INVESTIGATING THE EXISTENCE OF TRAUMA-SPECIFIC GROWTH:
A COMPARISON OF TWO POPULATIONS

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ABSTRACT
Posttraumatic growth (PTG) is defined as, “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). These positive psychological changes are thought to occur as the result of the rebuilding and restructuring of an individual’s core assumptions about the world and self that occur when a person experiences a traumatic event. In the current study, two specific trauma types, sexual assault and breast cancer diagnosis, were examined to see how these differing types of trauma may influence which core cognitive schemas are challenged as the result of experiencing the trauma and the domains in which PTG occurs. Participants (N = 105) completed a demographic questionnaire, the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979), the World Assumption Scale (WAS; Janoff-Bulman, 1989a), and the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). An exploratory factor analysis with this sample resulted in a five factor structure for the WAS and a one factor structure for the PTGI. Sexual assault survivors and breast cancer survivors did not differ on any of the five domains of the WAS. However, breast cancer survivors scored significantly higher than the sexual assault survivors on the PTGI. These findings may mean that the core cognitive schemas related to trauma do not differ based on the type of trauma that is experienced. These findings also indicate that the trauma type does influence an individual’s experience of posttraumatic growth, with breast cancer survivors experiencing higher levels of
posttraumatic growth, as measured by the PTGI, than sexual assault survivors. Implications of these findings and areas of future research are delineated.
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CHAPTER I

STATEMENT OF THE PROBLEM

Individuals who are affected by traumatic events experience a range of psychological reactions. Psychologists have often considered the negative psychological sequelae to trauma (e.g., nightmares, avoidance of trauma-related stimuli, increased arousal). Recent research has also begun to consider the potential positive psychological sequelae (e.g., increased goal-directed behavior, more intimate relationships with others, increased sense of personal strength) that can accompany a response to trauma (e.g., Cordova, Cunningham, Carlson, & Andrykoski, 2001; Frazier, Conlon, & Glaser, 2001; Linley & Joseph, 2004; McMillen, Smith, & Fisher, 1997; Tedeschi & Calhoun, 2004; Tedeschi, Park, & Calhoun, 1998; Weiss, 2002). Finding ways to transform the traumatic experience by acknowledging and perceiving positive aspects of the trauma may be one way individuals alleviate the anxiety associated with the negative psychological sequelae following trauma (Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995). As a by-product of rebuilding their lives and perceiving positive aspects of the trauma, many people experience positive outcomes following a traumatic event (Tedeschi & Calhoun, 2004).

Tedeschi and Calhoun (2004) have termed these positive outcomes “posttraumatic growth (PTG)” which they define as, “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (p. 1). A large body of
contemporary research on PTG has shown that individuals who have experienced different traumas (e.g., cancer diagnosis, sexual assault) have the potential to experience these positive outcomes (e.g., Cordova et al., 2001; Frazier et al., 2001; McMillen et al., 1997; Weiss, 2002, 2004). These positive outcomes may occur concomitant with negative outcomes, such as emotional distress, dysfunctional thinking patterns, hyperarousal, and vivid nightmares of the traumatic event (Tedeschi & Calhoun, 2004; Tedeschi et al., 1998).

PTG may be categorized into distinct facets (Tedeschi & Calhoun, 1996, 2004). To understand the distinct facets of PTG, Tedeschi and Calhoun (1996) conducted a review of reports of PTG and constructed 34 items that referred to positive change following the experience of a traumatic event. These 34 items were administered to a large pool of undergraduate students ($N = 604$). The data were then analyzed using a principal component analysis that revealed five interpretable components represented by 21 of the 34 items. These components stem from and are consistent with the benefits cited by individuals who have experienced PTG following a traumatic event. The five facets of PTG were labeled as follows: “Appreciation for Life,” which reflects greater appreciation for life and a changed sense of priorities; “Relating to Others,” which reflects warmer, more intimate relationships; “Personal Strength,” which reflects greater sense of personal strength; “New Possibilities,” which reflects recognition of new possibilities or paths for one’s life; and “Spiritual Change,” which reflects both spiritual and existential development. These items (and their corresponding components) were compiled to form a self-report measure called the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). According to these researchers, using a quantitative measure of PTG allows researchers to examine the positive outcomes of trauma and,
“allows comparison among persons confronted with different traumatic events in varying contexts” (p. 458).

Tedeschi and Calhoun (2004) proposed that these five facets of PTG occur as a result of the cognitive rebuilding and restructuring of an individual’s assumptive world that must be undertaken when challenged by a traumatic event. This assumptive world is a, “basic conceptual system, developed over time that provides us with expectations about ourselves and the world so that we might function effectively” (Janoff-Bulman, 1989a, p. 114). This assumptive world consists of certain core cognitive schemas that are often unquestioned until a traumatic event occurs (Janoff-Bulman, 1989b). Janoff-Bulman (1992) contends most people tend to have the following three fundamental positive assumptions or core cognitive schemas that are most affected by trauma: “The world is benevolent; the world is meaningful; and, the self is worthy” (p. 6). When a traumatic event occurs in a person’s life, these assumptions may appear to be falsely held illusions. In the aftermath of a traumatic event, individuals must rebuild cognitive schemas that incorporate the challenges to their fundamental assumptions in order to maintain an organized way of viewing the world and the self. According to Tedeschi and Calhoun, finding ways of incorporating the traumatic event into one’s schemas of the world and self can be experienced as growth.

Much of the initial research on PTG, to date, focuses on the experience of PTG as if it is a dichotomous question (e.g., Has the individual experienced PTG or not?) (e.g., Carver & Antoni, 2004; Lechner et al., 2003; McMillen, Zuravin, & Rideout, 1995; Tomich & Helgeson, 2004; Weiss, 2002). Although these researchers considered different ways in which individuals experience PTG, the main focus of their research was
on the existence of PTG in general. However, Calhoun, Hettler, and Pane (1998), Park (2004), and Tedeschi and Calhoun (1996) have argued that examining the five specific facets of PTG (identified through the principal component analysis of the PTGI) should be the focus of research in order to extend the initial reports that PTG does, in fact, occur. These researchers (Calhoun et al., 1998; Park, 2004; Tedeschi & Calhoun, 1996) have proposed that examining how an individual’s growth in these domains differs based on the type of trauma experienced would be an essential addition to extend PTG theory. The theories (e.g., Calhoun et al., 1998; Janoff-Bulman, 1992) suggest the type of PTG experienced should differ based on the nature of the traumatic event experienced. Furthermore, some prominent theorists in this field (e.g., Janoff-Bulman; Tedeschi & Calhoun, 2004) also suggest that cognitive schemas (e.g., the world is benevolent, the world is meaningful, and the self is worthy) are reappraised or rebuilt and will differ as a result of the type of or nature of trauma experienced.

The current research project approached empirically these two specific theoretical speculations. First, this research project tested empirically Tedeschi and Calhoun’s (2004) theoretical contention that the type of trauma experienced directly influences the type of PTG that occurs. Second, this research project tested empirically Tedeschi and Calhoun’s and Janoff-Bulman’s (1992) assertion that the type of trauma experienced influences the core cognitive schemas that are challenged.

In order to frame these examinations of theory accurately and contextually, this chapter expands on the beginning ideas presented thus far by briefly introducing several topics. First, the definition of trauma is presented. Next, this chapter reviews the spectrum of psychological reactions that occur when individuals encounter a traumatic
event. More specifically, PTG as a reaction to trauma is explored and the current research in PTG is introduced. A model of the process by which PTG occurs is then outlined. Finally, this chapter culminates in an articulation of the purpose of this study along with a clear statement of the research questions that were explored.

The Definition of Trauma

Although initially appearing to be relatively straightforward, defining trauma has presented challenges to researchers studying human reactions to these experiences (Breslau & Davis, 1987; Janoff-Bulman, 1992; Norris, 1992). Some researchers argue that an individual’s subjective appraisal of an event as traumatic should be sufficient to define the event as traumatic (Breslau & Davis, 1987; Breslau & Kessler, 2001; Creamer, McFarlane, & Burgess, 2005). Other researchers argue that the experienced event should be evaluated by some objective standard in order to be considered traumatic (Janoff-Bulman, 1992; Linley & Joseph, 2004; Norris, 1992; Tedeschi & Calhoun, 1995). These objective criteria to qualify an event as traumatic include being outside of the realm of an individual’s ordinary experience, uncontrollable, undesirable, and a threat to an individual’s survival (Calhoun & Tedeschi, 1998a; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995). The question as to which criteria ought to be used seems to have been resolved by considering that both the subjective nature and objective nature of an event are critical in determining whether it is to be considered traumatic. This dualistic definition is recommended by Calhoun and Tedeschi (1998a) who say, to be traumatic, the event must be subjectively interpreted as “seismic” (p. 216), which means it is traumatic enough to shatter an individual’s assumptions about the world and self, and the event must meet certain objective criteria (e.g., uncontrollable and life threatening) as well.
According to the American Psychiatric Association’s (2000) diagnostic criteria for posttraumatic stress disorder, a “traumatic event” that elicits posttraumatic stress symptoms must also meet both an objective and subjective criteria. To be considered traumatic, the event must meet the objective criteria that, “the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (p. 427). The event must also meet subjective criteria in that, “The person’s response involve[s] intense fear, helplessness, or horror” (p. 428). Consistent with these standards, as well as those of Calhoun and Tedeschi (1998a), an event was similarly considered traumatic in the current study when it met both the subjective and objective criteria.

Psychological Reactions to Trauma

An individual who experiences a traumatic event may display an array of reactions. Researchers have identified posttraumatic stress disorder as one potential set of negative reactions people have when they experience a traumatic event. The symptoms that meet the criteria for diagnosis of posttraumatic stress disorder are clustered into three categories: avoidance/numbing, increased arousal, and reexperiencing (American Psychiatric Association, 2000; Foa & Meadows, 1997). The first cluster of symptoms is related to avoidance of trauma-related stimuli and emotional numbing (Foa & Meadows). According to the American Psychiatric Association, this cluster of symptoms includes such things as efforts to avoid thoughts, feelings, and conversations associated with the trauma and efforts to avoid activities and places that remind the person of the trauma. The second cluster of symptoms includes persistent symptoms of increased arousal, which may include such things as difficulty falling or staying asleep, irritability or
outbursts of anger, difficulty concentrating, hypervigilance, and exaggerated startle response (American Psychiatric Association). The last cluster of symptoms, reexperiencing, has been considered the hallmark of posttraumatic stress disorder and consists of symptoms such as nightmares, flashbacks, and feeling as if the traumatic event is recurring (Breslau & Davis, 1987; Foa & Meadows). Janoff-Bulman (1992) suggests that this cluster of symptoms results from an inability to incorporate the traumatic event into existing cognitive schemas. As such, an individual continues to reexperience the traumatic event through nightmares and flashbacks until he or she can incorporate the event into existing cognitive schemas or create new cognitive schemas that take the event into account.

Of interest to the current project, Tedeschi and Calhoun (2004) argued that through this process of incorporation and cognitive rebuilding in the aftermath of trauma, PTG may occur. In studies that are reviewed more fully in Chapter 2, many researchers have found that individuals can have positive outcomes as the result of surviving a trauma (Abraido-Lanza, Guier & Colon, 1998; Bonanno, 2004; Bower, Kemeny, Taylor, & Fahey, 1998; Carver & Antoni, 2004; Cordova et al., 2001; Frazier et al., 2001; Fredrickson, Tugade, Waugh, & Larkin, 2003; Lechner et al., 2003; Linley & Joseph, 2004; McMillen & Loveland Cook, 2003; McMillen et al., 1997; McMillen et al., 1995; Milam, Ritt-Olson, & Unger, 2004; Petrie, Buick, Weinman, & Booth, 1999; Sears, Stanton, & Danoff-Burg, 2003; Siegel & Schrimshaw, 2000; Tedeschi et al., 1998; Tedeschi & Calhoun, 1996, 2004; Updegraff, Taylor, Kemeny, & Wyatt, 2002; Weiss, 2002, 2004). Positive outcomes are reflected in many different ways, such as spiritual growth, stronger personal relationships, sense of the self as stronger, increased healthy
behaviors, and/or a shift in priorities (Cordova et al., 2001; McMillen & Loveland Cook, 2003; McMillen et al., 1995; Petrie et al., 1999; Siegel & Schrimshaw, 2000; Tedeschi & Calhoun, 1996; Tedeschi et al., 1998; Updegraff et al., 2002).

As noted earlier, Tedeschi and Calhoun (2004) labeled these positive outcomes “PTG.” These authors described PTG as “the experience of individuals whose development, at least in some areas, has surpassed what was present before the struggle with crises occurred” (p. 4). Researchers who interview or survey people who have experienced a traumatic event report that those who experience PTG give an account of a life that is in some ways qualitatively improved when compared to functioning prior to the trauma experience. Tedeschi and Calhoun (1996, 2004) categorized this qualitative improvement into five distinct areas: shift in priorities, improved relationships with others, a sense of personal strength, new possibilities in life, and spiritual development. Although the trauma itself is not desired, individuals, in dealing with and working through the trauma, report that they have reaped some benefit and in turn function at a higher level than before the trauma.

Tedeschi and Calhoun (2004) proposed that PTG results from a process of cognitive rebuilding individuals engage in following a traumatic experience. A search of the extant literature, however, shows minimal research examining this process of cognitive rebuilding resulting in PTG (e.g., Bower et al., 1998; Calhoun, Cann, Tedeschi, & McMillan, 2000; Davis, Noel-Hoeksema, & Larson, 1998; Sears et al., 2003). Rather, research has usually focused simply on whether PTG exists in different populations. For example, research has been focused on showing that PTG can take place in sexual assault survivors (Frazier et al., 2001; Thompson, 2000), adult victims of childhood sexual abuse
(McMillen et al., 1995), individuals living with HIV/AIDS (Schwartzberg, 1993; Siegel & Schrimshaw, 2000; Updegraff et al., 2002), breast cancer survivors (Carver & Antoni, 2004; Cordova et al., 2001; Lechner et al., 2003; Petrie et al., 1999; Sears et al., 2003; Tomich & Helgeson, 2002; Weiss, 2002), disaster survivors (tornado, plane crash, mass shooting) (McMillen et al., 1997), individuals living with spinal cord injuries (McMillen & Loveland, 2003), myocardial infarction patients (Petrie et al.), and adolescents (Milam et al., 2004).

Not only does the research document that PTG occurs for individuals faced with varied traumatic events, researchers assessing aspects of PTG have found the experience of PTG to be relatively common (e.g., McMillen et al., 1997, Nolen-Hoeksema & Davis, 2004; Schaefer & Moos, 1998; Weiss, 2002). According to Nolen-Hoeksema and Davis (2004), “[An] increasing number of psychologists…have come to recognize the startling frequency with which reports of growth, benefits, and other positive life changes are reported” (p. 60). In studies of PTG in women with breast cancer, for example, a range of 83% to 98% of the women reported positive changes in their lives as the result of being diagnosed with and dealing with breast cancer (Sears et al., 2003; Weiss, 2002). Similarly, 95% of women in Thompson’s (2000) research who had been sexually assaulted reported positive outcomes as part of their recovery process. McMillen and Loveland Cook (2003) also found that 79% of adults with spinal cord injuries in their study reported positive outcomes resulting from the injury, including increased family closeness and increased compassion for others. Additionally, a study examining positive changes reported by women with HIV/AIDS found that 83% of the sample reported at least one positive change that they attributed to their HIV diagnosis (Siegel &
Schrimshaw, 2000). Finally, although it may seem unlikely, 47% of a sample of women who were sexually abused as children report perceiving some benefit from the traumatic experience (McMillen et al., 1995).

The growth an individual experiences following different traumas has been suggested to be a reflection of the “nature of the victimization” (Janoff-Bulman, 1992, p. 75). For example, one distinction made regarding the nature of the trauma in the literature pertains to those traumatic events that involve a human perpetrator and those that are considered “Acts of God” or random (Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995). Janoff-Bulman theorized that how an individual finds meaning in a traumatic event perpetrated by another human being (e.g., rape, assault, robbery, or sexual abuse) may be different from how an individual finds meaning in a traumatic event that is not perpetrated by another human being (e.g., illness or natural disaster). When considering this distinction in trauma type, the type of trauma experienced would likely influence individuals’ ability to reinterpret aspects of the event and subsequently reconstruct their cognitive schemas following a traumatic event. This differential cognitive reconstruction may in turn influence the type of PTG that occurs. For example, Frazier et al. (2001) found that victims of sexual assault exhibited increased recognition of personal strength and experienced a greater life appreciation, while at the same time exhibiting negative changes in their beliefs about the goodness of other people and the safety and fairness of the world. Janoff-Bulman (1992) stated:

Individuals who have been victimized at the hands of others (e.g., rape victims, incest victims, victims of physical assault) often find it more difficult to reinterpret their experience in terms of newfound appreciation for life; yet these survivors frequently report learning important lessons about their own personal strengths. (p. 137)
To this end, and of particular interest to the present study, Calhoun et al. (1998) stated:

An interesting question for future research is how PTG domains might vary as a function of the type of crisis (e.g. medical vs. death of significant other vs. natural disaster)…For example, certain types of events might inevitably result in positive changes in interpersonal relationships, whereas other types of events might result in positive changes in life philosophy. (pp. 26-27)

As Calhoun et al. noted, and as PTG theory (Tedeschi & Calhoun, 2004) suggests, a relationship likely exists between the type of trauma experienced and the specific PTG that ensues. To date, however, the literature shows minimal empirical research examining this important theoretical question. The current project undertook this important next step in PTG research to conduct an empirical examination of whether growth differences relate to the type of trauma endured. Investigating empirically the hypothesized existence of trauma-specific growth helped examine the current model of PTG and had implications for understanding the cognitive schemas that are presumed to be shattered by the trauma.

Cognitive Reconstructing and the Posttraumatic Growth Model

A key aspect of Calhoun and Tedeschi’s (2006) model of PTG is the expectation that PTG involves cognitive restructuring that occurs as a result of the trauma experienced. Cognitive reconstruction occurs through “The ability to transform the experience, to reinterpret the powerful data, [and] is ultimately related to survivors’ success in resolving their intense crisis” (Janoff-Bulman, 1992, p. 114). Tedeschi and Calhoun (2004) proposed that PTG results from this cognitive reconstruction process. Janoff-Bulman described this cognitive reconstruction process that potentially leads to PTG as “meaning making” (p. 135). “Meaning making” is when individuals incorporate a traumatic event into their preexisting schemas by perceiving positive elements, such as
having a newfound appreciation for life or feeling they are stronger as a result of the event. A person may experience PTG through this transformation and positive reinterpretation of an event, which is undergone in service of incorporating the trauma into his or her reconstructed cognitive schemas.

