

Posttraumatic Growth in Breast Cancer Patients and Survivors:

The Role of Giving and Receiving Social Support

By

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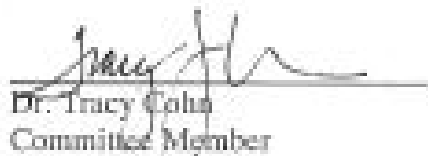
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## **Abstract**

Breast cancer is the second most commonly occurring cancer among women in the U.S., and nearly 300,000 women are expected to be diagnosed with breast cancer in the year 2015 (American Cancer Society [ACS], 2015). While it is the second leading cause of cancer-related deaths among women, death rates have steadily declined over the past 15 years, meaning that more and more women are joining the ranks of survivors (ACS, 2015). Research suggests that the majority of breast cancer survivors experience posttraumatic growth (PTG) as a result of coping with the challenges that accompany a diagnosis of cancer (Koutrouli, Anagnostopoulos, & Potamianos, 2012); however, the existing research on factors that contribute to PTG in breast cancer patients presents inconsistent results, particularly regarding the role of social support. Some studies have found social support and PTG to be positively related to one another, while other studies have found no relationship at all. The majority of studies examining social support and PTG have focused specifically on emotional support; however, there is some evidence that instrumental forms of support may influence PTG more than emotional support (Nenova, DuHamel, Zemon, Rini, & Redd, 2013). There has been very little research examining the relationship between providing support to others and PTG. Therefore, the purpose of the current study was to explore the relationship between receiving emotional and instrumental forms of social support and PTG, as well as the relationship between giving emotional and instrumental forms of social support and PTG, in a sample of breast cancer patients. Additionally, this study explored the relationship between the demographic variables of age and time since diagnosis and PTG. Results indicated that receiving both instrumental and emotional forms of social support were positively correlated with PTG after controlling for personality traits. Receiving instrumental support was found to be more strongly related to PTG which suggest that tangible

forms of support may contribute to the development of PTG more than emotional support. Providing instrumental support to others was also found to be positively correlated with PTG; however, providing emotional support was not. Additionally, the demographic variables of age and time since diagnosis were negatively correlated with PTG.

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## **Chapter 1: Overview**

Breast cancer is one of the most frequently diagnosed cancers among women in the United States with nearly 300,000 new cases being diagnosed each year (American Cancer Society, [ACS], 2015). Second only to skin cancer, it is estimated that one in eight women in the U.S. will develop invasive breast cancer, and one in thirty-six women will die from breast cancer (Howlander et al., 2012). Despite the fact that breast cancer is still the second leading cause of cancer deaths for women in the U.S., breast cancer deaths have been declining over the past fifteen years (ACS, 2015), resulting in more and more survivors. Currently, there are an estimated 2.8 million breast cancer survivors living in the U.S. (ACS, 2015).

Receiving a diagnosis of a life-threatening illness such as cancer will often result in a significant level of psychological distress. Cancer patients often experience a number of stressors that may be perceived as traumatic. Such stressors include lengthy medical treatments, side effects such as pain, fatigue, or hair loss, temporary or permanent changes in appearance, disruption in immediate and future plans, and threats of cancer recurrence (Manne et al., 2004). While trauma has been defined in a number of different ways in the literature, the Substance Abuse and Mental Health Services Administration (SAMHSA) defines trauma as “an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or threatening and that has lasting adverse effects on the individual’s functioning and physical, social, emotional, or spiritual well-being” (2012). Although trauma is typically associated with negative psychological symptoms, some individuals report experiencing positive changes as a result of coping with trauma. The following section will provide an overview of positive changes that may develop as a result of coping with trauma.

## **Positive Responses to Trauma**

The idea that suffering can lead to a positive transformation has been explored for many years (e.g., Frankl, 1961; Yalom, 1980); however, it has only been within the past couple of decades that researchers in the field of psychology have begun conducting empirical research on this phenomenon and developing theories as to how such change occurs. In a review of the literature on models of change, O’Leary, Alday, and Ickovics (1998) identified eight models of life change and positive growth, which they divided into two categories: intentional change and unintentional change. Models describing intentional change (i.e., Hager, 1992; Mahoney, 1982; Nerken, 1993) view change as an evolutionary process that is slow and purposeful. O’Leary and colleagues used the analogy of engaging in therapy to treat depression to explain intentional change models. Unintentional change models (i.e., Aldwin, 1994; Miller & C’deBaca, 1994; O’Leary & Ickovics, 1995; Shaefer & Moos, 1992; Tedeschi & Calhoun, 1995) view change as sudden and unexpected. For example, an unintentional change model would be used to explain the transformations one might experience following an unexpected crisis, such as being diagnosed with a life-threatening illness.

Of the models reviewed by O’Leary and colleagues (1998), Tedeschi and Calhoun’s (1995) model of transformational coping, later known as posttraumatic growth (PTG; Tedeschi & Calhoun, 1996), has been the most empirically validated and widely used model of growth to date (Joseph & Linley, 2006). Tedeschi and Calhoun’s (1995; 1996) model focuses on the positive growth that can occur as the result of coping with a traumatic experience. The authors assert that in order for positive growth to occur, one must endure a trauma that “shakes the foundation” of his or her assumptive world (Calhoun & Tedeschi, 1998, p. 216), meaning that higher-order goals and beliefs are challenged. The more distressed one is about the trauma, the

more rumination, or cognitive processing, will occur, which will cause an individual to reconstruct his or her belief system and experience positive growth.

Tedeschi and Calhoun's model of posttraumatic growth has evolved over the years and is currently regarded as the most comprehensive theoretical description of positive growth to date (Joseph & Linley, 2006); therefore, it will be used in the present study to conceptualize how individuals may experience positive changes after a diagnosis of breast cancer. The following sections will provide a more thorough account of PTG including how it is measured, theoretical underpinnings, and an overview of relevant literature pertaining to PTG in breast cancer populations.

### **Posttraumatic Growth**

**Posttraumatic Growth Inventory.** In order to measure PTG, Tedeschi and Calhoun (1996) developed the Posttraumatic Growth Inventory (PTGI). After reviewing the existent literature on positive growth, the authors developed a 34-item questionnaire which they administered to 604 undergraduate psychology students who had experienced a "significant life crisis." Participants were instructed to think about the crisis and rate the degree to which they believed change had occurred as a result of the crisis. Participants responded using a Likert-type scale ranging from 0 ("I did not experience this change as a result of my crisis") to 5 ("I experienced this change to a very great degree as a result of my crisis"), (Tedeschi & Calhoun, 1996, p. 459).

After the initial data were collected, data analysis yielded a five factor solution comprised of 21 items. The final five factors of the Posttraumatic Growth Inventory were labeled Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation for Life (Tedeschi & Calhoun, 1996). The "Relating to Others" subscale assesses the extent to which

individuals develop closer and more meaningful relationships with others after experiencing a traumatic event. Items on the “New Possibilities” subscale measure the degree to which one identifies new goals or new directions in life after a trauma. The “Personal Strength” subscale assesses the extent to which one feels stronger and more capable of handling difficult situations after trauma. The “Spiritual Change” subscale measures increases in spirituality or religious beliefs or an increase in engagement in existential thought processes. The final subscale, “Appreciation for Life,” assesses the degree to which individuals reevaluate their priorities or gain a stronger appreciation for what were once considered “little things” after experiencing a trauma (Tedeschi & Calhoun, 2004).

**Theoretical model of posttraumatic growth.** A multitude of studies have used the PTGI to explore the development of positive growth as a result of coping with a variety of traumatic experiences (Arpawong, Richeimer, Weinstein, Elghamrawy, & Milam, 2012; Cordova, Cunningham, Carlson, & Andrykowski, 2001; Engelkeymeyer & Marwit, 2008; Nenova, Duhamel, Zemon, Rini, & Redd, 2013; Sawyer, Ayers, & Field, 2010; Widows, Jacobsen, Booth-Jones, & Fields, 2005). The widespread use of the PTGI has allowed researchers to gain a better understanding of the theoretical foundations of posttraumatic growth. Tedeschi and Calhoun (2003) asserted that there are generally five conditions present that facilitate the experience of posttraumatic growth. These five conditions include: (1) an individual is exposed to a trauma that causes him or her to reevaluate previously held assumptions; (2) the individual is able to effectively tolerate the distress of the traumatic experience; (3) the individual disengages from previously held assumptions because these assumptions no longer fit into his or her post-trauma schema; (4) the distress from the trauma must persist long enough for the individual to start reconsidering previously held assumptions; (5) the individual will develop new assumptions

to account for the new information that has been acquired since the trauma, which will lead to schema changes (Tedeschi & Calhoun, 2003). Tedeschi and Calhoun (2004) posited that it is not the trauma itself that produces PTG but rather the result of coping with the trauma. The authors also noted that just because an individual experiences positive growth as a result of coping with trauma, this does not mean that he or she will not also continue to experience trauma-related distress, as these are independent of one another.

Tedeschi and Calhoun (2004) also identified individual characteristics that influence PTG, including personality traits and the amount of support one receives from others. Regarding personality characteristics, the authors asserted that individuals who score highly on measures of extraversion and openness are more likely to be cognizant of positive emotions during an adverse situation and be able to process information about the adverse situation more efficiently, therefore resulting in the schema change necessary to facilitate posttraumatic growth. Regarding social support, the authors posited that individuals who receive more social support may be more likely to experience posttraumatic growth. Tedeschi and Calhoun asserted that the experience of self-disclosure allows an individual the opportunity to examine previously held assumptions, solicit feedback from others, confront questions of meaning, and create new schemas.

The present study seeks to utilize Tedeschi and Calhoun's (1996; 2004) theory of Posttraumatic Growth to explore the relationship between social support and PTG for individuals with a diagnosis of breast cancer. The following sections will provide an overview of the existing literature pertaining to variables that have been found to predict PTG in breast cancer patients and survivors.

## **Posttraumatic Growth in Breast Cancer Patients and Survivors**

**Demographic variables.** Demographic variables such as age, race, education, income, marital status, and occupational status have been explored in a number of studies examining the relationship between breast cancer and PTG, whereas other variables, such as ethnicity and geographical location, have been largely understudied. Women who have been diagnosed with breast cancer at a younger age have consistently reported higher levels of PTG than their older counterparts (Bellizzi et al., 2010; Bellizzi & Blank, 2006; Cordova et al., 2007; Manne et al., 2004). Also, individuals who are married or who are employed are more likely to report higher levels of PTG (Bellizzi & Blank, 2006; Weiss, 2004).

The relationships between PTG and income and PTG and education are less clear. Some studies have found higher income to be associated with higher rates of PTG (Cordova et al., 2001) while others have found that income was unrelated to PTG (Cordova et al., 2007). Similarly, some studies have found that less education was associated with higher levels of PTG among breast cancer survivors (Bellizzi & Blank, 2006; Weiss, 2004), while others have found the reverse to be true (Cordova et al., 2007). It should also be noted that several studies have found no significant relationship between level of education attainment and PTG in breast cancer patients (Cohen & Numa, 2011; Sears et al, 2003; Silva, Moreira, & Canavarro, 2012).

Most of the literature related to posttraumatic growth in breast cancer patients has included a predominantly European-American sample (Bellizzi & Blank, 2006; Brunet et al., 2010; Cordova et al., 2001; Cordova et al., 2007; Sears et al., 2003). The exception to this is a study by Bellizzi et al. (2010) who examined PTG and health-related quality of life in a racially diverse sample of breast cancer survivors and found that African Americans reported more growth than their White and Hispanic counterparts; however, this relationship was mediated by

religiosity. Additionally, studies exploring positive growth by means other than using Tedeschi and Calhoun's (1996) PTGI have found African American women to experience more posttraumatic growth than European-American women (e.g., Bower, Meyerowitz, Desmond, & Bernaards, 2005; Tomich & Helgeson, 2004). This suggests that additional studies using the PTGI to explore posttraumatic growth in racially diverse samples of breast cancer patients are warranted.

Geographical location is another factor that may affect one's response to a diagnosis of cancer. While a literature search revealed no studies exploring how geographic location (urban versus rural) might affect the development of PTG, there is existing research indicating that rural cancer survivors report poorer mental health functioning, greater symptoms of anxiety and depression, greater distress, and lower overall scores on measures of quality-of-life and functional well-being as compared to their non-rural counterparts (Burriss & Andrykowski, 2010; Reid-Arndt & Cox, 2010). Considering these findings, it is conceivable to think that characteristics related to rural life may affect the extent to which individuals experience PTG.

**Disease and treatment characteristics.** Based on Tedeschi and Calhoun's (2004) theoretical model of PTG, individuals who have known about their diagnosis longer would be expected to report more growth due to having a longer amount of time to engage in the cognitive processing which facilitates the need for schema reconstruction. This has been found to be true in some studies but not others. For example, in their study comparing breast cancer survivors to healthy control participants, Cordova et al. (2001) found that the amount of time that had passed since participants were diagnosed with breast cancer was positively correlated with PTG. Similarly, Sears and colleagues (2003) found that individuals who had a longer period of time to process information about their illness reported more posttraumatic growth. Weiss (2004),

however, found the opposite results in a study of married, early stage breast cancer survivors. In this study, the time since diagnosis was inversely correlated with PTG. It should also be noted that some studies have found no relationship to exist between the amount of time that has passed since diagnosis and PTG (Bellizzi & Blank, 2006; Cohen & Numa, 2011; Cordova et al., 2007).

The majority of studies on PTG suggest no significant relationship between actual disease severity and PTG (Cordova et al., 2001; Manne et al., 2004; Weiss, 2004). However, there is evidence to support a positive correlation between one's perception of disease severity and PTG (Bellizzi & Blank, 2006; Cordova et al., 2001; Morris & Shakespeare-Finch, 2011; Sears et al., 2003). For example, Cordova et al. (2001) found that breast cancer survivors who met the criteria for PTSD experienced more posttraumatic growth than those who did not meet the criteria for PTSD. Similarly, in the Sears et al. (2003) study, individuals who reported more stress in reaction to cancer reported more posttraumatic growth. These findings are conceptually consistent with Tedeschi and Calhoun's (1996) model of posttraumatic growth. The more distressed one is in the aftermath of a trauma, the more challenged one's assumptions will be and the more necessary it will be to engage in schema reconstruction (Tedeschi & Calhoun).

The majority of the literature indicates that the type of treatment is unrelated to the amount of PTG one experiences (Bellizzi & Blank, 2006; Bower, Meyerowitz, Desmond, Bernaards, Rowland, & Ganz, 2005; Carver, Smith, Petronis, & Antoni, 2006; Cohen & Numa, 2011; Cordova et al., 2007; Tomich & Helgeson, 2002). However, in a sample of 307 breast cancer survivors, Lelorain, Bonnaud-Antignac, & Florin (2010) found that receiving chemotherapy was a predictor of PTG, although the effect size was small. The authors hypothesized that chemotherapy may be associated with more perceived seriousness of the



disease, which according to Tedeschi and Calhoun's (2004) theory, would result in more posttraumatic growth.

### **Social Support**

**Receiving social support.** Based on the current literature, the relationship between receiving social support and PTG is unclear. Tedeschi and Calhoun asserted that, "Supportive others can aid in posttraumatic growth by providing a way to craft narratives about the changes that have occurred, and by offering perspectives that can be integrated into schema change" (2004, p. 8). Similarly, Shaefer and Moos (1998) speculated that receiving support from others after a traumatic event can help create a more favorable appraisal of the event and help in the development of more effective coping strategies.

Several studies have explored the relationship between social support and PTG in cancer patients including individuals with breast cancer (Bozo et al., 2009; Cohen & Numa, 2011; Schmidt, Blank, Bellizzi, & Park, 2011; Schroevers et al., 2010; Scrignaro et al., 2011; Weiss, 2004); however, the results have been inconsistent. In a longitudinal study of a sample of long-term cancer survivors, Schroevers and colleagues (2010) discovered that a greater amount of received emotional support significantly predicted more PTG, whereas perceived emotional support or dissatisfaction with received emotional support were not related to PTG. Similarly, Bozo and colleagues (2009) measured social support as a moderator to the relationship between dispositional optimism and PTG in a population of postoperative breast cancer patients. Their findings indicated that patients who scored higher on measures of perceived social support (from family, friends, a private person, and globally) were more likely to experience PTG.

Contrary to these findings, Cohen and Numa (2011) explored predictors of PTG in breast cancer survivors who volunteered to work with newly diagnosed breast cancer patients versus

breast cancer survivors who did not participate in volunteer activities, and found social support to be unrelated to PTG. Similarly, Weiss (2004) explored the role of social support in married breast cancer survivors and found that there was no significant correlation between the PTGI and survivors' general perceptions of social support.

While some of the inconsistencies in the existing literature regarding the relationship between social support and PTG may be explained by methodological and sample differences, further exploration is warranted. Most studies concerning PTG and breast cancer patients have used broad measures of social support or have focused specifically on emotional social support; however, little attention has been given to other forms of social support. The following section will provide evidence for the importance of measuring other forms of social support in a population of breast cancer patients, specifically instrumental support.

**Subtypes of social support.** Historically, social support has been viewed as a multidimensional construct. Some researchers have identified as many as 6 different types of social support, including material aid, behavioral assistance, intimate interaction, guidance, feedback, and positive social interaction (Barrera & Ainlay, 1983); however, Shakespeare-Finch and Obst (2011) argued that many of these domains overlap and that social support can basically be categorized into two categories: emotional support and instrumental support. Emotional support typically refers to having someone who listens to and validates the recipient's thoughts and feelings, someone with whom the recipient can talk over problems, or someone to help in making difficult decisions. Instrumental support generally refers to more tangible services that one receives from network members such as financial assistance or transportation (Manne & Scholl, 2001; Nenova et al., 2013; Park, Cho, & Moon, 2010).

Prati and Pietrantonio (2009) hypothesized that “it is likely that the beneficial effect of social support is different when controlling for the impact of different types of social support” (p. 375). There is some evidence to suggest that tangible forms of social support, such as providing transportation, preparing meals, or helping with financial matters, are more likely to predict PTG. For example, in a study on stem cell transplant survivors and their partners, Nenova et al. (2013) utilized the Emotional and Instrumental Support subscale of the Partner Responses to Cancer Inventory (Manne & Scholl, 2001) to measure the relationship between emotional and instrumental forms of social support and PTG. Results indicated that although both types of social support were positively correlated with scores of PTG, only instrumental support was a unique predictor of PTG. There is also qualitative data to support the need for more tangible support. In a study by Sadler-Gerhardt, Reynolds, Britton, and Kruse (2010), eight breast cancer survivors shared their perceptions of how breast cancer changed their lives and how they made meaning of the experience. According to Sadler-Gerhardt et al., “Many of the participants could have benefitted from meals, transportation, child care, or other concrete help,” (p. 276).

The current section focuses on different subtypes of social support received and how those may relate to PTG; however, the following section will provide an overview of the literature pertaining to providing social support to others. The next section will also present evidence for why the relationship between providing support to others and PTG should be explored in a population of breast cancer patients.

