's hope and optimism and partner's hope and optimism as predictor variables. These variables were measured through self-report questionnaires. This study used an archival data set; the parent study was conducted between the Fall of 2006 and Fall of 2008 at the Indiana University Simon Cancer Center (IUSCC). The study was funded by the National Institute of Health/ National Cancer Institute (Grant Number 1 R03 CA115224-01). The goal of the parent study was to examine how couples cope with breast cancer to better inform intervention efforts. Approval was received from the Institutional Review Boards at Indiana University to conduct the study at the IUSCC, at Wishard Hospital, and at Wishard Specialty Clinics.

Setting and Sample

Eligibility criteria were as follows: a) breast cancer patients (Stage III or IV); b) patients currently undergoing chemotherapy/biological treatment; c) married or in a stable, live-in relationship; d) partner willing to participate in the study; and e) able to read and write in English. At the onset of collecting data, the researchers did not limit the inclusion criteria to only those with Stage III or IV. However, once beginning the study, they realized that recruitment of earlier stages was much more difficult both because of the sampling frame and

because other studies were recruiting specifically early stage cancer. The researchers then decided to limit the criteria to Stages III and IV.

Recruitment was completed in accordance with all three study sites: IUSCC, Wishard Hospital, and Wishard Specialty Clinics. Research assistants approached women who were receiving treatment in the infusion area and at the breast cancer clinic to discuss multiple research opportunities. Information was collected at this time to determine which studies, if any, the patients would be eligible to participate in. Because recruitment of minorities was found to be difficult from the IUSCC during the early stages of recruitment, the study personnel decided to include other recruitment sites after beginning the study. Thus, hard copies of flyers describing the study were distributed at Wishard Hospital and at Wishard Speciality Clinic. An on-line version of the flyer was available on the websites of Y-ME and Young Survivors Coalitions. The flyer was also distributed at the Susan G. Komen Race for the Cure in Indianapolis. However, only patients at the IUSCC expressed interest in participation; therefore, all participants received their care at IUSCC.

Of the 112 couples approached, 21 refused to participate in the study (18.75%). Health problems, daily responsibilities, and not being interested in the study were among the reasons for their refusal. Survey packages were mailed to 91 couples who were eligible and agreed to participate. Of these, 23 couples did not return their packages (25.27%) even after receiving a reminder phone call.

Measures

Demographics

A questionnaire was created specifically for the study to assess demographic information (Project Questionnaire). The questionnaire consisted of items with response options of multiple choice, a checklist, and open-ended. Age, education, history of a mood disorder, and ethnicity were assessed with this questionnaire. Treatment type was also assessed through the Project Questionnaire and verified through a chart review. The possible treatment options were: mastectomy, lumpectomy, radiation therapy, chemotherapy, and hormone therapy. Respondents were asked to list all treatment options that applied to their treatment regimen over the years; however, only current treatments were used as covariates for this study, excepting mastectomy. Mastectomy was included as a covariate regardless of when the patient had the mastectomy. Each treatment type was measured as a dichotomous variable (yes or no). Cancer stage and recurrence were also assessed through the Project Questionnaire and verified through chart review.

Adult Hope Scale

Hope was measured using the 12-item Adult Hope Scale (AHS; Snyder, Harris, et al., 1991). Four items measure pathways thinking (e.g. “there are lots of ways around any problem”) and four items measure agency (e.g. “I meet the goals that AI set for myself”), with four additional filler items. Using an 8-point Likert-type scale ranging from one (*definitely false*) to eight (*definitely true*), respondents are instructed to rate their extent of agreement with the questions (Rand, 2009). Higher scores on this measure indicate greater hope. Test-retest

reliability ranges from .73 to .85. Cronbach's alphas for patient and partner hope were .82 and .83, respectively, for the current study.

Life Orientation Test-Revised

Optimism was measured using the Life Orientation Test-Revised (LOT-R; Scheier et al., 1994). The LOT-R is a revised version of the original scale, Life Orientation Scale by Scheier and Carver (1985). The LOT-R is a 10-item measure with four filler items (e.g., "In uncertain times, I usually expect the best"). Using a 5-point Likert-type scale ranging from zero (*strongly disagree*) to four (*strongly agree*), respondents are instructed to rate their extent of agreement with the questions. Higher scores on the LOT-R indicate higher levels of optimism. Cronbach's alpha for patient and partner optimism were .79 and .88, respectively, for the current study.

Profile of Mood States

Psychological adjustment was assessed using the Profile of Mood States-Standard Form (POMS; McNair et al., 1992). This is the original 65-item POMS (McNair, Lorr, & Droppelman, 1971; Trunzo & Pinto, 2003). It is composed of adjectives (e.g., Tense, Sad, Angry) with which respondents are asked to rate based on a 5-point Likert-type scale how the individual felt in the past week. This measure yields six factor-analytically derived subscales (Tension-Anxiety, Anger-Hostility, Vigor-Activity, Fatigue-Inertia, Depression-Dejection, and Confusion-Bewilderment), which are summed (with Vigor-Activity weighted negatively) to yield a Total Mood Disturbance Score (Guadagnoli & Mor, 1989; McNair et al., 1992). Higher scores indicate greater maladjustment. In the present study, the original scoring method for the

POMS resulted in a mean score with a negative value. Some researchers recommend using an alternative scoring system to avoid negative scores on the POMS. Specifically, Andrykowski and colleagues (1993, 1996) have recommended the following formula: POMS Total = depression + tension + anger + fatigue + confusion + (32-Vigor). This was the formula used to compute total POMS scores for the participants in the present study. Cronbach's alpha for patient psychological adjustment was .86. Other studies have provided evidence of good predictive and construct validity within cancer populations (McNair et al., 1992).

Marital Adjustment Test

The Marital Adjustment Test by Locke and Wallace was used to measure marital adjustment in this sample (Locke & Wallace, 1959). This 15-item instrument (e.g., "When disagreements arise, they usually result in me giving in/her giving in/agreement by mutual give and take") is often used in the chronic illness literature and with caregivers. Scores range from two to 158, where higher scores indicate better marital adjustment. Locke and Wallace (1959) report a split-half reliability of $\alpha = .90$. Cronbach's alpha for patient marital adjustment was .73.

Procedure

Once it was determined that the patients met all of the study criteria, they were given information about the study and asked to consult with their partner about joint participation (Table 2, Step I). At this initial point of recruitment, the research assistant obtained the name of the patient, name of their treating oncologist, and the couple's contact information. The treating oncologists were contacted for each patient to confirm eligibility based on stage of

cancer and that they, as her physician, believed she would be able to participate in the study (Step II). Once the oncologist approved the participation of the patient, the research assistant contacted the couple to confirm interest (Step III). Those who agreed to participate were mailed survey packets with self-addressed envelopes to mail upon completion (Step IV). The decision to mail the surveys rather than do one-on-one interviews was made because past studies conducted by the principal investigator had difficulty recruiting participants for face-to-face interviews; the time demand was too great for this already stressed population. All measures were administered to both the patient and the partner. Scales were adapted to refer to either “your cancer” or “your partner’s cancer.” The language was sensitive to men and women as well as husbands or live-in partners. The surveys were color coded (women had pink surveys, men had blue surveys) to reduce any potential confusion. Participants returned signed informed consent forms with the other study materials through the mail. The couples were asked not to discuss the individual questions or their responses with each other until they had both returned their questionnaires. It was estimated that each assessment would take 60 minutes to complete. Individuals were contacted within two weeks of sending the questionnaires to remind them to complete their portion of the study. Packets of surveys for each participant were reviewed for missing data and the participant was contacted if information was found to be missing. Participants were reimbursed with \$30 for their participation once their surveys were received by the research assistant (Step V). When all materials were completed and returned, study personnel were granted access to the patient’s medical records. These were reviewed for disease and treatment variables such as symptoms and type of treatment. Data were entered and double-checked by trained research assistants.

RESULTS

Analytical Approach

To examine the differential contributions of the personality factors on patient adjustment, I used measured variable path analysis. Path analysis is preferred over multiple regression analyses for two reasons. For one, path analysis allows for testing more than one dependent variable at a time. This provides a more accurate estimate of the relationships among all the variables together and a better understanding of the relative strengths of variables in predicting outcomes. Thus, path analysis helps to answer questions regarding the relative predictive ability of one independent variable over another. Secondly, measured variable path analysis provides an indication of how well a model fits the observed data. Therefore, we are able to test a theoretical model (Kline, 1998).

To examine the relationships between discrepant personality styles and patient adjustment, I used hierarchical regression. In regression, a significant interaction effect indicates certain combinations of the predictor variables predict variance in the outcome variable above and beyond the variance predicted by each predictor variable alone (Aiken & West, 1991). In this study, a significant interaction effect could suggest two situations: discrepancies in personality are maladaptive or more adaptive. In order to understand the nature of a significant interaction, I plotted the personality scores on the appropriate adjustment variable. Without a graphical display of the interaction, it is impossible to know

what a significant interaction effect means (Aiken & West, 1991). Regression analyses were chosen over difference scores because difference scores often produce unreliable results (Lord, 1958; Maxwell & Howard, 1981; Overall & Woodward, 1975).

Data Cleaning and Screening

The data were examined to ensure normality (see Table 3). All measures were found to have acceptable values for skewness and kurtosis. Measures were considered within an appropriate range for skew if they had an absolute value less than 3.0. Measures were considered within an appropriate range for kurtosis if they had an absolute value less than 10.0 (Kline, 1998). Outliers were defined as scores greater than 3 standard deviations from the mean. One patient was found to have an extreme optimism score, with a z -score of -3.32. Rather than deleting the outlier and losing data in this small dataset, the outlier was winsorized. Winsorizing is a method of handling outliers that allows the researcher to not lose data but instead replaces the outlier with a set maximum (Barnett & Lewis, 1978). The value replaced for the outlier found in this study was three standard deviations below the mean ($3 SD = -11.85$).

There were substantial missing data, with 27.9% of dyads missing some form of data. The majority of the missing data occurred because either a patient or a partner did not complete their portion of the questionnaires. Four patients did not return their questionnaire packets, and eight partners did not return their questionnaire packets. Of the four patients who did not return their packets, two died. Because of the missing data, the 12 dyads that had either the patient or partner completely missing were excluded from the dataset. Seven participants

left one or more items blank. The participant's mean for the scale was imputed for any single missing item to correct for these missing data points.