Janoff-Bulman (1992) contends that the cognitive schemas that the traumatic event challenges are created over time to help individuals organize information about the world. By definition, a schema is “a stable cognitive pattern of (a) selective attendance to specific stimuli, (b) the combination of stimuli into recognizable and familiar forms, and (c) the conceptualization of the entire situation” (Cason, Resick, & Weaver, 2002, p. 133). Cognitive schemas function as a “mental structure that represents organized knowledge about a given concept or type of stimulus” (Janoff-Bulman, 1992, p. 28). Individuals hold schemas about most concepts or stimuli and these schemas vary from specific (e.g., how to drive a car) to general (e.g., how people interact with others). Janoff-Bulman proposed that the most general and most abstract cognitive schemas are also the most fundamental. The schemas that are integral to the study of PTG and the current project are those that are vulnerable to change following victimization (Janoff-Bulman, 1989b). Janoff-Bulman (1989b, 1992) identified three such fundamental schemas: the world is benevolent, the world is meaningful, and the self is worthy. When someone experiences a trauma, these assumptions, which are positive in nature, are often called into question for the first time. Having these particular fundamental schemas disrupted leads to anxiety. In order to alleviate this anxiety, Janoff-Bulman (1992) contended that individuals find ways to incorporate the traumatic event into their previously held cognitive schemas. This is a difficult task because the traumatic event
does not fit with the person’s cognitive schemas about the world as “benevolent” and “meaningful” and, as such, the person has difficulty assimilating the new event into his or her preexisting schemas (Brom & Witztum, 1995). Some researchers (e.g., Foa & Meadows, 1997; Janoff-Bulman, 1992) note that the hallmark stress symptom of reexperiencing a traumatic event (e.g., nightmares) occurs unconsciously so that attempts can be made for the event to be incorporated into preexisting schemas. According to Janoff-Bulman (1992), “Reexperiencing the event through unbidden thoughts and images is primarily in the service of this crucial cognitive reconstruction process” (p. 106).

This cognitive reconstruction process is integral in Calhoun and Tedeschi’s (2006) model of PTG (see Figure 1). In brief, in this model, an individual experiences a traumatic event and the process that occurs following this traumatic event may lead to PTG. When the individual experiences the traumatic event, he or she has dispositional factors¹ that will influence his or her reaction to the trauma. With this in mind, when a traumatic event occurs, Calhoun and Tedeschi (2006) proposed that an individual faces challenges to his or her ability to manage emotional distress, his or her fundamental schemas, beliefs and goals, and to his or her life narrative. When these challenges occur, theoretical researchers contend that a person’s disposition will influence the way he or she reacts to a traumatic event (e.g., Tedeschi & Calhoun, 2004; Tedeschi et al., 1998). There are certain dispositional factors that are of particular interest in PTG research. Several of these dispositional factors are resiliency, hardiness, and optimism. At times, these terms are confused with or incorrectly assumed to be PTG. These concepts differ from PTG in that they are present prior to a traumatic event occurring and are personal and social antecedents that mediate the stress of trauma (Siegel & Schrimshaw, 2000). Tedeschi and Calhoun, on the other hand, argue that PTG occurs after the trauma as the result of the cognitive reconstruction that happens following the event. Another distinction is that PTG leads to transformation and change as the result of the trauma, whereas dispositional factors (e.g., resiliency, hardiness, and optimism) are related to maintaining the same level of functioning following a trauma as a person had pretrauma (Bonanno, 2004; Tedeschi & Calhoun, 2004; Tedeschi et al., 1998).
Figure 1. A Model of Posttraumatic Growth
(Calhoun & Tedeschi, 2006)
a person begins to ruminate about the event. At this point, the rumination is primarily automatic and intrusive. This form of rumination is an individual’s unconscious attempt to incorporate the trauma into preexisting cognitive schemas and is an initial step in the cognitive reconstruction process (Foa & Meadows, 1997; Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004). Put another way, this rumination is an individual’s attempt to comprehend a trauma, or make sense of it (Davis et al., 1998). Tedeschi and Calhoun (2004) suggested that an individual’s ability to make sense of a traumatic event may be, “an intermediate step to PTG” (p. 10). Over time, as an individual begins to make sense of the traumatic event through automatic rumination, there may be a reduction in emotional distress and an increased ability to manage automatic rumination or “unbidden thoughts” about the trauma. At this point, an individual makes a shift from automatic thoughts about the trauma to deliberate cognitive processing of the event. If an individual is able to find benefit in the trauma as the result of this deliberate cognitive processing, he or she is likely to experience PTG. Tedeschi and Calhoun (2004) proposed that self-disclosure and social support are also important in this process of cognitive reconstruction and subsequently influence the likelihood of an individual experiencing PTG.

The empirical examination of two key aspects of Calhoun and Tedeschi’s (2006) model of PTG was the foundation for the questions of the current project. First, this study examined how the type of traumatic event experienced influenced the core cognitive schemas that were challenged. Second, discerning empirically whether the trauma an individual experiences has a differential impact on the type of subsequent PTG helped
demonstrate an important tenant in PTG theory. The current study focused on these two aspects of Calhoun and Tedeschi’s model of PTG.

The Current Study and the General Hypotheses

As noted by Tedeschi and Calhoun (1995) in their call for future research, “It is clear that growth is not a single, unitary phenomenon. Individuals facing one kind of difficulty may evidence growth in areas that differ from those experienced by individuals facing difficulty of a different kind” (p. 118). Janoff-Bulman (1992) and Tedeschi and Calhoun (1995) proposed that the cognitive schemas that are questioned and subsequently rebuilt may also be affected by the type of trauma experienced. Consistent with Calhoun and Tedeschi’s (2006) theory of PTG, and following from their call for future research in PTG, the current study examined questions regarding the effect of the type of trauma experienced on the five distinct facets of PTG. This study also examined the effect of the trauma experienced on the assumptive world (e.g., cognitive schemas) of the individual experiencing growth.

The current study surveyed individuals who had faced two different types of trauma: sexual assault and breast cancer. These two trauma types were distinguished by whether the trauma is perpetrated by another human being (i.e., sexual assault) or whether the trauma is random or not perpetrated by another human being (i.e., breast cancer). This fundamental difference helped investigate empirically the question within the theory as to whether someone who had experienced a trauma perpetrated by another person had different core cognitive schemas challenged than someone who had experienced a trauma that is not perpetrated by a human being. Empirical examination of this important theoretical tenet does not yet appear in the available literature. Because the
fundamental cognitive schemas most often challenged by the experience of trauma are beliefs that the world is meaningful and benevolent and that the self is worthy, this study examined empirically whether these cognitive schemas differed based on the type of trauma experienced. Second, by investigating a potential distinction in trauma type, this study examined empirically the theoretical speculation (Calhoun et al., 1998; Tedeschi & Calhoun, 2004) that the nature of the trauma influences the five distinct areas of PTG (greater appreciation for life and changed sense of priorities; warmer, more intimate relationships with others; greater sense of personal strength; recognition of new possibilities or paths for one’s life; and, spiritual/existential development). Following from this, the general hypotheses of the current study were that the core cognitive schemas impacted by trauma and the domains of posttraumatic growth would differ based on the type of trauma that was experienced.

In the following chapter, several core areas of Tedeschi and Calhoun’s model of PTG (i.e., traumatic event, core cognitive schemas, domains of PTG) are explicated further. The prior research in these areas is discussed and the chapter culminates in a statement of the research hypotheses that were examined in the current study.
CHAPTER II
REVIEW OF THE LITERATURE

Traumatic events occur on a daily basis in our world. A myriad of events can be defined as traumatic, such as hurricanes, motor vehicle accidents, terrorist attacks, being diagnosed with a potentially terminal illness, or being the victim of a violent crime. When a person experiences a traumatic event, it is often understood that the individual may experience negative reactions such as increased arousal, vivid reliving of the event, and avoidance of trauma related stimuli. Although these negative reactions are important to consider in our work as clinicians, theorists, and researchers, it is imperative that the positive psychological sequelae that may occur for some individuals following the experience of a trauma also be examined in order to appreciate the entire human condition. These positive psychological reactions to trauma can be though of as “posttraumatic growth” (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995, 2004) and include such reactions as increasing goal directed behavior, forming more intimate relationships with others, and increasing one’s sense of personal strength.

Posttraumatic growth (PTG) is defined as, “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). Tedeschi and Calhoun (2004) theorized that these positive psychological changes are the result of the rebuilding and restructuring of an individual’s core assumptions about the world and self that occur when that person
experiences a traumatic event. The belief that an individual has core cognitive assumptions that are vulnerable following a traumatic event is based on Janoff-Bulman’s (1992) theory of trauma recovery. In her theory, Janoff-Bulman (1992) explicates the core cognitive assumptions that are most often influenced by the experience of trauma. These core cognitive schemas include beliefs that the world is benevolent, the world is meaningful, and the self is worthy. When an individual experiences a traumatic event, these beliefs are called into question. Janoff-Bulman (1992) proposed that the task of trauma survivors is to find a way to integrate the traumatic experience into their cognitive schemas about the world as meaningful and benevolent and self as worthy, which have likely shifted as a result of the experience. Janoff-Bulman (1992) stated that survivors integrate their experience of the trauma into their cognitive schemas through “meaning making” which is a “powerful cognitive strategy [that] is the survivor’s process of accepting and ultimately transforming the traumatic experience by perceiving positive elements in the victimization” (p. 133).

It is this contention that individuals “positively construe aspects of their experience” (Janoff-Bulman, 1992, p. 135) that has informed Calhoun and Tedeschi’s (2006) model of PTG. This model of PTG delineates the manner by which they believe this positive construal influences the cognitive reconstruction process and in turn leads to PTG. Although there are several variables thought to influence PTG in Calhoun and Tedeschi’s model, the current study focused on three specific aspects of the model: the traumatic event experienced, the cognitive schemas that are reappraised, and the type of growth promoted. By isolating these specific constructs, the current study examined whether the type of trauma experienced challenges different cognitive schemas. The
current study also examined in what way the type of trauma experienced affects the type of PTG that occurs. More specifically, this study examined two specific trauma types, sexual assault and breast cancer diagnosis, to see how these differing types of trauma influenced which core cognitive schemas were challenged as the result of experiencing the trauma and the domains in which PTG occurs. If these two different trauma types resulted in different cognitive schemas being challenged and different growth occurring, then Calhoun and Tedeschi’s (2006) theory of PTG would be supported.

This examination of trauma-specific growth has been called for by theorists and researchers in the domain of trauma recovery (Calhoun, Cann, Tedeschi, & McMillan, 2000; Calhoun, Hettler, & Pane, 1998; Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995; Tomich & Helgeson, 2004). According to Calhoun et al. (1998):

An interesting question for future research is how PTG domains might vary as a function of the type of crisis…for example, certain types of events might inevitably result in positive change in interpersonal relationships, whereas other types of events might result in positive changes in life philosophy. (pp. 26-27)

Tedeschi and Calhoun (1995) argued that PTG is not a “unitary phenomenon” and future research should consider that “individuals facing one kind of difficulty may evidence growth in areas that differ from those experienced by individuals facing difficulty of a different kind” (p. 118). They also argued that future research should examine how one’s assumptive world influences the benefits one construes following a trauma. Calhoun et al. (2000) noted, “Further study of the relation of PTG and the cognitive processing of traumatic events is clearly warranted” (p. 526). Similarly, Gluhoski and Wortman contended that it would be important for future research to examine the relationship between world views such as the meaningfulness and benevolence of the world and
specific traumas. Janoff-Bulman (1992) also noted that research she has done has, “suggested the possibility that the specific changes [in assumptions] experienced may also, in part, reflect the nature of the victimization” (p.75), indicating that the nature of the trauma experienced influences the cognitive schemas that are shattered. Extending from these suggestions that the type of trauma experienced influences the type of cognitive schemas that are questioned, Calhoun and Tedeschi (2006) stated, “One of the most promising areas in which much more work needs to be done is in the ways in which cognitive factors are connected to growth” (p. 17).

Considering these calls for future research, the current study of trauma-specific growth was important in furthering the study of PTG. In order to further delineate the need for the current study, this chapter identifies and examines the specific aspects of Calhoun and Tedeschi’s (2006) model of PTG that were critical to this examination. These particular aspects of the model include the type of trauma experienced, the core cognitive schemas (i.e., meaningfulness of the world, benevolence of the world, and self-worth) that are challenged, and the type of PTG that occurs. To this end, this chapter begins by exploring what events are defined as traumatic. This chapter then discusses the core cognitive schemas that theoreticians (e.g., Janoff-Bulman, 1992) believe are influenced by the experience of trauma as well as examines the research that has been done within this area. PTG is further defined and the research that has examined the existence of PTG is explicated. This chapter then specifically discusses sexual assault and breast cancer and how the nature of these two specific traumas differs, examining the PTG research to date with these populations. Finally, the manner by which it is expected that the type of trauma experienced (i.e., sexual assault or breast cancer diagnosis)
influences the cognitive schemas of invulnerability and the type of PTG that occurs is proposed. Finally, the specific research questions that were addressed in the current study are delineated.

Defining an Event as Traumatic

A crucial aspect of the current study is the experience of a traumatic event. Defining the characteristics of traumatic events has been somewhat controversial in psychological research and practice (Breslau & Davis, 1987; Janoff-Bulman, 1992; Norris, 1992). The controversy surrounds the subjective versus objective nature of a traumatic event. Some researchers believe the most crucial aspect for an event to be considered traumatic is the individual’s subjective experience of it as such (e.g., Breslau & Davis, 1987; Creamer et al., 2005; Linley & Joseph, 2004; Solomon & Canino, 1990). These researchers argue that the strong emotional reaction that an individual has when faced with a potentially traumatic event is the deciding factor of whether the event should be considered traumatic for that person. As noted by Breslau and Davis (1987), “Stressors have little existence outside of human experience and life histories; their etiological role in disease is a function of the subjective meaning they have for individuals” (p. 260). In this way of thinking, any event that an individual believes is traumatic should be considered traumatic. According to Norris (1992), researchers taking this standpoint believe that, “A traumatic event should be defined as any event that produces symptoms of traumatic stress (intrusion, numbing, and arousal)” (p. 409). Another way of arguing this standpoint would be that any event that shatters an individual’s basic assumptions, such as the world is meaningful and benevolent, should be considered traumatic (Janoff-Bulman, 1992).
Although the subjective experience of an event is important in the consideration of whether an event is deemed traumatic, the argument that an event is traumatic if it produces traumatic stress experiences is circular (Dulmus & Hilarski, 2003). Janoff-Bulman (1992) stated, “We agree that the meaning of an event for any particular individual is important and then move beyond to consider the nature of events that are most likely to produce a traumatic response” (p. 53). Therefore, in addition to the subjective appraisal of an event, many researchers believe the objective nature of an experience is critical in evaluating whether an event should be considered traumatic (e.g., Calhoun & Tedeschi, 1998b; Janoff-Bulman, 1992; Norris, 1992; Tedeschi & Calhoun, 1995). These theorists would argue that when defining an event as traumatic, both the subjective and objective experience must be acknowledged. The American Psychiatric Association (2000) stresses the importance of both subjective and objective experiences when diagnosing posttraumatic stress disorder, stating an event is considered traumatic only if it meets both subjective and objective criterion. The subjective criterion (A.2) states, “The person’s response involved intense fear, helplessness, or horror” (p. 219). The objective criterion (A.1) states, “The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (p. 218). Consistent with other research in this area, several other aspects in addition to a threat to an individual’s survival may help objectively assess whether an event is traumatic. These aspects include whether the event is outside of the realm of ordinary experience, and whether it is uncontrollable, as well as whether the event is a threat to an individual’s survival (Calhoun & Tedeschi, 1998; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995).
Even though it is used commonly, the objective standard of defining the event as outside of the realm of ordinary experience is not without problems. Specifically, most Americans experience at least one potentially traumatic event, such as rape, combat, assault, or death of a loved one, in their lives (Solomon & Johnson, 2002). General population studies have found trauma exposure rates to be as high as 89% lifetime and 21% in the past year for Americans (Soloman & Johnson). Other studies have found that at least 50-60% of the United States population experiences a traumatic event during their lifetime (Ozer, Best, Lipsey, & Weiss, 2003). According to the most recent National Crime Survey, over four million Americans were victims of crimes of violence (e.g., rape, assault, or robbery) in 2005 (United States Department of Justice, 2006). More specifically, 188,960 United States citizens over the age of 12 were the victims of rape or sexual assault and close to 4 million citizens were victims of other assaults, which is defined in the survey as unlawful physical attack or threat of attack (United States Department of Justice). Defining traumatic events as outside of ordinary experience begins to seem erroneous when the presented statistics are considered.

High prevalence rates of victimization lead to the argument that some traumatic events are within the range of ordinary human experience (McCann, Sakheim, & Abrahamson, 1988). Recognizing this reality, the American Psychiatric Association, which had previously defined a traumatic event as something outside of the ordinary range of human experience (American Psychiatric Association, 1987), changed the next edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994) to no longer define the objective stressor criterion as something outside the ordinary realm of human experience (Solomon & Johnson, 2002).
Although it is true there are high rates of victimization on a societal level, it should be recognized these traumatic events are not within the range of ordinary experience for individuals: traumatic events, in many cases, can still be outside the range of ordinary experience for a specific individual even though these traumas occur at alarmingly high rates within our society. For this reason, being outside of the realm of ordinary experience continues to be a distinguishing characteristic for defining traumatic events in much of the literature in this area and was used in the present study as well.

As discussed, the first objective standard for an event to be considered traumatic is that it occurs outside of the realm of an individual’s ordinary experience. A second objective standard of an event that may be considered traumatic is that it must be uncontrollable (Calhoun & Tedeschi, 1998b). If something is uncontrollable, as well as outside of the realm of the individual’s ordinary experience, the individual is “psychologically unprepared” to assimilate the information into preexisting schemas (Janoff-Bulman, 1992). When an individual lacks the ability to control an event, that individual is more likely “to experience powerlessness [which is] more likely to challenge our psychological well-being” (Tedeschi & Calhoun, 1995, p. 17).

A third objective standard applied to defining an event as traumatic is when the event is threatening to an individual’s physical integrity (American Psychiatric Association, 2000; Calhoun & Tedeschi, 1998b; Janoff-Bulman, 1992; Lechner et al., 2003). An event that can be objectively considered life threatening is “seismic” in that it shatters an individual’s cognitive beliefs about the safety and meaningfulness of the world (Calhoun & Tedeschi, 1998b). According to Janoff-Bulman (1992), “There is something unique about traumatic events that…involve perhaps the most basic of threats,
that to our very survival” (p. 56). According to Becker (as cited in Janoff-Bulman, 1992), life threatening events are traumatic because, “to see the world as it really is [is] devastating and terrifying…it makes routine, automatic, secure, self-confident activity impossible” (p. 61). The American Psychiatric Association (2000) considers a believed or actual threat to an individual’s physical integrity to be a hallmark of considering an event traumatic and a necessary condition for diagnosing posttraumatic stress disorder. This threat to an individual’s physical integrity is extremely anxiety provoking and is an objective criterion for an event to be considered traumatic.