**Provision of social support to others.** The majority of social support research has focused on the effects of receiving social support; however, there is a body of research indicating that providing social support may have a variety of positive effects, including better physical and mental health, lower mortality rates, and higher scores on measures of overall well-being

(Shakespeare-Finch & Obst, 2011). Furthermore, there is some evidence to support that providing social support may be more beneficial than receiving it (Knoll, Kienle, Bauer, Pfuller, & Luszczynska, 2007).

Piferi and Lawler (2006) found that a higher tendency to provide social support was associated with less depression, less stress, greater self-esteem, and greater self-efficacy. Morrow-Howell, Hinterlong, Rozario, and Tang (2003) and Thomas (2010) found that older adults scored higher on measures of well-being when they provided support to others or engaged in volunteer activities. Similarly, Musick and Wilson (2003) found volunteering to be associated with lower levels of depression in adults aged 65 or older.

While very little research has been done, there is some preliminary evidence suggesting that a positive relationship may exist between providing support to others and PTG. For example, in a study by Karanci and Acarturk (2005), the authors found that volunteering in a disaster relief program predicted positive growth in earthquake survivors, although this relationship was present only after controlling for coping approaches. In a mixed methods study by Chambers et al. (2013), 10 prostate cancer survivors were trained to be peer mentors to current prostate cancer patients and their spouses. One of the main themes that emerged from the qualitative data was that the peer mentors felt a sense of personal growth after providing support to others.

There is qualitative evidence to suggest that helping others may contribute to PTG in a breast cancer population. Heppner et al. (2009) conducted a qualitative study with breast cancer survivors to investigate stressors related to lymphedema, coping mechanisms, and the role of social support. The only general theme that emerged for the social support category was “the opportunity to nurture others,” (p. 333). All participants in the study endorsed this theme and

indicated that providing support or nurturance to others was a way to give back and to take their mind off of the stressors associated with lymphedema.

Overall, very little research has explored how providing social support to others in the aftermath of trauma may facilitate positive growth. According to Tedeschi and Calhoun's (2004) model, exposure to a traumatic event initially creates a high level of distress which must be effectively managed in order for the cognitive processing to occur which produces the schema changes that result in posttraumatic growth. Research already supports the notion that providing social support to others can have a number of benefits, such as decreased stress and higher scores on measures of overall well-being. Therefore, it is conceivable that these positive benefits would also assist one in effectively managing the distress felt after a trauma, which would in turn facilitate positive growth.

**Social support and personality characteristics.** According to the literature, it is likely that personality traits contribute to the amount of social support one gives and receives. For example, individuals who are extroverted are more likely to enjoy the company of others and therefore have a wide circle of friends to provide social support in times of distress (Swickert, Rosentreter, Hittner, & Mushrush, 2002). Individuals who are considered high in agreeableness may be perceived as kind and gentle which would increase the likelihood that others would want to interact with them (Swickert, Hittner, & Foster, 2010). Individuals who are characterized as angry or hostile would likely be perceived as difficult to get along with and have a less expansive social network (Dehle & Landers, 2005).

Although the literature indicates that there are correlations between personality and social support and personality and posttraumatic growth, most studies examining social support and PTG have failed to control for personality characteristics. Therefore, the current study included a

brief personality assessment in order to control for the influence of personality traits when exploring the relationship between social support and PTG in a population of breast cancer patients.

### **Purpose and Importance of Study**

Although it is still the second leading cause of cancer-related deaths, breast cancer related deaths have steadily declined over the past 15 years, meaning that there are increasing numbers of women joining the ranks of survivors. Research suggests that the majority of breast cancer survivors experience at least some level of posttraumatic growth as a result of coping with the challenges that accompany a diagnosis of cancer (Koutrouli et al., 2012); however, the literature regarding the relationship between social support and posttraumatic growth in breast cancer patients is mixed, with some studies finding a positive correlation between the two (Schroevers et al., 2010; Bozo et al., 2009) while other studies have found no relationship at all (Cohen & Numa, 2011; Cordova et al., 2001; Weiss, 2004). The majority of studies examining social support and PTG have used broad measures of social support or have focused specifically on emotional support; however, there is some evidence that instrumental support may influence PTG more than emotional support (Nenova et al., 2013). In addition, there is evidence that providing support to others can have overall positive results including less depression, less stress, and greater self-efficacy (Piferi and Lawler, 2006); however, there have been no quantitative studies to date that have examined this relationship between providing social support to others and PTG.

The literature suggests that PTG may serve as a protective factor from depression and other posttraumatic stress symptoms (Morrill et al., 2008; Silva et al., 2012); therefore, further research regarding factors that contribute to PTG is necessary. This study aims to contribute to

the existing literature by exploring the relationship between receiving emotional and instrumental forms of social support and PTG, as well as the relationship between giving emotional and instrumental forms of social support and PTG, in a sample of breast cancer patients. Additionally, this study explores the relationship between the demographic variables of age and time since diagnosis and PTG.

### **Research Questions**

Given the inconsistencies in the existing literature surrounding the relationship between receiving social support and PTG in breast cancer patients and the gap in the literature regarding the relationship between providing social support to others and PTG in breast cancer patients, the current study proposed the following research questions:

1. Is there a relationship between receiving instrumental support and PTG, as well as giving instrumental support and PTG, when controlling for personality factors?
2. Is there a relationship between receiving emotional support and PTG, as well as giving emotional support and PTG, when controlling for personality factors?
3. Will the relationship between receiving instrumental support and PTG be stronger than the relationship between receiving emotional support and PTG?
4. Is there a relationship between time since diagnosis and PTG?
5. Is there a relationship between age and PTG?

### **Procedure**

Participants were recruited through various methods, including snowball sampling, Amazon Mechanical Turk, and a list of potential participants from a previous IRB-approved study who indicated interest in future research participation. Data was collected online using Qualtrics survey software. Research participants completed an anonymous questionnaire, which

included the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), the 2-Way Social Support Scale (Shakespeare-Finch and Obst, 2011), and the Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003). Research participants also completed a demographics questionnaire developed by the researcher. The data were then analyzed to assess the relationships between giving and receiving emotional and instrumental forms of social support and posttraumatic growth while controlling for personality factors. The analysis also assessed the relationship between time since diagnosis and posttraumatic growth as well as age and posttraumatic growth.

### **Instruments**

**Demographics questionnaire.** The demographic questionnaire was a 14-item assessment created by the researcher that gathered general demographic information as well as breast cancer-specific information. Participants were asked to provide their ethnicity, current age, geographical location (urban, suburban, or rural), annual income, level of education, and current relationship/marital status. Additionally, participants were asked about their age at time of diagnosis, relationship/marital status at time of diagnosis and during treatment, stage of cancer at diagnosis, cancer treatment modalities, whether or not the breast cancer experience was perceived to be life-threatening, and the extent to which the experience was perceived as stressful. Finally, the demographic questionnaire included one open-ended question to assess whether or not participants had experienced other traumatic events within the past five years.

**Posttraumatic Growth Inventory.** The Posttraumatic Growth Inventory (PTGI) was developed by Tedeschi and Calhoun (1996) in order to assess positive changes experienced after exposure to a traumatic event. This 21-item inventory produces a Total Growth score comprised of five subscale scores: Relating to Others, New Possibilities, Personal Strength, Appreciation



for Life, and Spiritual Change. Items are rated on a Likert scale ranging from 0 (“I did not experience this change as a result of my crisis”) to 5 (“I experienced this change to a great degree as a result of my crisis”). For the purposes of this study, participants were provided with the following instructions: “Indicate for each of the statements below the degree to which this change occurred in your life as a result of your breast cancer experience.” Answers ranged from 0 (“I did not experience this change as a result of my breast cancer experience”) to 5 (“I experienced this change a great deal as a result of my breast cancer experience”). In the current study, only the Total Growth score from the PTGI was used to assess posttraumatic growth.

The PTGI has been found to be psychometrically sound and exhibits good reliability and validity. In a survey of 604 undergraduate students, the PTGI demonstrated a high internal consistency of 0.90 for the Total Growth score (Tedeschi and Calhoun, 1996). In order to assess validity, Tedeschi and Calhoun compared the PTGI to a measure of personality characteristics and religious participation. The PTGI was found to be positively correlated with optimism ( $r = .23$ ) on the Life Orientation Test (Scheier & Carver, 1985) and all of the NEO Personality Inventory (Costa & McCrae, 1985) scales except Neuroticism, (Extraversion,  $r = .29$ ; Openness,  $r = .21$ ; Agreeableness,  $r = .18$ ; and Conscientiousness,  $r = .16$ ). Tedeschi and Calhoun utilized a three-item measure to explore religious participation (Pressman, Lyons, Larson, & Strain, 1990) and found that PTGI was positively correlated with religiosity ( $r = .25$ ). Additionally, the authors compared the PTGI to the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). The findings indicated that there was no significant relationship between the PTGI and social desirability.

It should be noted that for reasons unknown to the researcher, the first item on the PTGI was not displayed on the online questionnaire; therefore, PTGI scores that had been previously

collected by another researcher (Morrill et al., 2008) on a similar sample were used to predict the scores for the missing item using a regression-based imputation technique (McDonald, Thurston, & Nelson, 2000; Saunders et al., 2006). In the original data set collected by Morrill and colleagues, the imputation technique correctly predicted scores for item 1 55.8% of the time and the regression equation provided a predicted score within one point of the actual score 93.2% of the time. Scores for items 2-21 of the PTGI accounted for 54.5% of the variability in scores for item 1. Lower levels of accuracy with a different data set almost certainly occurred; however, the imputation technique was felt to incorporate significantly more information than systematically removing the item for every participant.

**2-Way Social Support Scale.** The 2-Way Social Support Scale (2-Way SSS) was developed by Shakespeare-Finch and Obst (2011) to assess both giving and receiving of instrumental and emotional support. The 2-Way SSS is a 20 item inventory that yields four subscales: Receiving Emotional Support, Giving Emotional Support, Receiving Instrumental Support, and Giving Instrumental Support. Participants were asked to indicate to what extent each statement was true for them on a 6-point Likert scale ranging from 0 (“not at all”) to 5 (“always”). For the purposes of this study, participants were asked to rate the amount of social support they have given and received since their diagnosis of breast cancer. Additionally, the wording on one item on the 2-Way SSS was slightly changed from “When someone I lived with was sick, I helped them” to “When someone I was close to was sick, I helped them.”

The 2-Way SSS has been found to be psychometrically sound and exhibits good reliability and validity. In a sample of 372 participants, the internal consistencies were as follows: Receiving Emotional Support,  $\alpha = .92$ ; Giving Emotional Support,  $\alpha = .86$ ; Receiving Instrumental Support  $\alpha = .86$ ; Giving Instrumental Support,  $\alpha = .84$  (Shakespeare-Finch & Obst,

2011). To assess for convergent validity, the 2-Way SSS was compared to two other social support measures, the Social Support Questionnaire (SSQ; Sarason, Levine, Basham, & Sarason, 1983) and the Berlin Social Support Scale (BSSS; Schulz & Schwarzer, 2003). Correlations between the 2-Way SSS and the BSSS ranged from .45 to .66 and correlations between the 2-Way SSS and the SSQ ranged from .27 to .55 (Shakespeare-Finch & Obst, 2011).

It should be noted that for reasons unknown to the researcher, the first item on the 2-Way SSS was not displayed on the online questionnaire; therefore, this writer utilized 2-Way SSS scores that had been previously collected by one of the authors of the scale on a similar sample to impute the scores for the missing item. A regression-based imputation technique was utilized to predict the missing items (McDonald, Thurston, & Nelson, 2000; Saunders et al., 2006). In the original data set, which is included in a study that is currently under review for publication, the imputation technique correctly predicted scores for item 1 42.1% of the time and the regression equation provided a predicted score within one point of the actual score 90.8% of the time. Scores for items 2-20 of the 2-Way SSS accounted for 64.9% of the variability in scores for item 1. As seen for imputation of scores for item 1 of the PTGI, Lower levels of accuracy in imputing scores for item 1 of the 2-Way SSS with a different data set almost certainly occurred.

**Ten-Item Personality Inventory.** The Ten-Item Personality Inventory developed by Gosling, Rentfrow, & Swann (2003) is a brief, 10-item measure developed to assess the Big Five personality dimensions. The TIPI scales that represent the Big Five personality traits include: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to New Experiences. Each of the 10 items consists of two descriptor words with the stem, “I see myself as:” Participants were instructed to rank each item on a Likert-type scale ranging from 1 (“strongly disagree”) to 7 (“agree strongly”).

The TIPI was normed on a sample of 1813 undergraduate students. Due to the brief nature of the TIPI, there are only 2 items per subscale and therefore, internal consistency estimates were low, ranging from .45 - .73. However, the TIPI did have moderate to strong convergent validity when compared to with other Big Five measures. For example convergent correlations between the TIPI and the Big-Five Inventory (BFI: John & Srivastava, 1999) ranged from .65 - .87. Convergent correlations between the TIPI and the NEO-PI-R (Costa & McCrae, 1992) ranged from .56 - .68.

### **Participants**

Participants ( $N=54$ ) in this study consisted of adult women who had been diagnosed with breast cancer within the past five years and who did not have a history of any other types of cancer. Participants' ages ranged from 27–74 years ( $M = 47.35$ ;  $SD = 11.32$ ). Forty-five (83.3%) participants identified as White/Caucasian, four (7.4%) identified as Black/African American, three (5.6%) identified as Asian, one (1.9%) identified as Hispanic, and one (1.9%) identified as Multi-Ethnic. The majority of participants ( $N = 45$ , 83.3%) were identified as living in an urban area.

The majority of the sample reported being married ( $N= 35$ , 64.8%). Six participants (11.1%) were single, five (9.3%) were in a committed relationship, four (7.4%) were divorced, three (5.6%) were widowed, and one (1.9%) was separated.

The sample varied with regard to annual income. Eight participants (14.8%) reported their annual income to fall within \$11,000 - \$25,000, eighteen (33.3%) reported their annual income to fall within \$26,000-\$50,000, eight (14.8%) reported their annual income to fall within \$51,000 - \$75,000, ten (18.5%) reported their annual income to fall within \$76,000-\$100,000, and ten (18.5%) participants reported their annual income to be greater than \$100,000.

Education levels varied as well. Fifteen participants (27.8%) reported their highest level of education to be a high school diploma, eight participants (14.8%) reported obtaining an associate's degree, twenty-one participants (38.9%) reported obtaining a bachelor's degree, and ten participants (18.5%) reported obtaining a graduate degree.

The majority of participants ( $N=44$ ; 81.5%) perceived being diagnosed with and treated for breast cancer as a threat of death or serious injury. Participants were also asked to rate, on a scale from 0-6, how stressful the breast cancer diagnosis and treatment for breast cancer was for them, with 0 indicating "not at all stressful" and 6 indicating "very stressful." Scores ranged from 2-6 with a mean of 5.13 and a standard deviation of .972.

Disease stage and treatment modalities were also reported. The majority of participants ( $N=29$ , 53.7%) reported their breast cancer as Stage I at the time of diagnosis. Fifteen participants (27.8%) reported their breast cancer to be a Stage II at the time of diagnosis, four (7.4%) reported Stage III, five (9.3%) reported Stage IV, and one participant (1.9%) reported Stage 0.

Participants endorsed a variety of treatment modalities. Twenty-one participants (38.9%) reported undergoing a full mastectomy as part of their breast cancer treatment. Nine participants (16.7%) reported undergoing a partial mastectomy, sixteen (29.6) reported undergoing a lumpectomy, and one participant (1.9%) reported receiving a bone-marrow transplant. Additionally, twenty-nine participants (53.7%) reported receiving chemotherapy, thirty-one (57.4%) received radiation, and fifteen (27.8%) received hormone therapy. Finally, eight participants (14.8%) reported receiving physical therapy as part of their treatment and one participant (1.9%) endorsed the "other" option as treatment.

The demographic questionnaire also contained the following open ended question: “Please list any other traumatic experiences you have had within the last 5 years that do not pertain to your breast cancer diagnosis or treatment.” Just over one half of the sample ( $N=28$ ; 51.9%) endorsed experiencing other types of trauma within the past five years.

### **Data Analyses**

**Survey results.** Scores on the Posttraumatic Growth Inventory ranged from 5–94 with a mean score of 62.28 and a standard deviation of 21.04. The 2-Way Social Support Scale yielded the following scores on each scale: Receiving Emotional Support scores ranged from 6-34 with a mean score of 29.15 and a standard deviation of 6.42; Giving Emotional Support scores ranged from 2-25 with a mean score of 19.56 and a standard deviation of 4.74; Receiving Instrumental Support scores ranged from 3-20 with a mean score of 15.89 and a standard deviation of 4.11; and Giving Instrumental Support scores ranged from 9-20 with a mean score of 15.31 and a standard deviation of 3.33. The TIPI scales yielded the following scores: Extraversion scores ranged from 1-7 with a mean of 4.34 and a standard deviation of 1.64; Agreeableness scores ranged from 2-7 with a mean of 5.50 and a standard deviation of 1.22; Conscientiousness scores ranged from 2-7 with a mean of 5.73 and a standard deviation of 1.23; Emotional Stability scores ranged from 1-7 with a mean of 4.71 and a standard deviation of 1.58; and Openness scores ranged from 2-7 with a mean of 5.08 and a standard deviation of 1.32.

**Research question 1.** The purpose of research question 1 was to identify whether or not a relationship existed between receiving instrumental support and PTG, as well as providing instrumental support and PTG, when controlling for personality factors. It was hypothesized that a positive relationship would exist between receiving instrumental support and posttraumatic growth after controlling for personality traits. This hypothesis was confirmed as findings

indicated that the amount of instrumental support received was moderately correlated with the amount of PTG reported, partial  $r(47) = .40, p = .002$ .

It was also hypothesized that a positive relationship would exist between providing instrumental support and posttraumatic growth, after controlling for personality factors. This hypothesis was confirmed, as results indicated that the amount of instrumental support provided to others was moderately correlated with the amount of PTG reported, partial  $r(47) = .34, p = .008$ .

**Research question 2.** The purpose of research question 2 was to identify whether or not a relationship existed between receiving emotional support and PTG, as well as giving emotional support and PTG, when controlling for personality factors. It was hypothesized by the researcher that a positive relationship would exist between receiving emotional support and posttraumatic growth, after controlling for personality factors. This hypothesis was confirmed as results indicated that there was a weak, yet significant, relationship between the amount of emotional support received and the amount of posttraumatic growth reported, partial  $r(47) = .26, p = .035$ .