Given that age was the only variable recorded for patients who refused participation, study participants and non-participants were compared on age with an independent samples t-test analysis. These two groups did not differ in age. A series of independent samples t-tests and chi-square tests were performed to examine potential differences between participants with complete data versus those with missing data. These two groups were compared on the following variables: age, self-reported and chart review recorded treatment types, cancer stage, mastectomy, lumpectomy, cancer recurrence, employment status, illness-related work disability, educational history, race, and religion. None of the tests were significant, suggesting that there were no significant differences between participants with complete data and those with missing data.

Many potential covariates were homogeneous in this sample of breast cancer patients. For example, race, religion, and cancer stage were not sufficiently variable to be able to use in analyses (98% Caucasian; 88% Christian; 92.9% in Stage IV). Because 95% of the patients were receiving both hormonal therapy and chemotherapy, current treatment could not be used as a covariate with such limited variability. The treatment and clinical variables had substantial missing data. Many of the chart-reviewed and self-reported treatment and clinical variables were unrelated (see Table 4). For example, self-reported and chart-reviewed reports of current use of chemotherapy ($r = .26, p = .170$) and hormonal therapies ($r = -.19, p = .317$) were unrelated. Self-reported and chart review records of stage were also unrelated ($r = .07, p = .730$). Self-reported and chart review records of mastectomy, lumpectomy and recurrence were related, however, as seen in Table 5. Therefore, the reliability of the treatment and clinical data

is uncertain. Even when analyses were run including two treatment variables, self-reported chemotherapy and self-reported hormonal therapy, which were related to some independent and dependent variables, the two variables were highly correlated ($r = -.91, p < .001$). Thus, because of the lack of variability, proportion of missing data, and the doubtful reliability of the self-reported and chart-reviewed treatment and clinical variables, these variables were not used in further analyses.

Because of the small sample size, a liberal p value was used to make decisions regarding the inclusion of covariates in the main analyses. Covariates were included if $p < .10$. Because of the exploratory nature of the study, covariates were identified both through previous research and theory as well as through correlational significance. The addition of covariates based on zero-order correlations increases the risk of Type I error and may result in incorrect conclusions. It may also undermine external validity (Hoyt, Imel, & Chan, 2008; Kline, 1998). However, some researchers suggest that over-inclusion of covariates in multiple regression may be a more conservative approach, underestimating the effects (Jaccard, Guilamo-Ramos, Johansson, & Bouris, 2006). I sought to be more inclusive in order to not overlook potentially important relationships and to be more conservative in my exploratory analyses.

Sample Description

Mean age of the patients was 52.2 years ($SD = 12.1$). Ninety-eight percent of the participants were Caucasian, and 88% identified themselves as being Christian. The sample included one homosexual couple, who were included in all analyses. Sixty-four percent of the patients rated their overall health as either good or very good, while 16% rated their health as fair, and 4% rated their health as poor.

Means and standard deviations for the main variables included in the path analysis and the regression analyses can be found in Table 6. The means and standard deviations for optimism (patient $M = 17.38$, $SD = 3.92$; partner $M = 16.04$, $SD = 4.43$) were similar to other breast cancer patients who have shown to have means ranging from 16.0 to 23.0 (Stanton & Snider, 1993; Trunzo & Pinto, 2003) and to a study of college students by Rand ($M = 21.23$; 2009). Means for patient hope ($M = 50.45$) and partner hope ($M = 50.57$) were similar to college students, $M = 50.21$ (Rand, 2009) and spinal cord injury patients, $M = 25.25$, which was measured on the 4-point rather than the 8-point scale (Elliott et al., 1991). Mean psychological adjustment ($M = 50.77$) was comparable to that found by Andrykowski et al. (1996), who used similar scoring methods of the POMS with breast cancer patients ($M = 51.8$). Marital adjustment ($M = 120.75$) was slightly lower than for the healthy married couples used in the measure's validity study who were deemed to be well adjusted ($M = 135.9$), yet was quite a bit higher than the maladjusted married couples in the validation study ($M = 71.7$; Locke & Wallace, 1959).

To further describe the sample, each participant was categorized as being high, low, or average in hope and optimism. A typical mean score on the AHS is 49, with a standard deviation of seven (Snyder, 2002). Thus, individuals were considered low in hope if they had scores less than 42, and high in hope if they had scores greater than 56. These high and low scores were used to create cut-off scores. Of the patients, 19.6% ($n = 11$) of the sample was low in hope, 50% ($n = 28$) of the sample had average hope scores, and 30.4% were high in hope. Of the partners, 21.4% were low in hope ($n = 12$), 48.2% had average hope scores ($n = 27$), and 30.4% ($n = 17$) had high hope. Scheier et al. (1994) reported a mean score of 22.33 on the LOT-R, with a standard deviation of 4.28. Thus, individuals were categorized as low in

optimism if they had a score less than 18 and categorized as high in optimism if they had scores greater than 27 on the LOT-R. These high and low scores were used to create cut-off scores. Of the patients, 60.7% were low in optimism ($n = 34$), 39.3% had average optimism scores ($n = 22$), and 0% were high in optimism ($n = 0$). Of the partners, 73.2% were low in optimism ($n = 41$), 26.8% had average optimism scores ($n = 15$), and 0% were high in optimism ($n = 0$).

Bivariate Correlations

Bivariate correlations were conducted to identify main effects between key variables, and the results can be found in Table 7. Of the potential covariates (i.e., age, history of mood disorder, health rating, and education), only patient's age and health rating were related to the adjustment and personality variables. Being older was associated with poorer marital adjustment and poorer psychological adjustment (at $p < .10$). These correlations suggest that as the patient ages, their satisfaction with their marital relationship (marital adjustment) decreases and they experience greater psychological distress. Higher levels of patient hope or optimism were related to better ratings of health. Thus, patients higher in hope or optimism more likely to rate their health more positively, or vice versa. Patients with partners who are high in hope are more likely to rate their health more positively, or vice versa. Poor subjective health rating was correlated with greater patient psychological distress. This suggests that as patients experience more psychological distress, they are likely to rate their current health status as being poorer, or that as their health deteriorates, they are likely to have more psychological distress. Psychological and marital adjustment were unrelated, providing evidence that these are two distinct aspects of well-being. Patient hope was related to patient optimism; partner

hope was also related to partner optimism. This provides support for the notion that although they are related, hope and optimism are two distinct traits. Patient and partner optimism and patient and partner hope were uncorrelated. Higher patient hope was related to better marital adjustment and greater psychological adjustment; higher patient optimism was only related to greater psychological adjustment. On the other hand, partner hope and optimism were both related to better patient marital adjustment, yet neither was related to patient psychological adjustment. Thus, partner personality appears to play a role in patient marital adjustment but not in their psychological adjustment.

Main Analyses

Measured-variable Path Analysis

To examine Hypotheses 1a, 1b, 2a, and 2b, I conducted a measured-variable path analysis using covariance matrix modeling using LISREL 8.8 (Jöreskog & Sörbom, 2006). Path analyses were conducted with two datasets, one with the outlier included with the raw value and another where the outlier was winsorized. The analyses did not differ, thus all values reported are from the dataset including the raw outlier. Parameters were estimated using maximum likelihood estimation, and the closeness of model fit was evaluated with the following indices: 1) chi-square; 2) the Comparative Fit Index (CFI; Bentler, 1990); and 3) the Root Mean Squared Error of Approximation (RMSEA; Steiger, 1990). Hu and Bentler (1999) suggest that acceptable model fit is indicated by a non-significant chi-square, a CFI value equal to or greater than .95, and an RMSEA value less than or equal to 0.06. If two paths were found to be significant with the same outcome variable, the two paths were forced to be equal and

through a chi-square difference test, I assessed the relative strength of each predictor. A significant change in chi-square suggested that one path more strongly predicts the outcome than the other.

I conducted a preliminary, saturated model of all independent and dependent variables. All predictor variables were freed to correlate. In this model, the paths from patient hope to marital adjustment ($\beta = 0.34$) and psychological adjustment ($\beta = -0.36$) were significant. The path from partner optimism to marital adjustment was significant ($\beta = 0.34$). Patient hope and optimism were correlated ($\beta = 0.39$) and partner hope and optimism were correlated ($\beta = 0.61$). All other paths were not significant.

Model Specification

To test my hypothesized model (see Figure 1), I freed paths from partner and patient hope to patient marital adjustment and partner and patient optimism to patient psychological adjustment. This model did not show good fit, $\chi^2(4, N=56) = 12.34, p = .015, RMSEA = 0.202, CFI = 0.86$ (see Figure 2). Because of this poor fit, I conducted exploratory model construction. Exploratory model construction creates a post-hoc model based on fit indices from a tested a priori model. This post-hoc model construction includes exploratory addition and subtraction of paths in order to maximize fit to inform future research. This process may increase the risk of Type I error. Additionally, there is a concern for over-fitting the model to this sample, therefore undermining external validity. This may also erroneously overestimate model fit (Kline, 1998). Therefore, it is possible the results are in fact spurious or that these findings are true only for this sample. Further research is needed to clarify the reliability of these findings. However, this process provided valuable new insights for future research.

Model Trimming

I began trimming the model by sequentially removing non-significant paths (i.e., $\zeta < 1.96$), starting with the path with the lowest ζ -value. The path from partner optimism to patient psychological adjustment ($\zeta = -.19$) was removed, and the resulting model still showed poor fit, $\chi^2(3) = 7.28, p = .063, RMSEA = 0.166, CFI = 0.86$.

Path Additions

Based on zero-order correlations, which showed relationships between patient age and subjective health rating and patient personality and adjustment, patient age and subjective health rating were added to the model. Paths from patient's age and subjective health rating to marital and psychological adjustment were added. This model produced mixed fitting indices, $\chi^2(3) = 3.97, p = .265, RMSEA = 0.08, CFI = 0.98$. Because these indices assess fit in different ways, they are not expected to be completely convergent (Barrett, 2007). A RMSEA that does not show adequate fit suggests that the model is not parsimonious and may be too complexly identified, however. Therefore, because two out of three fit indices showed good fit, the model is considered to be acceptable.