Although the debate will likely continue as to whether subjective or objective criteria are optimal to use to define trauma, for the purposes of the current research project, an event was considered traumatic when it met both subjective and objective criteria. That is, an event that, through subjective appraisal, resulted in strong emotional reactions (e.g., American Psychiatric Association, 2000; Breslau & Davis, 1987) and shattered an individual’s basic assumptions about the benevolence and meaningfulness of the world (e.g., Janoff-Bulman, 1992; Tedeschi & Calhoun, 2004) was considered traumatic only if this event also met the objective criteria of an event being defined as traumatic. The objective criteria for the current study, as defined earlier, were being outside of the realm of ordinary experience, being uncontrollable, and being a threat to an individual’s physical integrity (e.g., American Psychiatric Association; Calhoun & Tedeschi, 1998b; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995). As is shown later in this chapter, the traumatic events examined in the current study (i.e., sexual assault and breast cancer diagnosis) meet the established objective criteria to be considered a traumatic event.
An individual’s subjective experience of the traumatic event was established through the use of the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979). The IES is a widely used measure of traumatic stress (Brewin, 2005; Joseph, 2000). According to Horowitz et al., the IES “measures the current degree of subjective impact experienced as a result of a specific event” (p. 209). As noted by Sundin and Horowitz (2002), after reviewing numerous studies, the IES is “a reliable index of degree of subjective distress from a particular trauma, and can be used to compare one group of trauma victims with another, or hence one trauma type of victim with another” (p. 209). The IES is a 15-item measure in which higher scores indicate a greater frequency of intrusive thoughts and avoidance of stimuli related to the experience of a traumatic event (Joseph, 2000), with a total score over 19 as indicative of subjective distress related to the traumatic event (Horowitz et al.). The IES also consists of two subscales (Intrusion and Avoidance). Horowitz et al. reported a split half reliability of the total scale as 0.86, an internal reliability (Cronbach’s Alpha) of 0.78, and a test-retest reliability of 0.87 after one week. Internal consistency for the subscales was high (Intrusion at 0.78 and Avoidance at 0.82) (Horowitz et al.). The two subscales correlated at 0.42. Satisfactory internal reliability for the total scale of 0.86 was also reported by Zilberg, Weiss, and Horowitz (1982). According to a psychometric review by Joseph of the IES, the measure, across studies, has satisfactory internal consistency.

Sundin and Horowitz (2002) examined the validity of the IES by reviewing published articles assessing the psychometric properties of the IES. Sundin and Horowitz analyzed 12 studies that examined the two-factor structure of the IES and found seven studies that confirmed the two factor structure, three studies that found an additional
factor labeled “emotional numbing” and two studies that found one underlying factor. Twelve studies were found that examined the correlation between the subscales of Intrusion and Avoidance. The mean correlation between the subscales, based on these 12 studies was 0.63, which indicates the subscales are related but distinct. Horowitz et al. (1979) also examined the IES’s sensitivity to change over time, finding that individuals who engaged in therapy showed a significant decrease in scores on the IES after completion of therapy. Horowitz et al. also administered the IES to two samples (i.e., medical students and patients who had experienced traumatic events) and found that the patients ($M = 38.7$) experienced significantly more subjective distress than medical students ($M = 9.8$), $F = 170.8, p < 0.001$. Based on the widespread use of the IES as a measure of subjective distress related to traumatic events, the IES was used in the current study as a screening instrument. Both sexual assault and breast cancer will be shown to meet the objective criteria established in this section to be considered traumatic. The IES was used to show that these events also meet the subjective criteria established in this section to be considered traumatic. This chapter now turns to a discussion of a second facet of Calhoun and Tedeschi’s (2006) PTG model that was examined in the current study.

Core Cognitive Schemas Affected by Trauma

The cognitive schemas that are affected by the experience of a traumatic event are a second facet of the PTG model (Calhoun & Tedeschi, 2006) that was examined in the current study. According to Janoff-Bulman (1989a), these core cognitive schemas stem from an individual’s assumptive world, which she defines as a “Basic conceptual system, developed over time, that provides us with expectations about ourselves and the world so
that we might function effectively” (p. 114). As noted by Janoff-Bulman (1992), the term assumptive world was coined by Parkes (1975), who used the phrase to describe:

A strongly held set of assumptions about the world and the self which is confidently maintained and used as a means of recognizing, planning, and acting…assumptions such as these are learned and confirmed by the experience of many years. (p. 132)

The assumptive world is a conceptual system that individuals develop over time to organize the information they glean from the world. Individuals hold, at the most basic and general level, assumptions about the world and the self that help them organize information. Janoff-Bulman (1989a, 1992) proposed that the core assumptions individuals hold that are most vulnerable to trauma are that the world is benevolent and meaningful and that the self is worthy. It is these core cognitive assumptions that are affected when individuals experience a trauma, struggling with ways to view the world as benevolent and meaningful and the self as worthy while at the same time realizing that traumatic events can happen to them. As noted by Janoff-Bulman (1989a), “We may intellectually maintain that one out of four people gets cancer and that crimes and car accidents are common. Yet we truly do not believe that these events will happen to us” (p. 116). So, when these events do occur, they are not easily assimilated into our preexisting fundamental schemas.

The core cognitive schemas most affected when an individual experiences a trauma include a belief that the world is benevolent, the world is meaningful, and the self is worthy (Janoff-Bulman, 1989a, 1992). Janoff-Bulman (1989a, 1992) stated that people tend to think the world is benevolent and this benevolence has two aspects—benevolence of the world and benevolence of people. Individuals believe that the world is a good place and that positive outcomes will occur more often than negative outcomes, minimizing the
amount of “bad” things that happen in the world. And, although people tend to acknowledge that negative outcomes occur, they do not tend to believe these negative outcomes will occur for them. Janoff-Bulman theorized that individuals are likely to believe that people are good, kind, and trustworthy.

Janoff-Bulman (1992) also contended that people believe the world is meaningful, stating, “A meaningful world is one in which a self-outcome contingency is perceived” (p. 8). Individuals assume there is a relationship between who they are as people and what happens to them, believing the world is a just place. This idea stems from Lerner’s Just World Theory (Lerner & Miller, 1978), which postulated that individuals believe that people, based on their character, get what they deserve, which is why “bad things happen to bad people.” Lerner and Miller summarized the Just World Theory, stating:

Individuals have a need to believe that they live in a world where people generally get what they deserve. The belief that the world is just enables the individual to confront his physical and social environment as though they were stable and orderly. (p. 1030)

This belief acts as an organizing principle for individuals so that they do not become overwhelmed by a sense of randomness in the world. Furthermore, Janoff-Bulman stated that individuals tend to see a link between a person’s behavior and what happens to them, creating a sense of controllability in their lives. As noted by Janoff-Bulman (1989a), “From this perspective, it is the extent to which people engage in appropriate, precautionary behaviors that best determines what will happen to them. The assumption is that people can directly control their world through their own behaviors” (p. 118). To dispute this belief is to understand chance and randomness, realizing there are, at times, no explanations for why certain things happen to certain people.
The self as worthy is the third core cognitive schema theorized to be affected by trauma, which can be broken down into three components—belief in one’s self-worth, belief in self-controllability, and luck (Janoff-Bulman, 1989a). A belief in one’s self-worth is the, “extent to which people perceive themselves as good, moral, worthy, decent individuals” (p. 119). Self-controllability is the extent to which individuals believe they engage in “precautionary behaviors” and, therefore, control the events in their lives, and luck is the extent to which individuals believe they are lucky.

Janoff-Bulman (1989a, 1992) contended that these fundamental assumptions are our earliest cognitive schemas, originating in our interactions with caregivers during infancy. This portion of Janoff-Bulman’s theory of fundamental assumptions stems from Erik Erikson’s (1968) theory of development, Bowlby’s (1969, 1973) attachment theory, and Winnicott’s (1965) object relations theory of good enough mothering. Erikson proposed that establishing a sense of basic trust during an infant’s first year of life is a fundamental task that leads to psychological well being. When a caregiver appropriately responds to the needs of the infant, a sense of trust in others and in the self is established. This idea parallels the ideas of Winnicott, which are rooted in object relations theory. Object relations can be generally defined as “mental representations of self and other (objects)” (Prochaska & Norcross, 1999, p. 49). These object relations are internalized representations stemming from the interaction with significant others, particularly during infancy (Binder, Strupp, & Henry, 1995). According to Winnicott, an infant is reliant on a caregiver to respond to his or her needs for survival and the caregiver need not be perfect, but must be “good enough” for the infant to grow and mature (Summers, 1994). If the caregiver is “good enough” and the infant’s needs are met, the infant begins to
internalize representations of the world as a good place where individuals respond to his or her needs because of a basic sense of worthiness. According to Bowlby’s (1969, 1973) theory of attachment, these internal representations created through early interactions with attachment figures form the basis for a child’s working models of the self and the world. These models influence our expectations of others’ behaviors and provide us with a script for how we believe events will unfold (Binder et al.). Following from these theories is the idea that, “An available, responsive caregiver provides the basis for the child’s positive representations of the world and the self” (Janoff-Bulman, 1992, p. 14).

To empirically examine the existence of these theoretical assumptions, Janoff-Bulman (1989a) generated eight items for each of the eight core cognitive schemas of her model of assumptive worlds. These eight core cognitive assumptions are the benevolence of the world, benevolence of people, justice, controllability, randomness, self-worth, self-controllability, and luck. After an initial administration of a 64-item questionnaire to a general population ($N = 254$), the alpha coefficients generated indicated the measure could be reduced to four items per assumption. Reliabilities for the eight four-item scales were between .67 and .78. A 32-item questionnaire was then administered to a general population ($N = 356$) and a factor analysis was completed that revealed a seven factor structure, with one factor accounting for all items measuring the benevolence of the world and the benevolence of people. The other six factors (Justice, Controllability, Randomness, Self-Worth, Self-Controllability, and Luck) were each comprised of the four items intended for that factor. The eigenvalues for each of the seven factors were greater than 4.0 and the reliability ranged from .66 to .76 for each of the factors. In general, this study identified the factor structure of assumptive worlds
proposed by Janoff-Bulman and resulted in the creation of the World Assumption Scale (WAS) (Janoff-Bulman, 1989a).

Janoff-Bulman’s (1989a) initial study provided evidence that people have assumptive worlds that include beliefs about the world as meaningful and benevolent and the self as worthy, but further research was warranted to examine how these assumptions differ between those people who had experienced a specific trauma (“victims”) (i.e., rape, incest, death of parent or sibling, fire that destroyed their home, and/or disability as the result of an accident) and those people who had not experienced a specific trauma (“non-victims”). To address this issue, Janoff-Bulman (1989a) conducted an additional study, administering the WAS and the Zung Self-Rating Depression Scale to undergraduate students ($N = 338$) of whom some ($n = 83$) had experienced trauma at some point in their lives (i.e., rape, incest, death of a parent or sibling, fire that destroyed their home, and/or disability as the result of an accident) and some ($n = 255$) had not experienced trauma, to assess differences in assumptive worlds based on experiencing a trauma. Janoff-Bulman compared students who had experienced trauma to students who had not experienced trauma using 2 X 2 analyses of variance (victim status and gender) and found the victims had lower self-esteem ($M = 18.4$) and saw the world as more malevolent ($M = 17.2$) than non-victims ($M = 21.3$ and $M = 18.4$, respectively). Male victims tended to believe in chance more than male non-victims (15.0 vs. 13.7) and female victims believed in chance less than female nonvictims (12.8 vs. 14.3). Victims were also more likely to be depressed than nonvictims. No effect size information was noted in this study. These findings indicate a difference in assumptive worlds based on the experience of a trauma. In this study, the traumatic events were wide ranging. The current study examined two
specific traumatic events, exploring how the type of trauma experienced influenced specific differences in assumptive worlds.

Schwartzberg and Janoff-Bulman (1991) also examined the difference in assumptive worlds based on the experience of trauma, specifically the death of a parent. In this study, undergraduate students \( (N = 42;\) 21 bereaved students and 21 nonbereaved students) were administered the Symptom Checklist-90 (SCL-90), the WAS, a measure examining locus of control, a measure examining self-esteem, a measure examining the nature of the relationship between the participant and his or her parents in childhood, and a measure examining grief, which was given only to those who experienced the death of a parent. The researchers found alpha coefficients of .87 for the Benevolence of the World Scale, .76 for the Meaningfulness of the World Scale, and .80 for the Self-Worth Scale. The results from this study indicated that bereaved individuals were more likely than nonbereaved participants to believe that the world is less meaningful and that events were determined by chance. In examining within group differences, lower perceived meaningfulness for bereaved individuals indicated greater intensity of grief. Subjects who experienced more intense grief tended to see the world as more random, less just, and less controllable than those who experienced less intense grief symptoms. Also, bereaved individuals who had higher levels of self-worth experienced less intense grief. No effect sizes were noted in this study.

Bereaved participants also participated in semistructured interviews to examine how the death of a parent influenced the participants’ fundamental assumptions (Schwartzberg & Janoff-Bulman, 1991). An analysis of these interviews showed that 45% of the bereaved participants reported a shift in their life priorities and what they
considered important following the death of a parent. Thirty-five percent of the bereaved participants indicated they were more serious and they had a “broader, deeper understanding of life” (p. 281). Thirty percent of the bereaved participants stated they no longer felt invulnerable following the death of their parent and 25% felt more bitter and cynical after the death. Ninety percent of the bereaved participants noted that they asked “Why me?” after the death. These findings indicate the experience of losing a parent leads to a shift in fundamental assumptions, most notably a decrease in the belief of the world as meaningful, when compared to a nonbereaved population. These findings did not indicate a difference in the assumptions about self-worth and the benevolence of the world. Schwartzberg and Janoff-Bulman questioned whether this lack of a difference is the result of the social support individuals may experience when they lose a parent (especially at this relatively young age).

In this study (Schwartzberg & Janoff-Bulman, 1991), the experience of bereavement was shown to influence fundamental assumptions, specifically a belief in the world as meaningful, with students who had lost a parent believing the world is less meaningful than students who had not lost a parent. A shortcoming of this study was that it only examined one specific trauma group. Different trauma experiences may influence other assumptions (i.e., the world is benevolent and the self is worthy) in a different manner, based on the specific nature of the trauma. The current study took this step and examined how experiencing different traumatic events may influence an individual’s core cognitive assumptions.

Other studies using the WAS have also established the reliability of the measure for use with individuals who have experienced a traumatic event. Solomon and Laufer
(2004) used a Hebrew translation of the WAS with Israeli youth who experienced terrorism and found alpha coefficients of .78 for the Benevolence of the World Scale and the Self-Worth Scale and .77 for the Meaningfulness of the World Scale. In Gibson and Leitenberg’s (2001) study of sexual assault survivors, 1,050 women completed the Benevolence of the World and Meaningfulness of the World Scales and alpha coefficients of .88 and .70 were found, respectively. Harris and Valentiner (2002) examined the subscales of the WAS with 361 undergraduate females and found the following internal reliabilities for the subscales (α = .82 for Benevolence of the World, α = .63 for Benevolence of People, α = .65 for Justice, α = .70 for Controllability, α = .65 for Randomness, α = .83 for Self-Worth, α = .72 for Self-Control, and α = .84 for Luck).

Although the WAS is shown to be a reliable measure, there is limited information on the construct validity of using the WAS with trauma survivors. Janoff-Bulman’s (1989a) initial study of the factor structure revealed a 7 factor structure (as noted earlier), but the WAS is often used with 3 subscales (Benevolence of the World, Meaningfulness of the World, and Self-Worth) rather than breaking the measure down into the 7 subscales. Janoff-Bulman also noted that a lack of validity information exists for the measure (R. Janoff-Bulman, personal communication, November 13, 2006). Harris and Valentiner (2002) performed an exploratory factor analysis on the measure and found a five-factor solution was optimal (i.e., Self, Justice, Benevolence, Luck, and Randomness). Because of the lack of information regarding the validity of the WAS, as well as the conflicting use of subscales, the current study examined the factor structure of the WAS before other analyses were conducted. For the purpose of the research questions
to be addressed in this study and in line with the theory of trauma recovery, the use of the
3 subscales was assumed when forming the questions.

Gluhoski and Wortman (1996) also conducted research to examine whether world
views are altered by trauma and how different types of trauma influence world views,
stating, “A study which compares subjects who have experienced different types of trauma
would elucidate the relationship between diverse traumas and subsequent world views” (p.
418). Interviews were conducted with 3,617 people with follow up interviews conducted
three years later with 83.1% of the initial interviewees. Interviews included questions
regarding four world views: fatalism, justice, vulnerability, and self view. Individuals were
also questioned about whether they had experienced traumatic events such as the death of a
loved one, serious illness or injury, assault, job loss, divorce, and change of residence.
Participants were divided into six broad groups based on the time and nature of the
traumatic event experienced, defining a traumatic event as either a death or a “self-focused
event.” The researchers defined “self-focused events” as “having been the victim of an
attack, having had a life-threatening illness, or having experienced an involuntary
retirement” and death events were defined as losing “either a child, mother (under the age
of 50), father (under the age of 50), or spouse (under the age of 50)” (p. 421).

Using a series of multivariate analyses of covariance for each world view (i.e.,
fatalism, justice, vulnerability, and self view), the researchers (Gluhoski & Wortman,
1996) found that victims of a trauma were not more fatalistic than nonvictims. Victims
tended to feel less safe than nonvictims and victims had lower self-views than
nonvictims. Those participants who experienced a self-focused event between interviews
tended to see the world as more just than other subjects. Also, subjects who experienced
both death and self-focused events had a lower self-view. In general, this study indicated that the experience of a traumatic event does influence one’s world views and that this influence is partially a result of the nature of the trauma experienced. A limitation to this study was the use of broad categories to differentiate between trauma groups. More specific delineation between trauma groups was used in the current study so that trauma-specific changes in fundamental assumptions could be more clearly explicated. The nature of the traumatic events used by Gluhoski and Wortman is also questionable. For example, forced retirement may not be considered traumatic, based on the definition of trauma more generally accepted in trauma research. In addition, Gluhoski and Wortman examined changes in assumptions through the use of qualitative interviewing. A next step would be to examine these changes in assumptions through the use of quantitative measures, which the current study did.

Calhoun et al. (1998) also studied the effect of trauma experiences on cognitive assumptions, specifically examining generational differences in assumptions about the world being just. The WAS, the Just World Scale, and the Traumatic Stress Scale were administered to a sample of American adults ($N = 223$) divided into three age groups (18 to 25 years old, 25 to 55 years old, and 59 years and older). Using analysis of variance, Calhoun et al. found the youngest participants tended to view the world as less just and benevolent and people as less benevolent than the other age groups. The oldest participants tended to view the world as luckier and more controllable and view themselves as luckier than other participants. The researchers did not find statistically significant differences in assumptive worlds based on the level of stressfulness of critical life events, concluding that core cognitive schemas are not always influenced when one
experiences a traumatic event. Although this conclusion may be accurate, it could be that the subjects did not experience a traumatic event, experiencing more benign critical life events, which is why the researchers did not find a statistical effect of life event on assumptive worlds. The subjects involved in this study were not a trauma population and the researchers did not collect data on the nature of the “critical life event” the subjects were reporting, making it difficult to definitively state the reason for their results. The effect of a traumatic event on assumptive worlds and the differences created by specific traumatic events were a focus of the current study. The current study examined two specific traumatic events and the influence of these two experiences on assumptive worlds. By examining assumptive world differences with individuals who have experienced a traumatic event, rather than critical life events, it was thought that differences in assumptive worlds based on traumatic event may come to light.

More recently, Matthews and Marwit (2003-2004) examined the assumptive worlds of bereaved parents, specifically looking at how different types of loss (i.e., murder, accident, illness) affected parents’ world views. The sample in this study consisted of bereaved parents ($N = 135$) who had lost their child by accident ($n = 37$), murder ($n = 64$), or illness ($n = 34$). Subjects completed a demographic questionnaire, the WAS, and a measure of grief. Using multivariate analysis of covariance (with parent’s education, parent’s age, and time since death entered as the covariates), the researchers found that bereaved parents, in comparison to a control group of nonbereaved parents ($n = 35$), believed the world was less benevolent (25.04 vs. 15.71) and had lower senses of self-worth (40.16 vs. 25.98). The bereaved parents did not differ from nonbereaved parents on their beliefs of the world as meaningful (43.08 vs. 44.39). Those parents
whose child was murdered had more negative views of the benevolence of the world
\((M = 32.61, SD = 8.71)\) than those parents whose child died in an accident \((M = 25.05, SD = 10.17)\). Both groups (i.e., parents whose child was murdered and parents whose child died in an accident) had more negative views of the benevolence in the world when compared to those parents whose child died from illness \((M = 17.47, SD = 6.54)\). Those parents whose child died from illness had more negative beliefs about the meaningfulness of the world \((M = 52.26, SD = 6.55)\) than those parents whose child died from accident \((M = 44.75, SD = 13.18)\) and both groups had more negative views about the meaningfulness of the world than those parents whose child died by murder \((M = 34.39, SD = 8.81)\). Those parents whose child was murdered had the lowest sense of self-worth \((48.09\ vs.\ 40.12\ for\ parents\ whose\ child\ died\ from\ accident\ and\ 32.26\ for\ parents\ whose\ child\ died\ from\ illness)\). Overall, more negative views of the world were predictive of higher levels of reported grief. No effect size information was available in this study. Please note that in this study, higher numbers indicate more negative views.