It was also hypothesized that a positive relationship would exist between providing emotional support and posttraumatic growth, after controlling for personality factors. Contrary to the researcher's hypothesis, a significant relationship did not exist between providing emotional support to others and PTG, partial  $r(47) = .16, p = .126$ . Notably, prior to controlling for personality factors, giving emotional support to others was found to demonstrate a weak, but significant, relationship with PTG,  $r(52) = .28, p = .018$

**Research question 3.** The purpose of research question 3 was to identify whether or not the relationship between receiving instrumental support and PTG was stronger than the relationship between receiving emotional support and PTG. It was hypothesized by the

researcher that a stronger relationship would exist between receiving instrumental support and PTG than between receiving emotional support and PTG. Pearson-product correlations were obtained to examine the relationships between (a) receiving instrumental support and PTG,  $r(52) = .45, p = .000$ , and (b) receiving emotional support and PTG,  $r(52) = .33, p = .008$ . A test of the difference between these two dependent correlation coefficients was performed. Results indicated that the difference between the relationship between receiving emotional support and PTG and the relationship between receiving instrumental support and PTG does approach statistical significance,  $t(51) = -1.60, p = .058$ , and suggests that receiving instrumental support accounts for approximately 20% of the variance in PTG whereas receiving emotional support only accounts for approximately 11% of the variance in PTG.

**Research question 4.** The purpose of research question 4 was to identify whether or not a relationship existed between time since diagnosis and PTG. It was hypothesized that a positive relationship would be found between time since diagnosis and PTG. Results indicated that this relationship does approach statistical significance,  $r(52) = -.21, p = .057$ , with time since diagnosis accounting for 4% of the variance in PTG. It should be noted, however, that this relationship is opposite of what was expected and suggests that individuals who have known about their diagnosis for a shorter amount of time reported high levels of PTG.

**Research question 5.** The purpose of research question 5 was to identify whether or not a relationship existed between age and PTG. It was hypothesized by the researcher that a negative relationship would be found between age and PTG. This hypothesis was confirmed as results indicated that a significant negative relationship was found to exist between age and PTG,  $r(52) = -.29, p(\text{two-tailed}), = .014$ , with age accounting for approximately 9% of the variability in PTG scores.



## **Discussion**

There are a number of studies that have explored the construct of posttraumatic growth (PTG) among individuals with a history of breast cancer. Research suggests that the majority of breast cancer survivors experience PTG as a result of coping with the challenges that accompany a diagnosis of cancer; however, the existing research on factors that contribute to PTG in this population presents inconsistent results, particularly regarding the role of social support. Some studies have found social support and PTG to be positively related to one another while other studies have found no relationship at all. The majority of studies examining social support and PTG have focused specifically on emotional support; however, there is some evidence that instrumental forms of support may influence PTG more than emotional support (Nenova et al., 2013). Also, there has been very little research examining the relationship between providing support to others and PTG. Therefore, the purpose of this study is to explore the relationship between receiving emotional and instrumental support and PTG as well as the relationship between giving emotional and instrumental support and PTG in a sample of breast cancer patients. Additionally, the current study examines the relationship between time since diagnosis and PTG as well as age and PTG.

Consistent with the researcher's expectations, a moderate correlation was found to exist between receiving instrumental support and PTG, after controlling for personality factors. This is consistent with Tedeshi and Calhoun's (2004) assertion that the amount of social support one receives may enhance one's likelihood of experiencing posttraumatic growth. It should be noted that the relationship between receiving instrumental support and PTG was the strongest among all the relationships examined in this research study. This lends support to the existing literature that suggests instrumental forms of support may be especially crucial to the development of

positive growth in individuals who are navigating a life threatening illness (Nenova et al., 2013; Sadler-Gerhardt et al., 2010).

Also consistent with the researcher's expectations, a moderate relationship was found to exist between giving instrumental support and PTG. While there have been several studies that have demonstrated positive benefits of providing instrumental support (Brown et al., 2003; Karanci and Acarturk, 2005; Morrow-Howell et al., 2003), this finding is unique in that very little research has been conducted on the relationship between providing instrumental support to others and posttraumatic growth among the breast cancer population.

This study also examined the relationship between receiving emotional support and PTG, as well as providing emotional support and PTG, when controlling for personality factors. Consistent with the researcher's prediction, results indicated that individuals who reported receiving more emotional support also reported higher levels of PTG. This finding is supported by other researchers (Shaefer & Moos, 1998; Tedeschi & Calhoun, 2004) who have speculated that receiving social support allows victims to talk about their trauma, gain other perspectives, develop more effective coping strategies, and begin the process of changing their schema.

Despite the significant amount of research suggesting that providing support to others has a multitude of benefits (Brown et al., 2003; Knoll et al., 2007; Piferi & Lawler, 2006; Shakespeare-Finch & Obst, 2011), a significant relationship was not found to exist between providing emotional support to others and PTG after controlling for personality factors. This finding is interesting because a significant relationship was found between providing instrumental support and PTG when controlling for personality factors but not for providing emotional support. This suggests that providing more tangible forms of support to others may facilitate posttraumatic growth whereas providing emotional support does not.

The research related to receiving social support and PTG among the breast cancer population has primarily focused on emotional support; however, there is some evidence to suggest that instrumental forms of support may be just as important if not more so (Nenova et al., 2013; Sadler-Gerhardt et al., 2010). Therefore, the current study sought to identify whether or not the relationship between receiving instrumental support and PTG was stronger than the relationship between receiving emotional support and PTG. Consistent with the researcher's hypothesis, results indicated that the relationship between receiving instrumental support and PTG was stronger than the relationship between receiving emotional support and PTG. Notably, receiving instrumental support accounted for nearly double the amount of variability in PTG than did receiving emotional support. This finding is significant, as it suggests that not only does the type of social support (e.g. instrumental versus emotional) matter, but instrumental forms of support may be more likely to facilitate PTG than emotional forms of support.

According to Tedeschi and Calhoun's (2004) theoretical model of posttraumatic growth, individuals who have had longer to process their trauma and engage in schema reconstruction are more likely to report higher levels of PTG; therefore, in the current study, it was hypothesized that individuals who had known about their diagnosis longer would report higher levels of PTG. While the relationship between time since diagnosis and PTG did approach statistical significance, the relationship was the inverse of what was expected which suggests that individuals who have known about their diagnosis for shorter periods of time are more likely to report higher levels of PTG. While this finding does not support Tedeschi and Calhoun's position, it is consistent with several other studies that have also found the time since diagnosis and PTG to either be unrelated (Belizzi & Blank, 2006, Cohen & Numa, 2011; Cordova et al., 2007) or inversely related (Weiss, 2004) among a breast cancer population. One explanation

could be that the trauma associated with a diagnosis of breast cancer could be considered ongoing given that individuals often engage in a series of surgeries and/or other treatments; therefore, the time since diagnosis is not likely an accurate reflection of the time since the trauma occurred. Another explanation could be that the effects of PTG may diminish over time. In the future, it may be beneficial to conduct longitudinal research that assess levels of PTG during treatment and after treatment has been completed.

Many studies that have explored PTG among cancer patients and survivors have found that younger individuals report higher levels of PTG than their older counterparts (Bellizzi et al., 2010; Bellizzi & Blank, 2006; Cordova et al., 2007; Koutrouli et al., 2012; Manne et al., 2004). This was also found to be true in the current study. One explanation for this relationship is that younger participants are less likely to expect a diagnosis of cancer at their age, which in turn requires them to engage in a significant amount of cognitive restructuring to accommodate their new situation. Additionally, research suggests that a positive relationship exists between the perception of disease severity and PTG (Bellizzi & Blank, Cordova et al, 2001; Morris & Shakespeare-Finch, 2011; Sears et al., 2003). Therefore, it may be that younger participants perceive the diagnosis of breast cancer as more life-threatening than older participants, which results in higher levels of PTG.

### **Limitations and Future Research**

The current study provides support for the existing literature that indicates social support is positively correlated with PTG in a breast cancer population. It also provides preliminary data suggesting that individuals receiving instrumental support may be more likely to develop posttraumatic growth than individuals receiving emotional support. Additionally, it offers some evidence to suggest that providing instrumental support to others may contribute to the

development of posttraumatic growth. However, there are several limitations to the current study, including a small sample size, lack of diversity with regard to ethnicity and population size among participants, and missing questions in the data set.

Initial snowball sampling yielded a limited sample. The eligibility requirements of having a diagnosis within the past 5 years and having no other history of cancer may have disqualified many individuals who received the electronic announcement inviting them to participate in the study. In addition, individuals who received the announcement may simply have chosen not to pass it on to other potential participants. In an effort to obtain more participants, the researcher used Amazon MTurk to recruit participants. While MTurk provides a diverse pool of potential applicants, the mean age of MTurk participants is approximately 30 years old (Buhrmester, Kwang, & Gosling, 2011). Therefore, individuals who were most likely to meet the requirements to participate in the current study were not likely to be highly represented in the MTurk participant pool.

Another limitation of the current study was the lack of diversity among the sample with regard to ethnicity and population size (e.g. urban, suburban, or rural). The majority of participants identified as Caucasian, which is a persistent problem in PTG breast cancer studies (e.g. Bellizzi & Blank, 2006; Brunet et al., 2010; Cordova et al., 2007). Based on Bellizzi and colleagues' (2010) study which explored PTG in a racially diverse population, there is some evidence to suggest that differences may exist among individuals of different races/ethnicities in how they experience posttraumatic growth; therefore future research should aim to reach a more ethnically diverse sample. Additionally, while the sample represented individuals from many different states in the U.S., the majority of the participants were identified as living in urban areas. Given the existing research that indicates rural cancer survivors are more likely to report

poorer mental health functioning and greater overall distress than non-rural cancer survivors (Burriss & Andrykowski, 2010), it is possible that rurality could also impact the development of posttraumatic growth; therefore, future research should aim to explore the relationship between social support and PTG among breast cancer patients in rural areas.

Finally, after data were collected, it was discovered that two items were not displayed on the online questionnaire. The researcher was able to address this issue by employing a regression imputation technique with data that were previously collected by other researchers. While this did not likely make a significant difference in the overall pattern of results, the imputed data are estimates of the participants' answers as opposed to their actual answers and should therefore be considered a limitation of the study.

## **Conclusion**

This study examined the relationship between receiving instrumental and emotional forms of social support and PTG, as well as the relationship between giving instrumental and emotional forms of social support and PTG, in a sample of breast cancer patients and survivors. The findings indicated that receiving both instrumental and emotional forms of social support were positively correlated with PTG after controlling for personality traits. Receiving instrumental support was found to be more strongly related to PTG which suggests that tangible forms of support may contribute to the development of PTG more than emotional support. Providing instrumental support to others was also found to be positively correlated with PTG; however, providing emotional support was not. This suggests that the act of helping another individual in a concrete way may aid in the development of PTG whereas offering emotional support may not. Finally, the findings support the existing literature indicating that younger individuals report higher levels of PTG.

## Chapter 2: Literature Review

According to the American Cancer Society (ACS, 2015), breast cancer is one of the most frequently diagnosed cancers among women in the United States. Second only to skin cancer, it is estimated that one in eight women in the U.S. will develop invasive breast cancer, and one in thirty-six women will die from breast cancer (Howlander et al., 2012). The ACS (2015) estimates that there will be 231,840 new cases of invasive breast cancer and 60,290 cases of non-invasive breast cancer diagnosed in the U. S. in 2015. Despite the fact that breast cancer is still the second leading cause of cancer deaths for women in the U.S., breast cancer deaths have been declining over the past fifteen years (ACS, 2015). This decline is thought to be a result of earlier detection and advanced treatment options (ACS, 2015). Currently, there are an estimated 2.8 million breast cancer survivors living in the U.S. (ACS, 2015).

For many people, receiving a diagnosis of a life-threatening illness such as cancer will result in significant psychological distress. Cancer patients must deal with a number of negative experiences that may be perceived as traumatic. Such experiences include lengthy medical treatments; side effects such as pain, fatigue, or hair loss; temporary or permanent changes in appearance; disruption in immediate and future plans; and threats of cancer reoccurrence (Manne et al., 2004). While trauma has been defined in a number of different ways in the literature, the Substance Abuse and Mental Health Services Administration (SAMHSA) defines trauma as, “an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or threatening and that has lasting adverse effects on the individual’s functioning and physical, social, emotional, or spiritual well-being” (2012). Although trauma is typically associated with negative psychological symptoms, recent studies have discovered that some individuals report positive changes in the aftermath of trauma. The next section will

provide an overview of the typical negative reactions to a traumatic experience, followed by a more detailed account of positive changes that may develop as a result of coping with trauma.

### **Negative Responses to Trauma**

According to the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013), the psychological distress that one experiences after exposure to a traumatic event may manifest in several different ways. Some individuals may respond with fear or anxiety, while others may exhibit more anhedonic or dysphoric symptoms. Individuals may also become outwardly angry or aggressive or report dissociative symptoms. According to the *DSM-5* (APA, 2013), it is not uncommon for individuals to exhibit a combination of these symptoms after experiencing a traumatic event, which often creates a complex clinical presentation.

The negative psychological effects of cancer have been well-documented in the literature (Alter et al., 1996; Andrykowski & Cordova, 1998; Jacobsen et al., 2002; Kangas, Henry, & Bryant, 2002; Kazak et al., 2004). Specifically, research indicates that a diagnosis of cancer may result in anxiety, depression, maladaptive coping, psychosexual concerns, and vocational difficulties (Baider, Walach, Perry, de Nours, 1998; Brewin, Watson, McCarthy, Lyman, & Dayson, 1998; Epping-Jordan et al., 1999; Smith, Redd, Peyser, & Vogl, 1999). It has also been documented that some individuals diagnosed with cancer may meet the criteria for Posttraumatic Stress Disorder (PTSD; Bleicker et al., 2000; Brewin, et al., 1998; Hampton & Frombach, 2000; Kelly, Raphael, & Smithers, 1995). According to the *DSM-5*, PTSD is characterized by exposure to actual or threatened death, serious injury, or sexual violence that is followed by intrusive symptoms (i.e., distressing memories, dreams, or flashbacks); psychological distress that is provoked by internal or external trauma-related cues; negative alterations in mood and thought



processes (i.e., depression, anhedonia, detachment from others, thought distortions); and alterations in arousal and reactivity (i.e., sleep disturbances, difficulties concentrating, exaggerated startle response, self-destructive behaviors; APA, 2013). In a review of the literature on cancer-related PTSD, Kangas et al. (2002) found the incidence of cancer-related PTSD to range from approximately 5% - 19% depending on the methodology employed.

Negative symptoms such as those related to PTSD are not the only outcomes associated with traumatic experiences. Research indicates that some individuals may also experience positive psychological growth in the aftermath of trauma (Affleck & Tennen, 1996; Aldwin, 1994; Joseph & Linley, 2004; McMillen & Fisher, 1998; Miller & C'deBaca, 1994; Park et al., 1996; Tedeschi & Calhoun, 1996; 2004). The following section will provide an overview of various theoretical models explaining how positive changes may result from a traumatic experience.

### **Positive Responses to Trauma**

The idea that suffering can lead to a positive transformation has been explored for many years (e.g. - Frankl, 1961; Yalom, 1980); however, it has only been within the past couple of decades that researchers in the field of psychology have begun conducting empirical research on why some individuals are more likely than others to experience positive growth as a result of coping with a traumatic experience.

O'Leary, Alday, and Ickovics (1998) identified eight models of life change and positive growth which they divided into two categories: intentional change and unintentional change. Models describing intentional change view change as an evolutionary process that is slow and purposeful. O'Leary and colleagues used the analogy of engaging in therapy to treat depression to explain intentional change models. Unintentional change models view change as sudden and

unexpected. For example, an unintentional change model would be used to explain the transformations one might experience following an unexpected crisis, such as being diagnosed with a life-threatening illness. The present study seeks to explore how positive change can occur as a result of coping with a diagnosis of breast cancer; therefore, the following section will provide a brief overview of unintentional change models.

### **Models of Unintentional Change**

**Life crisis and personal growth.** According to Shafer and Moos's (1992) life crisis and personal growth model, the degree to which an individual experiences personal growth after a crisis is contingent on the interaction of four domains, which include the environmental system, personal system, event-related factors, and coping response style. The environmental system refers to one's social support, financial situation, and living arrangements. Personal characteristics include self-efficacy, motivation, health status, and prior experience with crises. Event-related factors include the timing, duration, and severity of the crisis. Coping responses are divided into two categories, approach coping and avoidance coping. Approach coping refers to actively seeking support, reframing the crisis, and taking steps to solve the problem at hand, whereas avoidance coping refers to minimizing the problem or giving up on a solution. Schaefer and Moos posited that each domain influences the other and that positive growth may occur in the form of enhanced social resources, enhanced personal strengths, and improved coping skills.

**Quantum change.** Miller and C'deBaca's (1994) model of quantum change is described as a sudden deviation from one's normative functioning that may or may not be precipitated by an environmental event. The authors argued that quantum change is different from ordinary change because it occurs rapidly and can result in significant changes to individual traits that are generally considered stable, such as one's values, life goals, temperament, and perceptual style.

In a descriptive study of quantum change, Miller and C'deBaca interviewed participants who had experienced a rapid change due to situations such as a trauma, a debilitating surgery, an alter call at a church service, or a moment of insight into one's emotions. Most participants reported that such changes yielded positive results such as an increased sense of meaning, decreased sense of something missing in life, and increased happiness, satisfaction, and closeness to God; however, the authors posited that the changes may also be perceived as negative and may therefore result in a lower level of functioning than the original baseline. O'Leary et al. (1998) cautioned that the quantum change theory has received little empirical support because the event that stimulates change is unexpected and can therefore only be studied through retrospective interviews.

**Resilience and thriving.** O'Leary and Ickovics's (1995) resilience and thriving model proposed three potential outcomes resulting from coping with exposure to trauma: survival, recovery, or thriving. Survival refers to when individuals survive a trauma but are never able to return to the level of psychological functioning they experienced before the trauma occurred. Recovery refers to when individuals are able to return to the level of functioning they experienced before the trauma occurred. Thriving refers to when individuals achieve a higher level of functioning than what they experienced before the trauma occurred. According to O'Leary and Ickovics, the probability that one will thrive in the aftermath of trauma may be contingent on one's willingness to confront adversity as well as on the availability of personal and social resources. They also argued that individuals who move beyond their original level of functioning will likely develop an enhanced meaning in life and will be better able to cope with future stressors.

**Transformational coping.** Similar to O'Leary and Ickovics (1995), Aldwin's (1994) transformational coping model postulated that coping with a crisis may lead to homeostasis in

which an individual remains at his or her level of functioning, or it could lead to a transformation in the form of positive or negative change. Aldwin utilized the opponent process model (Soloman, 1980) to explain why exposure to a crisis may lead to positive outcomes. The opponent process model suggests that a strong negative affective state is always followed by a strong positive affective state; therefore, if a crisis evokes negative emotions, it must be followed by positive emotions that may result in change. Aldwin also used the deviation amplification theory to explain how crisis could result in positive change. This theory suggested that systems with feedback loops may operate so that small changes are intensified to the extent that they cause a transformation. In their review, O’Leary et al. (1998) illustrated this theory using an example of a person living in poverty whose situation is amplified into homelessness due to a small change in income.

**Transformation.** Tedeschi and Calhoun’s (1995) model of transformational coping, later known as posttraumatic growth (PTG), views change as the result of coping with an unexpected or uncontrollable traumatic event. Like O’Leary and Ickovics (1995) and Scafer and Moos (1992), Tedeschi and Calhoun focused on positive growth after trauma that was facilitated by active attempts to cope. They postulated that in order for positive growth to occur, one must endure a trauma that “shakes the foundations” of his or her assumptive world (Calhoun & Tedeschi, 1998, p. 216), meaning that higher-order goals and beliefs are challenged. The more distressed one is about the trauma, the more rumination, or cognitive processing, will occur, which will cause an individual to reconstruct his or her belief system and experience positive growth.