Model Trimming

After adding paths from patient age and health rating to the adjustment variables, the model was reexamined for nonsignificant paths. After these additions, other paths became nonsignificant and were then removed. The path from subjective health rating to patient marital adjustment was removed because of its low ζ -score ($\zeta = -0.08$). This resulted in a good-fitting model, $\chi^2(4) = 3.98, p = .409, RMSEA = 0.00, CFI = 1.00$. The path from patient

optimism to patient psychological adjustment was nonsignificant ($z = -1.5$) and was removed. This resulted in mixed-fitting indices, $\chi^2_{(3)} = 5.12, p = .163, RMSEA = 0.118, CFI = 0.95$. To compare the relative fit of two models, chi-square difference tests are often conducted (Kline, 1998). However, with the removal of the path from patient optimism to psychological adjustment, patient optimism no longer had paths to other variables and was therefore removed from the model. Without this variable, I could not compare this model with the nested model.

Final Model

Although the path from patient optimism to patient psychological adjustment was not significant, this path was retained in the final model to maintain an acceptably fitting model (see Figure 3). Despite its non-significance, the path's effect size ($\beta = -0.19$) suggests that greater optimism may predict better psychological adjustment, which is consistent with Hypothesis 1b. This model also suggests that cancer patients who report greater subjective health experience less psychological distress ($\beta = -0.37$) and older patients experience greater marital adjustment ($\beta = 0.24$) and less psychological distress ($\beta = -0.33$). The relationships between age and marital and psychological adjustment in measured-variable path analysis were discrepant from the relationships found through bivariate correlations. These findings suggest a suppression effect; controlling for other present relationships in path analysis allows for the emergence of relationships among variables that are larger in magnitude and different in direction (MacKinnon, Krull, & Lockwood, 2000). Subjective health ratings did not predict patient marital adjustment in this model, however. This model also suggests that partner optimism is unrelated to patient psychological.

This modified model does, however, suggest that higher levels of patient hope ($\beta = 0.28$) and partner hope ($\beta = 0.38$) are independently related to greater marital adjustment, which is consistent with Hypotheses 1a and 2a. When the coefficients of the paths from patient and partner hope to marital adjustment were constrained to be equal, there was no significant change in model fit, $\Delta\chi^2_{(1)} = 0.32, p = .572$, suggesting that patient and partner hope equally influence marital adjustment.

Reversed Path Analysis

The hypothesized model was also tested by reversing arrows to create paths from the outcome variables (i.e., marital adjustment and psychological adjustment) to the predictor variables (i.e., patient and partner hope and optimism). This model was created to examine issues of directionality. Paths between nonsimilar personality factors across persons (patient hope and partner optimism) were not correlated and were thus removed from the models. The fit indices for the reversed model were mixed, $\chi^2(2) = 2.62, p = .270$, RMSEA = 0.077, CFI = 0.99 (see Figure 4). Because two of three fit indices showed good fit, this suggests that the model accurately reproduces the correlations between variables (Barrett, 2007). Marital adjustment was related to partner hope ($\beta = 0.41$), patient hope ($\beta = 0.29$) and partner optimism ($\beta = 0.43$). In terms of hope, these findings were consistent with the original, hypothesized model. The relationship between marital adjustment and partner optimism was inconsistent with the original model, however. Paths from psychological adjustment to patient hope ($\beta = -0.41$) and patient optimism ($\beta = -0.33$) were found to be statistically significant. In terms of optimism, these findings were consistent with the hypothesized model. The

relationship from psychological adjustment to patient hope was inconsistent with the hypothesized model.

Addition of Covariates

This model was also tested with the covariates included, with paths freed from age and subjective health to the personality factors (see Figure 5). The fit indices were mixed, $\chi^2(2) = 3.10$, $p = .212$, RMSEA = 0.104, CFI = .99. Similar to the previous model, marital adjustment was a significant predictor of partner hope ($\beta = 0.42$), patient hope ($\beta = 0.27$), and partner optimism ($\beta = 0.40$). However, when controlling for age and subjective health, the path from psychological adjustment to patient hope ($\beta = -0.34$) was significant while the path to patient optimism was not. The findings that were inconsistent with the hypothesized model may suggest that these relationships exist in one direction but not in the other. For instance, when testing the hypothesized model, the modification indices did not suggest that the addition of a path from hope to psychological adjustment would improve the model; however, the reversed analyses provide evidence that the path from psychological adjustment to patient hope is significant. Therefore, this suggests that the relationship in the direction of psychological adjustment to patient hope is more important, or significant, than in the other direction (patient hope to psychological adjustment). Thus, some of these relationships appear to be dependent on the direction of the path (e.g, psychological adjustment may influence patient hope more so than hope influences psychological adjustment). Generally, these results suggest that we cannot make any conclusions regarding directionality in these relationships between personality and adjustment. Also, the results may be discrepant depending on the hypothesized direction of the relationship. Therefore, these results imply that three situations could be

occurring: 1) high levels of hope or optimism result in better relationships and psychological well-being, 2) better relationships and psychological well-being result in higher levels of hope or optimism, or 3) both of these occur together.

Exploratory Analyses

Hierarchical Linear Regressions

To examine my exploratory Hypotheses 3a and 3b, I conducted several hierarchical linear regressions with SPSS Version 17 to examine the individual and interactive effects of patient and partner personality on the outcome variables (i.e., patient psychological adjustment and marital adjustment).

Psychological Adjustment

A hierarchical regression was conducted with patient psychological adjustment as the criterion. In the first step, I entered patient age and patient's rating of health. In the second step I entered the mean-centered hope and optimism scores for both the partner and the patient (Keith, 2006). In the third step I entered the two-way multiplicative interaction terms of all variations of mean-centered scores for patient hope, patient optimism, partner hope, and partner optimism predicting psychological adjustment. Interaction terms were used to identify whether certain combinations of patient and partner personality influence the patient's psychological adjustment (Aiken & West, 1991).

No interaction effects were found for psychological adjustment (see Table 8). In Step 1, the main effects of patient age and patient's overall health rating significantly predicted

psychological adjustment, $F(2, 53) = 9.00, p < .001$. These variables accounted for 25% of the variance in psychological adjustment. The variables in Steps 2 ($\Delta R^2 = 0.103, p = .197$) and 3 ($\Delta R^2 = .041, p = .823$) did not significantly account for additional variance in psychological adjustment. The hypothesis that discrepancies in patient and partner optimism would predict poorer patient psychological adjustment was not supported by the data, $\beta = 0.192, t = 0.78, p = .436$ (for Patient Optimism x Partner Optimism). None of the other interaction terms of patient and partner hope and optimism were found to be significant predictors of patient psychological adjustment. This suggests that the combinations of patient and partner personality factors are unrelated to patient psychological adjustment.

Marital Adjustment

A second hierarchical regression was conducted with marital adjustment as the criterion. In the first step, I entered patient age and patient's rating of health. In the second step I entered the mean-centered hope and optimism scores for both the partner and the patient and psychological adjustment (Keith, 2006). In the third step I entered the two-way multiplicative interaction terms of all variations of mean-centered scores for patient hope, patient optimism, partner hope, and partner optimism predicting marital adjustment. Interaction terms were used to identify whether certain combinations of patient and partner personality influence the patient's marital adjustment (Aiken & West, 1991).

Unlike the analyses with psychological adjustment, two significant interactions were found with marital adjustment (see Table 9). In Step 1, a model containing the main effects of patient age and patient's overall health rating significantly predicted patient marital adjustment, $F(2, 53) = 3.3, p = .046$. These variables accounted for 33% of the variance in the marital

adjustment. The variables in Step 2 significantly accounted for an additional 29% of the variance in marital adjustment ($\Delta R^2 = .268, p = .003$). The variables in Step 3 did not significantly account for additional variance ($\Delta R^2 = .115, p = .176$).

Two interactions produced large effect sizes with marital adjustment: the interaction of patient and partner optimism ($\beta = -0.56, t = -2.70, p = .010$) and the interaction of patient optimism and partner hope ($\beta = 0.65, t = 2.66, p = .011$). In testing the hypothesis that discrepancies in partner and patient hope predict poor marital adjustment, a moderate effect size was found ($\beta = -0.32, t = -1.83, p = .074$). Despite the moderate effect size, this interaction was nonsignificant. To clarify these interactions, figures were constructed using SPSS. In plotting interaction effects, we can better understand the nature of the relationships among variables (See Tables 6-8; Aiken & West, 1991). As recommended by Aiken and West (1991), I also conducted post-hoc analyses of simple slopes to determine if the three regressions on marital adjustment were different from zero. The regressions were probed across two values of partner optimism or hope. The two values used were one standard deviation above and below the partner's mean on either hope (for the hope x hope and patient optimism x partner hope interactions) or optimism (for the optimism x optimism interaction). In testing the patient optimism and partner hope interaction with marital adjustment, the slope at one standard deviation below the mean ($t = -2.632, p = .011$) was significantly different from zero while the slope at one standard deviation above the mean ($t = 1.967, p = .056$) was not significantly different from zero. At one standard deviation below the mean, the direction of this slope indicates that marital adjustment tends to be lower at higher levels of patient optimism when partner hope is low. The slope at one standard deviation above the mean was near significance, and suggests that the patient experiences greater marital satisfaction when

she is high in optimism and her partner is high in hope. In testing the patient optimism and partner optimism interaction, the slope for one standard deviation below the mean was not significantly different from zero ($t = 1.99, p = .053$) while the slope at one standard deviation above the mean was significantly different from zero ($t = -2.64, p = .012$). At one standard deviation above the mean, the direction of the slope indicates that the patient tends to be less satisfied with her marital relationship when she is high in optimism and when her partner is high in hope. Nearing statistical significance, the direction of the slope at one standard deviation below the mean indicates that great marital adjustment results when the patient is high in optimism and has a partner low in optimism. In testing the interaction between patient and partner hope on marital adjustment, the slope at one standard deviation below the mean was significantly different from zero ($t = 2.67, p = .011$) while the slope at one standard deviation above the mean was not significantly different from zero ($t = -0.06, p = .95$). The direction of the significant slope indicates that the patient experiences greater marital adjustment when she is high in hope and has a partner low in hope.

DISCUSSION

As roughly one-third of breast cancer patients report continued psychological or marital distress one-year post-diagnosis, it is important to understand who is at higher risk for maladjustment. I sought to identify factors related to differences in adjustment among breast cancer patients. I hypothesized that two goal-related personality traits, hope and optimism, would account for some of these differences in adjustment. Hope and optimism have both been shown to be related to better physical and psychological health in the face of stressors but are rarely studied concurrently. I hypothesized that these two personality factors would have differential relationships with psychological and marital adjustment. I hypothesized that hope would relate more strongly with marital adjustment than optimism. On the other hand, I hypothesized that optimism would relate most strongly with psychological adjustment. In addition to the patient's personality traits, their partner's traits were also hypothesized to relate to patients' adjustment, as is suggested in the literature (Feudtner, 2005; Kayser & Sormanti, 2002).