The results from this study (Matthews and Marwit, 2003-2004) provide further evidence that an individual’s assumptive world is affected by traumatic experiences. These findings also suggest that changes in the assumptive world of those who experience a traumatic event are influenced by the nature of the traumatic event. Matthews and Marwit noted that one shortcoming of this study is that the sample size for each group did not reach 45, which is the recommended sample size for appropriate power (Cohen, 1992). The current study extended the results of Matthews and Marwit’s research by examining the difference in assumptive worlds affected within different
trauma groups as well as examining differences in the experience of PTG based on the type of trauma experienced.

The aforementioned research (Calhoun et al., 1998; Gluhorski & Wortman, 1996; Janoff-Bulman, 1989; Matthews & Marwit, 2003-2004; Schwartzberg & Janoff-Bulman, 1991) provides evidence for the existence of fundamental assumptions regarding benevolence of the world, meaningfulness of the world, and self-worth. With the exception of the Calhoun et al. (1998) study, the extant research also suggests that an individual’s core cognitive schemas are influenced by the experience of trauma, often leading to a more negative view of the world and the self than the view of those who have not experienced a similar trauma. Calhoun and Tedeschi (2006) theorized that an individual’s task following trauma and the shattering of one’s core assumptions, “tends to be the repair, restructuring, or rebuilding of the individual’s general way of understanding the world” (p. 10). According to Janoff-Bulman (2006), “The task for the survivor is to rebuild a viable assumptive world that is both valid and comfortable” (p. 86). This assumptive world is often more negative, but not wholly negative, rather one that is, “a more complex assumptive world, one that can account for their victimization, but nevertheless provides a more positive view of the self and the world” (p. 86). Through this rebuilding process, an individual may discover a sense of personal strength, an understanding of new possibilities in life, better relationships with others, a greater appreciation for life, and/or change in their spiritual beliefs. In other words, through the creation of a more complex assumptive world, an individual may experience PTG.

The previous section defined the assumptive world (i.e., core cognitive schemas affected by trauma) and delineated key theoretical contentions of how and why human
beings create these core cognitive schemas (e.g., Bowlby, 1969, 1973; Erikson, 1968; Janoff-Bulman, 1989, 1992; Lerner & Miller, 1978; Winnicott, 1965). This section also explicated the research that has examined the existence of the assumptive world and the research that has examined the differences in assumptive worlds based on experiencing a trauma. The current study extended these general findings by quantitatively examining how assumptive worlds differed based on the specific traumatic event experienced, comparing two trauma groups (i.e., sexual assault survivors and breast cancer survivors) on their core cognitive schemas vulnerable to trauma. The current study also examined another facet of Calhoun and Tedeschi’s (2006) model of posttraumatic growth—how the type of trauma experienced influenced the type of PTG that occurs. The next section discusses the history of PTG, examines the existence of PTG, and delineates the extant research showing the relationship between the trauma experienced and the domains of PTG.

Posttraumatic Growth

A third facet of Calhoun and Tedeschi’s (2006) model of PTG that was examined in the current study was the specificity of growth that may occur for individuals who experienced different traumatic events. The possibility that growth can occur as the result of experiencing trauma has been considered for centuries and is an important concept in many religions and cultures (e.g., Egyptian mythology, Hinduism, Buddhism, Christianity, Islam) (Calhoun & Tedeschi, 2006; Tedeschi et al., 1998). Existential philosophers and psychologists (e.g., Frankl, Kierkegaard, May, Nietzsche) have long appreciated the possibility of trauma leading to the creation of meaning (Calhoun & Tedeschi; Tedeschi et al.). Growth following experiences of trauma can also be found in crisis intervention work, particularly the work of Finkel (1974) that described potentially
traumatic life events as “growth-potentiating” experiences (Tedeschi et al., p. 5). The experience of growth following trauma has also been present in literature for centuries (e.g., Greek tragedies).

This possibility that growth may follow traumatic experiences has been discussed anecdotally for centuries, but it has only recently been the specific focus of behavioral sciences (Calhoun & Tedeschi, 2006). According to Calhoun and Tedeschi, the focus on growth from experiencing trauma first occurred with empirical studies during the 1990’s when Schaefer and Moos (1992), O’Leary and Ickovics (1995), Tedeschi and Calhoun (1995), and Park, Cohen, and Murch (1996) began writing about the concept of psychological growth occurring following a traumatic event. This concept has been discussed in the extant literature as “benefit finding,” “meaning making,” “positive by-products,” “adversarial growth,” and “stress related growth.” In 1998, Tedeschi et al. termed this psychological growth “posttraumatic growth,” stating, “PTG is the best descriptor for this phenomenon because this term makes clear that the persons experiencing this phenomenon have developed beyond their previous level of adaptation, psychological functioning, or life awareness, that is, they have grown” (p. 3). They went on to define PTG as, “a significant beneficial change in cognitive and emotional life” (p. 3) occurring as one struggles following the experience of a traumatic event. More specifically, Tedeschi and Calhoun (2004) defined PTG as, “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (p. 1). It is also defined as:

The experience of individuals whose development, at least in some areas, has surpassed what was present before the struggle with crises occurred. PTG is not simply a return to baseline—it is an experience of improvement that for some persons is deeply profound. (Tedeschi & Calhoun, 2004, p. 4)
Individuals who experience PTG report growth in different areas of their life. These areas of growth are broken into 3 broad categories—changed perception in the self, changed relationship with others, and changed philosophy of life (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995)—each of which has more specific facets. A changed sense of self can include a greater sense of personal strength. As noted earlier in the discussion about the shattering of core assumptions, survivors of traumatic events often feel an increased sense of vulnerability, viewing the world as more negative and dangerous. Hand-in-hand with this sense of vulnerability, survivors often experience an increased sense of strength. This sense of strength correlates with a sense of vulnerability and is captured in the belief that if one can handle the current traumatic event, one can handle anything (Tedeschi & Calhoun, 1995). Individuals who experience a trauma may learn about their ability to be self-reliant, a sense of strength that one is able to handle a situation on his or her own. Calhoun and Tedeschi (2006) encapsulate gaining a greater sense of personal strength with the statement, “I am more vulnerable than I thought, but much stronger than I ever imagined” (p. 5). A changed sense of self may also manifest itself in the recognition of different or new paths for one’s life (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995). According to Calhoun and Tedeschi (2006), individuals, “report the emergence of new possibilities in life, developing new interests, new activities, and perhaps embarking on significant new paths in life” (p. 5).

Changed relationships with others is another general area of growth reported by individuals following a traumatic event (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995, 2004). Individuals who have experienced a traumatic event often report feeling a stronger connection with others, particularly those who have also experienced a
traumatic event. They may feel an increased sense of empathy and compassion for the struggles of others, possibly leading to an increased lending of support to others in need. Individuals who experience a traumatic event also report an increase in self-disclosure with an increased sense of freedom to be oneself (Calhoun & Tedeschi; Tedeschi & Calhoun, 1995). Calhoun and Tedeschi noted that this increase in self-disclosure may lead to closer, more intimate relationships, although for some it may push others away.

The third general domain of growth reported by individuals who have survived a trauma is a changed philosophy of life (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995, 2004). A changed philosophy in life may include a greater appreciation for life. This greater appreciation for life is often discussed in terms of enjoyment in small things that may have been ignored prior to the traumatic event. Experiencing a traumatic event, as noted earlier, often leads to confrontation with one’s mortality, which may trigger new appreciation for the life that one has. As noted by Calhoun and Tedeschi, individuals often comment that the priorities in their life shift following a traumatic event, with “greater meaning being found in intrinsically important priorities (e.g., spending time with one’s children) and less importance being attached to extrinsic priorities (e.g., making lots of money)” (p. 6). A changed philosophy in life may also include religious or spiritual growth. According to Tedeschi and Calhoun (1995), a strengthening of religious beliefs may serve the purpose of helping individuals regain a sense of control over their life, may be a source of comfort, and/or meaning may be found in religious doctrine related to suffering. For other individuals, this area of growth may be more related to existential growth, confronting one’s purpose in life, than to a specific religion (Calhoun & Tedeschi; Tedeschi & Calhoun, 2004)
To examine empirically the existence of these specific areas of psychological growth following trauma, Tedeschi and Calhoun (1996) developed a scale called the Posttraumatic Growth Inventory (PTGI), noting that a measure of PTG, “allows comparison among persons confronted with different traumatic events in varying contexts” (p. 458). Tedeschi and Calhoun conducted a literature review and created 34 items based on the themes of positive change that emerged from the literature. These 34 items were administered to undergraduate students ($N = 604$) and their responses were analyzed with principal component analysis with varimax rotation. This principal component analysis suggested 5 interpretable components consisting of 21 items. These 21 items accounted for 55% of the common variance. A second principal component analysis was completed with the 21 retained items which also produced 5 interpretable components that accounted for 62% of the common variance. There was a .98 correlation between scores on the 21-item inventory and the 34-item inventory, suggesting that information was not lost in the shorter version of the inventory. The five components that emerged from the data were labeled “Relating to Others,” “New Possibilities,” “Personal Strength,” “Spiritual Change,” and “Appreciation of Life.”

The PTGI is a widely used measure in PTG research. According to Cohen, Cimbolic, Armeli, and Hettler (1998), the PTGI has an advantage over other measures of psychological growth following trauma (e.g., Stress-Related Growth Scale [SRGS]; Park, et al., 1996) because, “It enables researchers to test for varying effects on specific thriving domains (e.g., personal relationships, religious beliefs) as a function of variables such as type of stressor and length of time since stressor occurrence” (p. 326). Cohen et al. noted that research supports the use of subscale scores on the PTGI, whereas the
research on the SGRS only supports the use of the total score. Other researchers have examined the factor structure of the PTGI. Morris, Shakespeare-Finch, Rieck and Newbery (2005) examined the factor structure of the PTGI with an Australian population using principal component analysis with varimax rotation, finding a five components comparable to the five factor solution found by Tedeschi and Calhoun (1996) that accounted for 67.49% of the variance in the data. Jaarsma, Pool, Sanderman and Ranchor (2006) used a Dutch translation of the PTGI with cancer patients and, using principal component analysis, also found a five component structure for the measure that accounted for 70.8% of the variance. Most recently, Taku, Cann, Calhoun, and Tedeschi (2008) examined a three factor (Changed Perception of Self, Changed Interpersonal Relationships, Changed Philosophy of Life), five factor (Appreciation for Life, Personal Strength, Relating to Others, New Possibilities, Spiritual Change) and one factor structure of the PTGI using confirmatory factor analysis ($N = 926$). An obliquely rotated 5 factor structure was found to best fit the data, confirming the original factor structure found by Tedeschi and Calhoun (1996).

Other researchers did not find a five factor solution for the PTGI. Polatinsky and Esprey (2000) used the PTGI in their research with bereaved parents and found the five underlying factors of the PTGI were highly intercorrelated, and although they considered the five factors as well as the total score throughout their research, they noted that the PTGI should be considered to have one underlying construct with their sample, rather than five factors. Weiss and Berger (2006), using principal components analysis with varimax rotation, found a three component solution in a Spanish version of the PTGI. These 3 component solution included 13 items from the original measure and the 3
components were named Philosophy of Life, Self/Positive Life Attitude, and Interpersonal Relationships. This structure accounted for 66.7% of the total variance.

Powell, Rosner, Butollo, Tedeschi, and Calhoun (2003) also found a three-factor solution in a Bosnian translation of the PTGI administered to refugees from Sarajevo. This factor solution only included 10 items from the original 21 item PTGI with many of the original 21 items loading highly on more than one factor. The factors were named Changes in Self/Positive Life Attitude, Changed Philosophy of Life, and A Changed Sense of Relationship to Others and these 3 factors accounted for 57.93% of the variance. Sheikh and Marotta (2005) found a one-component solution for the PTGI with a sample of individuals with cardiovascular disease using a principal component analysis with varimax rotation (the same procedure reported by Tedeschi and Calhoun (1996)). This component accounted for 56.2% of the total variance. Sheikh and Marotta followed the varimax rotation with an oblique rotation, which also indicated a one component solution. These researchers note that the PTGI is measuring a global construct in their sample (i.e., people with a history of cardiovascular). These findings indicate there is some debate over the factor structure of the PTGI. As noted by Park and Lechner (2006), “The evidence regarding whether people experience growth in distinct domains is inconclusive” and “studies employing factor analysis have typically found that the first factor extracted explained a great deal more variance than subsequent factors or that most items loaded on one factor” (p. 57). In the current study, the PTGI was used and the factor structure was assessed with the current sample before subsequent analyses. A five-factor structure was assumed when forming the research questions for the current study.
The PTGI has been found to be a reliable measure. High internal consistency was found for the PTGI with different samples, with Cronbach’s alpha ranging from .96 to .90 (Bates, Trajstman, & Jackson, 2004; Jaarsma et al., 2006; Sheikh & Marotta, 2005; Morris et al., 2005; Tedeschi & Calhoun, 1996). Test-retest reliability for the PTGI is also acceptable ($r = .78$ at three months in Bates et al. and $r = .71$ at two months in Tedeschi & Calhoun). Substantial internal consistency was also found for the five domains of posttraumatic growth, with Cronbach’s alpha ranging from .65 to .93 for Spiritual Change, .84 to .89 for New Possibilities, .85 to .91 for Relating to Others, .67 to .89 for Appreciation of Life, and .72 to .90 for Personal Strength (Jaarsma et al.; Morris et al.; Sheikh & Marotta; Tedeschi & Calhoun). These findings indicate that the PTGI is a reliable measure. It was used in the current study and reliability information was gathered with the sample for this study.

In addition to creating the PTGI, Tedeschi and Calhoun (1995, 2004) and Calhoun and Tedeschi (2006) also proposed a model of the process of PTG (see Figure 1). In this model, an individual experiences a “seismic” traumatic event, which is an event that shatters an individual’s cognitive beliefs about the safety and meaningfulness of the world (Calhoun & Tedeschi, 1998b). As noted by Tedeschi and Calhoun (2004), an individual’s disposition will affect how he or she interprets this seismic event. An individual’s disposition includes factors such as resiliency, hardiness, and optimism. Resiliency is a dispositional factor that can be thought of as the ability to go on with life after hardship or trauma, maintaining the same level of functioning posttrauma as one had pretrauma (Tedeschi et al., 1998; Tedeschi & Calhoun, 2004); or the ability to maintain a stable equilibrium when exposed to unfavorable or aversive life events, generally
exhibiting a stable trajectory of healthy functioning (Bonanno, 2004). In a similar vein, Fredrickson et al. (2003) defined resiliency as a “stable personality trait” that is characterized by the ability to “bounce back” from negative experiences. Hardiness, another dispositional factor, can be thought of as a personality trait where one deals with life’s adversities by perceiving potentially stressful life events in less threatening terms (Tedeschi et al., 1998). It is often thought of in terms of “commitment, control, and challenge” (Tedeschi & Calhoun, 2004, p. 4) in response to life events, where one is committed to finding meaningful purpose in life, one believes he or she can control one’s surroundings and the outcome of events, and one sees stressful life events as challenges from which one can learn and grow (Bonanno, 2004; Tedeschi et al., 1998; Tedeschi & Calhoun, 2004). Finally, optimism can be thought of as expectations of positive outcomes to events (Tedeschi & Calhoun, 2004; Tennen & Affleck, 1998). If an event is “seismic,” as defined objectively and subjectively (see earlier debate on the definition of trauma), it challenges an individual’s ability to manage emotional distress, the individual’s beliefs and goals (or core cognitive schemas), and the individual’s life narrative.

The individual experiencing these challenges tends to ruminate over the event. Calhoun and Tedeschi (2006) defined rumination similarly to Martin and Tesser (1996), stating rumination, “includes reminiscing, problem solving, trying to make sense” (p. 9) and can be thought of “as synonymous with cognitive engagement” (p. 9). At this point following the experience of a traumatic event, rumination is more likely to be automatic and outside of one’s control, similar to posttraumatic stress disorder symptoms of reliving. Tedeschi and Calhoun (2004) and Calhoun and Tedeschi (2006) described this type of rumination as similar to “sense making” (Davis et al., 1998) and “meaning as
comprehensibility” (Janoff-Bulman & Frantz, 1997). They stated that these initial intrusive ruminations are an individual’s attempt to comprehend that the traumatic event has occurred and result in initial revisions to the individual’s cognitive schemas so that the individual can begin to make sense of the traumatic event. An individual at this level of rumination may self-disclose his or her experience of the traumatic event through writing and talking, possibly seeking out social support.

According to Calhoun and Tedeschi (2006), an individual may eventually experience a decrease in emotional distress and “management of automatic rumination” (p. 8). As an individual begins to manage automatic rumination, rumination becomes more deliberate and schema change may occur. Calhoun and Tedeschi (2006) stated that more deliberate rumination leads to, “the repair, restructuring, or rebuilding of the individual’s general way of understanding the world” (p. 10). Calhoun and Tedeschi (2006) likened deliberate rumination to “benefit finding” (Davis et al., 1998) and “meaning as significance” (Janoff-Bulman & Frantz, 1997), stating that deliberate rumination is, “the more reflective element that can yield PTG” (p. 10). Calhoun and Tedeschi (2006) noted that once individuals find “comprehensibility” in the trauma, “they can move from the mere survival that was their original focus to recognizing some other possibilities that become PTG” (p. 10). As individuals deliberately think about the traumatic event, they often find purpose or meaning in the experience and subsequently report PTG.