Tedeschi and Calhoun’s model of posttraumatic growth has evolved over the years and is currently regarded as the most comprehensive theoretical description of positive growth to date

(Joseph & Linley, 2006); therefore, it will be used in the present study to conceptualize how individuals may experience positive changes after a diagnosis of breast cancer. The following sections will provide a more comprehensive account of PTG including how it is measured, theoretical underpinnings, and an overview of relevant literature pertaining to PTG in breast cancer populations.

### **Posttraumatic Growth**

**Posttraumatic Growth Inventory.** In order to measure PTG, Tedeschi and Calhoun (1996) developed the Posttraumatic Growth Inventory (PTGI). They began developing the PTGI by identifying three general areas in which individuals experience positive growth. These areas were based on a review of the literature and their own previous research and included changes in self-perception, changes in interpersonal relationships, and a changed philosophy of life (Tedeschi & Calhoun). Based on these three areas, Tedeschi and Calhoun initially developed a 34-item questionnaire which they administered to 604 undergraduate psychology students (405 females and 199 males) who had experienced a “significant life crisis.” Participants were instructed to think about the crisis and rate the degree to which they believed change had occurred as a result of the crisis. Participants responded using a Likert-type scale ranging from 0 (“I did not experience this change as a result of my crisis”) to 5 (“I experienced this change to very great degree as a result of my crisis”), (Tedeschi & Calhoun, 1996, p. 459). The majority of participants were between the ages of 17 - 25 and identified as single. They reported a variety of crises including bereavement (36%), injury producing accidents (16%), separation or divorce of parents (8%), relationship breakup (7%), criminal victimization (5%), academic problems (4%), and unwanted pregnancy (2%). The time since the crisis had occurred also varied: less than 6

months ago (22%), between 7 and 12 months ago (16%), between 13 and 23 months ago (17%), between 2 and 4 years ago (32%), and more than 4 years ago (13%), (Tedeschi & Calhoun).

After the initial data was collected, data analysis yielded a five factor solution comprised of 21 items. The final five factors were labeled Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation for Life (Tedeschi & Calhoun). The internal consistency of the overall scale was .90 and the internal consistencies for the five factors ranged from .67 - .85.

Tedeschi and Calhoun (1996) noted some gender differences in the overall scale, in that women reported finding more benefits than men, and women scored higher on every factor except the New Possibilities factor, which was not significantly different between women and men. Additionally, the authors acknowledged that there were likely to be some low to moderate correlations between PTGI and various personality characteristics. To test this, they used the Life Orientation Test to explore optimism (LOT; Scheier & Carver, 1985), the NEO Personality Inventory to explore Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness (NEO; Costa & McCrae, 1985), and a three-item measure to explore religious participation. Results indicated that PTGI was positively correlated with optimism and all the factors of the NEO except for Neuroticism. Extraversion was the only NEO factor that was positively correlated with each PTGI factor. Finally, religiosity was positively correlated with the PTGI.

To examine the construct validity of the PTGI, Tedeschi and Calhoun (1996) wanted to ensure that the PTGI assessed benefits unique to individuals who have experienced a trauma compared to individuals who have only experienced ordinary life events. The authors recruited a sample of 194 participants to complete the PTGI as well as the Traumatic Stress Schedule (TSS;

Norris, 1990). The TSS is a screening instrument designed to assess the prevalence and impact of traumatic effects and was therefore used to identify participants who had not experienced any traumatic events versus those who had experienced at least one traumatic event. When taking the instruments, participants were asked to only rate changes that occurred within the past year. Based on answers on the TSS instrument, the data from 117 participants (54 who reported at least one trauma and 63 who reported no trauma) was analyzed. Tedeschi and Calhoun conducted a gender x severity of trauma analysis of variance (ANOVA) with the PTGI score as the dependent variable. The results of the analysis reiterated that females reported more benefits than males, participants who experienced severe trauma reported more benefits than those who did not, and the gender x severity of trauma interaction was not significant.

**Theoretical model of posttraumatic growth.** The development and use of the PTGI allowed researches to gain a better understanding of the theoretical foundations of posttraumatic growth. Tedeschi and Calhoun (2003) posited that there are generally five conditions present that facilitate the experience of posttraumatic growth. The authors asserted that an individual must first experience a trauma that causes him or her to reevaluate previously held assumptions. Next, the individual must be able to effectively manage the initial distress associated with the trauma to allow for cognitive processing to take place. In the third condition, the individual will disengage from previously held assumptions because these assumptions no longer fit into his or her post-trauma schema. Then, the distress from the trauma must persist long enough for the individual to start reconsidering previously held assumptions. In the final condition, the individual will begin building new assumptions to account for the new information that has been acquired since the trauma, which leads to schema changes (Tedeschi & Calhoun, 2003). Tedeschi and Calhoun (2004) noted that it is not the trauma itself that produces PTG but rather the result of coping with

the trauma. The authors also noted that just because an individual experiences positive growth as a result of coping with trauma does not mean that he or she will not also continue to experience trauma-related distress, as these are independent of one another.

During the development on the PTGI, Tedeschi and Calhoun (1996) identified five domains in which individuals may experience posttraumatic growth. These domains include: Greater Appreciation for Life, Relating to Others, Personal Strength, New Possibilities, and Spiritual Change. The first domain, a greater appreciation for life, refers to situations in which individuals reevaluate their priorities or gain a stronger appreciation for what were once considered “little things.” The second domain, relating to others, refers to the development of closer and more meaningful relationships with others. The third domain, personal strength, refers to situations in which individuals feel stronger and capable of handling difficult situations. The fourth domain, new possibilities, includes the identification of new goals or directions in life. The final domain, spiritual growth, refers to an increase in spirituality or religious beliefs or an increased engagement in existential thought processes (Tedeschi & Calhoun, 2004).

Tedeschi and Calhoun (2004) also identified individual characteristics that influence PTG including personality traits, one’s ability to manage distressing emotions, and the amount of support one receives from others. Regarding personality characteristics, Tedeschi and Calhoun posited that there are two personality traits, extraversion and openness, that influence the likelihood of an individual experiencing positive growth in the aftermath of trauma. The authors speculated that individuals who score high on measures of extraversion and openness are more likely to be cognizant of positive emotions during an adverse situation and be able to process information about the adverse situation more efficiently, therefore resulting in the schema change necessary to facilitate posttraumatic growth.



Tedeschi and Calhoun (2004) also asserted that an individual's ability to manage distress influences the likelihood that he or she will experience posttraumatic growth. Exposure to a traumatic event initially creates a high level of distress during which cognitive processing may be automatic in the form of ruminations or intrusive thoughts and images of the trauma. According to Tedeschi and Calhoun, such cognitive processing enables individuals to disengage from their previously held assumptions and beliefs and develop new, more adaptive schemas which can result in posttraumatic growth. The authors posited that the longer the distress persists, the more cognitive processing will take place, and therefore the more posttraumatic growth will occur (Tedeschi & Calhoun).

Finally, Tedeschi and Calhoun (2004) identified the amount of social support one receives as an individual characteristic that may enhance one's likelihood of experiencing posttraumatic growth. Supportive others can help facilitate PTG by providing a safe environment for the individual to share his or her experiences. The experience of self-disclosure allows the individual an opportunity to examine previously held assumptions, solicit feedback from others, confront questions of meaning, and create new schemas (Tedeschi & Calhoun). The role of social support in posttraumatic growth is of particular interest to the current study and will be further discussed in a later section.

To summarize, Tedeschi and Calhoun began exploring the construct of positive growth after trauma in the mid-1980s which led to the development of the PTGI in 1996. The PTGI has been used in a multitude of studies which have served to inform researchers about the theoretical model of posttraumatic growth. Tedeschi and Calhoun's model is the most frequently used model of positive growth in the literature today (Helgeson, Reynolds, & Tomich, 2006; Linley & Joseph, 2004). There have been a multitude of studies published in the literature supporting the

development of PTG as a result of coping with a variety of traumatic experiences, including bereavement (Engelkeymeyer & Marwit, 2008), cancer (Arpawong, Richeimer, Weinstein, Elghamrawy, & Milam, 2012; Cordova, Cunningham, Carlson, & Andrykowski, 2001; Widows, Jacobsen, Booth-Jones, & Fields, 2005), combat (Bush, Skopp, McCann, & Luxton, 2011), heart disease (Senol-Durak & Ayvasik, 2010; Sheikh, 2004), HIV/AIDS (Sawyer, Ayers, & Field, 2010), natural disasters (Karanci & Acarturk, 2005), prisoner of war experiences (Erbes et al., 2005; Solomon & Dekel, 2007), sexual assault (Frazier & Berman, 2003), and stem cell transplant survivors (Nenova, Duhamel, Zemon, Rini, & Redd, 2013).

The present study seeks to utilize Tedeschi and Calhoun's (1996; 2004) model of posttraumatic growth to explore the relationship between social support and PTG for individuals with a diagnosis of breast cancer. The following sections will provide an overview of the existent literature pertaining to variables that have been found to predict PTG in breast cancer patients including demographics, disease and treatment characteristics, psychosocial characteristics, and the role of giving and receiving social support.

### **Posttraumatic Growth in Breast Cancer Patients and Survivors**

**Disease and treatment characteristics.** Based on Tedeschi and Calhoun's (2004) theoretical model of PTG, individuals who have known about their diagnosis longer would be likely to report more growth due to having a longer amount of time to engage in the cognitive processing which facilitates the need for schema reconstruction. Some studies have supported this assertion while others have not. For example, Sears, Stanton, and Danoff-Burg (2003) explored the relationship between benefit finding, positive reappraisal coping, and posttraumatic growth in a sample of 92 women who were in the early stages of breast cancer. Surveys were administered to the participants at the beginning of the study and again at 3 months and 12

months. Results indicated that individuals who had a longer period of time to process information about their illness reported more posttraumatic growth. Cordova et al. (2001) found similar results in their study, which compared breast cancer survivors to healthy control participants in reports of depression, well-being and PTG. The amount of time that had passed since participants were diagnosed with breast cancer was positively correlated with PTG. Weiss (2004), however, found the opposite results in a study of 72 married, early stage breast cancer survivors. In this study, the time since diagnosis was inversely correlated with PTG. This finding is interesting given that the inclusion criterion was similar to that of Sears and colleagues. It should also be noted that some studies have found no relationship to exist between the amount of time that has passed since diagnosis and PTG (Bellizzi & Blank, 2006; Cohen & Numa, 2011; Cordova et al., 2007).

The majority of studies in PTG suggest no significant relationship between actual disease severity and PTG (Cordova et al., 2001; Manne et al., 2004; Weiss, 2004). However, there is evidence to support a positive correlation between one's perception of disease severity and PTG (Bellizzi & Blank, 2006; Cordova et al., 2001; Morris & Shakespeare-Finch, 2011; Sears et al., 2003). For example, Cordova et al. (2001) found that breast cancer survivors who met the criteria for PTSD experienced more posttraumatic growth than those who did not meet the criteria for PTSD. Similarly, in the Sears et al. (2003) study, individuals who reported more stress in reaction to cancer reported more posttraumatic growth. Bellizzi and Blank found that individuals who perceived the intensity of the disease as high at the time of diagnosis reported higher levels of growth in the relating to others domain of PTG. These findings are conceptually consistent with Tedeschi and Calhoun's (1996) model of posttraumatic growth. The more distressed one is

in the aftermath of a trauma, the more challenged one's assumptions will be and the more necessary it will be to engage in schema reconstruction.

Some studies that have explored the relationship between breast cancer and PTG have also considered the various types of treatment modalities including chemotherapy, radiotherapy, lumpectomy, or mastectomy. The majority of the literature indicates that the type of treatment is unrelated the amount of PTG one experiences (Bellizzi & Blank, 2006; Bower, Meyerowitz, Desmond, Bornaards, Rowland, & Ganz, 2005; Carver, Smith, Petronis, & Antoni, 2006; Cohen & Numa, 2011; Cordova et al., 2007; Tomich & Helgeson, 2002). However, in a sample of 307 breast cancer survivors, Lelorain, Bonnaud-Antignac, & Florin (2010) found that receiving chemotherapy was a predictor of PTG, although the effect size was small. The authors hypothesized that chemotherapy may be associated with more perceived seriousness of the disease, which according Tedeschi and Calhoun's (2004) theory, would result in more posttraumatic growth.

**Demographic variables.** Demographic variables such as age, race, education, income, marital status, and occupational status have been explored in a number of studies examining the relationship between breast cancer and PTG whereas other variables, such as ethnicity and geographical location have been largely understudied. Women who have been diagnosed with breast cancer at a younger age have consistently reported higher levels of PTG than their older counterparts (Bellizzi et al., 2010; Bellizzi & Blank, 2006; Cordova et al., 2007; Manne et al., 2004). Also, individuals who are married are more likely to report higher level of PTG (Bellizzi & Blank, 2006; Weiss, 2004). Additionally, Bellizzi and Blank (2006) and Bellizzi et al. (2010) found that breast cancer survivors who worked either part-time or full-time reported higher levels of PTG.

The relationships between PTG and education and PTG and income are less clear. Bellizzi & Blank (2006) found that less education was associated with higher levels of PTG in their sample of 224 breast cancer survivors, 60% of whom had attended college. Weiss (2004) also found that in a sample of 72 breast cancer survivors, PTGI scores were higher for those who had only a high school education than those who pursued further education. Contrary to these findings, Cordova et al. (2007) found higher levels of education to be positively correlated with PTG; however, it should be noted that the majority of participants ( $N = 65$ ) were well-educated with 95% of the sample having at least some college or vocational training. Other studies have found no relationship between level of education attainment and PTG in breast cancer patients (Cohen & Numa, 2011; Sears et al, 2003; Silva, Moreira, & Canavarro, 2012).

In regard to income, Cordova et al. (2001) found higher income to be associated with higher rates of PTG in a sample of 70 breast cancer survivors. The authors postulated that having more financial resources may act as a buffer to the stress that one experiences during a life-threatening illness. However, in a later study of 65 participants, Cordova et al. (2007) found that income was unrelated to levels of PTG. It may be that the latter study did not find higher income to be associated with PTG because of the disproportional income distribution of nearly half the sample earning an annual income over \$100,000.

Most of the literature related to posttraumatic growth in breast cancer patients has included a predominantly European-American sample. Inclusion rates for African-American women have ranged from 3% – 8% (Bellizzi & Blank, 2006; Cordova et al., 2001, Cordova et al., 2007; Sears et al., 2003); 1% - 3% for Hispanic women (Brunet et al., 2010; Bellizzi & Blank, 2006; Sears et al., 2003); and 1% - 6% for Asian Americans (Brunet et al., 2010; Sears et al., 2003; Cordova et al., 2007). The exception to this is a study by Bellizzi et al. (2010) who

examined PTG and health-related quality of life in a racially diverse sample of breast cancer survivors. In this study, 62.3% of the sample identified as Caucasian, 25.5% identified as African American, and 12.2% identified as Hispanic. Bellizzi et al. (2010) found that African Americans reported more growth than their Caucasian and Hispanic counterparts; however, this relationship was mediated by religiosity, meaning that once religiosity was taken into account, there was no significant difference between Caucasian, Hispanic, or African American women in reports of PTG. It should be noted that there have been additional studies exploring posttraumatic growth by means other than using Tedeschi and Calhoun's (1996) PTGI which have found African American women to experience more posttraumatic growth than European-American women (e.g. Bower, Meyerowitz, Desmond, & Bernaards, 2005; Tomich & Helgeson, 2004). This suggests that additional studies using the PTGI to explore posttraumatic growth in racially diverse samples of breast cancer patients are warranted.

Geographical location is another factor that may affect one's response to a diagnosis of cancer. While a literature search revealed no studies exploring how geographic location (urban versus rural) might affect the development of PTG, there is existing research indicating that rural cancer survivors report poorer mental health functioning, greater symptoms of anxiety and depression, greater distress, and more emotional problems as compared to their non-rural counterparts (Burriss & Andrykowski, 2010). Similarly, in a study that focused specifically on breast cancer patients, individuals who lived in more rural areas scored lower overall on measures of quality-of-life and functional well-being (Reid-Arndt & Cox, 2010). Considering these findings, it is conceivable to think that characteristics related to rural life may affect the extent to which individuals experience PTG.

**Psychosocial variables.** The literature on PTG and breast cancer indicates that coping styles may impact how much PTG one experiences. Some studies have used the Brief COPE scale (Carver, 1997) to investigate methods of coping. The Brief COPE contains 28 items and 14 subscales including active coping, planning, suppression of competing activities, restraint coping, seeking instrumental social support, seeking emotional social support, positive reinterpretations, acceptance, turning to religion, focus on venting of emotions, denial, behavioral disengagement, mental disengagement, and alcohol and drug use.

In Belizzi & Blank's (2006) study, the authors conducted a factor analysis of the items on the Brief COPE scale and found 2 distinct factors, Active Adaptive Coping and Maladaptive Coping. The Active Adaptive Coping factor included the subscales of self-distraction, active coping, seeking emotional and instrumental support, venting, positive reframing, planning, acceptance, and religion. Regression analyses indicated that active adaptive coping explained the greatest amount of variance in all three of the PTG domains used in a study which were Relating to Others, New Possibilities, and Appreciation for Life (Belizzi & Blank).

Lelorain et al. (2010) found similar results in a sample of 307 breast cancer survivors. Similar to Bellizzi and Blank (2006), the authors conducted a factor analysis on the subscales of the Brief COPE (Carver, 1997) which yielded 7 factors including: Relational Coping comprised of emotional support, instrumental support, and venting; Active Coping comprised of active coping, self-distraction, and planning; Positive Coping comprised of humor, positive reframing, and one item of the acceptance subscale. The 4 remaining factors corresponded with the original subscales which were Religion, Substance Use, Denial, and Blame. Regression analyses indicated that active, positive, relational, and religious coping all predicted growth.

According to Tedeschi and Calhoun's (1996, 2004) model, certain personality characteristics such as extraversion, openness to experience, and optimism have been found to correlate positively with PTG. Consistent with their model, Bozo et al. (2009) found that dispositional optimism was positively correlated with PTG in a sample of postoperative breast cancer patients; however, other studies did not support these findings. For example, Sears et al. (2003) found that hope and optimism were not related to PTG in early-stage breast cancer patients and Bellizzi and Blank (2006) replicated these findings in their study of breast cancer survivors.

### **Social Support**

**Receiving social support.** Based on the current literature, the relationship between receiving social support and PTG is unclear. Tedeschi and Calhoun asserted that, "Supportive others can aid in posttraumatic growth by providing a way to craft narratives about the changes that have occurred, and by offering perspectives that can be integrated into schema change" (2004, p. 8). Similarly, Shaefer and Moos (1998) speculated that receiving support from others after a traumatic event can help create a more favorable appraisal of the event and help in the development of more effective coping strategies. Prati and Pietrantonio (2009) conducted a meta-analysis of 103 studies examining the role of optimism, social support, and coping in contributing to PTG. Forty-six studies that measured the contribution of social support to PTG were identified and analysis indicated that social support had a moderate effect on PTG. It should be noted that their criteria for inclusion was any study that measured positive change as a result of exposure to a traumatic event; thus, not all studies utilized Tedeschi and Calhoun's PTGI nor did they pertain specifically to cancer patients.