In addition to these main study questions, I sought to investigate how certain combinations of patient-partner hope and optimism relate to patient marital and psychological adjustment. I hypothesized that discrepancies between patient and partner personality (e.g., while one member of the couple is high in the trait, the other is low in the trait) would result in poorer patient marital and psychological adjustment. I specifically hypothesized that

discrepancies in patient and partner hope would relate to poorer patient marital adjustment while discrepancies in patient and partner optimism would relate to poorer patient psychological adjustment. Thus, this study examined how patient and partner hope and optimism relate to patient marital and psychological adjustment.

The hypothesis that hope would more strongly predict marital adjustment than optimism was supported. This result suggests that one's beliefs about one's abilities to reach goals have an impact on the marital relationship. This provides initial evidence supporting the application of hope theory to social relationships by Snyder and Feldman (2000). As theorized, individuals with higher levels of hope may be able to divide their goal-oriented thinking into self-goals and communal goals (Snyder & Feldman, 2000). Given that a good marriage is a communal goal between two individuals, hope appears to be beneficial to marital satisfaction in couples coping with breast cancer. On the other hand, Helgeson (1994) and Murray and Holmes (1997) reported findings that greater optimism for the relationship is related to longer lasting relationships. However, these studies did not include measures of hope and demonstrate the importance of studying hope and optimism concurrently to evaluate their differential relationships with marital adjustment. Moreover, as one can see from the zero-order correlations, patient hope was significantly correlated with both marital adjustment and psychological adjustment. The zero-order correlation between patient hope and psychological adjustment may be significant only because of the shared variance hope has with optimism. In path analysis, when accounting for all variables in the model, the commonalities between hope and optimism are removed and the unique contributions of the variables to the outcome variables are captured.

The hypothesis that optimism would more strongly predict psychological adjustment than hope was not supported. However, there was a trend toward significance. With partial support of the hypotheses that hope and optimism would differentially predict marital and psychological adjustment, these findings support the notion that hope and optimism are indeed separate constructs that consist of unique goal-oriented thought processes. Moreover, hope and optimism may act differently depending on the context. For instance, optimism is theorized as being most helpful in situations largely out of one's control; whereas, hope may be more influential in situations where one's own abilities has an impact on the outcome (Rand, 2009). With the trend toward statistical significance, optimism appears to be beneficial to patient psychological adjustment within the context of breast cancer. Psychological adjustment can be thought of as a result of obtaining desired outcomes in life. However, when the outcome is largely out of an individual's control (e.g., reducing tumor size), and they experience a setback in reaching such outcomes (e.g., tumor size increases), psychological distress results. These findings provide some evidence that optimism may be more related to expectancies about the future that may or may not be within one's control. On the other hand, hope has been conceptualized as a set of beliefs about one's own abilities and may be most beneficial in situations where one has control over the outcome (Rand, 2009). Satisfaction with marital relationships can be defined as a goal within the relationship. Snyder (1994) states, "the very fact that these relationships are significant means we have goals related to them" (p. 257). The two individuals in a relationship will engage in behaviors that will help them reach their communal goal – the goal of being in a healthy, maintained relationship (Snyder, 1994). Indeed, the findings from this study support this idea.

There was support for the role of partner personality in adjustment in breast cancer. Both patient and partner hope predicted marital adjustment. Patient and partner hope equally predicted patient marital adjustment; thus, each influences the patient's marital satisfaction within the context of breast cancer. This provides evidence for the work of Feudtner (2005) and Kayser and Sormanti (2002) who have theorized that dyads mutually contribute to each other's adjustment via personality factors. This also expands the research conducted by Fisher and McNulty (2008), Ruiz et al. (2006), and Karney and Bradbury (1997), which found a reciprocal nature of neuroticism on well-being in couples, by identifying other personality factors which act similarly. With the empirical support of the role of partner hope on patient marital adjustment, it appears that the beliefs about personal goal achievement of both members of the relationship impact the relationship. Therefore, these findings are initial support for the idea that hopeful thinking may have an important influence on relational satisfaction.

Unlike hope and marital adjustment, only the path from patient optimism to patient psychological adjustment was near significance; there was no evidence that partner optimism predicted patient psychological adjustment. These results may be due to the small sample and low power to find significant interactions. These findings contradict previous research by Ruiz et al. (2006), which found neuroticism in one individual could influence depressive symptoms in their partner. These researchers also conceptualized a 'transitive model' of the relationship between personality and adjustment. This model includes the traditional within-person relationship between personality and adjustment as well as a more interpersonal framework where both individuals in a dyad influence the other individual (Ruiz et al., 2006). The findings from this study, however, provide some evidence that while partner traits may play a role in

some life domains (e.g., in relationships), there are some, such as with psychological well-being, where an individual has the greatest role in his or her own well-being.

The results of this study support previous research finding age to be related to adjustment among cancer patients. Like Carver et al. (1993), Kerényi (2008), and Stanton et al. (2000), younger women in the present study were more likely to experience psychological distress. Older age may create a buffer for the negative effects of cancer on well-being. Perhaps having had more time to accomplish one's life goals, older women did not feel that cancer interfered with their desired life outcomes (Schroevers, Ranchor, & Sanderman, 2004). Researchers hypothesize that younger women experience more distress because of the additional "life stage challenges" they experience when compared to older patients (Kroenke et al., 2004, p. 1849). For instance, younger patients may experience more losses in areas such as education, career, or family (e.g., loss of fertility; Kroenke et al., 2004; Schroevers et al., 2004; Vinokur et al., 1990). Thus, younger cancer patients may experience more changes to important future goals (Kroenke et al., 2004). Older women also experience other age-related declines in health that are separate from cancer progression or treatment which are anticipated, and that may change their expectancies for or definition of health (Kroenke et al., 2004; Schroevers et al., 2004; Soltow, Given, & Given, 2010). Additionally, this study found evidence that younger women were more likely to experience dissatisfaction with their marital relationship. This is consistent with previous research which has found that older cancer patients experience increased marital closeness after being diagnosed with cancer whereas younger cancer patients often experience marital strain (Gagliese, Gauthier, & Rodin, 2007).

The patient's subjective rating of health also predicted psychological adjustment. Individuals who rated their health as being good were more likely to be psychologically

adjusted. This is consistent with previous research, which has found that physical distress relates to psychological distress (Ciaramella & Poli, 2001; Gagliese et al., 2007). In rating their health as good, very good, or excellent, perhaps these women did not feel especially burdened by their illness. Indeed, greater disease-related disability is often related to greater psychological distress (Ciaramella & Poli, 2001; Gagliese et al., 2007). Without this burden, they may then feel they are still capable of reaching their goals, thus resulting in better psychological adjustment.

Combinations of Personality on Adjustment

The hypothesis that discrepancies in patient-partner optimism would correlate with poorer psychological adjustment was not supported, as no significant interaction effects were found with psychological adjustment. As seen through the model building, there was a trend for patient optimism predicting psychological adjustment only. This suggests that partner optimism may not play a role in patient psychological adjustment.

The hypothesis that discrepancies in patient-partner hope would correlate with poorer marital adjustment also was not supported. In fact, through post-hoc probing, it appears that the patient experiences greater marital adjustment when she and her partner have discrepant hope levels. Certain combinations of patient and partner hope and optimism also predicted differential outcomes with marital adjustment. These results provide evidence that the relationship between optimism and marital adjustment may be more complicated than previously thought. While there is evidence that hope and optimism do have differential direct relationships with marital and psychological adjustment, the interaction effects suggest that there are moderation effects determining adjustment outcomes.

Two interactions with hope and optimism and marital adjustment had strong effect sizes: patient and partner optimism and patient optimism and partner hope. The interaction between patient optimism and partner optimism also provides evidence counter to the hypothesis that discrepancies in patient and partner personality would result in poor patient adjustment. Indeed, the patient appears more satisfied with her marital relationship when she and her partner have opposite personality styles. The patient is less satisfied when she and her partner are both high in optimism. The results from these two interactions suggest that complementary personality styles result in *better* marital adjustment. One explanation for these results may be that in coping with a chronic stressor such as breast cancer, a balanced perspective on struggles and successes may be optimal for the health of a marital relationship. For example, one person in the dyad may be extremely optimistic about the course of treatment and the benefits of treatment to extend survival, which may be helpful in staying motivated and having sustained effort toward goals. If the other person in the dyad is more pessimistic, or even more realistic, they may be more likely to plan for the worse or to be more rational in decision-making. The interaction between patient optimism and partner hope, on the other hand, appears to be more complicated. For instance, the patient reports marital satisfaction when she is high in optimism and when her partner is high in hope. Conversely, the patient appears to be dissatisfied with her marital relationship when she is high in optimism and when her partner is low in hope. Therefore, two out of the three interactions suggest that, counter to the hypotheses, complementary personality styles result in optimal marital adjustment. Yet, in some combinations of patient-partner hope and optimism, similar personality styles can result in greater marital adjustment.

Implications

Much of the research investigating the properties of hope and optimism has studied them separately. Because they are closely related and have similar relationships with important outcomes, it is important to investigate them together in order to identify similarities and differences between the two traits. This study found that the two traits do differentially predict different domains of adjustment. Therefore, this study provides evidence that hope and optimism are indeed separate, yet related constructs which seem to offer varying benefits across different situations. Hence, future research should continue to identify situations where one trait is more influential in order to better the understanding of these traits. Additionally, future research investigating the influence of one of these traits on different physical, psychological, or relational outcomes ought to include both traits to tease apart which trait is most influential.

The findings of this study also enrich the couples' literature. Particularly, this study adds to previous research by providing additional support for the influence partners have on each other. Although theory suggests that adjustment is a dyadic process, few studies have investigated how one partner affects the other. Personality traits other than neuroticism appear important to well-being, and future research should investigate other traits which may mutually contribute to the dyad's well-being and other outcomes. Additionally, this research provides a description of marital adjustment during an adverse event such as breast cancer. No previous research has investigated how dyads' personality factors relate to satisfaction within the relationship. This study suggests that personality does indeed affect marital satisfaction.