Although Calhoun and Tedeschi (2006) have postulated this model of the process of PTG, the extant research in this field has predominately focused on the simple question of whether psychological growth following the experience of a traumatic event
exists (e.g., Abraido-Lanza et al., 1998; McMillen & Loveland Cook, 2003; McMillen et al., 1997; McMillen et al., 1995; Milam et al., 2004; Schwartzberg, 1993; Siegel & Schrimshaw, 2000; Tedeschi & Calhoun, 1996; Updegraff et al., 2002). Tedeschi and Calhoun (1996) initially examined the construct validity of PTG as they developed the PTGI, hypothesizing that individuals who experience a severe trauma would report more benefit than individuals who did not experience trauma. To address this, undergraduate students ($N = 604$) were administered the PTGI and the Traumatic Stress Schedule to assess the occurrence of and impact of traumatic events on individuals. Analysis showed that individuals experiencing traumatic events had higher scores ($M = 83.16, SD = 19.27$) than individuals who did not experience traumatic events ($M = 69.75, SD = 20.47$), $F(1, 113) = 12.33, p < .001$. Analysis also showed women had higher scores than men on the scales of new possibilities, relating to others, personal strength, and spiritual change and men had higher scores than women on the scale of appreciation of life. No effect size information was given in this study. These findings indicate that individuals surviving a traumatic event experience higher levels of PTG than individuals who have not experienced a traumatic event. One issue with these findings is that the population studied was undergraduate students exclusively. Tedeschi and Calhoun argued that college students experience comparable forms of trauma to the general population and, although this may be true, the traumatic experiences noted by the students (e.g., academic problems, parental divorce) may not fit the criteria used to objectively define an event as traumatic. Their suggestion that future research should focus on individuals experiencing a “seismic” traumatic event was incorporated into the current study by examining PTG with sexual assault survivors and breast cancer survivors.
McMillen et al. (1997) did examine people who experienced “seismic” traumatic events, comparing individuals’ perceived benefits following the experience of three types of disasters. McMillen et al. defined perceived benefits as, “The process by which those who have experienced traumatic events report benefit and growth as a result of their experience” (p. 733). McMillen et al. studied individuals’ experience of three different types of trauma: a tornado ($n = 42$), a plane crash into a hotel ($n = 46$), and a mass shooting ($n = 136$). Survivors of these traumatic events were interviewed at four to six weeks following the event and again three years following the event. Forty-two survivors of the tornado were interviewed five weeks after the tornado and 39 of these survivors were interviewed again three years after the tornado. Forty-six survivors of the plane crash were interviewed four to six weeks following the crash and 41 of these survivors were interviewed three years later. One hundred and thirty-six of those who survived experiencing the mass shooting were interviewed six to eight weeks following the shooting and 116 of these survivors were interviewed again three years after the shooting. During each of the interviews, survivors were asked, “Can you think of anything positive that came about as a result of the [plane crash/tornado/shooting]?” (p. 734). If individuals answered yes, they were asked to list the positive of things they experienced. Researchers also assessed the severity of the exposure to the traumatic event through a series of questions (e.g., Did you think you were going to die?; Were you injured?).

Findings from McMillen et al.’s (1997) research indicated that perceived benefit was common across all three traumatic events. Those who experienced the plane crash had the lowest rate of perceived benefit and those who experienced the tornado had the highest rate of perceived benefit. People who thought they were going to die were also
likely to report more personal growth. To explain why tornado survivors had the highest rate of perceived benefits, the researchers postulated that certain types of traumatic events are more likely to lead to social support. Those who receive more social support may be better able to process the event, which may lead to the experience of more PTG. This research is critical to the current study because it examined what kinds of events produce more or less PTG, helping to distinguish among traumatic events. A limit to this study was that it only used a single item to assess perceived benefits because, according to the researchers, the PTGI was not available at the time of the study. The current study examined trauma-specific growth using an established quantitative measure (i.e., PTGI), testing the theoretical assertions that specific domains of growth exist and differ based on the event experienced.

The existence of positive psychological changes following trauma has been examined with other populations as well. McMillen and Loveland Cook (2003) studied the existence of positive changes with individuals who experienced a spinal cord injury, specifically looking at the distinction between positive “by-products” and successful coping. Adults with spinal cord injuries ($N = 42$) and individuals close to these participants were interviewed 18 to 36 months post spinal cord injury. Subjects were administered numerous measures, including the Perceived Benefit Scale (PBS; McMillen & Fisher, 1998), to assess for positive by-products of the spinal cord injury. The PBS is a 30-item measure that assesses “several different types of commonly reported positive by-products of adversity” (McMillen & Loveland Cook, p. 78). The PBS was also administered to the close individuals, who completed the measures about the individuals with spinal cord injuries. The findings from this study indicated that 79% of the subjects
reported positive by-products from their injury, with increased family closeness, and increased compassion for others the most often cited positive by-products. In addition to being administered the PBS, subjects were also asked whether there were other ways they had benefited from their injury and 76% of the subjects reported positive by-products not included in the PBS, such as new attitudes, new views of self, changed life opportunities, and gratitude. The individuals close to the subjects who were interviewed generally agreed with the subjects’ self-report of perceived benefits. This finding provides intersubjective validity to the existence of positive psychological changes following trauma. In addition, McMillen and Loveland Cook’s finding that the correlates of positive by-products differ from the correlates for traditional outcome measures of psychopathology and well-being provides evidence for the construct validity of positive psychological changes following trauma. One limitation to the research findings of McMillen and Loveland Cook, though, is their use of simplistic statistics (i.e., correlations and t-tests) to compare the multitude of measures they administered. In the current study, more rigorous statistics were used to examine the link between trauma type and PTG.

The existence of PTG has also been examined with HIV-positive individuals. Schwartzberg (1993) initiated research with HIV-positive gay men to examine if and how these men found meaning in AIDS and what strategies they used to maintain a belief in a meaningful world following their diagnosis. Qualitative research was conducted with gay men \((N = 19)\) infected with HIV, using a semistructured interview. The interviewed men viewed their HIV diagnosis as both positive and negative. Fourteen of the men (74%) saw being HIV-positive as a catalyst for personal growth (e.g., being more appreciative of loved ones, reprioritizing, being less self-centered) and as increasing their
sense of belonging. Eight of the men saw being HIV-positive as a catalyst for spiritual growth. Many of the men also experienced negative ramifications from being diagnosed as HIV-positive. Fourteen of the men described being HIV-positive as an irreparable loss and 13 of the men viewed their diagnosis as a punishment. Seven of the men thought their diagnosis led to isolation and six of the men believed the diagnosis confirmed their sense of powerlessness. In a separate analysis of the qualitative data, Schwartzberg examined the subjects’ ability to find meaning in their diagnosis. Seven of the men were seen as having found high meaning in their diagnosis; their primary representations of being HIV-positive were as personal growth, spiritual growth, and belonging. Four of the men voiced defensive meaning, defined as insubstantial or superficial growth, and four of the men voiced shattered meaning, unable to create a meaningful framework for understanding their diagnosis. The final group of four men spoke of irrelevant meaning, in which they compartmentalized their diagnosis so that it did not become a primary aspect of their identity. These qualitative findings show the coexistence of both positive and negative change experienced by individuals following an HIV diagnosis.

Siegel and Schrimshaw (2000) extended Schwartzberg’s (1993) study by examining the positive changes and stress related growth reported by disadvantaged African American, Puerto Rican, and White women with HIV/AIDS. Participants (N = 54) met with interviewers three times to discuss various aspects of living with HIV. Of these fifty-four participants, 83% reported at least one positive change that they attributed to their HIV diagnosis. These reported positive changes include change in health-related behaviors, greater spiritual or religious faith, closer relationships, new goals and greater appreciation of life and the time they have left. Most of the women in the study
acknowledged adversity and negative consequences related to their illness while also
perceiving positive consequences, indicating that individuals do not need to deny adversity
to perceive positive consequences. These findings corroborate Schwartzberg’s (1993)
conclusions that individuals who have been diagnosed with HIV experience PTG,
extending these findings to diverse women in a lower socioeconomic standing. Both of
these studies (Schwartzberg; Siegel & Schrimshaw) are important in that they provide
evidence for the existence of PTG with a specific population (i.e., individuals diagnosed
with HIV/AIDS). The next step in PTG research is to validate these findings using
quantitative measures, as well as continue to examine the existence of PTG in other trauma
populations. The current study examined, using a quantitative measure (i.e., PTGI), PTG in
individuals who were survivors of sexual assault and survivors of breast cancer.

Updegraff et al. (2002) also examined psychological growth following trauma in a
sample of HIV positive women of low socioeconomic status. The researchers
hypothesized that women would be more likely to make positive changes in areas not as
affected by HIV infection (i.e., more positive changes in domains of self and life priorities
and more negative changes in domains of health and relationships), in effect contending
that the type of trauma experienced will influence the type of growth that occurs.
Participants were HIV-positive women (N = 189) who were asked six open-ended
questions (and were administered other measures) about changes following HIV diagnosis.
Analysis of the results show that participants reported more HIV related positive changes
than negative changes. These positive changes included a feeling of being stronger, wiser,
more understanding, more focused on priorities like their family, helping others, and living
life to the fullest. Participants also noted that being HIV-positive made them feel less
interested in sex, more fearful of starting and maintaining a romantic relationship, and less physically attractive. These findings indicate that women experience positive psychological changes following a HIV positive diagnosis and that these positive psychological changes are influenced by the nature of the trauma experienced. The authors provided some initial qualitative evidence that the type of trauma experienced influences the type of growth that occurs, an observation that was extended in the current study. They argued that that stressors or traumas that have long durations, such as illnesses like cancer or HIV, provide a longer time for adaptation, which may lead to higher levels of psychological growth than sudden traumatic events directly caused by another person. The current study empirically examined this contention by comparing two trauma populations on their experience of PTG, using the PTGI.

The existence of psychological growth following trauma has also been examined with other chronically ill populations. For example, Abraido-Lanza et al. (1998) researched the existence of thriving in Latinas suffering with chronic illness, most notably arthritis. They defined thriving similarly to PTG, stating thriving is when “individuals experience growth beyond equilibrium [which is] operationalized in terms of …finding strength, new insight, or meaning in life as the result of illness” (p. 408). Qualitative analysis of semistructured interviews with 109 women at the first interview and 66 of these women at the three-year follow up interview showed six themes of psychological growth. The most frequent type of psychological growth the women experienced was enhanced appreciation and meaning. They also experienced positive attitude, hope and optimism, as well as personal growth and strength. Some women experienced increased spirituality and empathy for others and some women experienced a
change in their philosophy of life. These themes of psychological growth mirror the
domains of PTG. Future research, such as the current study, should continue to focus on
diverse populations that have experienced different traumatic events, using quantitative
measures to enhance the research examining PTG.

Research examining the existence of PTG has also been done with different age
groups. Milam et al. (2004) used quantitative measures to examine the existence of PTG
in adolescents. Specifically, Milam et al. examined the occurrence of negative life events,
PTG, religiosity, depression, and substance use in predominately Hispanic adolescents
\((N = 435)\), with the mean age of 15.8 \((SD = 1.52)\). Milam et al. altered the PTGI for this
study to make negative responses possible. The measure was altered to a five-point Likert
scale where a score of 4 or 5 indicated positive change, a score of 3 indicated no change,
and a score of 1 or 2 indicated negative change. The prominent traumatic event reported
by the adolescents was the death of a close family member, followed by events such as
moving to a new home, loss of a close friend, major illness in family, parents’ divorce,
being held back a grade, and major illness or injury to self. The mean PTGI score for this
sample was 3.56, indicating mild positive change. The death of a close family member
had the highest PTG score and moving to a new home had the lowest PTG score, but
these differences were nonsignificant. Higher levels of PTG were significantly associated
with being older and more religious, lower substance use, and unrelated to time since
event and depression. Overall PTG scores did not differ based on the type of traumatic
event experienced.

Based on these findings, Milam et al. (2004) contended that PTG does not differ
by trauma type, suggesting there is a threshold for distress necessary for PTG to occur,
but any life event that reaches this threshold can result in PTG. Although it may be true that individuals who have experienced different types of trauma may similarly experience PTG, the different domains of PTG may differ based on the type of trauma experienced. By examining PTG as a unitary phenomenon, Milam et al. may have missed nuances in the experience of PTG in adolescents, notably trauma-specific differences in PTG. The current study attempted to more specifically examine the domains of PTG, testing whether PTG differed by trauma type when the domains of PTG are examined. In addition, the validity of the measure used to assess growth is questionable because the PTGI was altered for this study. Past research (e.g., Schwartzberg, 1993; Siegel & Schrimshaw, 2000; Tedeschi & Calhoun, 1995) has shown that negative consequences co-occur with positive changes following the experience of a trauma. A separate measure of negative consequences, rather than altering the PTGI, may have more accurately reflected the constructs of interest to these researchers. Milam et al.’s research continues to be important, though, in that it validates the experience of PTG in an adolescent population.

The extant research examining the existence of PTG has been explicated in the previous section (e.g., Abraido-Lanza, et al., 1998; McMillen & Loveland Cook, 2003; McMillen et al., 1997; McMillen et al., 1995; Milam et al., 2004; Schwartzberg, 1993; Siegel & Schrimshaw, 2000; Tedeschi & Calhoun, 1996; Updegraff et al., 2002). These studies represent initial steps in the area of PTG research, providing evidence for the existence of a construct that had been anecdotally recognized for centuries. This research, in general, focused on whether different trauma populations (i.e., HIV positive individuals, individuals with spinal cord injuries, adolescents, college students, natural
disaster survivors, plane crash survivors, shooting survivors, individuals with chronic illness) experienced PTG. The findings from these studies substantiate that different trauma populations experience PTG. These results were found using both qualitative and quantitative methods. One of the next steps in PTG research, as noted by theorists and researchers (e.g., Calhoun et al., 2000; Calhoun et al., 1998; L.G. Calhoun, personal communication, November 18, 2005; Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995) is to examine how the domains of PTG may differ as a function of the type of trauma experienced. The current study examined this variation, as well as examined how the type of trauma experienced influenced the cognitive assumptions that are shattered.

In the next section, the specific populations that were examined in the current study, sexual assault survivors and breast cancer survivors, are discussed further. The research that has been done for these populations in the three areas of interest to the current study (surviving a traumatic event, shattering of core cognitive schemas, and experiencing PTG) is explicated, leading to a delineation of the specific research questions addressed in this study.

The Two Populations of Interest in the Current Study

As is articulated further in subsequent sections, both breast cancer and sexual assault are considered traumatic events. Both events have been found to shatter individuals’ core cognitive schemas related to vulnerability (Frazier et al., 2001; Harris & Valentiner, 2002; Thompson, 2000; Tomich & Helgeson, 2002; Ullman, 1997) and both events have been shown to result in PTG for some individuals (Belizzi & Blank, 2006; Cordova et al., 2001; Frazier et al., 2001; McMillen et al., 1995; Petrie et al., 1999; Sears
et al., 2003; Thompson, 2000; Tomich, Helgeson, & Nowak Vache, 2005; Weiss, 2002).

Although these events are similar in this general way, a distinction can be made in the nature of these events. Theorists and researchers (i.e., Gluhoski & Wortman, 1996; Janoff-Bulman, 1992) have discussed the need to delineate between the nature of traumatic events when studying the core cognitive schemas and PTG. Janoff-Bulman noted that an event can be thought of as being discrete or being chronic, occurring to an individual or occurring to a group, or involving a perpetrator or being an “Act of God.” In a study conducted by Gluhoski and Wortman, the researchers drew a distinction between traumas that were self-focused (e.g., being the victim of an attack, being diagnosed with a life threatening illness, having to retire involuntarily) and those that were other-focused (e.g., having a loved one die). Stemming from previous discussions and for the purpose of the current study, a distinction between traumatic events was made based on the source of the traumatic event, with one source being a human perpetrator (i.e., sexual assault) and the other source being random or not having an identifiable human perpetrator (i.e., breast cancer). Other distinctions can also be made between these traumatic events. For example, sexual assault is often a discrete, time-limited event, whereas a breast cancer diagnosis is a more long-term, chronic trauma.

Preliminary research (e.g., Gluhoski & Wortman, 1996; McMillen et al., 1997; Milam et al., 2004; Petrie et al., 1999) has shown, and theorists (e.g., Calhoun et al., 1998; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995) contend, that the type of traumatic event experienced influences the cognitive schemas that are questioned and the PTG that ensues. To extend the research in the field of PTG, the current study empirically examined the influence that the source of a traumatic event (i.e., human perpetrated or
not human perpetrated) has on an individual’s core cognitive schemas about the
meaningfulness of the world, the benevolence of the world, and self-worth, as well as
empirically examined the influence this distinction has on the type of PTG that occurs.

In service of this empirical investigation, the following sections discuss these
populations (i.e., sexual assault survivors and breast cancer survivors) as well as explicate
how each event fits within the facets of the current study (i.e., traumatic event, core
cognitive schemas, PTG). First, for each event, there is a brief assessment of whether the
event meets the established criteria to be considered traumatic. That is, are these events
that an individual would subjectively appraise to be emotionally distressing and do they
meet the objective criteria to be considered traumatic? Second, for each event, the
research that has examined how the event affects an individual’s core cognitive schemas
related to trauma is explicated. Third, for each event, the research providing evidence for
the existence of PTG with these populations is delineated.

Sexual Assault Survivors

In 2005, there were 191,670 reported victims of rape, attempted rape, or sexual
assault (Rape, Abuse, & Incest National Network, 2006). For the purposes of this
investigation, sexual assault will be used to encompass rape, attempted rape and
unwanted sexual touching. The majority of individuals who survive sexual assault
subjectively appraise the event to be emotionally distressing (e.g., Frazier et al., 2001;
Frazier, Mortenson, & Steward, 2005; McCann et al., 1988). Because experiencing
sexual assault is overwhelming, the effects of individual differences, such as disposition,
are negated and anyone faced with this traumatic event would likely find the experience
emotionally distressing (Breslau & Davis, 1987). In fact, sexual assault is thought of as
one of the most distressing events an individual can experience (Frazier et al., 2001) and often results in mental health problems (Frazier et al., 2005). More specifically, women who are the victims of sexual assault commonly react with feelings of fear, anxiety, depression, anger, guilt, and shame (McCann et al; Neville & Heppner). Women who have been sexually assaulted report long lasting sexual dysfunction they attribute to the assault (Neville & Heppner). Also, a link between eating disorders and a history of sexual assault has been suggested (Neville & Heppner).

Considering the strong emotional response elicited when one is the victim of sexual assault (e.g., Frazier et al., 2001; Frazier et al., 2005; McCann et al., 1988; Neville & Heppner, 1999), most individuals would subjectively consider sexual assault to be traumatic. This event also meets the previously explicated objective criteria to be considered a traumatic event. Sexual assault is outside the range of ordinary experience for an individual. Although, as noted earlier, there are more than 200,000 victims of sexual assault annually, sexual assault is still outside the range of an individual’s normal, daily experience.

Sexual assault is also uncontrollable, although many individuals who are the victims of sexual assault blame the assault on their behaviors leading up to the assault. Theorists (Hill & Zautra, 1989; Janoff-Bulman, 1979, 1989b) describe this coping strategy as behavioral self-blame, which is blaming one’s past behaviors for the occurrence of an event (Janoff-Bulman, 1989b). In a survey of workers at rape crisis centers, Janoff-Bulman (1979) found that behavioral self-blame was a common response to sexual assault, with workers at rape crisis centers indicating that 69% of the women reported some aspect of behavioral self-blame when discussing the assault. Through the
use of this coping strategy, individuals are able to increase their sense of control and
decrease their sense of vulnerability. In spite of many sexual assault victims engaging in
behavioral self-blame as a means of increasing their sense of control, it does not negate
the fact that the sexual assault is uncontrollable.

The final objective criterion to consider is whether sexual assault is a threat to an
individual’s physical integrity. By definition, sexual assault is a threat to an individual’s
physical integrity and includes any type of unwanted sexual activity. Also, findings in the
National Violence Against Women Survey indicate that 41.4% of women who are
sexually assaulted after the age of 18 are physically assaulted beyond the sexual assault
itself (Rape, Abuse, & Incest National Network, 2006). In a study about lifetime rates of
posttraumatic stress disorder, Kilpatrick and Resnick (1992; as cited in Norris, 1992)
found lifetime and current rates of posttraumatic stress disorder were the highest in
women who had been raped and sexually assaulted. This brief synopsis of sexual assault
and the subjective and objective criteria to consider an event traumatic (i.e., out of the
ordinary, uncontrollable, threat to physical integrity) leads to the conclusion that sexual
assault is a traumatic event.