Several studies have explored the relationship between social support and PTG in cancer patients including individuals with breast cancer (Bozo et al., 2009; Cohen & Numa, 2011; Schmidt, Blank, Bellizzi, & Park, 2011; Schroevers et al., 2010; Scrignaro et al., 2011; Weiss, 2004); however, the results have been inconsistent. Schroevers and colleagues (2010) conducted a longitudinal study exploring the role of social support in PTG in a sample of long-term cancer survivors. The authors utilized the Social Support List (SSL; Sonderen, 1991) to measure three categories of social support: perceived emotional support, received emotional support, and dissatisfaction with received emotional support at 3 months after diagnosis and again approximately 8 years later. The Silver Linings Questionnaire (Sondergren & Hyland, 2000) was used to measure positive growth at 8 years after diagnosis. Results indicated that participants who reported receiving more emotional support in the early stages of their diagnosis were more likely to report more positive growth at 8 years post-diagnosis. Perceived emotional support and dissatisfaction with received emotional support were not predictive of long-term positive growth (Schroevers et al., 2010).

Bozo and colleagues (2009) measured social support as a moderator to the relationship between dispositional optimism and PTG in a population of postoperative breast cancer patients. The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) was used to measure social support. The MSPSS measures four domains, which include perceived support from family, perceived support from friends, perceived support from a private person, and a global measure of perceived support. The results indicated that patients who scored higher on all measures of perceived social support were more likely to report higher levels of PTG. Further, perceived support from a private person moderated the relationship between dispositional optimism and PTG, meaning that when perceived social support from a

private person was high, there was a stronger correlation between dispositional optimism and PTG. Perceived global social support, perceived social support from friends, and perceived social support from family were not found to be moderators.

Cohen and Numa (2011) explored predictors of PTG in breast cancer survivors who volunteered to work with newly diagnosed breast cancer patients versus breast cancer survivors that did not participate in volunteer activities. The MSPSS was utilized to measure social support and results indicated that there was no significant relationship between perceived social support and PTG. Cordova et al. (2001) measured social support using the Duke-UNC Functional Social Support Questionnaire (Broadhead, Gehlbach, De Gruy, & Kaplan, 1988) and found social support to be unrelated to PTG in a group of breast cancer survivors. Similarly, Weiss (2004) utilized the Brief Social Support Questionnaire (Sarason, Sarason, Shearin, & Pierce, 1987) to measure social support in married breast cancer survivors. Results indicated that there was no significant correlation between PTG and survivors' general perceptions of social support.

While some of the inconsistencies in the existing literature regarding the relationship between social support and PTG may be explained by methodological and sample differences, further exploration is warranted. Most studies concerning PTG and breast cancer patients have used broad measures of social support or have focused specifically on emotional social support; however, little attention has been given to other forms of social support. The following section will provide evidence for the importance of measuring other forms of social support in a population of breast cancer patients, specifically instrumental support.

**Subtypes of social support.** Historically, social support has been viewed as a multidimensional construct. House (1981) proposed a model of social support that had four domains which included emotional concern, instrumental aid, information assistance, and

appraisal. Other researchers, including Barrera and Ainlay (1983), identified as many as six different types of social support, including material aid, behavioral assistance, intimate interaction, guidance, feedback, and positive social interaction. However, Shakespeare-Finch and Obst (2011) argued that many of these domains overlap and that social support can basically be categorized into two categories: emotional support and instrumental support. Emotional support typically refers to having someone who listens to and validates the recipient's thoughts and feelings, someone with whom the recipient can talk over problems, or someone to help in making difficult decisions. Instrumental support generally refers to more tangible services that one receives from network members such as financial assistance or transportation (Manne & Scholl, 2001; Nenova et al., 2013; Park, Cho, & Moon, 2010).

Prati and Pietrantonio (2009) hypothesized that "it is likely that the beneficial effect of social support is different when controlling for the impact of different types of social support" (p. 375). There is some evidence to suggest that tangible forms of social support, such as providing transportation, preparing meals, or helping with financial matters, are more likely to predict PTG. For example, in a study on stem cell transplant survivors and their partners, Nenova et al. (2013) utilized the Emotional and Instrumental Support subscale of the Partner Responses to Cancer Inventory (Manne & Scholl, 2001) to measure the relationship between emotional and instrumental forms of social support and PTG. Results indicated that although both types of social support were positively correlated with scores of PTG, only instrumental support was a unique predictor of PTG. In this study, instrumental social support referred to acts such as helping with chores or handling financial matters (Nenova et al., 2013). There are also qualitative data to support the need for more tangible support. In a study by Sadler-Gerhardt, Reynolds, Britton, and Kruse (2010), eight breast cancer survivors shared their perceptions of

how breast cancer changed their lives and how they made meaning of the experience. According to Sadler-Gerhardt et al., “many of the participants could have benefitted from meals, transportation, child care, or other concrete help” (p. 276).

The current section has reviewed the different subtypes of social support received and how those may relate to PTG; therefore, the next section will provide an overview of the literature pertaining to providing social support to others. Additionally, the next section will present evidence for why the relationship between providing support to others and PTG should be explored in a population of breast cancer patients.

**Provision of social support to others.** The majority of social support research has focused on the effects of receiving social support; however, there is a body of research indicating that providing social support may have a variety of positive effects including better physical and mental health, lower mortality rates, and higher scores on measures of overall well-being (Shakespeare-Finch & Obst, 2011). Furthermore, there is some evidence to support that providing social support may be more beneficial than receiving it (Knoll, Kienle, Bauer, Pfuller, & Luszczynska, 2007).

Piferi and Lawler (2006) investigated the relationship between providing social support to others and ambulatory blood pressure and found that a higher tendency to provide social support was associated with less depression, less stress, greater self-esteem, and greater self-efficacy. Thomas (2010) found that older adults scored higher on measures of well-being when they provided support to others, whereas receiving support was less important. Brown, Nesse, Vinokur, and Smith (2003) examined the effects of giving and receiving social support on mortality in a sample of older couples. Results indicated that individuals who provided emotional support to their spouse and instrumental support to relatives, friends, and neighbors had reduced

mortality rates and that receiving social support had no effect on mortality after controlling for providing support.

Individuals often provide social support to others through volunteering. Utilizing data from the Americans' Changing Lives Study (House, 1989), Morrow-Howell and colleagues (2003) found that older adults who engaged in volunteer activities reported higher levels of well-being. Similarly, using the same data set, Musick and Wilson (2003) found volunteering to be associated with lower levels of depression in adults aged 65 or older.

There is also some evidence to suggest that women receive more benefits than men from providing support to others. For example, in a longitudinal study by Vaananen, Buunk, Kivimaki, Pentti, and Vahtera (2005), women who reported giving more support than receiving it in intimate relationships were overall healthier as evidenced by fewer sick-leave absences from work over a 9-year period. Conversely, men who reported receiving more support than giving in an intimate relationship had fewer absences.

While very little research has been done, there is some preliminary evidence suggesting that a positive relationship may exist between providing support to others and PTG. For example, in a study by Karanci and Acarturk (2005), the authors found that volunteering in a disaster relief program predicted positive growth in earthquake survivors, although this relationship was present only after controlling for coping approaches. In a study by Chambers et al. (2013), 10 prostate cancer survivors were trained to be peer mentors to current prostate cancer patients and their spouses. Quantitative measures were used to rate the effectiveness of the peer intervention on the current patients/spouses, and focus groups were utilized to learn about the experiences of the peers who provided the supportive intervention. One of the main themes that emerged from the qualitative data is that the peers felt a sense of personal growth after providing support to

others. For example, one peer stated, “There’s three things you learn out of this; one is that you become more compassionate, you gain wisdom and you gain insight” (Chambers et al., p. 447).

There is qualitative evidence to suggest that helping others may contribute to PTG in a breast cancer population. Heppner et al. (2009) conducted a qualitative study with breast cancer survivors to investigate stressors related to lymphedema, coping mechanisms, and the role of social support. The only general theme that emerged for the social support category was “the opportunity to nurture others” (Heppner et al., p. 333). All participants in the study endorsed this theme and indicated that providing support or nurturance to others was a way to give back to others and take their mind off of the stressors associated with lymphedema.

Overall all, very little research has explored how providing social support to others in the aftermath of trauma may facilitate positive growth. According to Tedeschi and Calhoun’s (2004) model, exposure to a traumatic event initially creates a high level of distress which must be effectively managed in order for the cognitive processing to occur which produces the schema changes that result in posttraumatic growth. Research already supports the notion that providing social support to others can have a number of benefits, such as decreased stress and higher scores on measures of overall well-being; therefore, it is conceivable that these positive benefits would also assist one in effectively managing the distress felt after a trauma, which would in turn facilitate positive growth.

**Social support and personality characteristics.** The relationship between various personality traits and PTG have been discussed in previous sections of the present literature review; however, there is also literature supporting a link between certain personality characteristics and social support. Personality traits can impact social support in many ways. For example, individuals who are considered high in agreeableness may be perceived as kind and

gentle, which would increase the likelihood that others would want to interact with them (Swickert, Hittner, & Foster, 2010). Similarly, individuals who are extroverted are more likely to enjoy the company of others and therefore have a wider circle of friends to provide social support in times of distress (Swickert, Rosentreter, Hittner, & Mushrush, 2002). Conversely, individuals who have a tendency towards anger and hostility would likely be perceived as difficult to get along with and have a less expansive social network (Dehle & Landers, 2005).

In a study examining the relationship between the Big Five personality traits and perceived social support in a population of undergraduate students ( $N = 366$ ), Swickert and colleagues (2010) found that extraversion and openness to experience were positively related to perceived social support, and neuroticism was negatively related to perceived social support. Bowling, Beehr, and Swader (2005) examined the role of personality traits (extraversion, neuroticism, and agreeableness) in giving and receiving support from co-workers. Results indicated that extraversion and agreeableness predicted giving and receiving non-job support and positive work-related support. Neuroticism, however, was found to be unrelated to giving or receiving any kind of support (Bowling et al., 2005).

Despite the fact that there is literature to support correlations between both personality and social support and personality and posttraumatic growth, most studies examining social support and PTG have not controlled for personality factors. Therefore, the current study will include a brief personality assessment in order to control for the influence of personality traits when exploring the relationship between social support and PTG in a population of breast cancer patients.

### **Purpose and Importance of Study**

Nearly 300,000 women are expected to be diagnosed with breast cancer in the year 2015 (ACS, 2015). Although it is still the second leading cause of cancer-related deaths, breast cancer related deaths have steadily declined over the past 15 years, meaning that more and more women are joining the ranks of survivors. Research suggests that the majority of breast cancer survivors experience at least some level of posttraumatic growth as a result of coping with the challenges that accompany a diagnosis of cancer (Koutrouli et al., 2012); however, the literature regarding the relationship between social support and posttraumatic growth in breast cancer patients is mixed with some studies finding a positive correlation between the two (Schroevers et al., 2010; Bozo et al., 2009), while other studies have found no relationship at all (Cohen & Numa, 2011; Cordova et al., 2001; Weiss, 2004). The majority of studies examining social support and PTG have used broad measures of social support or have focused specifically on emotional support; however, there is some evidence that instrumental support may influence PTG more than emotional support (Nenova et al., 2013). In addition, there is evidence that providing support to others can have overall positive results, including less depression, less stress, and greater self-efficacy (Piferi and Lawler, 2006); however, there have been no quantitative studies to date that have examined this relationship between providing social support to others and PTG.

The literature suggests that PTG may serve as a protective factor from depression and other posttraumatic stress symptoms (Morrill et al., 2008; Silva et al., 2012); therefore, further research regarding factors that contribute to PTG is necessary. The current study aims to contribute to the existing literature by exploring the relationship between receiving emotional and instrumental forms of social support and PTG, as well as the relationship between giving emotional and instrumental forms of social support and PTG, in a sample of breast cancer



patients and survivors. Additionally, this study explores the relationship between the demographic variables of age and time since diagnosis and PTG.

### **Research Questions and Hypotheses**

Given the inconsistencies in the existing literature surrounding the relationship between receiving social support and PTG in breast cancer patients, and the gap in the literature regarding the relationship between providing social support to others and PTG in breast cancer patients, the following research questions and hypotheses were proposed:

1. Is there a relationship between giving and receiving instrumental support and PTG when controlling for personality factors?

Hypothesis 1a: It is expected that receiving greater levels of instrumental support will be associated with higher levels of PTG, after controlling for personality factors

Hypothesis 1b: It is expected that giving greater levels of instrumental support will be associated with higher levels of PTG, after controlling for personality factors.

2. Is there a relationship between giving and receiving emotional support and PTG when controlling for personality factors?

Hypothesis 2a: It is expected that receiving greater levels of emotional support will be associated with higher levels of PTG, after controlling for personality factors.

Hypothesis 2b: It is expected that giving greater levels of emotional support will be associated with higher levels of PTG, after controlling for personality factors.

3. Will the relationship between receiving instrumental support and PTG be stronger than the relationship between receiving emotional support and PTG?

Hypothesis 3: It is expected that a stronger relationship will exist between receiving instrumental support and PTG than with receiving emotional support and PTG.

4. Is there a relationship between time since diagnosis and PTG?

Hypothesis 4: It is expected that a positive correlation will be found between time since diagnosis and PTG.

5. Is there a relationship between age and PTG?

Hypothesis 5: It is expected that a negative correlation will be found between age and PTG.

### **Chapter 3: Methods**

The literature regarding the relationship between social support and posttraumatic growth in breast cancer patients is inconsistent, with some studies finding a positive correlation between the two (e.g., Schroevers et al., 2010; Bozo et al., 2009) and other studies finding no relationship at all (Cohen & Numa, 2011; Cordova et al., 2001; Weiss, 2004). The majority of studies examining social support and PTG have used broad measures of social support or have focused specifically on emotional support; however, there is some evidence that instrumental support may influence PTG more than emotional support (Nenova et al., 2013). In addition, there is evidence that providing support to others can have overall positive results, including lower levels of depression and stress and higher scores on measures of well-being; however, there have been no quantitative studies to date that have examined this relationship between providing social support to others and PTG.

The literature suggests that PTG may serve as a protective factor from the negative psychological effects of trauma, such as depression and other posttraumatic stress symptoms (Morrill et al., 2008; Silva et al., 2012); therefore, further research regarding factors that contribute to PTG is warranted. The current study aims to explore the relationship between received emotional and instrumental support and PTG, as well as the relationship between giving emotional and instrumental support and PTG in a sample of individuals who have a history of breast cancer. Additionally, the current study also explores the relationship between various demographic variables and measures of PTG.

This chapter describes the methodology that was employed for the current study. It begins by providing information regarding the criteria that participants were required to meet in order to participate in the study. Then, an overview of the instruments that were used as well as

relevant psychometric properties of these instruments is reported. Finally, the procedure for data collection and statistical techniques for analyzing the data are presented.

## **Participants**

**Sample recruitment.** Participants were initially recruited via snowball sampling. Snowball sampling refers to the process in which organizations, listservs, or websites are identified and asked to forward information regarding the present study to other potential participants. This process has been identified as a valid means for obtaining access to populations that are otherwise difficult to reach (Patton, 2002). Additionally, a list of breast cancer patients from an earlier IRB approved study who expressed interest in participating in further research were contacted and asked to send the study link to their contacts. Finally, an online survey company, Amazon Mechanical Turk (MTurk), was utilized. Amazon MTurk provides researchers with a ready pool of individuals who receive nominal compensation (from \$.05 - \$1.00) to complete tasks and projects. Participants receive a brief summary of the project and are made aware of the amount of compensation. Buhrmester, Kwang, and Gosling (2011) conducted an investigation of Amazon MTurk and found that participants tend to be slightly more demographically diverse than standard internet samples and may be recruited quickly and inexpensively. These researchers also asserted that the compensation rates do not appear to affect the quality of the data and the data is at least as reliable as that collected by other more traditional methods. Similarly, Casler, Bickel, and Hackett (2013) compared responses on a behavioral task among three different groups of participants, including face-to-face participants, those who were recruited through social media websites, and those recruited through MTurk. Results indicated that MTurk participants were significantly more socio-economically and

ethnically diverse than the other two groups, yet the test results among the three groups were equivalent.

**Sample selection.** All interested participants were required to meet the following criteria: (a) identified as women, (b) were at least 18 years of age, (c) had been diagnosed with breast cancer within the past 5 years, (d) had no history of any other type of cancer, and (e) consented to participate in the study. Individuals who did not meet all of the above criteria were excluded from participation.

### **Instruments**

**Eligibility questionnaire.** The eligibility questionnaire was a 4-question screening instrument created by the investigator to determine whether or not a potential participant met the eligibility criteria. The questions ensured that the potential participant identified as a woman, met the age requirement, had a history of being diagnosed with breast cancer within the past five years, and had no history of any other types of cancer.

The 5-year cutoff for time since diagnosis was implemented for multiple reasons. According to Brunet et al. (2010), the 5 year mark is a significant milestone in the cancer literature and it is often the point at which women are able to discontinue taking hormone medications known as selective estrogen response modifiers to protect against the reoccurrence of breast cancer (ACS, 2015). Additionally, the PTGI was initially normed on a sample who reported that their traumatic experiences occurred within the past 5.5 years (Tedeschi & Calhoun, 1996). Finally, limiting the time since diagnosis to 5 years reduced the likelihood that participants had experienced another illness or another traumatic experience that might have interfered with their responses on the PTGI.

**Demographic questionnaire.** The demographic questionnaire was a 14-item assessment created by the investigator to assess general demographic information as well as breast cancer-specific information. Participants were asked to provide information about their ethnicity, current age, annual income, level of education, and current relationship/marital status. Participants were also asked about their age at the time of their diagnosis, stage of cancer at diagnosis, cancer treatment modalities, relationship/marital status at time of diagnosis and during treatment, whether or not the breast cancer experience was perceived to be traumatic, and the extent to which the experience was perceived as stressful.

Similar to how previous researchers have assessed whether or not breast cancer was perceived as a traumatic (Cordova et al., 2001; Weiss, 2004), the present demographic questionnaire asked the following questions: “Did you perceive being diagnosed with and treated for breast cancer as a threat of death or serious injury?” and on a scale ranging from 0 (“not at all”) to 6 (“very much”), “How stressful was the breast cancer diagnosis and treatment for you?” Additionally, the demographic questionnaire included one open-ended question to assess whether or not participants have experienced other traumatic events within the past five years.