Although personality traits are thought to be relatively stable, they are also malleable. Therefore, there is a potential for situational hope or pessimism. In these cases, one potential for intervention could involve discussions pertinent to the costs and benefits of treatments or the possibilities of successes and failures within the context of cancer care. For example, an interventional approach for an individual high in optimism would be to discuss the potential for things to go poorly despite good effort. Another use for interventions would be to assess personality styles as a risk factor for different psychological and marital outcomes and then tailor interventions based on their profile. For instance, two members of a marital relationship are found to have similarly low levels of hope. Because this study found that dyads where both members are low in optimism had poorer marital adjustment, extra services or couples counseling could be recommended for their benefit as they cope with cancer.

Limitations and Future Directions

There are several limitations to consider in discussing the results of this study. First, the study was underpowered due to the small sample size. This restricted the complexity of the study questions and the ability to detect significant differences. With a greater sample size, we may have been able to find significance and make more definitive statements about the differences between hope and optimism. Future research should aim to replicate these findings with a larger sample. The archival nature of this analysis also limited the researcher to ask certain questions and to use certain measurement tools.

Second, there was a lack of diversity in the present sample. Due to difficulty recruiting, recruitment was restricted to Stages III and IV breast cancer. If all stages had been recruited we would be allowed to test for differences in adjustment across stages. Future research should

aim to sample from all cancer stages to identify any potential differences in stage. The recruitment process also resulted in a homogeneous sample – a sample of predominately middle-aged, educated, white women. With a more diverse sample, we may have seen differing results. Additionally, the recruitment of this sample may have been due to self-selection and volunteer bias. Those who chose to participate may have been physically healthier patients despite being in Stage IV. They may also have been better adjusted than the average patient. Conversely, these patients may have participated because they were struggling and needed a way to express their struggles. Because they had to participate with their partner, these dyads may have either wanted a venue to discuss problems or were reasonably adjusted in their marital relationship. Also, intentional over-sampling of minority races, cultures, or religions should be attempted in order to understand differences in personality or adjustment unique to different persons or groups.

Third, conclusions from these findings must be drawn within the context of breast cancer. The relationships found between personality traits and adjustment in this study may be unique to this set of breast cancer patients and their partners. The majority of the patients (73%) self-reported that their disease was in Stage IV, a stage characterized by the diffusion of tumors into other organs and lymph nodes than the breast. Despite the severity of disease, the majority of patients reported their health as being “good”, “very good,” or “excellent.” The average length of time since diagnosis was 36.99 months (over 3 years). Patients may have reported good health because they had survived with the disease for an extended period of time, and perhaps felt better than when originally diagnosed. Therefore, it could be expected that patients would experience situational hope and optimism based on the course of their disease thus far. These experiences may have had an effect on the findings of this study. It may

be important to attempt to replicate these findings with a dissimilar cancer type, such as lung or brain cancer patients, who often have a graver and shorter disease course. With these patients, we might find different results.

Fourth, this study used a cross-sectional design and does not provide information about mood and marital satisfaction before being diagnosed with cancer. In other words, these analyses cannot provide insights on changes in mood or marital satisfaction in response to a cancer diagnosis. As evidenced by the reversed models, we cannot glean any information about the directionality of the relationships found in this study. However, two studies provide evidence that cancer does indeed influence changes in well-being (Kroenke et al., 2004; Schroevers et al., 2004). Kroenke et al. (2004) studied quality of life pre-diagnosis of cancer and 20-25 months post-diagnosis, and found that subjective quality of life declined in patients diagnosed with breast cancer when compared to age-paired patients who had not been diagnosed with cancer. Schroevers et al. (2004) found that when compared with women of a similar age, cancer patients one year post-diagnosis experienced declines in quality of life unique to having cancer and not due to aging. These findings suggest that future research should include age-related comparisons in quality of life of individuals with and without cancer. Large epidemiological studies establishing baseline records of various psychological and marital outcomes before cancer is diagnosed to allow for comparisons post-diagnosis would be helpful in better understanding the psychological and marital effects of cancer. Additionally, the cross-sectional design does not provide information regarding pre-diagnosis hope and optimism levels. Although hope and optimism are thought to be trait-like, it is possible that hope or optimism levels may be altered due to a diagnosis of cancer. There have

been no studies investigating the stability of hope and optimism over time, especially before and within chronic stressors. Therefore, all relationships should be interpreted cautiously.

Fifth, the Marital Adjustment Test (Locke & Wallace, 1959) may have influenced the results. Although this measure is widely used, it is also one of the older measures of marital satisfaction. It is considered to be a measure of more traditional marital values, and may not be as applicable to more contemporary relationships (unmarried or same-sex couples; Cohen, 1985; Heyman, Sayers, & Bellack, 1994). Additionally, some researchers argue that the measure has sexist underpinnings; therefore, it is unclear what exactly this scale measures in terms of relationships in 2010. This may explain the lack of relationship between psychological adjustment and marital adjustment, despite evidence that women tend to have various mental and physical health benefits from being in a partnered relationship (Kiecolt-Glaser & Newton, 2001). Other researchers have expressed concern that scores on this measure may be inflated due to social desirability (Cohen, 1985). The relationships observed between marital adjustment and hope and optimism may be different had I used a more contemporary measure of marital adjustment.

Lastly, the lack of correlations and variability among the treatment variables limited this study. Previous research suggests that treatment variables are important covariates of adjustment outcomes. Symptom severity has also been shown to be important to cancer patients' well-being, especially psychological adjustment, and is important to include in behavioral oncology studies (Cella et al., 1993; Walsh, Donnelly, & Rybicki, 2000). Any conclusions made from the findings must be made cautiously without the use of treatment variables and symptom severity as potential covariates. It is important for future research to identify both reliable and valid measures of treatment variables. Based on the findings from the

current study, it may also be important to continue to use two or more measures of treatment variables. Additionally, as treatment and disease-related variables are essential to the study of cancer-related physical and psychological effects, it is prudent to understand such differences in chart and self-reports of these variables.

Despite these limitations, this study enriches the literature on hope and optimism theories by studying these two related constructs together. These findings provide some initial support for the idea that these two constructs work on separate, yet related, goal processes and may be influential in differing situations. Additionally, this study provides initial support for the effects of partner personality on patient adjustment outside of neuroticism. Lastly, this study contributes to the dyad literature by identifying two additional factors (i.e., hope and optimism) influencing marital adjustment.

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TABLES

Table 1
Study Measures

Variable	Name of Measure	Characteristics	Sample Items
Background Variables			
Demographics	Project Questionnaire	Developed for the purpose of this study. Multiple choice, checklist and open-ended questions.	Age, education, view of current health.
Disease Variables		Obtained from a chart review after obtaining informed consent	Stage, lymph node status, surgery type, radiation, chemotherapy, biological treatment(s), recurrent or original diagnosis.
Predictor Variables			
Optimism	Life Orientation Test-Revised (LOT-R)	Ten item measure with 4 filler items. Five point Likert scale. Cronbach's alpha = .79 for patient, .88 for partner	"I always look on the bright side of things." "In uncertain times, I usually expect the best."
Hope	Adult Hope Scale (AHS)	12-item measure on an 8-point Likert scale ranging from 1 (definitely false) to 8 (definitely true), with higher scores indicating greater levels of hope. Cronbach's alpha = .82 for patients, .83 for partners. Test-retest reliability: .73 - .85.	"I can think of many ways to get out of a jam." "I energetically pursue my goals."
Outcome Variables			
Marital Adjustment	Marital Adjustment Test (MAT)	15-item instrument. The authors report a split-half reliability of .73.	"When disagreements arise, they usually result in Me giving in/Her giving in/Agreement by mutual give and take."
Psychological Adjustment	Profile of Mood States (POMS)	Yields total score based on 6 subscales composed of adjectives rated on 5-point Likert scale regarding how individuals have felt in the past week. Cronbach's alpha = .86.	Tense; Sad; Angry; Active; Worn-out; Confused

Table 2
Recruitment Time-line

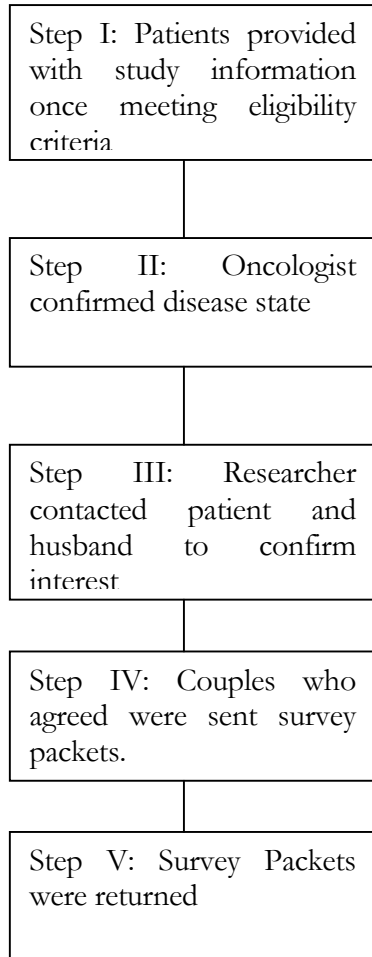


Table 3
Skewness and Kurtosis Values of Independent and Dependent Variables

Variable	Skewness	Kurtosis
Patient		
Hope	-0.307	-0.542
Optimism	-0.533	0.527
Psychological Adjustment	0.673	0.122
Marital Adjustment	-0.881	0.421
Partner		
Hope	-0.342	-0.763
Optimism	-0.314	-0.341

Table 4
Percentage of Participants, Chart-review vs. Self-report

	Chart Review (N)	Self-Report (N)
Current Treatment		
Chemotherapy	70.6% (24/34)	81.0% (34/42)
Hormonal Therapy	79.4% (27/34)	20.0% (8/40)
Radiation	2.9% (1/34)	2.3% (1/43)
Clinical Variables		
In Stage IV	92.9% (26/28)	73.2% (41/56)
Mastectomy (yes)	52.4% (22/42)	41.1% (23/56)
Lumpectomy (yes)	23.8% (10/42)	23.2% (13/56)
Recurrent Cancer (yes)	61.9% (26/42)	69.6% (39/56)

Table 5
Correlations Among Self-Reported Treatment Data and Treatment Data Obtained From Chart Reviews

	1	2	3	4	5	6	7	8	9	10	11	12	13
Self-reported Data													
1. Chemo-therapy	---												
2. Hormonal therapy	-.91	---											
3. Radiation	.08	-.08	---										
4. Stage	.28	-.21	.08	---									
5. Mastectomy	-.30	.29	-.12	.01	---								
6. Lumpectomy	-.30	.18	-.09	-.15	-.03	---							
7. Recurrence	.17	-.22	.12	.29*	.16	-.01	---						
Chart Review Data													
8. Chemo-therapy	.26	-.26	.13	-.02	-.24	-.20	-.24	---					
9. Hormonal Therapy	.19	-.19	.08	.08	.20	.14	.35*	-.33	---				
10. Stage	-.09	.09	.05	.05	-.28	-.29	.38*	.32	-.09	---			
11. Mastectomy	.07	-.08	-.17	-.17	.31*	.09	.14	-.26	.07	-.19	---		
12. Lumpectomy	.05	-.06	-.10	-.10	-.18	.48**	.23	.21	.11	.12	-.25	---	
13. Recurrence	.02	-.19	.14	.14	-.03	.21	.59**	-.17	.43*	.32	.14	-.02	---

Note. No patient's chart reported the patient was currently receiving radiation treatment.