Given that it has been established that sexual assault is a traumatic event, the next
aspect to consider is how being sexually assaulted may affect an individual’s core
cognitive schemas related to vulnerability. Janoff-Bulman (1992) theorized that human
perpetrated traumas, such as sexual assault, are likely to influence individuals’
assumptions about self-worth and benevolence of the world more than they influence
assumptions about meaningfulness of the world. Tedeschi and Calhoun (1995) stated
that, “Rape may challenge the schema involving trust or benevolence” (p. 84). Research
examining these theoretical contentions has been scarce. Matthews and Marwit (2003-2004), as noted earlier, examined the effect of trauma type on cognitive assumptions and found that parents of murder victims had more negative views of the benevolence of the world than the other trauma populations. Matthews and Marwit attributed this finding to the fact that the death was in the hands of another. This finding may be similar for women who have been sexually assaulted and for all human perpetrated traumas. The research that does exist specific to sexual assault (e.g., Frazier et al., 2001; Harris & Valentiner, 2002; Thompson, 2000; Ullman, 1997) is explicated in order to facilitate an understanding of the findings expected in the current study when examining the effect of trauma type on fundamental assumptions related to traumatic experiences.

Frazier et al. (2001) examined positive and negative life changes four times over a one year period with female sexual assault survivors ($N = 171$). Participants were administered a 17-item life change measure, the depression subscale from the Brief Symptom Inventory, and checklist items regarding posttraumatic stress disorder. Frazier et al. found that female survivors of sexual assault experienced negative changes in their belief about the goodness of others and the safety and fairness of the world. The decrease in these beliefs was present across all four time periods, existing at one year post-assault. The current study extended these findings by using a measure specifically designed to assess an individual’s core cognitive schemas (WAS). With the use of the WAS, the current study was able to more clearly delineate the effect of trauma type on the core cognitive schemas.

Thompson (2000) also examined the influence of sexual assault on women’s cognitions. Pulling from a larger mixed design study with women who had been raped
(N = 60), Thompson interviewed women (n = 5) recovering from sexual assault using open-ended questions about their recovery. There were several themes that emerged from analysis of the interviews. Women discussed moving from being a victim to a survivor, stating that to do so, “the women had to ‘work through’ the trauma of the rape” (p. 331). Working through the trauma included making cognitive changes that allowed the women to find meaning in the event. Through qualitative analysis of the women’s responses, sexual assault was described as, “a devastating event, which violates basic human assumptions of personal integrity and control and of a just and safe world” (p. 333). Similar to Frazier et al. (2001), these findings suggest that sexual assault survivors will have negative changes in the core cognitive assumption that the world is meaningful. The current study extended these findings by examining changes in core cognitive schemas with an established quantitative measure, allowing the possibility of comparisons between trauma populations on the cognitive schemas affected by the type of trauma experienced. The current study also extended these findings by using a larger sample in order to aid in generalizability of the findings.

Harris and Valentiner (2002) also examined Janoff-Bulman’s (1992) contention that human perpetrated traumas are most likely to influence cognitions about self-worth and benevolence of the world. Specifically, as part of their research, Harris and Valentiner examined whether an individual’s core cognitive schemas changed based on the experience of sexual assault. Harris and Valentiner administered seven scales, including the WAS and an index of trauma severity, to undergraduate women (N = 361). Of these 361 undergraduate women, 313 had not experienced sexual assault, 12 had experienced attempted sexual assault, and 36 had experienced completed sexual assault.
A comparison of these groups on the WAS indicated that women who had experienced a completed sexual assault had lower WAS self-worth scores ($M = 34.0$, $SD = 8.4$) than the non-assault group ($M = 37.2$, $SD = 6.7$) and lower WAS luck scores ($M = 14.2$, $SD = 5.3$) than the non-assault group ($M = 16.7$, $SD = 4.4$) and the attempted assault group ($M = 18.9$, $SD = 3.8$). The groups did not differ on other dimensions, such as justice, benevolence or randomness. No effect size information was given in this study. These findings suggest that the experience of sexual assault is related to some core cognitive schemas (i.e., self and luck) and may not be related to other core cognitive schemas (i.e., justice, benevolence, randomness).

Harris and Valentiner’s (2002) findings are contrary to previous research that has found sexual assault survivors experience negative changes in their view of the world as meaningful (Frazier et al., 2001; Thompson, 2000) and in their view of benevolence of others (Frazier et al.). These findings provide support for Janoff-Bulman’s (1992) theoretical contention that experiencing a human perpetrated trauma (sexual assault in this research) results in negative changes in worth of self (i.e., WAS-self worth scores and WAS-luck scores). These disparate findings suggest that further research should be done to examine the relationship between type of trauma experienced and cognitive schemas that are influenced. It remains unclear how human perpetrated traumas, such as sexual assault, influence the core cognitive schemas of meaningfulness, benevolence and self-worth. The current study attempted to further elucidate the influence of trauma type on cognitive schemas, clarifying earlier research on this topic.

Ullman (1997) also has conducted research regarding the effect of sexual assault on individuals’ fundamental assumptions (i.e., the world is meaningful, the world is
benevolent, and the self is worthy). Ullman examined the association between attributions of blame for the event, fundamental assumptions, search for meaning, and adjustment. Measures of attribution of blame (four items created for the study), search for meaning (two items created for the study), fundamental assumptions (WAS), and adjustment (15 items created for the study) were administered to sexual assault survivors ($N = 155$). Results indicated that women who blamed themselves for the sexual assault were less likely to search for meaning in the sexual assault and were more likely to perceive meaningfulness in the world. Women who made more external attributions of blame were less likely to see the world as benevolent and were less likely to see the self as worthy. No effect size information was given in this study. These findings indicated that individuals’ core cognitive schemas are influenced by a sense of controllability, as indicated by the association between attributions of blame and fundamental assumptions of women who have been sexually assaulted. The current study continued the empirical examination of the link between experiencing a traumatic event and changes in core cognitive schemas, examining specifically how these changes in core cognitive schemas were related to the type of trauma experienced.

The limited research examining the effect of sexual assault on an individual’s core cognitive schemas has been discussed and how these findings have informed the current study have been explained. Theoreticians’ expectations (i.e., Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995) regarding which core cognitive schemas will be affected by a human perpetrated trauma such as sexual assault differ somewhat from what the research in this area has found (i.e., Frazier et al., 2001; Harris & Valentiner, 2002; Thompson, 2000; Ullman, 1997). The current study hoped to clarify previous research findings,
exploring how a human perpetrated trauma influences core cognitive schemas, while also comparing these influences to how a non-human perpetrated trauma influences core cognitive schemas.

Another aspect of the current study was the existence of PTG with individuals experiencing a human perpetrated trauma, specifically how the domains of PTG are influenced by a human perpetrated trauma such as sexual assault. The domains of PTG, as discussed earlier, are assumed to be better relationships with others, new possibilities in life, a sense of personal strength, spiritual change, and a greater appreciation for life (Tedeschi & Calhoun, 1996). Theoreticians (e.g., Janoff-Bulman, 1992; McCann et al., 1988; McMillen et al., 1997; Tedeschi & Calhoun, 1995) have postulated how experiencing a trauma such as sexual assault would influence an individual’s experience of PTG. Janoff-Bulman theorized that traumas that involve a perpetrator will lead to a breakdown in trust in interpersonal relationships because individuals are “acutely aware” that another person intentionally harmed them. Similar to Janoff-Bulman, McCann et al. stated, “Rape victims often report decreased trust in men and fears of getting close to both men and women” (p. 549). Stemming from their research on the influence of trauma type on perceived benefit, McMillen et al. argued that traumas that elicit more social support and individuals who receive more social support may become closer with others, leading to more PTG in the domain of better relationships. Based on the reporting rate, victim-blaming, and the shame involved with having been sexually assaulted, sexual assault survivors may experience less social support than individuals experiencing other traumatic events, such as a breast cancer diagnosis, and therefore experience less PTG in the realm of better relationships than other trauma survivors. On the other hand, Tedeschi and Calhoun
argued that traumatic events that are attributed to the actions of others, such as sexual
assault, may lead to, “enhanced capabilities for making interpersonal judgments
[producing] more freedom to act in a trusting fashion” (p. 83), theorizing that sexual assault
survivors may actually show better relationships with others than thought by other theorists
(i.e., Janoff-Bulman; McCann et al.). Janoff-Bulman also stated:

Individuals who have been victimized at the hands of others (e.g., rape victims,
incest victims, victims of physical assault) often find it more difficult to
reinterpret their experience in terms of newfound appreciation for life; yet these
survivors frequently report learning important lessons about their own personal
strengths. (p. 137)

What becomes apparent by these theoretical arguments is it is unclear as to which
domains of PTG will be most influenced by experiencing a human perpetrated trauma.
Therefore, the limited research done in this area (i.e., Frazier et al., 2001; McMillen et al.,
1995; Thompson, 2000) will be discussed in an attempt to clarify which domains of PTG
may be most influenced by human perpetrated traumas.

Frazier et al. (2001), as discussed earlier, also empirically examined PTG with
sexual assault survivors. A life change measure, a measure of depression, and a measure
of posttraumatic stress disorder were administered to women who had been sexually
assaulted (N = 171). The measures were given across four time periods post-assault—two
weeks, two months, six months, and one year. Overall, the findings indicated that women
who are sexually assaulted experience PTG. Specifically, the results show that the
subjects experienced positive changes in relationships soon after the assault and that these
changes remained stable through the one-year assessment. During the recovery process,
certain changes emerged, such as increased recognition of one’s strength and an
increased sense of purpose in life. Also, those women who had increased recognition of
their strength and experienced greater life appreciation experienced less distress. Frazier
et al. noted small to medium effect sizes for these findings. These findings indicated that experiencing sexual assault influences the domains of PTG in a distinct way (i.e., positive changes in relationships, increased personal strength, and increased sense of purpose in life). Frazier et al. noted they did not use the PTGI in this study because the measure did not exist at the onset of data collection. The current study planned to examine how sexual assault influences the domains of PTG using an established quantitative measure (i.e., the PTGI), extending the findings of Frazier et al. and allowing for comparison between trauma types.

McMillen et al. (1995) also empirically examined the existence of psychological growth following a human perpetrated traumatic event, exploring perception of benefits with women who experienced childhood sexual abuse. McMillen et al. interviewed women who had experienced childhood sexual abuse ($N = 154$). Of these participants 46.8% of the women reported perceiving some benefits from the experience. These perceived benefits fell into four main categories: “protection of children,” “self-protection” “increased knowledge of childhood sexual abuse” and “strength” (p. 1039). Those women who endorsed protection of children stated that as the result of being a victim, they are better able to protect children from being victims. They also noted they have more open relationships with children so that the children can disclose abuse if it is happening. Women who discussed self-protection stated they are less naïve, more aware, less trusting, more careful in relationships, and more trusting of their instincts. Women also noted they have increased their knowledge of childhood sexual abuse and have an increased empathy for others who have experienced it. Finally, women described
themselves as being a stronger, better person as well as more self-sufficient, as the result of surviving childhood sexual abuse.

McMillen et al. (1995) also found that those women who perceived some benefit in the experience had higher self-esteem, more comfort depending on others and less relationship anxiety than those women who did not perceive benefit from the abuse. This research is integral in highlighting that PTG following a traumatic event is a by-product of experiencing a traumatic event. A traumatic event, such as childhood sexual abuse, is not desired, but struggling with the event and finding a way to find meaning in it may lead to psychological growth. These findings should be extended using quantitative measures of psychological growth, such as the PTGI, so that the psychological growth for individuals experiencing this type of trauma can be compared with individuals experiencing other types of traumas.

Thompson (2000) also examined PTG with sexual assault survivors. In this study, also discussed earlier, 95% of the women ($N = 60$) in the larger study reported positive outcomes as one part of their recovery process. The qualitative study that emerged from this larger study consisted of interviews with women who had survived sexual assault ($n = 5$). Themes emerged in the women’s interviews that mirrored several of the domains of PTG. Specifically, many of the women interviewed stated their view of self shifted during the recovery process from that of a victim to that of a survivor. The view of the self as a survivor, “evoked the image of a person who possessed characteristics which the participants perceived as positive, such as strength” (p. 328). Many of the women also described themselves as more reliant, tough, and determined as an outcome of recovering from sexual assault. Although many of the women experienced themselves as stronger as
result of their recovery, they also described loss in the realm of relationships, reporting a loss of friendships and a loss of sexual interest, affecting their intimate relationships. Stemming from this research, it appears that women who have been sexually traumatized may experience PTG, most likely in the domain of strength of self. They may be less likely to experience growth in the domain of better relationships. This research was extended in the current study by using an established quantitative measure, along with a larger sample size, and by comparing the experiences of those individuals who have been sexually assaulted with those who have been diagnosed with breast cancer.

As is evidenced by the limited amount of research explicating the influence of the experience of sexual assault on the domains of PTG, further research must be done in this area. Theoreticians (i.e., Janoff-Bulman, 1992; McCann et al., 1988; McMillen et al., 1997; Tedeschi & Calhoun, 1995) propose how human perpetrated traumas, specifically sexual assault, affect the domains of PTG, but there remains a dearth of research that verifies this proposal (i.e., Frazier et al., 2001; McMillen et al., 1995; Thompson, 2000). The current study attempted to test empirically this theoretical postulate by examining quantitatively the experience of surviving sexual assault on the domains of PTG and by comparing this experience with the experience that surviving breast cancer has on the domains of PTG. This study extended the research in the area of PTG by comparing how the type of trauma (i.e., sexual assault or breast cancer) influenced the core cognitive schemas of invulnerability. In order to further understand how these types of trauma may differentially influence individuals’ core cognitive schemas and experience of PTG, the traumatic experience of being diagnosed with breast cancer is discussed next. First, there is an examination of a breast cancer diagnosis being a traumatic event. Second, there is a
review of the link between breast cancer with an individual’s core cognitive schemas affected by trauma. Third, there is a discussion of the impact that the experience of breast cancer has on an individual’s experience of PTG. Finally, a review of the extant research examining this impact concludes this section.

_Breast Cancer Survivors_

Estimates indicate there were 211,240 new cases of invasive breast cancer diagnosed in the United States in 2005 (the last year for which statistics are available). Forty-thousand women were expected to die from breast cancer in 2005 (American Cancer Society, 2007). Being diagnosed with breast cancer is an emotionally distressing event (Bower et al., 2005; Collins, Taylor, & Skokan, 1990; Timko & Janoff-Bullman, 1985; Weiss, 2002), so much so that it is likely to negate the effects of individual differences, such as disposition, and anyone faced with this event would find the diagnosis subjectively distressing (Breslau & Davis, 1987). In a study conducted by Weiss, 59% of the women studied (N = 41) defined the experience of having breast cancer as traumatic. Bower et al. found that over 40% of the participants in their study (N =763) had fears of breast cancer recurrence. Women who have been diagnosed with breast cancer also report feeling more vulnerable and being fearful as a result of their diagnosis (Collins et al.). Considering the strong emotional response elicited from being diagnosed with breast cancer, a breast cancer diagnosis is typically experienced as traumatic.

Being diagnosed with breast cancer also meets the objective criteria (i.e., outside the realm of ordinary experience, uncontrollable, and a threat to physical integrity) for being considered traumatic. Although, as noted earlier, it was estimated there would be 211,240 new cases of invasive breast cancer diagnosed in 2005 (American Cancer Society, 2007).
individuals often believe that they will not be the one who is diagnosed. Janoff-Bulman (1992) asserted that individuals acknowledge the possibility that they could experience a trauma such as being diagnosed with breast cancer, but that these are, “no more than a verbal statement in the absence of true belief” (p. 20). Being diagnosed with breast cancer is also, in general, not something that is controllable. According to the American Cancer Society, the strongest correlated risk factors for breast cancer are being female, being older, having inherited genetic mutations, having two or more first degree relatives with breast cancer, and breast density. None of these risk factors are something that can be controlled. The final objective criterion to consider an event traumatic is that it is a threat to an individual’s physical integrity. Considering the expectation that over 40,000 women died from breast cancer in 2005 and that the surgical treatment for breast cancer may include mastectomy in which a women’s breast is removed (American Cancer Society), a breast cancer diagnosis is objectively thought of as a threat to a woman’s physical integrity. Considering this information, and for the purposes of the current study, breast cancer is acknowledged as a traumatic event according to both subjective and objective criteria.

Defining breast cancer as a traumatic event indicates that, theoretically, experiencing this diagnosis will lead to changes in an individual’s core cognitive schemas affected by trauma. Janoff-Bulman (1992) theorized ways in which a medical diagnosis, such as breast cancer, may influence these core cognitive schemas. Janoff-Bulman stated that an “Act of God” trauma most likely will influence an individual’s perception of the meaningfulness of the world, stating that those traumas that do not involve a perpetrator often lead to questions about meaning. Matthews and Marwit (2003-2004) found this to
be the case in their study examining the fundamental assumptions of three groups of bereaved parents. The researchers found that those parents whose child died by illness were more likely to experience negative beliefs in the meaningfulness of the world than parents whose child died as the result of a human perpetrated trauma (i.e., murder).

Janoff-Bulman (1992) also theorized that individuals experiencing something like a medical trauma are more likely to receive social support, which is helpful in processing events. Tedeschi and Calhoun (1995) also noted that those events that lead to more social support are likely to result in more growth for individuals than the traumatic events experienced that tend to not illicit social support, such as sexual assault. In terms of the core cognitive schemas related to trauma, Janoff-Bulman (1989a) suggested that individuals who acknowledge the support of others as they cognitively process the traumatic event will be more likely to maintain a view of the world as benevolent and the self as worthy. In previously discussed research, Schwartzberg and Janoff-Bulman (1991) found that bereaved college students did not experience a change in their view of the benevolence of the world, which they suggested may be because of the increased amount of social support these individuals received when a parent dies. In the study earlier noted by Matthews and Marwit (2003-2004), the researchers also found that parents whose child died as the result of an illness experienced less negative change in their views of the benevolence of the world or the self as worthy than those parents whose child died as the result of a human perpetrated trauma (i.e., murder). Considering these findings, one may question whether individuals experiencing a medical trauma, such as being diagnosed with breast cancer, may experience an increased amount of social support in comparison to
individuals experiencing a human perpetrated trauma, leading to minimal changes in their views of the benevolence of the world and the worthiness of the self.

To date, there is minimal research in the literature examining the impact of breast cancer diagnosis on core cognitive schemas affected by trauma. Tomich and Helgeson (2002) examined the relationship between beliefs about the world and self to the quality of life for breast cancer survivors and a group of healthy controls. Women with Stage I, II, or III breast cancer diagnosed five years previously (N = 164) and a matched sample of healthy women were administered the WAS, questions assessing the meaning the stressful life event had on the participant’s life, a measure of spirituality, a measure of health-related quality of life, and a measure of mood during the previous week. Using multivariate analysis of variance, the researchers found that women diagnosed with breast cancer experienced the world as more uncontrollable and random than healthy controls. No differences between groups were found in individuals’ view of the world as benevolent or just. The quality of life for both breast cancer survivors and healthy controls was largely the same. These findings indicate that women with a breast cancer diagnosis are more likely to experience changes in their views of the meaningfulness of the world, more specifically in the controllability and randomness of the world, in comparison to a healthy control group. They are less likely to experience changes in their view of the world as benevolent when compared to a healthy control group.