Finally, participants were asked to provide their zip code in order to identify their geographical location as urban, suburban, or rural. This was determined using the United States Department of Agriculture’s Rural-Urban Continuum Codes (2013), which classify populations by county using the following nine categories: (1) Counties in metro areas of 1 million or more in population; (2) Counties in metro areas of 250,000 to 1 million in population; (3) Counties in metro areas of fewer than 250,000 in population; (4) Urban population of 20,000 or more, adjacent to a metro area; (5) Urban population of 20,000 or more, not adjacent to a metro area; (6) Urban population of 2,500 to 19,999, adjacent to a metro area; (7) Urban population of

2,500 to 19,999, not adjacent to a metro area; (8) Completely rural or less than 2,500 urban population, adjacent to a metro area; and (9) Completely rural or less than 2,500 urban population, not adjacent to a metro area. For the purposes of the current study, individuals who fell within categories 1-3 were identified as living in an urban area, individuals who fell within categories 4-7 were identified as living in a suburban area, and individuals who fell within categories 8 and 9 were identified as living in a rural area.

**Posttraumatic Growth Inventory (PTGI).** The PTGI was developed by Tedeschi and Calhoun (1996) in order to assess positive changes experienced after exposure to a traumatic event. The inventory consists of 21 items and yields a Total Growth score comprised of five subscale scores: Relating to Others, New Possibilities, Personal Strength, Appreciation for Life, and Spiritual Change. Items are rated on a Likert scale ranging from 0 (“I did not experience this change as a result of my crisis”) to 5 (“I experienced this change to a great degree as a result of my crisis”).

The reliability of the PTGI is reported from a sample of undergraduate students ( $N = 604$ ) who reported experiencing a traumatic event within the past five years (Tedeschi & Calhoun, 1996). The PTGI demonstrated a high internal consistency of 0.90 for the Total Growth score, and the individual factor internal consistencies were as follows: New Possibilities ( $\alpha = .84$ ), Relating to Others ( $\alpha = .85$ ), Personal Strength ( $\alpha = .72$ ), Spiritual Change ( $\alpha = .85$ ), and Appreciation for Life ( $\alpha = .67$ ). Test-retest reliability was established with a sample of 28 college students over a 2 month period. Results indicated that the test-retest reliability for the overall PTGI was acceptable at  $r = .71$

In order to assess validity, Tedeschi and Calhoun compared the PTGI to a measure of personality characteristics and religious participation. The PTGI was found to be positively correlated with

optimism ( $r = .23$ ) on the Life Orientation Test (Scheier & Carver, 1985) and all of the NEO Personality Inventory (Costa & McCrae, 1985) scales except Neuroticism, (Extraversion,  $r = .29$ ; Openness,  $r = .21$ ; Agreeableness,  $r = .18$ ; and Conscientiousness,  $r = .16$ ). Tedeschi and Calhoun utilized a three-item measure to explore religious participation (Pressman, Lyons, Larson, & Strain, 1990) and found that PTGI was positively correlated with religiosity ( $r = .25$ ). Additionally, the authors compared the PTGI to the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). The findings indicated that there was no significant relationship between the PTGI and social desirability. The authors did note some gender differences in the overall scale, in that women reported finding more benefits ( $M = 75.18$ ,  $SD = 21.24$ ) than men ( $M = 67.77$ ,  $SD = 22.07$ ) ( $t(1,590) = 3.94$ ,  $p < .001$ ), and women scored higher on every factor except the New Possibilities factor, which was not significantly different between women and men.

The PTGI is one the most widely used instruments to assess positive growth following the diagnosis and treatment of malignant diseases (Stanton, Bower, & Low, 2006) and it has been used in multiple studies that have included breast cancer patients (e.g., Bellizzi & Blank, 2006; Bellizzi et al., 2010; Cordova et al., 2001; Lelorain et al., 2010; Sears et al., 2003; Weiss, 2004). For example, Brunet and colleagues (2010) tested the five-factor structure of the PTGI in a sample of breast cancer survivors ( $N = 470$ ) and found that the five-factor model was a good fit with all items loading significantly on their expected factors. The internal consistency for each factor was as follows: Relating to Others ( $\alpha = .91$ ), New Possibilities ( $\alpha = .85$ ), Personal Strength ( $\alpha = .86$ ), Spiritual Change ( $\alpha = .83$ ), and Appreciation for Life ( $\alpha = .84$ ). The internal consistency for the total PTGI was .95.



For the purpose of this study, all items remained the same as the original PTGI; however, instructions and answers were slightly changed. Participants were instructed to: “Indicate for each of the statements below the degree to which this change occurred in your life as a result of your breast cancer experience.” Answers will range from 0 (“I did not experience this change as a result of my breast cancer experience”) to 5 (“I experienced this change a great deal as a result of my breast cancer experience”).

**2-Way Social Support Scale (2-Way SSS).** The 2-Way SSS is a 20-item inventory developed by Shakespeare-Finch and Obst (2011) to assess both giving and receiving of instrumental and emotional support. Based on the existing measures of social support, current literature, and pilot data from other research projects (Jacobsen, 2009; Skorka, 2007), the authors initially developed a pool of 29 items which were administered to two different samples. The first sample consisted of 372 participants (191 undergraduate students and 181 community members) and the second sample consisted of 417 participants (248 undergraduate students and 169 community members). Participants were asked to indicate to what extent each statement was true for them on a 6-point Likert scale ranging from 0 (“not at all”) to 5 (“always”). Higher scores indicated higher levels of giving or receiving social support. Principal components analysis (PCA) with a varimax rotation produced a four factor solution. The first factor was Receiving Emotional Support and included questions such as “There is at least one person that I can share most things with.” The internal consistency for this factor was  $\alpha = .92$ . The second factor was Giving Emotional Support and included questions such as, “I am there to listen to other’s [sic] problems.” Internal consistency for this scale was  $\alpha = .86$ . The third factor was Receiving Instrumental Support and included questions such as “There is someone who would give me financial assistance.” The internal consistency for this scale was  $\alpha = .86$ . Finally, the

fourth factor was Giving Instrumental Support and included questions such as, “I am a person others turn to for help with tasks.” The internal consistency for this factor was  $\alpha = .84$  (Shakespeare-Finch & Obst).

To assess for convergent validity, the 2-Way SSS was compared to two other social support measures, the Social Support Questionnaire (SSQ; Sarason, Levine, Basham, & Sarason, 1983) and the Berlin Social Support Scale (BSSS; Schulz & Schwarzer, 2003). Results indicated that the four factors that make up the 2-Way SSS were moderately to largely correlated with other social support measures. Specifically, correlations between the 2-Way SSS and the BSSS ranged from .45 to .66. Correlations between the 2-Way SSS and the SSQ ranged from .27 to .55 (Shakespeare-Finch & Obst, 2011).

For the purposes of this study, participants were asked to rate the amount of social support they have given and received since their diagnosis of breast cancer. Additionally, one item on the 2-Way SSS was slightly changed from “When someone I lived with was sick, I helped them” to “When someone I was close to was sick, I helped them.”

**Ten-Item Personality Inventory (TIPI).** The Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) is a brief, 10-item measure developed to assess the Big Five personality dimensions. The TIPI subscales that represent the Big Five personality traits include: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to New Experiences. Items on the TIPI were developed based on other longer measures of Big Five traits including Goldberg’s (1992) list of unipolar and bipolar Big-Five markers and John and Srivastava’s (1999) Adjective Checklist Big-Five markers. Each of the 10 items consists of two descriptor words with the stem, “I see myself as:” Participants are instructed to rank each item on a Likert-type scale ranging from 1 (“strongly disagree”) to 7 (“agree strongly”).

The TIPI was normed on a sample of 1813 undergraduate students. Due to the brief nature of the TIPI, there are only 2 items per subscale and therefore, internal consistency estimates were low, ranging from .45 - .73. However, the TIPI did have moderate to strong convergent validity when compared to other Big Five measures. For example convergent correlations between the TIPI and the Big-Five Inventory (BFI: John & Srivastava, 1999) ranged from .65 - .87. Convergent correlations between the TIPI and the NEO-PI-R (Costa & McCrae, 1992) ranged from .56 - .68.

### **Procedure**

Approval for this study was obtained from Radford University's Institutional Review Board (IRB). Participants were recruited through snowball sampling, making contact with a list of potential participants from a previous IRB approved study who indicated interest in future research participation, and through Amazon MTurk.

Individuals who were recruited via snowball sampling or who had indicated interest in future research participation received an electronic announcement of the study in the form of an e-mail which included a link that could be used to access the study (Appendix A). Individuals who were recruited via Amazon MTurk received an electronic announcement through their Amazon MTurk account which also included a link that could be used to access the study (Appendix B). Once participants accessed the link, they were directed to a webpage that required them to first complete the eligibility questionnaire (Appendix C). If participants did not meet the eligibility criteria, they were directed to another webpage with the following message: "Thank you for your time and interest in this study. Based on your previous response, you are not eligible to complete this survey." Ineligible participants were then given the option to end the survey or access the resource page (Appendix D). Participants that did meet the eligibility

criteria were directed to the informed consent page (Appendix E). Individuals recruited via Amazon MTurk received a slightly different informed consent which indicated that they would be compensated \$1.00 for their participation (Appendix F). There were no other differences in the two informed consents. After reading the informed consent, participants who chose the “I agree” option were directed to the survey questions. These questions included the following: the Demographics Questionnaire (Appendix G), the Posttraumatic Growth Inventory (Appendix H), the Ten-Item Personality Inventory (Appendix I), and the 2-Way Social Support Scale (Appendix J). A total number of 65 items were included.

### **Hypotheses and Data Analysis**

All data was analyzed with the Statistical Package for Social Sciences (SPSS). Posttraumatic growth was measured by the total score on the Posttraumatic Growth Inventory. The amount of emotional and instrumental support that was given and received was measured by the 2-Way Social Support Scale, which includes the following subscales: Receiving Instrumental Support, Receiving Emotional Support, Giving Instrumental Support, and Providing Emotional Support. Personality traits were measured using the Ten Item Personality Inventory, which includes the following subscales: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to New Experiences.

Hypothesis 1a: It was expected that receiving greater levels of instrumental support would be associated with higher levels of PTG, after controlling for personality factors. A one-tailed partial correlation was conducted between the total PTGI scores and the Receiving Instrumental Support scores, while controlling for personality traits with the TIPI scores.

Hypothesis 1b: It was expected that giving greater levels of instrumental support would be associated with higher levels of PTG, after controlling for personality factors. A one-tailed

partial correlation was conducted between the total PTGI scores and the Giving Instrumental Support scores, while controlling for personality traits with the TIPI scores.

Hypothesis 2a: It was expected that receiving greater levels of emotional support would be associated with higher levels of PTG, after controlling for personality factors. A one-tailed partial correlation was conducted between the total PTGI scores and the Receiving Emotional Support scores, while controlling for personality traits with the TIPI scores.

Hypothesis 2b: It was expected that giving greater levels of emotional support would be associated with higher levels of PTG, after controlling for personality factors. A one-tailed partial correlation was conducted between the total PTGI scores and the Giving Emotional Support scores, while controlling for personality traits with the TIPI scores.

Hypothesis 3: It was expected that a stronger relationship would exist between receiving instrumental support and PTG than with receiving emotional support and PTG. Pearson-product correlations were obtained to examine the relationships between: (a) receiving instrumental support and PTG and (b) receiving emotional support and PTG. A test of the difference between these two dependent correlation coefficients was performed.

Hypothesis 4: It was expected that a positive correlation would be found between time since diagnosis and PTG. The time since diagnosis was calculated by subtracting the participants' ages at the time of diagnosis from their current ages. A one-tailed Pearson-product correlation was conducted, utilizing the time since diagnosis and the total PTGI score.

Hypothesis 5: It was expected that a negative correlation would be found between age and PTG. A one-tailed Pearson-product correlation was conducted using participants' current ages and the total PTGI score.

## **Chapter 4: Data Analysis**

The purpose of this research study was to examine the relationship between giving and receiving emotional and instrumental social support and posttraumatic growth among breast cancer patients and survivors. Research participants completed an anonymous online questionnaire, which included the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), the 2-Way Social Support Scale (Shakespeare-Finch and Obst, 2011), and the Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003). Research participants also completed a demographics questionnaire developed by the researcher. The data were then analyzed to assess the relationships between giving and receiving emotional and instrumental forms of social support and posttraumatic growth while controlling for personality factors. The analysis also assessed the relationship between time since diagnosis and posttraumatic growth as well as age and posttraumatic growth.

### **Description of the Sample**

Participants in this study consisted of adult women who had been diagnosed with breast cancer within the past five years and who did not have a history of any other types of cancer. Participants were recruited through snowball sampling and Amazon Mechanical Turk, both of which provided a hyperlink which directed participants to complete the research using Qualtrics survey software. At the beginning of the survey, participants answered four eligibility questions to ensure that they met the criteria for participation. Sixty-seven participants completed the survey; however, due to missing information or having a diagnosis that was not within the timeframe required for participation, 13 participants were removed. The final sample size consisted of 54 participants. The following section provides demographics related to the sample.

## Sample Demographics

Each participant completed a demographic questionnaire which included questions related to personal demographics as well as disease characteristics and trauma history. Personal demographics included age (at diagnosis and current), ethnicity, marital status (at diagnosis, during treatment, and current), income, and education level. Questions related specifically to breast cancer included disease stage, treatment modalities, perceived level of distress, and threat perception. Additionally, participants were asked one open-ended question related to whether or not they had experienced any other traumatic events, aside from their diagnosis of breast cancer, within the past five years.

The ages of research participants ranged from 27–74 years ( $M = 47.35$ ;  $SD = 11.32$ ). Forty-five (83.3%) participants identified as White/Caucasian, four (7.4%) identified as Black/African American, three (5.6%) identified as Asian, one (1.9%) identified as Hispanic, and one (1.9%) identified as Multi-Ethnic. Individuals from 21 different states participated in the research; however, most ( $N = 45$ ; 83.3%) were identified as living in urban areas, while only six (11.1%) were identified as living in suburban areas, and only three (5.6%) were identified as living in rural areas.

With regard to relationship status at the time of the research, thirty-five (64.8%) participants reported being married, six participants (11.1%) were single, five (9.3%) were in a committed relationship, four (7.4%) were divorced, three (5.6%) were widowed, and one (1.9%) was separated. The researcher also inquired about relationship status at the time of diagnosis as well as during the treatment process; however, participants did not endorse any notable changes in the status of their relationships from the time of diagnosis until the time they participated in the current research.

The sample varied with regard to annual income. Eight participants (14.8%) reported their annual income to fall within \$11,000 - \$25,000, eighteen (33.3%) reported their annual income to fall within \$26,000-\$50,000, eight (14.8%) reported their annual income to fall within \$51,000 - \$75,000, ten (18.5%) reported their annual income to fall within \$76,000-\$100,000, and ten (18.5%) participants reported their annual income to be greater than \$100,000.

Education levels varied as well. Fifteen participants (27.8%) reported their highest level of education to be a high school diploma, eight participants (14.8%) reported obtaining an associate's degree, twenty-one participants (38.9%) reported obtaining a bachelor's degree, and ten participants (18.5%) reported obtaining a graduate degree. Please see Table 1 for participant demographics.

Regarding the demographic questions that specifically focused on participants' breast cancer experience, the majority of participants ( $N = 44$ ; 81.5%) perceived being diagnosed with and treated for breast cancer as a threat of death or serious injury. Participants were also asked to rate, on a scale from 0-6, how stressful the breast cancer diagnosis and treatment was for them, with 0 indicating "not at all stressful" and 6 indicating "very stressful." Scores ranged from 2-6 with a mean of 5.13 and a standard deviation of .972.

Disease stage and treatment modalities were also reported. The majority of participants ( $N = 29$ , 53.7%) reported their breast cancer as Stage I at the time of diagnosis. Fifteen participants (27.8%) reported their breast cancer to be at Stage II at the time of diagnosis, four (7.4%) reported Stage III, five (9.3%) reported Stage IV, and one participant (1.9%) reported Stage 0.

Participants endorsed a variety of treatment modalities. Twenty-one participants (38.9%) reported undergoing a full mastectomy as part of their breast cancer treatment. Nine participants



(16.7%) reported undergoing a partial mastectomy, sixteen (29.6) reported undergoing a lumpectomy, and one participant (1.9%) reported receiving a bone-marrow transplant. Additionally, twenty-nine participants (53.7%) reported receiving chemotherapy, thirty-one (57.4%) received radiation, and fifteen (27.8%) received hormone therapy. Finally, eight participants (14.8%) reported receiving physical therapy as part of their treatment and one participant (1.9%) endorsed the “other” option as treatment. Please see Table 2 for demographics specific to breast cancer.

The demographic questionnaire contained the following open ended question: “Please list any other traumatic experiences you have had within the last 5 years that do not pertain to your breast cancer diagnosis or treatment.” Just over one half of the sample ( $N = 28$ ; 51.9%) endorsed experiencing other types of trauma over the past five years. Please see Tables 1 and 2 for details of participant demographics.

Table 1. Demographic Information of Participants

Variable	<i>N</i>	Percentage
Ethnicity		
Caucasian	45	83.3
African American	4	7.4
Asian	3	5.6
Hispanic	1	1.9
Multi-Ethnic	1	1.9
Relationship Status		
Married	35	64.8
Single	6	11.1
Committed Relationship	5	9.3
Divorced	4	7.4
Widowed	3	5.6
Separated	1	1.9
Annual Income		
\$11,000 - \$25,000	8	14.8
\$26,000 - \$50,000	18	33.3
\$51,000 - \$75,000	8	14.8
\$76,000 - \$100,000	10	18.5
>\$100,000	10	18.5
Education Level		
High School Diploma	15	27.8
Associate's Degree	8	14.8
Bachelor's Degree	21	38.9
Graduate Degree	10	18.5
Geographical Location		
Urban	45	83.3
Suburban	6	11.1
Rural	3	5.6

Table 2. Breast Cancer Specific Demographic Information

Variable		<i>N</i>	Percentage
<b>Breast Cancer Stage</b>			
	Stage 0	1	1.9
	Stage I	29	53.7
	Stage II	15	27.8
	Stage III	4	7.4
	Stage IV	5	9.3
<b>Surgical Treatments</b>			
	Full Mastectomy	21	38.9
	Partial Mastectomy	9	16.7
	Lumpectomy	16	29.6
<b>Other Treatment Modalities</b>			
	Chemotherapy	29	53.7
	Radiation	31	57.4
	Hormone Therapy	15	27.8
	Physical Therapy	8	14.8
	Bone Marrow Transplant	1	1.9
	Other	1	1.9
<b>Perception of BC as Life Threatening</b>			
	Yes	44	81.5
	No	10	18.5

## Survey Results

**Posttraumatic Growth Inventory.** The Posttraumatic Growth Inventory (PTGI) was developed by Tedeschi and Calhoun (1996) in order to assess positive changes experienced after exposure to a traumatic event. The inventory consists of 21 items and yields a Total Growth score comprised of five subscale scores: Relating to Others, New Possibilities, Personal Strength, Appreciation for Life, and Spiritual Change. Items are rated on a Likert scale ranging from 0 (“I did not experience this change as a result of my crisis”) to 5 (“I experienced this change to a

great degree as a result of my crisis”). Higher scores indicate higher levels of posttraumatic growth. In the current study, all the PTGI items remained the same as the original; however, instructions and answers were slightly changed. Participants were instructed to: “Indicate for each of the statements below the degree to which this change occurred in your life as a result of your breast cancer experience.” Answers ranged from 0 (“I did not experience this change as a result of my breast cancer experience”) to 5 (“I experienced this change a great deal as a result of my breast cancer experience”). Only the Total Growth score from the PTGI was used to assess posttraumatic growth. These scores are calculated by adding up participant’s answers and can range from 0–105. In the current study, Total Growth ranged from 5–94 with a mean score of 62.28 and a standard deviation of 21.04.