* $p < .05$; ** $p < .01$

Table 6
Patient Demographics

	<i>M</i>	<i>SD</i>
Age	52.16	12.14
	<i>N</i>	<i>%</i>
Race		
Caucasian	55	98.2%
Minority	1	1.8%
Education		
Some High School	2	3.6%
High School Graduate	16	28.6%
Some College	8	14.3%
College Graduate	16	28.6%
Some Graduate School	2	3.6%
Post Graduate	12	21.4%
Change in Income		
Yes	28	50.0%
No	28	50.0%
Religious Affiliation		
Christian, Catholic	14	25.0%
Christian, Not Catholic	35	62.5%
None	3	5.4%
Other	4	7.1%
Rating of Health		
Poor	2	3.6%
Fair	9	16.1%
Good	27	48.2%
Very Good	11	19.6%
Excellent	6	10.7%

Table 7
Correlations Among Measures of Patient and Partner Personality and Patient Adjustment Variables

	Age	Health	AHS(PT)	LOT-R(PT)	POMS	MAT	AHS(SP)	LOT-R(SP)
PT.								
Age	---	-.21	.10	.04	.26*	-.26*	-.01	.12
H.R.		---	.39**	.35**	-.37**	.14	.24**	.17
AHS			---	.40**	-.44**	.33**	.14	.00
LOT-R				---	-.34*	.12	.13	.18
POMS					---	-.10	-.12	-.07
MAT						---	.42**	.43**
SP.								
AHS							---	.61**
LOT-R								---
Mean	52.19		50.45	17.38	50.77	120.75	50.57	16.04
SD	12.14		7.79	3.95	23.92	23.00	7.79	4.43
α			.823	.790	.863	.729	.828	.883

Note. **PT.** = Patient; H.R. = Health Rating; AHS = Adult Hope Scale; LOT-R = Life Orientation Test; POMS = Profile of Mood States; MAT = Marital Adjustment Test; **SP.** = Partner; * $p < .10$; ** $p < .05$

Table 8
Hierarchical Regression Analysis with Psychological Adjustment

	β	R^2	ΔR^2	$\Delta R^2 p$	df	F	$F\text{-test } p$
Step 1		0.253	0.253	.000	2, 53	9.0	.000
Patient Age	-0.35						.005
Patient Health Rating	-0.44						.001
Step 2		0.356	0.103	.197	7, 48	3.8	.002
Marital Adjustment	0.17						.257
Spouse Hope	-0.08						.600
Spouse Optimism	0.02						.908
Patient Hope	-0.29						.048
Patient Optimism	-0.13						.350
Step 3		0.397	0.041	.823	13, 42	2.1	.033
Hope X							
Hope	0.06						.770
Optimism X							
Optimism	0.19						.436
Pt. Optimism X							
Sp. Hope	-0.07						.802
Pt. Hope X							
Sp. Optimism	-0.00						.982
Sp. Hope X							
Sp. Optimism	-0.12						.424
Pt. Hope X							
Pt. Optimism	-0.15						.342

Table 9
Hierarchical Regression Analysis with Marital Adjustment

	β	R^2	ΔR^2	$\Delta R^2 p$	df	F	$F\text{-test } p$
Step 1		0.110	0.110	.046	2, 53	3.3	.046
Patient Age	0.31						.025
Patient Health Rating	0.21						.121
Step 2		0.377	0.268	.003	7, 48	4.2	.001
Psychological Adjustment	0.16						.257
Spouse Hope	0.22						.149
Spouse Optimism	0.28						.067
Patient Hope	0.36						.013
Patient Optimism	-0.07						.596
Step 3		0.492	0.115	.176	6, 42	3.1	.003
Hope X							
Hope	-0.32						.074
Optimism X							
Optimism	-0.56						.010
Pt. Optimism X							
Sp. Hope	0.65						.011
Pt. Hope X							
Sp. Optimism	0.20						.249
Sp. Hope X							
Sp. Optimism	-0.10						.480
Pt. Hope X							
Pt. Optimism	-0.06						.666

FIGURES

Hypothesized Model

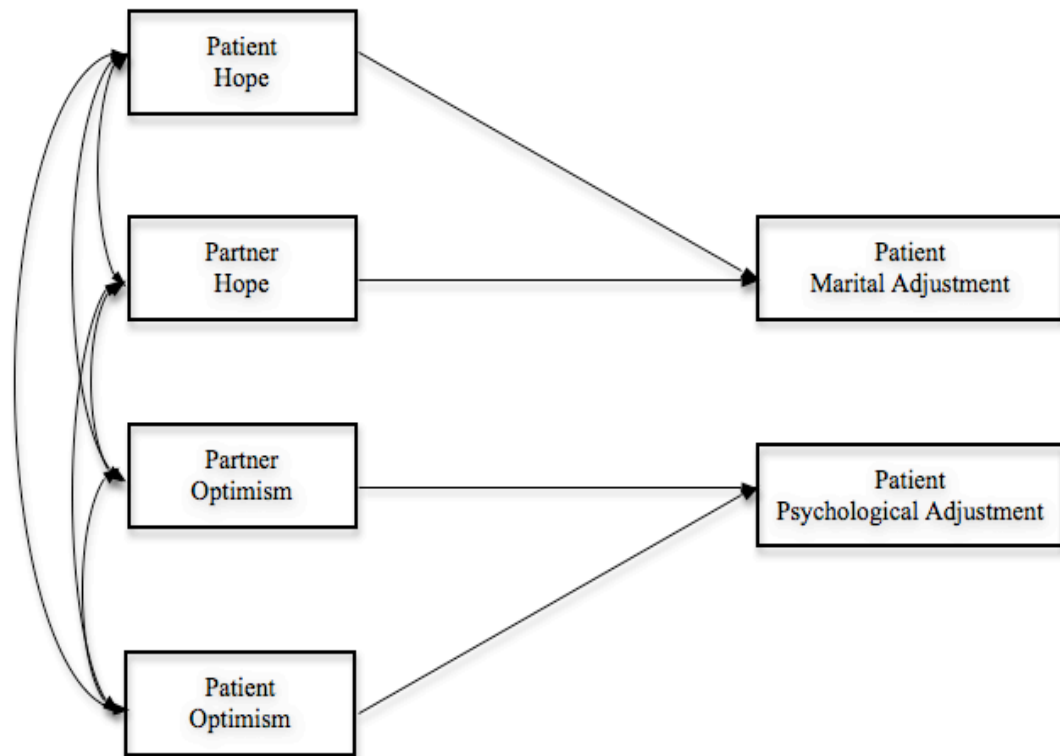


Figure 1.

Test of the Hypothesized Model

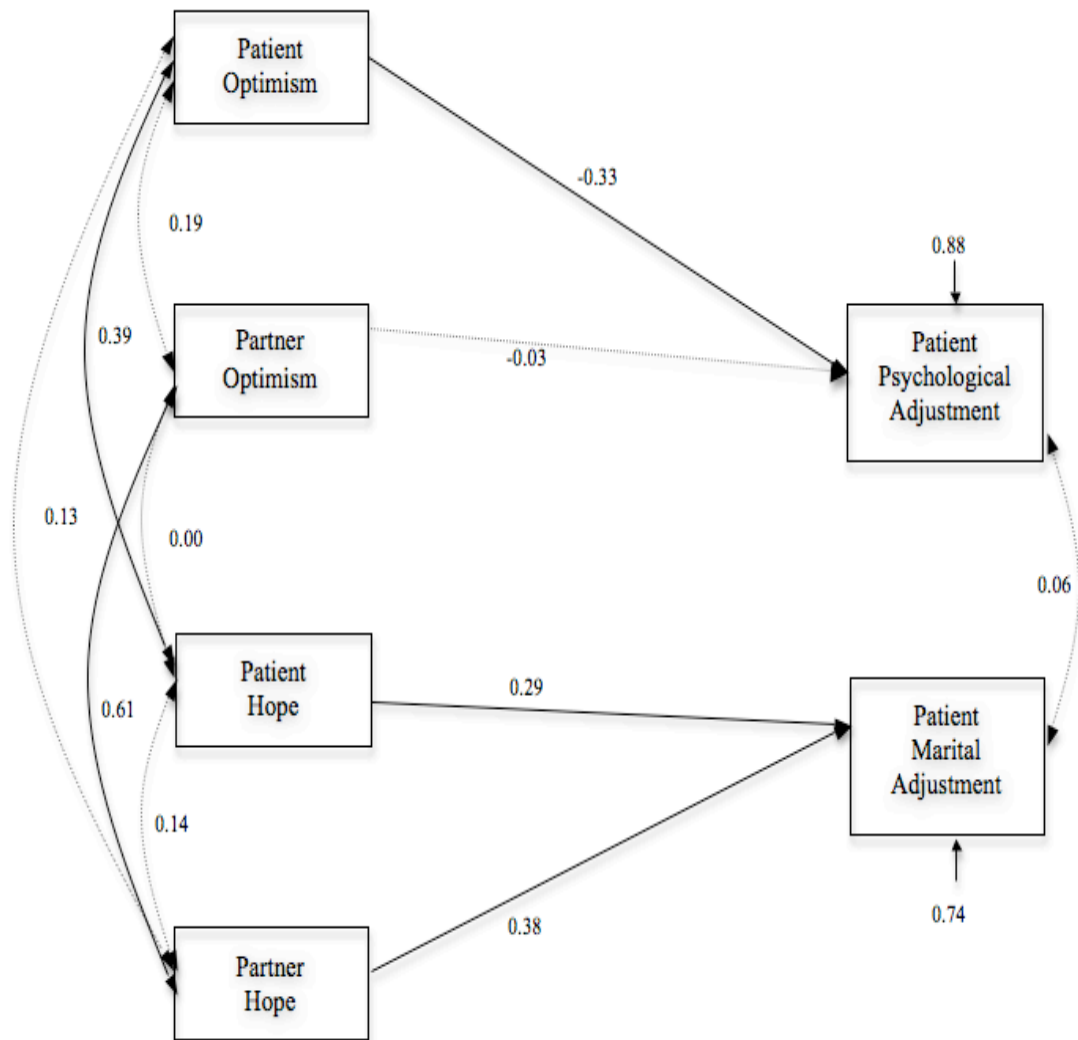


Figure 2.