Following from general research with other populations, the study by Tomich and Helgeson (2002), and the theoretical contentions of Janoff-Bulman (1992), the current study quantitatively examined the impact of a medical trauma on individuals’ core cognitive schemas affected by trauma, comparing the changes in the schemas to those of
individuals experiencing a human perpetrated trauma. This study also examined the impact of trauma type on PTG. Next, the empirical research (Bellizzi & Blank, 2006; Cordova et al., 2001; Petrie et al., 1999; Sears et al., 2003; Tomich et al., 2005; Weiss, 2002) on the impact of breast cancer diagnosis on PTG is discussed to give clarity on the expected changes in the domains of PTG. In general, research in this area shows that women diagnosed with breast cancer believe they have better relationships with others, greater appreciation for life, and greater purpose in life.

Weiss (2002) examined the existence of PTG in breast cancer survivors and measured the intersubjective validity of PTG by examining the correlation between breast cancer survivors’ report of PTG and their husband’s report of the survivors’ PTG. Subjects included couples \( N = 41 \) with women diagnosed with Stage I, II, or III breast cancer between 1 year and 5 ½ years prior to the beginning of the study. Participants completed sociodemographic questionnaires, rating of stress caused by the cancer diagnosis, indications of whether the cancer diagnosis was traumatic (e.g., threat to physical integrity, intense fear and helplessness), the PTGI (for oneself and for one’s spouse), and an open ended question about the positive and negative life changes associated with the breast cancer diagnosis.

Results (Weiss, 2002) indicated that experiencing breast cancer is highly stressful for both wives and husbands, with 59% of the women defining the experience as traumatic. On the open ended question, 98% of the wives and 88% of the husbands reported positive changes in their lives following the wife’s breast cancer diagnosis, which mirrored the domains of PTG measured by the PTGI. Eighty-eight percent of the wives and 83% of the husbands also reported negative changes in their lives following
the wife’s breast cancer diagnosis, indicating the coexistence of positive and negative life
changes following the experience of a breast cancer diagnosis. The wives’ mean PTGI
score was 60.21 (SD = 18.81) and women’s scores were significantly higher than their
husbands’ reported PTGI scores (M = 46.00, SD = 22.83), possibly the result of the direct
threat to physical integrity that is experienced by the women diagnosed with breast
cancer. The wives’ scores on the PTGI were not significantly different than their
husbands’ scores of their wives’ believed PTG and showed a positive, significant,
moderate correlation \[r(39) = .51, p < .01\], indicating the intersubjective validity of PTG
following a breast cancer diagnosis. These findings indicate that PTG appears to be an
actual change in functioning for an individual (as evidenced by their spouses’
observations), not just a positive illusion of change. A limit to this study is the high
socioeconomic status of the sample. Of the couples that participated in the study, the
annual income ranged from $30,000 to more than $90,000, with 61.5% of the sample
falling into the highest income bracket. Another limitation to this study is the specificity
of the sample (i.e., married breast cancer survivors), which hinders the generalizability of
the findings.

In a study by Sears et al. (2003), researchers, using a longitudinal design, examined
the relationship between benefit finding, positive reappraisal coping, and PTG in women
with early stage (Stage I or II) breast cancer. The authors defined benefit finding as the
identification of benefit from adversity. They defined positive reappraisal coping as the
intentional use of benefit-related information to cope and PTG as the experience of
significant positive change arising from the struggle with a major life crisis. Women with
Stage I or II breast cancer (N = 92) were administered the Life Orientation Test (LOT), the
Hope Scale, a measure of stressor characteristics (i.e., treatment for breast cancer, time since diagnosis), a measure of perceived control over cancer, one item assessing how stressful the experience of cancer is for the participant, a measure of emotional support, the Profile of Mood States (POMS), the Functional Assessment of Cancer Therapy (FACT), one item assessing perceived health, an open ended question about perceived benefits from the experience of breast cancer, and the Positive Reappraisal subscale (REAPP) of the COPE. These measures were administered at baseline and 3 months later. Sixty of these women completed the measures again at 12 months, with the addition of the PTGI (Tedeschi & Calhoun 1996). Findings indicated that there are specific predictors for benefit finding (education and optimism), positive reappraisal coping (hope), and PTG (perceived cancer stress), showing these concepts to be distinct from each other. Of particular interest to the current study, findings suggest that the most common category of benefit experienced by the participants was in relating to others.

Petrie et al. (1999) also examined positive changes experienced by breast cancer patients, comparing these positive changes to the positive changes experienced by myocardial infarction patients. These two illnesses were chosen by the authors because of the differences between them, stating that a breast cancer diagnosis is frightening with serious consequences and myocardial infarction has a sudden onset with good recovery prognosis (p. 538). Myocardial infarction patients ($N = 104$) and breast cancer patients ($N = 49$) were sent questionnaires three months post discharge from the hospital (MI patients) or the end of radiation treatment (breast cancer patients). The positive effects of the illness were assessed with the open-ended question, “What positive effects do you feel may have occurred in your life due to your heart attack/cancer?” (p. 539). Analysis of the
answer to this question indicated that myocardial infarction patients were more likely than breast cancer patients to report positive effects as a result of their illness. Myocardial infarction patients’ most common changes were healthy lifestyle changes, greater appreciation for life, improved close relationships, and change in personal priorities. Breast cancer patients reported an improvement in quality of close relationships, greater appreciation for life, change in personal priorities, and greater empathy for others. These results suggest that patients suffering from medical traumas, specifically breast cancer and myocardial infarction, are able to draw positive experiences from their illness. These results also indicate that the type of traumatic event experienced may influence the amount and type of positive consequences reported. The current study expanded upon this research by using established quantitative measures to statistically examine trauma-specific PTG.

In a recent study by Bellizzi and Blank (2006), the authors examined the impact of contextual, disease-related and intraindividual variables on PTG for women with breast cancer. Breast cancer survivors ($N = 215$), one to four years after treatment, were administered measures of contextual and disease related variables, optimism, hope, coping strategies, emotional intensity of diagnosis, and PTG (but only three domains of the PTGI—relationship with others, purpose in life, and appreciation for life—were administered). Findings indicated that women who experienced higher emotional intensity when diagnosed with breast cancer reported higher levels of PTG in the domains of relationship with others, purpose in life, and appreciation for life, than women who did not rate emotional intensity as high. Women who were in married or in committed relationships reported more PTG in their relationships with others and purpose in life than women who were not in committed relationships. Women who had regional
disease reported more growth in relationships than those who had invasive or localized breast cancer; type of disease did not relate to women’s appreciation for life. In general, these findings show that different variables, such as emotional intensity, relationship status, and disease status, affect the experience of PTG. This study examined the differences within one trauma population. The current study extended this to look at how the distinct experience of two different trauma populations influenced the domains of PTG, specifically how the variable of human perpetrated trauma versus non-human perpetrated trauma affected the experience of PTG. This study also used the full PTGI, administering all five domains, in order to more fully understand the impact of trauma type on the domains of PTG.

Tomich et al. (2005) examined the perceived growth of women with breast cancer, comparing these findings to matched controls who had experienced random stressful life events. The researchers specifically were interested in whether the changes people report are specific to the event they experience. Women diagnosed with breast cancer ($N = 184$) and an age matched comparison group were administered a 14 item measure of benefit finding and were asked three open-ended questions to assess perceived growth, perceived decline, and changes in life views. Findings indicated that women with breast cancer reported greater appreciation for life, self-improvement, reprioritizing, and increased faith compared to women with random stressful life events. Women with breast cancer did not differ on reports of improved relationships and health behavior change in comparison to women with random stressful life events. The authors discussed how these findings indicate that the perceived benefits related to a breast cancer diagnosis are not similar across different stressful life events, suggesting the
existence of trauma-specific PTG. The current study planned to extend these findings by utilizing the PTGI to examine the domains of PTG, examining how PTG differs between different trauma populations.

Cordova et al. (2001) compared a sample of breast cancer survivors with a healthy comparison group on their experience of PTG. The researchers hypothesized that breast cancer survivors would experience similar levels of depression and well-being as healthy comparisons, but would experience higher levels of PTG, particularly in the domains of better relationships, increased spirituality, and greater appreciation for life. Breast cancer survivors ($N = 70$) who were fewer than five years postdiagnosis but more than two months past chemotherapy participated in the study and these participants were matched with a healthy comparison group. Both groups completed demographic information, a medical outcomes health survey, a social support questionnaire (DUKE-SSQ), a depression scale (CES-D), a well-being scale (Ryff’s Well-Being Scale), a behavior scale (Cancer Patient Behavior Scale), and a PTG scale (PTGI). Participants with breast cancer were asked to complete the measures with breast cancer in mind and the healthy control group was asked to complete the measures with current life situations in mind. Individuals in the breast cancer survivor group were also administered the Impact of Event Scale (IES), two yes or no questions (i.e., “Did you perceive being diagnosed with and treated for breast cancer as a threat of death or serious injury or a threat to your physical integrity?”; “Given your experience with breast cancer, has your response ever involved intense fear or helplessness?” [p. 179]) to assess whether breast cancer was considered a traumatic stress, and one question on a seven-point scale (i.e., “How much
have you talked about your breast cancer experience with others before today?” [p. 179]) to assess how often individuals diagnosed with breast cancer talked about their diagnosis.

Using a multivariate analysis of variance, Cordova et al. (2001) found that women with breast cancer experienced similar levels of depression and well-being as a healthy comparison group, but exhibited a pattern of greater PTG. Women with breast cancer scored higher on the total PTGI ($M = 64.1$, $SD = 24.8$) than the healthy control group ($M = 56.3$, $SD = 26.3$). More specifically, women with breast cancer showed significantly higher scores in the domains of relating to others, spiritual change and appreciation of life, as hypothesized. There were no significant differences in the domains of new possibilities or personal strength. The results also suggested that greater reported PTG is associated with more prior talking about breast cancer, experiencing the diagnosis as traumatic, a longer time since diagnosis, and a higher income, but was unrelated to social support. This research is important in that it compares different groups on the domains of PTG. The current study planned to extend this research by comparing two trauma populations (rather than one trauma population and a control group) on the domains of PTG and on the populations’ core cognitive schemas.

The studies reviewed that examine PTG with breast cancer survivors indicate that women diagnosed with breast cancer most often report positive changes in their relationships with others, their appreciation for life, and their priorities in life. The limited research that examined the influence of a breast cancer diagnosis on core cognitive schemas (Tomich & Helgeson, 2002) suggests that a breast cancer diagnosis influences an individual’s view of the world as meaningful, but does not affect the individual’s view of the world as benevolent. Having discussed both sexual assault
survivors and breast cancer survivors, it is important to now turn to a discussion of the current study, delineating the research questions that were examined.

The Current Study

This chapter has explicated aspects of Calhoun and Tedeschi’s (2006) model of PTG that were examined in the current study. How an event is defined as traumatic has been discussed. The core cognitive assumptions vulnerable to change following trauma have been described and the research examining these assumptions has been summarized. PTG has been defined and the research in this field has been discussed. These three aspects of Calhoun and Tedeschi’s (2006) model of PTG (traumatic event, core cognitive schemas, and PTG) were also examined more specifically in relation to the two trauma populations examined in the current study (sexual assault survivors and breast cancer survivors). These discussions were undertaken to serve as a foundation for the current study.

The current study is one of the next steps suggested by researchers in the field of PTG. Theorists and researchers (Calhoun et al., 2000; Calhoun et al., 1998; Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995; Tomich & Helgeson, 2004) have called for an examination of trauma-specific growth, noting that PTG domains likely vary based on the type of trauma experienced. As noted earlier, there is limited research comparing two trauma populations on their experience of PTG. The populations of sexual assault survivors and breast cancer survivors were chosen for the current study because they are similar, yet distinct. These events are similar in that they are traumatic events experienced by women that have been found to lead to changes in core cognitive schemas of meaningfulness, benevolence, and self-worth and PTG. These events differ in the nature or source of the event, with sexual assault being a human
perpetrated trauma and breast cancer being a non-human perpetrated trauma. The current study hypothesized that individuals’ experience of different trauma types would lead to differential perceived changes in core cognitive schemas shown to be affected by trauma and domains of PTG.

Based on the previously delineated psychological research within the field of PTG and trauma recovery, the main research questions in the current study were (a) What is the effect of trauma type on the core cognitive schemas (see Figure 2)?; and (b) What is the impact of trauma type on the experience of PTG (see Figure 2)? The specific hypotheses tested include:

_Hypothesis 1:_ Individuals’ core cognitive schemas affected by trauma, as measured by the WAS, will differ based on the type of trauma experienced.

_Hypothesis 1a:_ There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in their view of the world as benevolent.

_Hypothesis 1b:_ There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in their view of the self as worthy.

_Hypothesis 1c:_ There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in their view of the world as meaningful.

_Hypothesis 2:_ Individuals’ experience of posttraumatic growth, as measured by the PTGI, will differ based on the type of trauma experienced.
Hypothesis 2a: There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in the PTG domain of personal strength.

Hypothesis 2b: There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in the PTG domain of spiritual change.

Figure 2. Model of Posttraumatic Growth: Focus of the Current Study (Adapted from Calhoun & Tedeschi, 2006)
Hypothesis 2c: There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in the PTG domain of relating to others.

Hypothesis 2d: There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in the PTG domain of new possibilities.

Hypothesis 2e: There will be a statistically significant group mean difference between sexual assault survivors and breast cancer survivors in the PTG domain of appreciation for life.

The next chapter discusses the participants involved in the current study, the measures used, and the process of data collection.
CHAPTER III

METHODOLOGY

The current study was an examination of trauma-specific growth. The previous chapters have delineated some of the important concepts in trauma-specific growth (i.e., the traumatic event, the core cognitive schemas, and the domains of posttraumatic growth). The previous chapters have also examined the extant research in these areas in order to provide a foundation for the current study. This chapter explicates the specific manner by which these research questions were examined. The research questions of the current study included (a) the association between trauma type and the core cognitive schemas vulnerable to change following a traumatic experience (see Figure 2), and (b) the association between trauma type and the domains of posttraumatic growth (see Figure 2). In order to answer these questions, this chapter discusses the participants who were included in the current study and the measures that were administered.

Participants

Participants in the current study consisted of women ($N = 105$) over the age of 18 who were survivors of one of two traumatic events: sexual assault survivors ($n = 55$) or breast cancer survivors ($n = 50$). These participants included any individuals who completed the surveys, were over the age of 18, and scored higher than 19 on the IES. The average age of sexual assault survivors who participated in this study was 36.3 years old ($SD = 10.25$). The average age of breast cancer survivors who participated in this
study was 52.0 years old ($SD = 9.99$). As noted in the literature (e.g., Calhoun et al., 1998), the most frequently used time frame for assessing PTG is at least one year after the traumatic event. This time frame allows an individual time to process the occurrence of the event, which is critical for an individual to experience PTG. Therefore, only individuals who were at least one year post-trauma (i.e., one year after being sexually assaulted or one year after being diagnosed with breast cancer) were included in the current study. This time frame is similar to the time frame used by other researchers in the field of posttraumatic growth (e.g., Cordova et al., 2001; Weiss, 2002). Table 1 provides the demographic information for the sample in the current study.

Table 1. Demographic Information: A Comparison of the Two Trauma Groups

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SA Survivors n (%)</th>
<th>BC Survivors n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>European American</td>
<td>51 (92.7)</td>
<td>45 (91.8)</td>
</tr>
<tr>
<td>African American</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Asian American</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Latina</td>
<td>1 (1.8)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Native American</td>
<td>0 (0)</td>
<td>3 (6.1)</td>
</tr>
<tr>
<td>Multiracial</td>
<td>3 (5.5)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Partner Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>16 (29.1)</td>
<td>9 (18.0)</td>
</tr>
<tr>
<td>Partnered</td>
<td>11 (20.0)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Widowed</td>
<td>0 (0)</td>
<td>2 (4.0)</td>
</tr>
<tr>
<td>Married</td>
<td>25 (45.5)</td>
<td>36 (72.0)</td>
</tr>
<tr>
<td>Separated</td>
<td>3 (5.5)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Time Since Trauma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>48 (87.2)</td>
<td>23 (46.9)</td>
</tr>
<tr>
<td>3 – 5 years</td>
<td>6 (10.9)</td>
<td>7 (14.3)</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>1 (1.8)</td>
<td>19 (38.8)</td>
</tr>
<tr>
<td>Characteristic</td>
<td>SA Survivors n (%)</td>
<td>BC Survivors n (%)</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Psychotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>36 (65.5)</td>
<td>14 (28.0)</td>
</tr>
<tr>
<td>No</td>
<td>19 (34.5)</td>
<td>36 (72.0)</td>
</tr>
</tbody>
</table>

For the current study, an a priori estimation of sample size was completed. Using the guidelines established by Cohen (1992) and Stevens (2002), an a priori power analysis was completed to detect a medium effect size at a power of at least .80 and significance at .05, when using a multivariate analysis of variance with two independent groups and five dependent variables. The estimated sample size, based on this power analysis was 50 participants per group. Thus, the sample for the current study was to include a minimum of 50 sexual assault survivors and 50 breast cancer survivors. When data collection was completed on surveymonkey.com, there were 79 sexual assault survivors and 82 breast cancer survivors who had participated in the current study. When data analysis began, those participants who did not complete the majority of the survey items were deleted, resulting in 63 sexual assault survivors and 78 breast cancer survivors who completed sufficient survey items to warrant further analysis (i.e., did more than complete the demographic information) (N = 141). These participants were then screened and any participants who were less than one year from the traumatic event (N = 20; n = 3 sexual assault survivors and n = 17 breast cancer survivors) or who scored equal to or less than 19 on the IES (N = 16; n = 5 sexual assault survivors and n = 11 breast cancer survivors) were eliminated from analyses. This resulted in a final sample size of 105, with 55 sexual assault survivors and 50 breast cancer survivors.
Procedures

Participants experienced one of two traumatic events: sexual assault or breast cancer diagnosis. These two groups were chosen based on the distinction between them, with one (i.e., sexual assault) being human-perpetrated and the other (i.e., breast cancer diagnosis) not being human-perpetrated. All participants were given an informed consent form (see Appendix A) to participate in this research and received a written debriefing about their participation following completion of the inventories (see Appendix B). Participants completed a research packet consisting of the Impact of Event Scale (IES; Horowitz et al., 1979), the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), the World Assumptions Scale (WAS; Janoff-Bulman, 1989a), and a demographic questionnaire. Participants were recruited in several ways. First, a contact person at an agency for sexual assault survivors posted a link to the online survey on two listservs for sexual assault survivors (i.e., SARNCO and SA-Ohio). SARNCO (Sexual Assault Response Network of Central Ohio) is a sexual assault intervention and prevention organization. Services of this agency include referrals to counseling, community outreach and emotional support from volunteer advocates (Ohio Health, 2007). Second, this researcher posted a link to the online survey on a Susan B. Komen message board for breast cancer survivors. The Susan B. Komen Organization is “the largest source of

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2 Both demographic questionnaires were supposed to include a question to ensure that participants had not experienced both traumas (i.e., “Have you ever been sexually assaulted?” on the breast cancer survivors’ demographic questionnaire and “Have you ever been diagnosed with breast cancer?” on the sexual assault survivors’ demographic questionnaire). There was an error when the surveys were posted and the breast cancer survivors’ demographic questionnaire did not include this question. None of the sexual assault survivors report having been diagnosed with breast cancer. Since this question was not asked of the breast cancer survivors, though, no further analysis can be done on this issue.
nonprofit funds dedicated to the fight against breast cancer in the world” (Susan G. Komen for the Cure Columbus, 2007, ¶ 3). Third, colleagues of this researcher were asked to forward the link to the online survey to any sexual assault or breast cancer survivors they may know.