It should be noted that for reasons unknown to the researcher, the first item on the PTGI was not displayed on the online questionnaire; therefore, PTGI scores that had been previously collected by another researcher (Morrill et al., 2008) on a similar sample were used to predict the scores for the missing item using a regression-based imputation technique (McDonald, Thurston, & Nelson, 2000; Saunders et al., 2006). In the original data set collected by Morrill and colleagues, the imputation technique correctly predicted scores for item 1 55.8% of the time and the regression equation provided a predicted score within one point of the actual score 93.2% of the time. Scores for items 2-21 of the PTGI accounted for 54.5% of the variability in scores for item 1. Lower levels of accuracy with a different data set almost certainly occurred; however, the imputation technique was felt to incorporate significantly more information than systematically removing the item for every participant.

**2-Way Social Support Scale.** The 2-Way Social Support Scale (2-Way SSS) was developed by Shakespeare-Finch and Obst (2011) to assess both giving and receiving of

instrumental and emotional support. The 2-Way SSS is a 20 item inventory that yields four subscales: Receiving Emotional Support, Giving Emotional Support, Receiving Instrumental Support, and Giving Instrumental Support. Participants were asked to indicate to what extent each statement was true for them on a 6-point Likert scale ranging from 0 (“not at all”) to 5 (“always”). Higher scores indicated higher levels of giving or receiving social support. For the purposes of this study, participants were asked to rate the amount of social support they have given and received since their diagnosis of breast cancer. Additionally, the wording on one item on the 2-Way SSS was slightly changed from “When someone I lived with was sick, I helped them” to “When someone I was close to was sick, I helped them.”

Scores for the 2-Way SSS subscales are calculated by adding up participants’ answers to the questions on each respective subscale. Scores on the Receiving Emotional Support scale can range from 0–35. In the current study, scores ranged from 6-34 with a mean score of 29.15 and a standard deviation of 6.42. Scores on the Giving Emotional Support scale can range from 0-25. In the current study, scores ranged from 2-25 with a mean score of 19.56 and a standard deviation of 4.74. Scores on the Receiving Instrumental Support scale can range from 0-20. In the current study, scores ranged from 3-20 with a mean score of 15.89 and a standard deviation of 4.11. Scores on the Giving Instrumental Support scale can range from 0-20. In the current study, scores ranged from 9-20 with a mean score of 15.31 and a standard deviation of 3.33.

It should be noted that for reasons unknown to the researcher, the first item on the 2-Way SSS was not displayed on the online questionnaire; therefore, this writer utilized 2-Way SSS scores that had been previously collected by one of the authors of the scale on a similar sample to impute the scores for the missing item. A regression-based imputation technique was utilized to predict the missing items (McDonald, Thurston, & Nelson, 2000; Saunders et al., 2006). In the

original data set, which is included in a study that is currently under review for publication, the imputation technique correctly predicted scores for item 1 42.1% of the time and the regression equation provided a predicted score within one point of the actual score 90.8% of the time. Scores for items 2-20 of the 2-Way SSS accounted for 64.9% of the variability in scores for item 1. As seen for imputation of scores for item 1 of the PTGI, Lower levels of accuracy in imputing scores for item 1 of the 2-Way SSS with a different data set almost certainly occurred.

**Ten-Item Personality Inventory.** The Ten-Item Personality Inventory developed by Gosling, Rentfrow, & Swann (2003) is a brief, 10-item measure developed to assess the Big Five personality dimensions. The TIPI subscales that represent the Big Five personality traits include: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to New Experiences. Each of the 10 items consists of two descriptor words with the stem, “I see myself as:” Participants were instructed to rank each item on a Likert-type scale ranging from 1 (“strongly disagree”) to 7 (“agree strongly”). Subscale scores were determined by calculating the average of participants’ two answers on each respective subscale. Scores can range from 1-7 and the higher the score, the more likely that the participant identifies with that particular personality trait. In the current study, scores for the Extraversion subscale ranged from 1-7 with a mean of 4.34 and a standard deviation of 1.64. Scores for the Agreeableness subscale ranged from 2-7 with a mean of 5.50 and a standard deviation of 1.22. Scores for the Conscientiousness scale ranged from 2-7 with a mean of 5.73 and a standard deviation of 1.23. Scores for the Emotional Stability scale ranged from 1-7 with a mean of 4.71 and a standard deviation of 1.58. Finally, scores for the Openness scale ranged from 2-7 with a mean of 5.08 and a standard deviation of 1.32. Please see Table 3 for survey results and Table 4 for correlational data among the survey variables.

Table 3. Descriptive Statistics of Measures

Measure	<i>N</i>	Mean	SD	Min	Max
PTGI	54	62.28	21.04	5.00	94.00
2-Way SSS					
Receiving Instrumental SS	54	15.89	4.11	3.00	20.00
Giving Instrumental SS	54	15.31	3.32	9.00	20.00
Receiving Emotional SS	54	29.15	6.42	6.00	34.00
Giving Emotional SS	54	19.56	4.74	2.00	25.00
TIPI					
Extraversion	54	4.34	1.64	1.00	7.00
Agreeableness	54	5.49	1.22	2.00	7.00
Conscientiousness	54	5.73	1.27	2.00	7.00
Emotional Stability	54	4.71	1.58	1.00	7.00
Openness	54	5.08	1.32	2.00	7.00

Table 4. Correlation Matrix (PTGI, 2-Way SSS, and TIPI)

	1	2	3	4	5	6	7	8	9	10
(1) PTGI	1.00									
(2) RES	.33*	1.00								
(3) GES	.29*	.77**	1.00							
(4) RIS	.45**	.79**	.61**	1.00						
(5) GIS	.41**	.66**	.84**	.60**	1.00					
(6) Extraversion	.18	.37**	.46**	.36**	.42**	1.00				
(7) Agreeableness	.19	.39**	.46**	.32*	.39**	.09	1.00			
(8) Conscientious	-.07	.23	.18	.08	.19	-.08	.55**	1.00		
(9) Emotion Stability	.09	.24	.18	.28*	.16	.16	.48**	.34*	1.00	
(10) Openness	.10	.14	.28*	-.02	.26	.15	.33*	.27	.27*	1.00

Note: RES denotes Receiving Emotional Support; GES denotes Giving Emotional Support; RIS denotes Receiving Instrumental Support; GIS denotes Receiving Instrumental Support  
 \* $p < .05$ ; \*\* $p < .01$

### Statistical Tests of Research Questions

**Research question 1.** Research question 1 sought to identify whether or not a relationship exists between receiving instrumental support and PTG, as well as providing instrumental support and PTG, when controlling for personality factors. It was hypothesized by the researcher that a positive relationship would exist between receiving instrumental support and posttraumatic growth after controlling for personality traits. A one-tailed partial correlation was used to assess this relationship using the scores on the Receiving Instrumental Support scale of the 2-Way SSS and Total Growth scores on the PTGI while controlling for personality factors with the scores on the TIPI scales. The researcher's hypothesis was confirmed, as findings



indicated that the amount of instrumental support received was moderately correlated with the amount of PTG reported, partial  $r(47) = .40, p = .002$ .

It was also hypothesized that a positive relationship would exist between providing instrumental support and posttraumatic growth, after controlling for personality factors. A one-tailed partial correlation was used to assess this relationship using the scores on the Giving Instrumental Support scale of the 2-Way SSS and the Total Growth scores on the PTGI while controlling for personality factors with the scores on the TIPI scales. The researcher's hypothesis was confirmed, as results indicated that the amount of instrumental support provided to others was moderately correlated with the amount of PTG reported, partial  $r(47) = .34, p = .008$ .

**Research question 2.** Research question 2 sought to identify whether or not there is a relationship between receiving emotional support and PTG, as well as giving emotional support and PTG, when controlling for personality factors. It was hypothesized by the researcher that a positive relationship would exist between receiving emotional support and posttraumatic growth, after controlling for personality factors. A one-tailed partial correlation was used to assess this relationship using scores from the Receiving Emotional Support scale on the 2-Way SSS and the Total Growth scores on the PTGI while controlling for personality factors with the scores from the TIPI scales. The researcher's hypothesis was confirmed as results indicated that there was a weak, yet significant, relationship between the amount of emotional support received and the amount of posttraumatic growth reported, partial  $r(47) = .26, p = .035$ .

It was also hypothesized that a positive relationship would exist between providing emotional support and posttraumatic growth, after controlling for personality factors. A one-tailed partial correlation was used to assess this relationship using scores from the Giving Emotional Support scale on the 2-Way SSS and the Total Growth scores on the PTGI while

controlling for personality factors with the scores on the TIPI scales. Results indicated that, contrary to the researcher's hypothesis, a significant relationship did not exist between providing emotional support to others and PTG, partial  $r(47) = .16, p = .126$ . Notably, prior to controlling for personality factors, giving emotional support to others was found to demonstrate a weak, but significant, relationship with PTG,  $r(52) = .28, p = .018$ .

**Research question 3.** Research question 3 sought to identify whether or not the relationship between receiving instrumental support and PTG will be stronger than the relationship between receiving emotional support and PTG. It was hypothesized by the researcher that a stronger relationship would exist between receiving instrumental support and PTG than between receiving emotional support and PTG. Pearson-product correlations were obtained to examine the relationships between (a) receiving instrumental support and PTG,  $r(52) = .45, p = .000$ , and (b) receiving emotional support and PTG,  $r(52) = .33, p = .008$ . A test of the difference between these two dependent correlation coefficients was performed. Results indicated that the difference between the relationship between receiving emotional support and PTG and the relationship between receiving instrumental support and PTG does approach statistical significance,  $t(51) = -1.60, p = .058$ , and suggests that receiving instrumental support accounts for approximately 20% of the variance in PTG whereas receiving emotional support only accounts for approximately 11% of the variance in PTG.

**Research question 4.** Research question 4 sought to identify whether or not a relationship exists between time since diagnosis and PTG. It was hypothesized by the researcher that a positive relationship would be found between time since diagnosis and PTG. Time since diagnosis was calculated by subtracting the participants' age at which they were reportedly diagnosed from their current age. A Pearson-product correlation was used to assess this

relationship using the time since diagnosis that was calculated by the researcher and the Total PTGI score. Results indicated that this relationship does approach statistical significance,  $r(52) = -.21, p = .057$ , with time since diagnosis accounting for 4% of the variance in PTG. It should be noted, however, that this relationship is opposite of what was expected and suggests that individuals who have known about their diagnosis for a shorter amount of time reported high levels of PTG.

**Research question 5.** Research question 5 sought to identify whether or not a relationship exists between age and PTG. It was hypothesized by the researcher that a negative relationship would be found between age and PTG. A Pearson-product correlation was used to assess this relationship using the participants' current age and the Total PTGI score. Results indicated that a significant relationship was found to exist between age and PTG,  $r(52) = -.29, p$  (two-tailed) = .014, with age accounting for approximately 9% of the variability in PTG scores.

## **Conclusion**

This chapter presented the sample demographics and documented the survey results for the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), the 2-Way Social Support Scale (Shakespeare-Finch and Obst, 2011), and the Ten Item Personality Inventory (Gosling, et al., 2003). This chapter then reported the results of the researcher's hypotheses related to the relationship between giving and receiving emotional and instrumental social support and posttraumatic growth in a population of breast cancer patients and survivors. This chapter also reported the results of the researcher's hypotheses related to the relationship between time since diagnosis and age with PTG.

Consistent with the researcher's expectations, results indicated that, when controlling for personality factors, significant relationships do exist between receiving instrumental support and

PTG, giving instrumental support and PTG, and receiving emotional support and PTG, when controlling for personality factors. Receiving instrumental support was found to have the strongest correlation with posttraumatic growth, accounting for approximately 17% of the variance in PTGI scores. Additionally, findings indicated that the difference among the relationship between receiving instrumental support and PTG was stronger than the relationship between receiving emotional support and PTG, with results approaching statistical significance. Finally, results indicated that a significant relationship exists between age and posttraumatic growth, with younger participants reporting higher levels of PTG.

Contrary to the researcher's expectations, a significant relationship did not exist between providing emotional support and PTG when controlling for personality factors. Additionally, while the relationship between time since diagnosis and PTG did approach statistical significance, it was inverse to what was expected, with individuals who have known about their diagnosis a shorter amount of time reporting higher levels of PTG.

## **Chapter 5: Discussion**

This chapter provides an overview of the current study, beginning with a summary of the research. Next, this chapter presents the research findings and examines how the current findings relate to the existing literature. This chapter will then identify limitations in the current study as well as future directions for this field of research. Finally, this chapter will close with conclusions drawn from the current study.

### **Research Summary**

Research suggests that the majority of breast cancer survivors experience posttraumatic growth (PTG) as a result of coping with the challenges that accompany a diagnosis of breast cancer (Koutrouli et al., 2012); however, the existing research on factors that contribute to PTG among breast cancer patients presents inconsistent results, particularly regarding the role of social support. Despite Tedeschi and Calhoun's (2004) assertion that social support likely contributes to PTG, some studies among the breast cancer population have found social support and PTG to be positively related to one another, while other studies have found no relationship at all. Additionally, there has been very little research on the relationship between providing support to others and PTG. Therefore, the purpose of this research study was to explore the relationships between receiving emotional and instrumental forms of social support and PTG as well as the relationship between providing emotional and instrumental forms of social support and PTG. Additionally, the relationships between age and PTG and time since diagnosis and PTG were also explored.

This research was directed by the following research questions:

1. Is there a relationship between receiving instrumental support and PTG, as well as providing instrumental support and PTG, after controlling for personality factors?

2. Is there a relationship between receiving emotional support and PTG, as well as providing emotional support and PTG, after controlling for personality factors?
3. Will the relationship between receiving instrumental support and PTG be stronger than the relationship between receiving emotional support and PTG?
4. Is there a relationship between time since diagnosis and PTG?
5. Is there a relationship between age and PTG?

### **Discussion of the Results**

**Research question 1.** The goal of research question 1 was to identify whether or not a relationship existed between receiving instrumental support and PTG, as well as providing instrumental support and PTG, when controlling for personality factors. It was hypothesized that a positive relationship would exist between receiving instrumental support and PTG, after controlling for personality factors. This hypothesis was confirmed, as results indicated that amount of instrumental support received was moderately correlated with PTG. This is consistent with Tedeshi and Calhoun's (2004) assertion that the amount of social support that is received may enhance one's likelihood of experiencing posttraumatic growth. It should be noted that the relationship between receiving instrumental support and PTG is the strongest among all the relationships examined in this research study. This lends support to the existing literature that asserts that instrumental forms of support may be especially crucial to the development of positive growth in individuals who are navigating a life threatening illness (Nenova et al., 2013; Sadler-Gerhardt et al., 2010).

It was also hypothesized that a significant relationship would exist between providing instrumental support and PTG, after controlling for personality factors. This hypothesis was confirmed, as results indicated that a moderate relationship existed between the amount of

instrumental support provided to others and levels of PTG. While there have been several studies that have demonstrated positive benefits of providing instrumental support (Brown et al., 2003; Karanci and Acarturk, 2005; Morrow-Howell et al., 2003), this finding is unique in that very little research has been conducted on the relationship between providing instrumental support to others and posttraumatic growth among the breast cancer population.

**Research question 2.** The goal of research question 2 was to identify whether or not a relationship existed between receiving emotional support and PTG, as well as providing emotional support and PTG, when controlling for personality factors. It was hypothesized that a positive relationship would exist between receiving emotional support and PTG, after controlling for personality factors. This hypothesis was confirmed, as results indicated that individuals who reported receiving more emotional support also reported higher levels of PTG. This finding is supported by other researchers (Shaefer & Moos, 1998; Tedeschi & Calhoun, 2004), who have speculated that receiving social support allows victims to talk about their trauma, gain other perspectives, develop more effective coping strategies, and begin the process of changing their schema.

It was also hypothesized that a significant relationship would exist between providing emotional support and PTG, after controlling for personality factors. This hypothesis was not supported, as a significant relationship was not found to exist between providing emotional support to others and PTG. The lack of relationship between providing emotional support and PTG is interesting, given the amount of research that suggest that providing support to others has a multitude of benefits (Brown et al., 2003; Knoll et al., 2007; Piferi & Lawler, 2006; Shakespeare-Finch & Obst, 2011). This finding is also interesting because a significant relationship was found between providing instrumental support and PTG when controlling for

personality factors, but not for providing emotional support. This suggests that providing more tangible forms of support to others may facilitate posttraumatic growth whereas providing emotional support does not.

**Research question 3.** The goal of research question 3 was to identify whether or not the relationship between receiving instrumental support and PTG was stronger than the relationship between receiving emotional support and PTG. Consistent with the researcher's hypothesis, results indicated that the relationship between receiving instrumental support and PTG was stronger than the relationship between receiving emotional support and PTG. Notably, receiving instrumental support accounted for nearly double the variability in PTG than receiving emotional support. Much of the research that has explored the relationship between social support and PTG have used broad measures of social support or focused on emotional support only. This finding is significant, as it suggests that not only does the type of social support (e.g. instrumental versus emotional) one receives matter, but that instrumental forms of support may be more likely to facilitate PTG than emotional forms of support.

**Research question 4.** The purpose of research question 4 was to identify whether or not a relationship existed between the time since diagnosis and PTG. It was hypothesized that a greater amount of time that had passed since one's diagnosis would result in higher levels of PTG. This assumption was based on Tedeschi and Calhoun's (2004) theoretical model of posttraumatic growth which posits that individuals who have had longer to process their trauma and engage in schema reconstruction are more likely to report higher levels of PTG. While the relationship between time since diagnosis and PTG did approach statistical significance, the relationship was the inverse of what was expected, which suggests that individuals who have known about their diagnosis for shorter periods of time are more likely to report higher levels of



PTG. While this finding does not support Tedeschi and Calhoun's position, it is consistent with several other studies that have also found the time since diagnosis and PTG to either be unrelated (Bellizzi & Blank, 2006, Cohen & Numa, 2011; Cordova et al., 2007) or inversely related (Weiss, 2004) among a breast cancer population. One explanation could be that the trauma associated with a diagnosis of breast cancer could be considered ongoing, given that individuals often engage in a series of surgeries and/or other treatments; therefore, the time since diagnosis is not likely an accurate reflection of the time since the trauma occurred. Another explanation may be that the effects of PTG diminish over time. In the future, it may be beneficial to conduct longitudinal research that assess levels of PTG during treatment and after treatment has been completed.