Final Model With Covariates

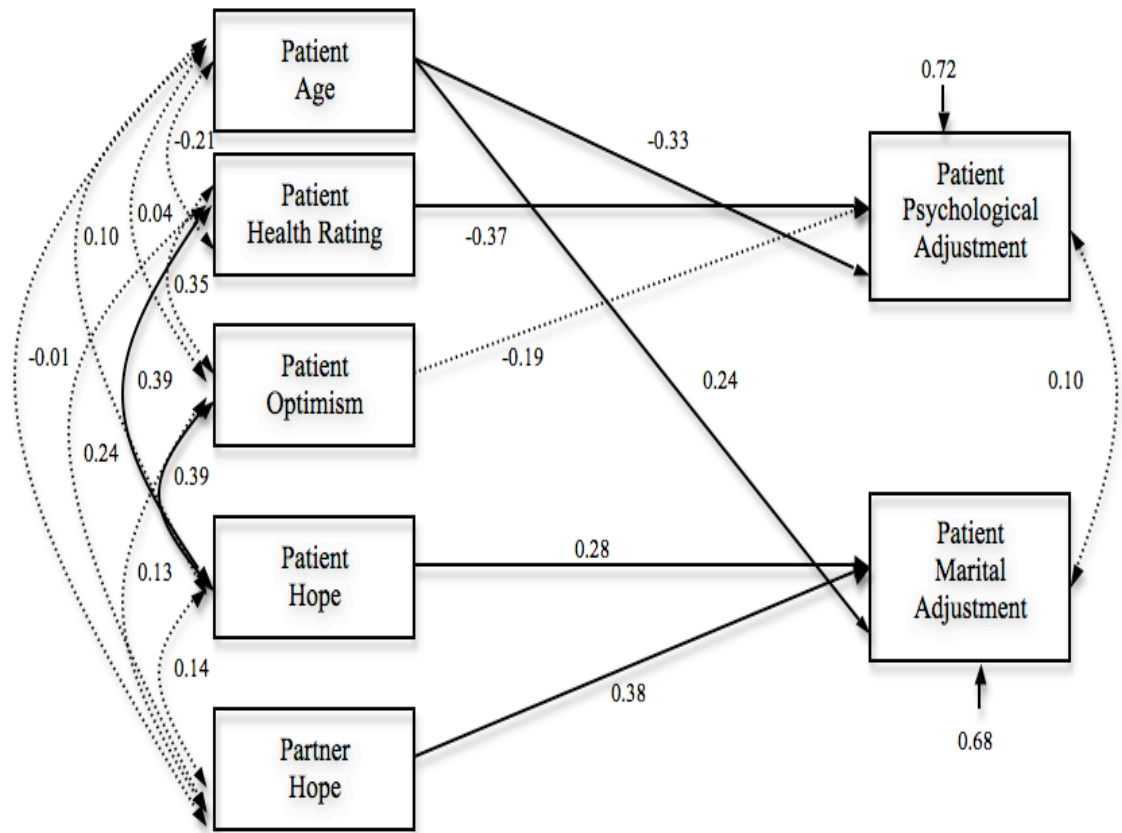


Figure 3.

Test of Reversed Hypothesized Model

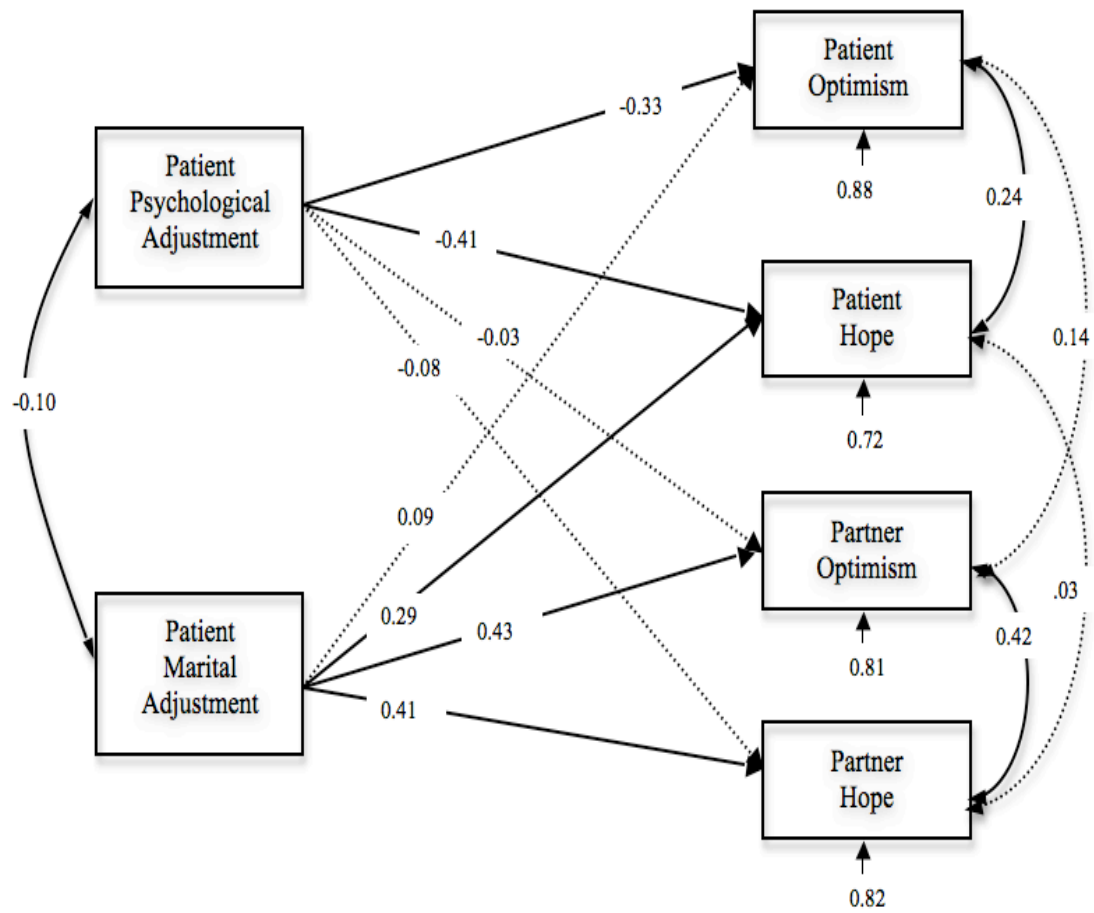


Figure 4.

Test of Reversed Hypothesized Model with Covariates Added

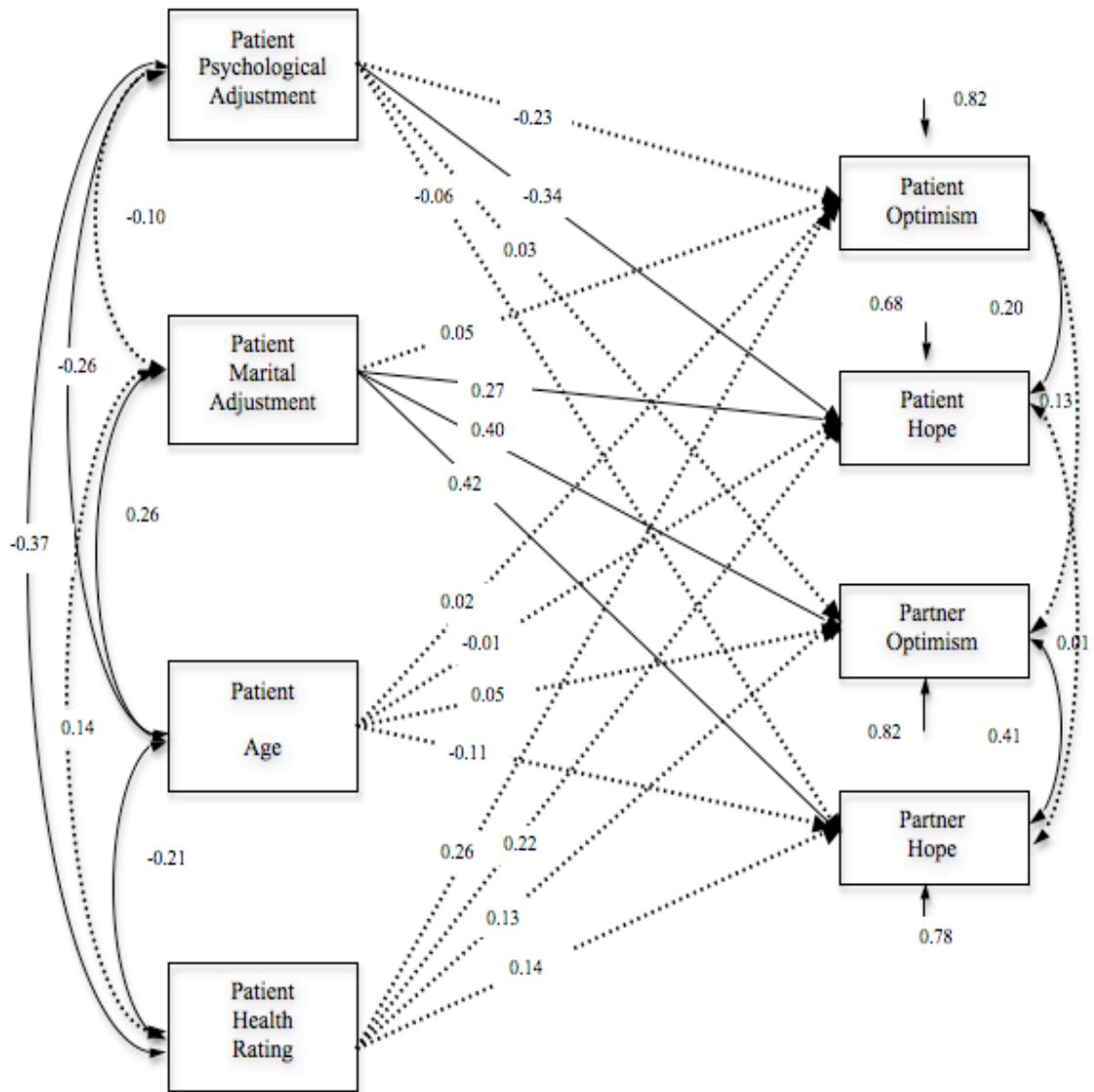


Figure 5.

Interaction of Patient Optimism and Partner Optimism on Marital Adjustment

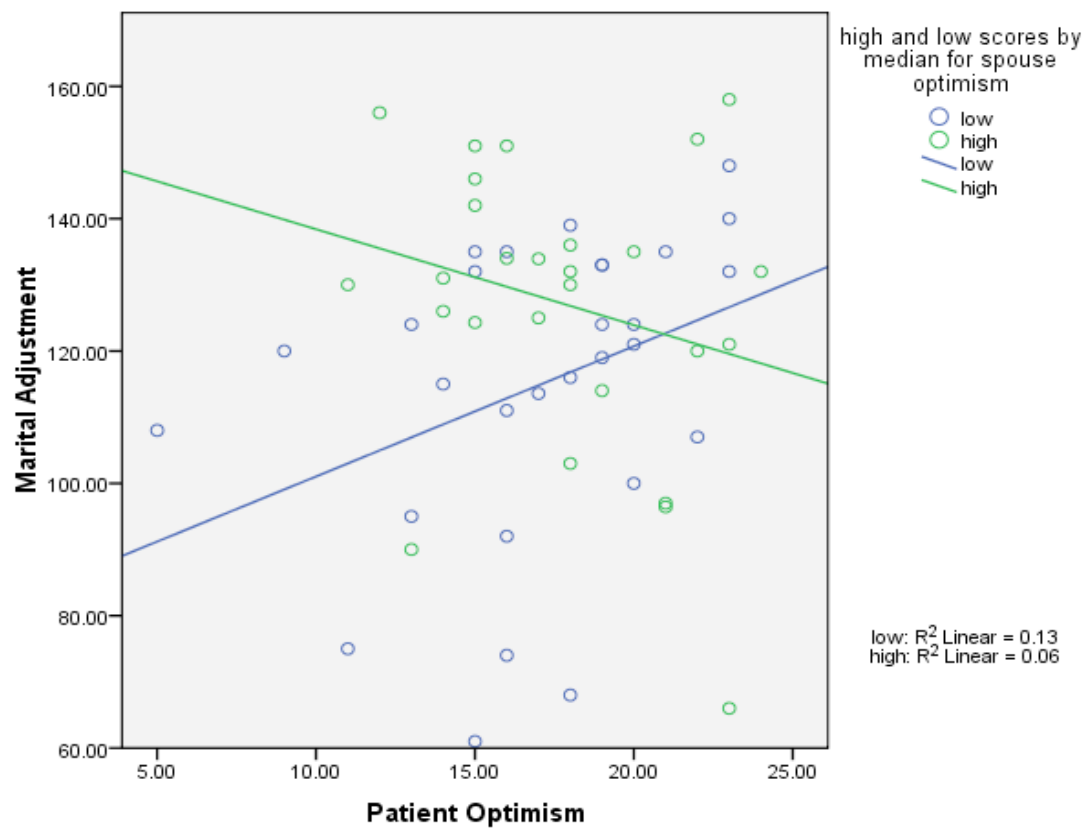


Figure 6.

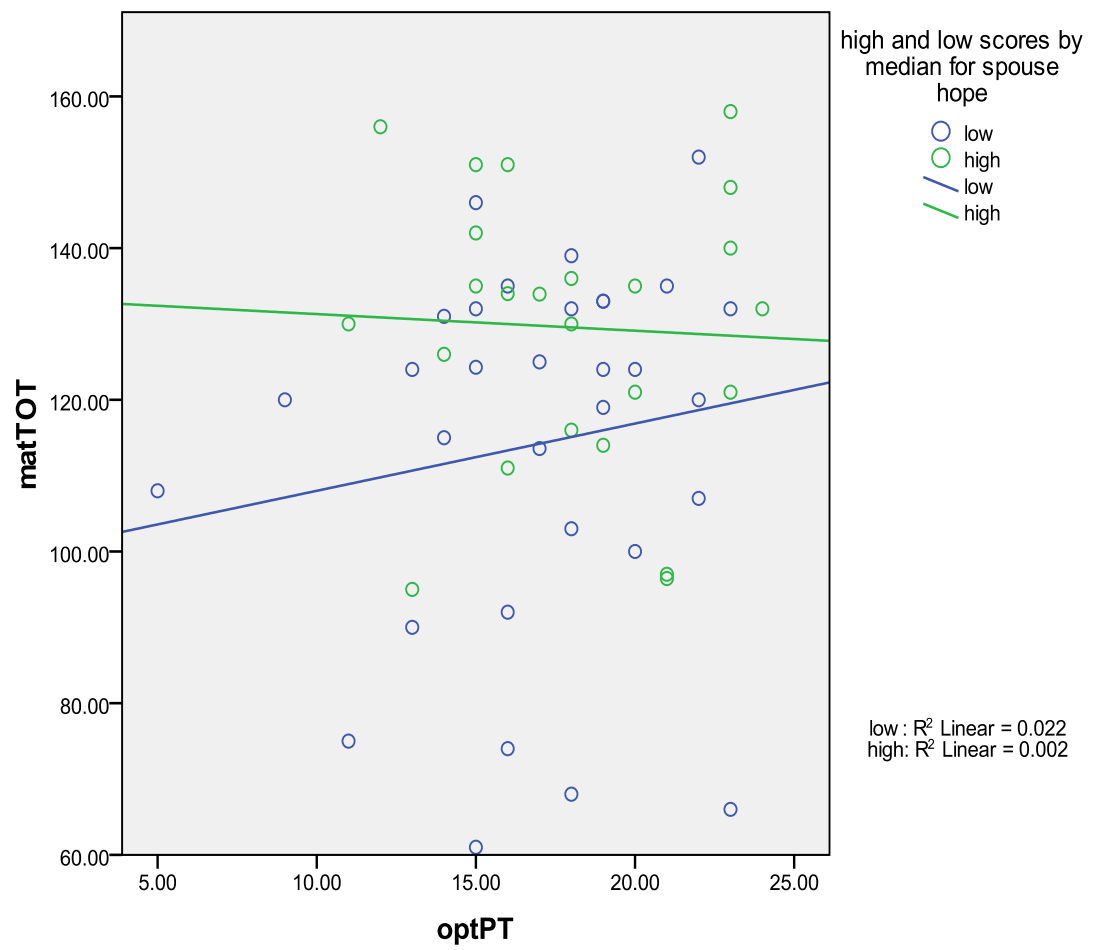
Interaction of Patient Optimism and Partner Hope with Marital Adjustment

Figure 7.

Interaction of Patient Hope and Partner Hope with Marital Adjustment

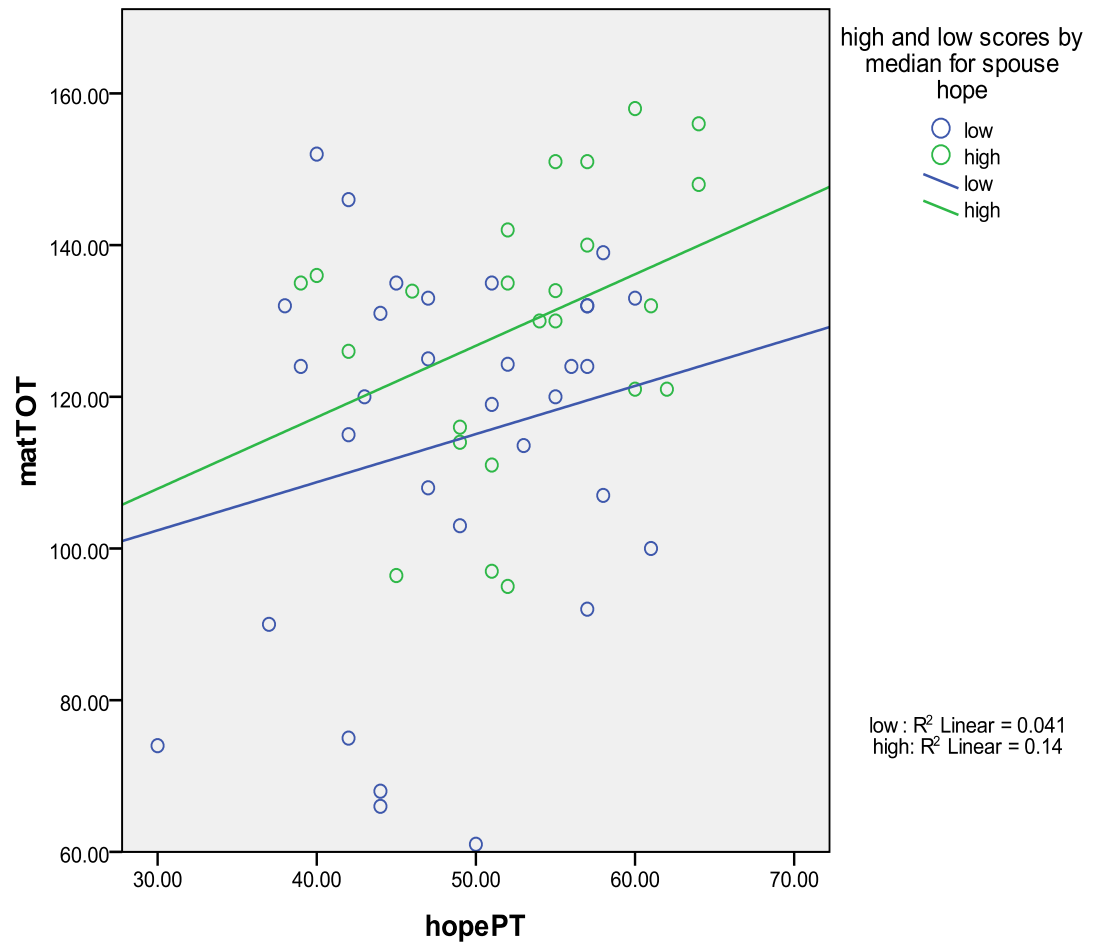


Figure 8.