**Research question 5.** The goal of research question 5 was to identify whether or not a relationship existed between age and PTG. It was hypothesized that a negative relationship would exist between age and PTG. This hypothesis was supported, as findings indicated that younger participants endorsed higher levels of PTG. This finding is consistent with other studies that have assessed this relationship in similar populations (Bellizzi et al., 2010; Bellizzi & Blank, 2006; Cordova et al., 2007; Koutrouli et al., 2012; Manne et al., 2004). One explanation for this relationship is that younger participants are less likely to expect a diagnosis of cancer at their age, which in turn requires them to engage in a significant amount of cognitive restructuring to accommodate their new situation. Additionally, research suggests that a positive relationship exists between the perception of disease severity and PTG (Bellizzi & Blank, Cordova et al, 2001; Morris & Shakespeare-Finch, 2011; Sears et al., 2003). Therefore, it may be that younger participants perceive the diagnosis of breast cancer as more life-threatening than older participants, which results in higher levels of PTG.

## **Limitations and Future Research**

The current study provides support to the existing literature that identifies social support as a contributing factor to the development of PTG in a breast cancer population. It also provides preliminary data that suggests that receiving instrumental support may contribute more to the development of PTG than receiving emotional support and that providing instrumental support to others may also contribute to PTG. However, there are also a number of limitations to the current study including a small sample size, lack of diversity among participants, and missing questions in the data set.

While snowball sampling has been found to be a valid means for obtaining access to populations that are otherwise difficult to reach (Patton, 2002), it was not found to be particularly effective in the current study. One explanation for this is that the eligibility requirements of having a diagnosis within the past 5 years and having no other history of cancer may have disqualified many individuals who received the electronic announcement. Another explanation may be that individuals who received the announcement simply chose not to pass it on to other potential participants. The research also utilized Amazon MTurk to recruit participants and while MTurk does provide a diverse pool of potential applicants, the mean age of MTurk participants is approximately 30 years old (Buhrmester, Kwang, & Gosling, 2011). Therefore, individuals who were most likely to meet the requirements to participate in the current study were not likely to be highly represented in the MTurk participant pool.

Another limitation of the current study was the lack of diversity among the sample with regard to ethnicity and population size (e.g urban, suburban, or rural). The majority of participants identified as Caucasian, which has been a consistent theme among other studies

exploring PTG in breast cancer patients (e.g. Bellizzi & Blank, 2006; Brunet et al., 2010; Cordova et al., 2007). However, based on Bellizzi and colleagues' (2010) study, which explored PTG in a racially diverse population, there is some evidence to suggest that differences may exist among how individuals of different races/ethnicities experience posttraumatic growth; therefore, future research should aim to reach a more ethnically diverse sample. Additionally, while the sample represented individuals from many different states in the U.S., the majority of the sample were identified as living in urban areas. Given the existing research that indicates rural cancer survivors are more likely to report higher levels of depression and anxiety and greater overall distress than non-rural cancer survivors (Burris & Andrykowski, 2010), it is possible that rurality could also impact the development of posttraumatic growth; therefore, future research should aim to explore the relationship between social support and PTG among breast cancer patients in rural areas.

Finally, after data was collected, it was discovered that two items were not displayed on the online questionnaire. The researcher was able to address this issue by utilizing a regression-based imputation technique utilizing data that were previously collected by other researchers. While this did not likely make a significant difference in the overall pattern of results, the imputed data are estimates of the participants' answers as opposed to their actual answers and should therefore be considered a limitation in the study.

## **Conclusion**

This study examined the relationship between receiving instrumental and emotional forms of social support and PTG, as well as the relationship between giving instrumental and emotional forms of social support and PTG, in a sample of breast cancer patients and survivors. The findings indicated that receiving both instrumental and emotional forms of social support

were positively correlated with PTG after controlling for personality traits. Receiving instrumental support was found to be more strongly related to PTG, which suggests that tangible forms of support may contribute to the development of PTG more than emotional support. Providing instrumental support to others was also found to be positively correlated with PTG; however, providing emotional support was not. This suggests that the act of helping another individual in a concrete way may aid in the development of PTG whereas offering emotional support may not. Finally, the findings support the existing literature that younger individuals report higher levels of PTG.

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## Appendix A: E-mail Recruitment Letter

Dear Prospective Participant:

My name is Jaclyn Mullins and I am a graduate student in the Department of Psychology at Radford University. I am currently working on my doctoral dissertation, chaired by Dr. Sarah Hastings, which seeks to explore the relationship between social support and positive change among breast cancer patients and survivors. If you have already participated in this study, we thank you. However, if you have not, this is a friendly reminder.

In order to participate in our study, you must be a female of at least 18 years of age who has had a diagnosis of breast cancer within the last 5 years. Additionally, you must have no history of any other types of cancer. Your participation in this study is completely voluntary and you may withdraw at any time without penalty. If you choose to participate, it will take approximately 20 minutes of your time. Participation will involve answering questions regarding demographic information as well as the completion of 3 brief measures assessing positive change, social support, and personality characteristics. You will not be required to submit your name and all of your responses will be kept confidential and will only be available to the researchers in this study.

If you would like to participate in this study, please visit the following website:

[\\*\\* survey link \\*\\*](#)

This research has been approved by the Institutional Review Board at Radford University. If you have questions about this study, please contact Dr. Sarah Hastings, 540-831-6169 or [slhasting@radford.edu](mailto:slhasting@radford.edu). If you have questions about your rights as a research subject, you may contact Dr. Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University, [dgrady4@radford.edu](mailto:dgrady4@radford.edu), 540-831-7163.

Thank you for taking the time to assist me in this research. If you know other breast cancer patients or survivors who may be interested in participating in this study, please feel free to pass along this email advertisement.

**Jaclyn Lea Mullins, M.S.**  
**Counseling Psychology Doctoral Candidate**  
**Radford University Psy.D. Program**  
**Tel: 910.231.3936 | [jmullins13@radford.edu](mailto:jmullins13@radford.edu)**

## **Appendix B: Amazon Mechanical Turk Brief Summary**

### Instructions:

This survey seeks to explore the relationship between social support and positive change among breast cancer patients and survivors. In order to participate, you must be a female of at least 18 years of age who has had a diagnosis of breast cancer within the last 5 years. Additionally, you must have no history of any other types of cancer. Participation will involve answering questions regarding demographic information as well as the completion of 3 brief measures assessing positive change, social support, and personality characteristics. Select the link below to complete the survey. At the end of the survey, you will receive a code to paste into the box below to receive a \$1.00 credit for taking our survey.

**Make sure to leave this window open as you complete the survey.** When you are finished, you will return to this page to paste the code into the box.

## **Appendix C: Eligibility Questions**

**Please indicate Yes or No to the following questions:**

1. Do you identify as female? **Yes** **No**
2. Are you age 18 or older? **Yes** **No**
3. Have you been diagnosed with breast cancer within the past 5 years? **Yes** **No**
4. Do you have a history of being diagnosed with any other types of cancer? **Yes** **No**



## Appendix D: Resource Page

# RU

*Radford University  
Department of Psychology  
P. O. Box 6946  
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## National Mental Health Resources

### National Alliance on Mental Illness

<https://www.nami.org/> - NAMI is the nation's largest grassroots mental health organization dedicated to building better lives for the millions of Americans affected by mental illness. NAMI advocates for access to services, treatment, supports and research and is steadfast in its commitment to raise awareness and build a community for hope for all of those in need.

### Mental Health America

[www.mentalhealthamerica.net](http://www.mentalhealthamerica.net) - MHA, the leading advocacy organization addressing the full spectrum of mental and substance use conditions and their effects nationwide, works to inform, advocate and enable access to quality behavioral health services for all Americans.

### Healthfinder.gov

[www.healthfinder.gov](http://www.healthfinder.gov) - A federal government website managed by the U.S. Department of Health and Human Services where you will find information and tools to help you and those you care about stay healthy as well as assist you in locating medical, dental, and mental health providers in your area.

## National Breast Cancer Resources

### American Cancer Society

[www.cancer.org](http://www.cancer.org) or 1-800-227-2345

### Susan G. Komen

<http://www.komen.org/> or 1-877 GO KOMEN (1-877-465-6636)

### The Cancer Support Community

<http://www.cancersupportcommunity.org/> - The CSC is an international non-profit dedicated to providing support, education and hope to people affected by cancer.

### CancerCare

[www.cancercare.org](http://www.cancercare.org) or 1-800-831-HOPE (4673) – *CancerCare* is a national nonprofit organization that assists individuals and families better cope with the emotional and practical challenges arising from cancer. Services include counseling, support groups, educational publications and workshops, and financial assistance.

## Appendix E: Informed Consent



### Adult Informed Consent

**Title of Research:** Posttraumatic Growth in Breast Cancer Patients and Survivors: The Role of Giving and Receiving Social Support

**Researchers:** Dr. Sarah Hastings and Jaclyn Mullins, M.S.

You are being asked to participate in a study exploring the relationship between social support and positive change among breast cancer patients and survivors.

If you agree to participate, we ask that you complete a survey that will require about 20 minutes of your time. Participation will involve answering questions regarding demographic information as well as the completion of 3 brief measures assessing positive change, social support, and personality characteristics. We would like your honest opinions and reactions.

You will not be required to disclose your name. All information obtained in connection with this study will be kept confidential by the researchers.

We anticipate the risks in participating in this study are no greater than those experienced in everyday life. You can choose not to be in this study. If you decide to be in this study, you may choose not to answer certain questions. What you choose will not affect any current or future relationship with Radford University.

There are no direct benefits to you from participating in this study.

If you have any questions about this study, please ask before you give your consent for participation. If you have questions after the study is completed, please contact Dr. Sarah Hastings, 540-831-6169 or [slhasting@radford.edu](mailto:slhasting@radford.edu).

This study was determined to be expedited for review by the Radford University Committee for the Review of Human Subjects Research. If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contact Dr. Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University [dgrady4@radford.edu](mailto:dgrady4@radford.edu) 540-831-7163.

Please save a copy of this form for your records or contact the investigators for an additional copy of the document.

Thank You

If you would like to participate in this study, please click on the button labeled “I agree.” If you do not want to participate in this study, please click on the button labeled “Cancel.” By clicking “I agree,” you are indicating that you have read the information provided above and have decided to participate. You may withdraw at any time, without prejudice after submitting this form, should you choose to discontinue participation in this study.

I have read this information and want to participate in this study described above.

- I agree
- Cancel

## Appendix F: Informed Consent



### Adult Informed Consent

**Title of Research:** Posttraumatic Growth in Breast Cancer Patients and Survivors: The Role of Giving and Receiving Social Support

**Researchers:** Sarah Hastings, Ph.D., Tracy Cohn, Ph.D., Thomas Pierce, Ph.D., and Jaclyn Mullins, M.S.

You are being asked to participate in a research study exploring the relationship between social support and positive change among breast cancer patients and survivors.

If you agree to participate, we ask that you complete a survey that will require about 20 minutes of your time. Participation will involve answering questions regarding demographic information as well as the completion of 3 brief measures assessing positive change, social support, and personality characteristics. We would like your honest opinions and reactions.

You will not be required to disclose your name. All information obtained in connection with this study will be kept confidential by the researchers.

We anticipate the risks in participating in this study are no greater than those experienced in everyday life. You can choose not to be in this study. If you decide to be in this study, you may choose not to answer certain questions. What you choose will not affect any current or future relationship with Radford University.

If you choose to participate, you will be compensated in the amount of \$1.00 through your affiliation with Amazon Turk.

If you have any questions about this study, please ask before you give your consent for participation. If you have questions after the study is completed, please contact Dr. Sarah Hastings, 540-831-6169 or [slhasting@radford.edu](mailto:slhasting@radford.edu).

This study was determined to be expedited for review by the Radford University Committee for the Review of Human Subjects Research. If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contact Dr. Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University [dgrady4@radford.edu](mailto:dgrady4@radford.edu) 540-831-7163.

Please save a copy of this form for your records or contact the investigators for an additional copy of the document.

Thank You

If you would like to participate in this study, please click on the button labeled “I agree.” If you do not want to participate in this study, please click on the button labeled “Cancel.” By clicking “I agree,” you are indicating that you have read the information provided above and have decided to participate. You may withdraw at any time, without prejudice after submitting this form, should you choose to discontinue participation in this study.

I have read this information and want to participate in this study described above.

- I agree (1)
- Cancel (2)

## Appendix G: Demographics Questionnaire

1. What is your zip code? (This will be used to classify your place of residence as urban, suburban, or rural)
2. What is your current age?
3. At what age were you diagnosed with breast cancer?
4. What stage was your breast cancer at the time of your diagnosis?
  - Stage 0
  - Stage I
  - Stage II
  - Stage III
  - Stage IV
  - Unsure
  
5. Please indicate what forms of treatment you have been exposed to during your breast cancer experience. Please check all that apply.
  - Full Mastectomy
  - Partial Mastectomy
  - Lumpectomy
  - Bone Marrow Transplant
  - Chemotherapy
  - Radiation
  - Hormone Therapy
  - Physical Therapy
  - Alternative Medicine
  - Other

6. On a scale from 0-6, how stressful was the breast cancer diagnosis and treatment for you?

Not At All Stressful 0

1

2

3

4

5

Extremely Stressful

7. Did you perceive being diagnosed with and treated for breast cancer as a threat of death or serious injury?

Yes

No

8. What is your ethnicity?

Asian

Black/African American

Hispanic

Pacific Islander

Middle Eastern

Native American/American Indian

White/Caucasian

Multi-Ethnic

Other (please described) \_\_\_\_\_



9. What is your current marital status?

- Single
- Committed Relationship
- Married
- Divorced
- Widowed
- Separated

10. What was your marital status during your cancer treatment experience?

- Single
- Committed Relationship
- Married
- Divorced
- Widowed
- Separated

11. What was your marital status at the time of your breast cancer diagnosis?

- Single
- Committed Relationship
- Married
- Divorced
- Widowed
- Separated

12. What is the annual income level for your family before taxes?

\$0 - \$10,000

\$11,000 - \$ 25,000

\$26,000 - \$50,000

\$51,000 - \$75,000

\$76,000 - \$100,000

Over \$100,000

13. What is your highest level of education?

Some high school

High school diploma

Associate's Degree

Bachelor's Degree

Graduate Degree

14. Please list any other traumatic experiences you have had within the past 5 years that do not pertain to your breast cancer diagnosis or treatment.

## Appendix H: Posttraumatic Growth Inventory

Tedeschi & Calhoun (1996)

Indicate for each of the statements below the degree to which this change occurred in your life as a result of your breast cancer experience.

- 0= I did not experience this change as a result of my breast cancer experience.
- 1= I experienced this change to a very small degree as a result of my breast cancer experience.
- 2= I experienced this change to a small degree as a result of my breast cancer experience.
- 3= I experienced this change to a moderate degree as a result of my breast cancer experience.
- 4= I experienced this change to a great degree as a result of my breast cancer experience.
- 5= I experienced this change to a very great degree as a result of my breast cancer experience.

	Degree of Change					
	No Change	Very Small	Small	Moderate	Great	Very Great
1. I changed my priorities about what is important in life.	0	1	2	3	4	5
2. I have a greater appreciation for the value of my own life.	0	1	2	3	4	5
3. I developed new interests.	0	1	2	3	4	5
4. I have a greater feeling of self-reliance.	0	1	2	3	4	5
5. I have a better understanding of spiritual matters.	0	1	2	3	4	5
6. I more clearly see that I can count on people in times of trouble.	0	1	2	3	4	5
7. I established a new path for my life.	0	1	2	3	4	5
8. I have a greater sense of closeness with others.	0	1	2	3	4	5
9. I am more willing to express my emotions.	0	1	2	3	4	5
10. I know better that I can handle difficulties.	0	1	2	3	4	5
11. I am able to do better things with my life.	0	1	2	3	4	5
12. I am better able to accept the way things work out.	0	1	2	3	4	5

13. I can better appreciate each day.	0	1	2	3	4	5
14. New opportunities are available which wouldn't have been otherwise.	0	1	2	3	4	5
15. I have more compassion for others.	0	1	2	3	4	5
16. I put more effort into my relationships.	0	1	2	3	4	5
17. I am more likely to try to change things which need changing.	0	1	2	3	4	5
18. I have a stronger religious faith.	0	1	2	3	4	5
19. I discovered that I'm stronger than I thought I was.	0	1	2	3	4	5
20. I learned a great deal about how wonderful people are.	0	1	2	3	4	5
21. I better accept needing others.	0	1	2	3	4	5

## Appendix I: Ten-Item Personality Inventory-(TIPI)

(Gosling, Rentfrow, & Swann, 2003)

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree Strongly	Disagree Moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree Moderately	Agree Strongly
1	2	3	4	5	6	7

I see myself as:

1. \_\_\_\_\_ Extraverted, enthusiastic.
2. \_\_\_\_\_ Critical, quarrelsome.
3. \_\_\_\_\_ Dependable, self-disciplined.
4. \_\_\_\_\_ Anxious, easily upset.
5. \_\_\_\_\_ Open to new experiences, complex.
6. \_\_\_\_\_ Reserved, quiet.
7. \_\_\_\_\_ Sympathetic, warm.
8. \_\_\_\_\_ Disorganized, careless.
9. \_\_\_\_\_ Calm, emotionally stable.
10. \_\_\_\_\_ Conventional, uncreative.

## Appendix J: 2-Way Social Support Scale

(Shakespeare-Finch and Obst, 2011)

**The following statements relate to your experience of giving and receiving social support. Please read each statement and then indicate the degree to which the statement is generally true for you from not at all (0) to always (5). Please answer each question based on the social support you have given and received since being diagnosed with breast cancer.**

	Not at All					Always
1. There is someone I can talk to about the pressures in my life.	0	1	2	3	4	5
2. I am there to listen to other's problems	0	1	2	3	4	5
3. If stranded somewhere, there is someone who would get me	0	1	2	3	4	5
4. I help others when they are too busy to get everything done.	0	1	2	3	4	5
5. People confide in me when they have problems.	0	1	2	3	4	5
6. I feel that I have a circle of people who value me.	0	1	2	3	4	5
7. I am a person others turn to for help with tasks.	0	1	2	3	4	5
8. There is someone in my life that makes me feel worthwhile.	0	1	2	3	4	5
9. I give others a sense of comfort in times of need.	0	1	2	3	4	5
10. There is at least one person I feel that I can trust.	0	1	2	3	4	5
11. When someone I was close to was sick, I helped them.	0	1	2	3	4	5
12. There is someone in my life I can get emotional support from.	0	1	2	3	4	5
13. People close to me tell me their fears and worries.	0	1	2	3	4	5
14. I have helped someone with their responsibilities when they were unable to fulfill them.	0	1	2	3	4	5
15. There is someone who would give me financial assistance	0	1	2	3	4	5
16. When I am feeling down, there is someone I can lean on.	0	1	2	3	4	5

17. There is at least one person that I can share most things with	0	1	2	3	4	5
18. I have someone to help me if I am physically unwell.	0	1	2	3	4	5
19. I look for ways to cheer people up when they are feeling down.	0	1	2	3	4	5
20. There is someone who can help me fulfill my responsibilities when I am unable.	0	1	2	3	4	5