All surveys for the current study were completed online at surveymonkey.com. One concern related to gathering data online is that the data will differ from data gathered using more traditional methods. According to Gosling, Vazire, Srivastava, and John (2004), there is evidence that, “psychological findings obtained using Web samples are consistent with findings obtained using traditional methods” (p. 102), citing several studies (e.g., Buchanan & Smith, 1999; Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002; Srivastava, John, Gosling, & Potter, 2003) that examined cross-method replicability. Meyerson and Tryon (2003) found that the reliability and validity of data gathered from an Internet sample is “psychometrically equivalent” to data obtained in person, noting that their results “add to a growing body of evidence…that the Internet is a valid forum for conducting psychological research” (p. 618). Forston, Scotti, Del Ben, and Chen (2006) also noted that the psychometric properties of Internet surveys are comparable to paper and pencil measures when doing trauma research, stating “researchers can feel comfortable that Internet data collection is a viable--and reliable--means for conducting trauma research” (p. 709). Based on the aforementioned research, collecting data on the internet in the current study was assumed to be a reliable and valid manner of gathering data.
Instruments

*Impact of Event Scale* (IES; Horowitz et al., 1979; see Appendix C). The IES measures “current subjective distress for any life event” (Horowitz et al., p. 209). The IES consists of 15 items in a 4-point Likert-type format with possible answers being *Not at All* (0), *Rarely* (1), *Sometimes* (3), or *Often* (5). Total scores on the IES range from 0 to 75 with higher scores indicating greater subjective distress (Joseph, 2000). Individuals are given the following directions: *Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you. If they did not occur, please mark the “not at all” column.* These directions vary from the original directions by omitting the statement “during the past seven days.” This was done because for inclusion in the current study, the individual must have experienced subjective distress as a result of experiencing the traumatic event, but the individual does not need to be currently distressed by the event. The IES contains two subscales—Intrusion and Avoidance. The Intrusion subscale consists of seven items that measure “unbidden thoughts and images” related to the traumatic event, with a possible score range of 0 to 35 for the subscale (Horowitz et al., p. 210). A sample item from this subscale is, “I thought about it when I didn’t mean to.” The Avoidance subscale consists of 8 items which measure avoidant behaviors related to the event, with a possible score range of 0 to 40 for the subscale. A sample item from this subscale is, “I avoided letting myself get upset when I thought about it or was reminded of it.” In the current study, the total score was used because the IES is being used as an overall measure of subjective distress. According to Horowitz et al., a total score over 19 is indicative of
subjective distress related to the traumatic event. Therefore, any participant who scored over 19 on the IES was included in the study.

The IES is a reliable measure. In the current study, the internal reliability of the IES was .89. Horowitz et al. (1979) reported the total IES has internal reliability of .78, split half reliability as .86 and test-retest reliability (one week) as .87. Horowitz et al. also found internal reliability of .78 for the Intrusion subscale and .82 for the Avoidance subscale. Zilberg et al. (1982) reported internal consistency of .86 for the total IES.

Joseph (2000), in a review of the IES, stated data confirms the IES has satisfactory internal consistency. Horowitz et al. also examined the validity of the IES as a measure of subjective distress, finding that individuals who engaged in therapy showed a significant decrease in scores on the IES after completion of therapy. Horowitz et al. also administered the IES to two samples (i.e., medical students and patients who had experienced a traumatic event) and found that patients experienced significantly more subjective distress than medical students ($F = 170.8, p < 0.001$). Joseph reported there are strong correlations between the IES and PTSD measures, as well as other measures of psychological distress such as the BDI and SCL-90, which provides evidence for convergent validity as a measure of subjective distress. Sundin and Horowitz (2002) also reviewed 21 studies that assessed the convergent validity of the IES (e.g., Arata et al., 1991; Davidson & Baum, 1986; Spurrell & McFarlane, 1995), finding that the correlations between scores on the IES and the measures used by the researchers indicate the IES contributes information beyond that which is provided by other symptom measures (e.g., of PTSD, depression, anxiety).
The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996; see Appendix D) measures “the extent to which survivors of traumatic events perceive personal benefits, including changes in perceptions of self, relationships with others, and philosophy of life, accruing from their attempts to cope with trauma and its aftermath” (Tedeschi & Calhoun, 1996, p. 458). The PTGI consists of 21 items in a 6 point Likert-type format ranging from I did not experience this change as a result of my crisis (1) to I experienced this change to a very great degree as a result of my crisis (6). Scores for the PTGI range from 21 to 126. Individuals were given the direction, Indicate for each of the statements below the degree to which this change occurred in your life as the result of [being sexually assaulted/being diagnosed with breast cancer], using the following scale. According to Tedeschi and Calhoun, this measure consists of five factors/subscales: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. Relating to Others consists of seven items that measure the extent to which an individual has experienced a building of relationships as a result of coping with the trauma. Scores on this subscale range from 7 to 42. A sample item is, “Knowing that I can count on people in times of trouble.” New Possibilities consists of five items that measure the extent to which an individual has experienced new opportunities, paths, or interests as a result of dealing with the trauma. Scores on this subscale range from 5 to 30. A sample item is, “I’m more likely to try to change things that need changing.” Personal Strength consists of four items that measure the extent to which an individual experiences himself or herself as stronger as a result of coping with the trauma. Scores on this subscale range from 4 to 24. A sample item is, “A feeling of self-reliance.” Spiritual Change consists of two items which measure the extent to which
an individual experiences an increase in spirituality or religiosity as result of coping with the trauma. Scores on this subscale range from 2 to 12. A sample item is, “I have a stronger religious faith.” Appreciation of Life consists of three items that measure the extent to which an individual experiences a greater appreciation of life as a result of dealing with the trauma. Scores on this subscale range from 3 to 18. A sample item is, “An appreciation for the value of my own life.” Higher scores on the items of the subscales indicate that the individual experienced posttraumatic growth in this domain.

As noted, the number of items per subscale differs. This difference is because of the factor loadings found by Tedeschi and Calhoun when they conducted a principal component analysis on the items during scale construction. This principle component analysis was completed after the proposed scale was administered to undergraduate students recruited from psychology courses ($N = 604$). The five factor structure of the PTGI was confirmed by Jaarsma et al. (2006) with Dutch cancer patients, Morris et al. (2005) with an Australian population, and Tatu et al. (2008) with a trauma population. The five factor structure was not confirmed by Polatinsky and Esprey (2000) who found a one factor solution with bereaved parents, Weiss and Berger (2006) who found a three factor solution with a Spanish translation of the PTGI, Powell et al. (2003) who found a three factor solution with a Bosnian translation of the PTGI and Sheikh and Marotta (2005) who found a one factor solution for individuals with cardiovascular disease. These differing findings call into question the validity of using the domains of the PTGI so that a factor analysis of the PTGI was conducted with the current sample prior to subsequent analyses.

Tedeschi and Calhoun (1996) examined the internal consistency of the measure, finding overall alpha for the 21-item PTGI to be .90. Other researchers (e.g., Bates et al.,}
2004; Jaarsma et al., 2006; Morris et al., 2005; Sheikh & Marotta, 2005) have also found high internal consistency for the PTGI, with Cronbach’s alpha ranging from .90 to .96. Each subscale also has been found to have “substantial” internal consistency: Relating to Others (seven items; $\alpha = .85$ to .91), New Possibilities (five items; $\alpha = .84$ to .89), Personal Strength (four items; $\alpha = .72$ to .90), Spiritual Change (two items; $\alpha = .65$ to .93), and Appreciation for Life (three items; $\alpha = .67$ to .89) (Jaarsma et al.; Morris et al.; Sheikh & Marotta; Tedeschi & Calhoun). Tedeschi and Calhoun (1996) examined test-retest reliability over two months with a sample of 28 people recruited from undergraduate psychology courses. Test-retest reliability for the entire measure was acceptable ($r = .71$). Bates et al. also found acceptable test-retest reliability for the entire measure ($r = .78$) at three months.

Tedeschi and Calhoun (1996) examined concurrent and discriminant validity by having some participants complete the NEO Personality Inventory ($n = 235$) (NEO-PI; Costa & McCrae, 1985), the Life Orientation Test ($n = 449$) (LOT; Scheier & Carver, 1985), the Marlowe-Crowne Social Desirability Scale ($n = 318$) (Crowne & Marlowe, 1960) and an index of religious participation ($n = 237$) (Pressman, Lyons, Larson, & Strain, 1990). During this initial work with the scale, Tedeschi and Calhoun found that the PTGI was not related to social desirability, age of the participants ($r = .01$, n.s.), and time since the traumatic event ($r = .02$, n.s.). Scores on the PTGI were positively related to optimism ($r = .23$, $p < .01$), religiosity ($r = .25$, $p < .01$) and four major dimensions of personality (as measured by the NEO-PI) (i.e., extraversion [$r = .29$, $p < .01$], openness to new experiences [$r = .21$, $p < .01$], agreeableness [$r = .18$, $p < .01$], and conscientiousness [$r = .16$, $p < .01$]). The PTGI was not significantly related to neuroticism. Tedeschi and
Calhoun also examined construct validity by administering the PTGI and the Traumatic Stress Schedule (Norris, 1990) to 117 participants, theorizing that individuals who experienced a traumatic event would report more posttraumatic growth than individuals who did not experience a traumatic event. Individuals who experienced severe trauma, in comparison to individuals who had not experienced a trauma, had statistically significant higher scores on all factors except Spiritual Change.

*World Assumptions Scale* (WAS; Janoff-Bulman, 1989a; see Appendix E). The WAS measures individuals’ basic assumptions (i.e., core cognitive schemas) about the world. The WAS consists of 32 items scored on a 6-point Likert-type scale, with endpoints of *(1) Strongly Disagree* and *(6) Strongly Agree*. Scores on the WAS range from 32 to 192. Individuals are given the instruction, *Using the scale below, please select the number that indicates how much you agree or disagree with each statement; Please answer honestly.* According to Janoff-Bulman, this measure consists of three subscales: Benevolence of the World, Meaningfulness of the World, and self-Worth. The first subscale, Benevolence of the World, consists of eight items. This subscale measures the extent to which individuals view the world and people positively or negatively. Scores on this subscale range from 8 to 48. A sample item is, “The good things that happen in this world far outnumber the bad.” The second subscale, Meaningfulness of the World, consists of 12 items. This subscale measures the extent to which individuals believe in a “just world” in which “people deserve what they get and get what they deserve” (Janoff-Bulman, 1989a, p. 118), as well as the extent to which individuals believe they can control the outcomes in their lives through their own behaviors. This subscale also measures the extent to which individuals believe that outcomes and events are based on
chance and randomness. Scores on this subscale range from 12 to 72. A sample item is, “Misfortune is least likely to strike worthy, decent people.” The third subscale, Self-Worth, also consists of 12 items. The Self-Worth subscale measures the extent to which individuals view themselves as “good, moral, worthy, decent individuals” (Janoff-Bulman, 1989a, p. 119). This subscale also measures the extent to which individuals see themselves as engaging in the appropriate precautionary measures and the extent to which individuals believe they are lucky. Scores on this subscale range from 12 to 72. A sample item is, “I am very satisfied with the kind of person I am.” Scores are obtained for each subscale by summing the responses across the items for that subscale, with higher numbers on a subscale indicating stronger agreement with that assumption.

Schwartzberg and Janoff-Bulman (1991) used the WAS to examine fundamental assumptions for bereaved college students \( (N = 42) \) and in this study, internal consistency was assessed to be \( \alpha = .87 \) for the Benevolence of the World subscale, \( \alpha = .76 \) for the Meaningfulness of the World subscale, and \( \alpha = .80 \) for the Self-Worth subscale. Solomon and Laufer (2004) found alpha coefficients of .78 for the Benevolence of the World subscale and Self-Worth subscale and .77 for the Meaningfulness of the World subscale in their research with Israeli youth who experienced terrorism. Harris and Valentiner (2002), who used the WAS in their research on the effect of sexual assault on assumptive worlds, report test-retest reliabilities ranging from .66 to .78 for the subscales of the WAS (sample size and time span unspecified). To examine construct validity, Janoff-Bulman (1989a) administered the WAS to undergraduate participants \( (N = 338) \). The participants were broken down into victims of “extremely negative life events” \( (n = 83) \) and nonvictims \( (n = 255) \). Differences were found between victims and nonvictims on the
WAS, indicating that world assumptions become more negative (e.g., the world is less meaningful) as a result of experiencing a traumatic event.

To examine the factor structure of the WAS, Janoff-Bulman (1989a) administered the 32-item questionnaire to a general population ($N = 356$) and a factor analysis with varimax rotation was completed that revealed a seven factor structure (i.e., Benevolence, Justice, Controllability, Randomness, Self-Worth, Self-Controllability, and Luck). The eigenvalues for each of the seven factors were greater than 4.0 and the reliability ranged from .66 to .76 for each of the factors. Although this initial factor analysis revealed a seven factor structure was optimal, most research utilizing the WAS uses a three factor structure (i.e., Benevolence, Meaningfulness, and Self-Worth). To further understand the factor structure of the WAS, Harris and Valentiner (2002) performed a principal component analysis on the measure and found a five-component solution was optimal (i.e., Self, Justice, Benevolence, Luck, and Randomness). Harris and Valentiner noted “the five-factor solution was optimal because it was indicated by the parallel analyses, appeared highly interpretable, and showed the closest relationships with Janoff-Bulman’s results” (p. 294). The limited information on the factor structure of the WAS indicated the need to conduct an exploratory factor analysis with the current sample to determine the factor structure of the WAS prior to subsequent analyses.

Demographic Questionnaires (see Appendix F and Appendix G). Participants completed a demographic questionnaire containing items about their age, race/ethnicity, time since assault/diagnosis, partner status, and participation in therapy. The demographic questionnaire also included three items assessing the participant’s experience of social support following the traumatic event. These items are adapted from
Stanton et al. (2003) and are included in the current study based on McMillen et al.’s (1997) suggestion that certain types of traumatic events are more likely to lead to social support, which may increase a person’s ability to process an event and experience PTG.

The next chapter statistically examines the hypotheses that were delineated in Chapter II. The two trauma groups were compared on several demographic variables. Then, the factor analysis of the WAS and the PTGI with the current sample is discussed. The internal reliability of the measures and the correlation between measures are reported. Finally, the results of the statistical analyses to examine hypothesis one and hypothesis two are explicated.
CHAPTER IV
RESULTS

In this chapter, the statistical analyses conducted with the data collected in the current study are presented. First, the pre-analyses undertaken prior to examining the hypotheses of the current study are delineated. These include the ways in which the two trauma populations (i.e., sexual assault survivors and breast cancer survivors) compare in terms of demographic variables, an examination of the factor structures of the WAS and the PTGI with the current sample, the internal reliability of the measures used and a correlation matrix of the IES, WAS, and PTGI. Next, the statistical analyses undertaken to assess hypothesis one, which states that an individual’s core cognitive schemas affected by trauma will differ based on the type of trauma experienced, are presented. Finally, hypothesis two, which states that an individual’s experience of posttraumatic growth will differ based on the type of trauma experienced, is assessed statistically.

Pre-Analysis

All data were screened for outliers prior to an examination of the hypotheses of the current study. Also, as outlined in Chapter III, all participants who were less than one year from assault (n = 3) or diagnosis (n = 17) and/or scored equal to or lower than 19 on the IES (n = 16) were not included in the current study, resulting in a final sample size of 105 participants (55 sexual assault survivors and 50 breast cancer survivors.) The two samples, sexual assault survivors and breast cancer survivors, were compared on the
sample characteristics previously identified as being related to PTG. Any significant
differences between the two groups on the sample characteristics would be considered
covariates in subsequent analyses to ensure that any significant differences found in the
study were related to the variable of trauma experienced (i.e., sexual assault or breast
cancer diagnosis). The sample variables examined included age, race, partner status, time
since assault/diagnosis, perceived support (which was a composite score of three Likert-
type scale items), participation in therapy, and total IES score. Independent sample t-tests
(see Table 2) were conducted on the following variables: age, perceived support, and
total IES score. These results showed that breast cancer survivors (M = 52.5, SD =
10.61) were significantly older than sexual assault survivors (M = 36.4, SD = 10.37), t
(93) = 7.56, p < .0001. Sexual assault survivors (M = 45.1, SD = 13.05) scored
significantly higher than breast cancer survivors (M = 38.9, SD = 12.03) on the IES, t
(97) = -2.43, p = .017. Differences between sexual assault survivors (M = 12.76,
SD = 4.43) and breast cancer survivors (M = 14.3, SD = 4.32) on perceived support were
not statistically significant, t (103) = 1.80, p = .075.

Table 2. Independent Sample t-tests: A Comparison of the Trauma Groups (N=105)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SA Survivors M (SD)</th>
<th>BC Survivors M (SD)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>36.4 (10.37)</td>
<td>52.5 (10.61)</td>
<td>7.56</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>IES</td>
<td>45.1 (13.05)</td>
<td>38.9 (12.03)</td>
<td>-2.43</td>
<td>.017</td>
</tr>
<tr>
<td>Perceived Support</td>
<td>12.76 (4.43)</td>
<td>14.3 (4.32)</td>
<td>1.80</td>
<td>.075</td>
</tr>
</tbody>
</table>
Chi-square analyses were conducted on the following variables: race, partner status, time since assault/diagnosis, and participation in therapy. In the chi-square analysis of race, the categories were combined, with one category including European Americans and the other category including all other races (i.e., African American, Asian American, Latina, Native American, Multiracial, and Other). Categories were also combined in the chi-square analysis of partner status with one category including single women (i.e., single, widowed, separated, and other) and the other category including partnered women (i.e., partnered and married). This collapsing of categories was done to increase cell size and increase the validity of using the chi-square analysis for comparison of the two groups. These results showed that there were not significant differences in the groups’ partner status, $X^2 (1, N = 105) = .9027, p = .34$, and race, $X^2 (1, N = 104) = .0289, p = .86$. There was a significant difference between the two groups in time since they were assaulted or diagnosed, $X^2 (2, N = 104) = 24.82, p < .0001$, with it being longer since sexual assault survivors were assaulted (48 sexual assault survivors versus 23 breast cancer survivors more than 5 years since assault or diagnosis and 1 sexual assault survivor versus 19 breast cancer survivors between 1 and 2 years since assault or diagnosis). There was also a significant difference between the two groups in participation in therapy, $X^2 (1, N = 105) = 14.73, p = .0001$, with more sexual assault survivors ($n = 36$) than breast cancer survivors ($n = 14$) participating in therapy. Based on this information, the following variables were examined as potential covariates with the outcome variables under consideration: age, total IES, time since assault/diagnosis, perceived support, and participation in therapy. Perceived support was examined as a potential covariate because, although it was not significant at the .05 level, it was
significant at the .10 level. It was decided to err on the conservative side to include this
variable as a potential covariate. This was done to ensure that any differences found
between the two groups on the WAS and PTGI were related to the type of trauma
experienced, rather than other differences in sample characteristics.

In addition to comparing the samples on demographic variables, factor analyses
on the WAS and the PTGI were conducted prior to examining the hypotheses of the
current study. It was hypothesized that sexual assault survivors and breast cancer
survivors’ core cognitive schemas of benevolence, meaningfulness and self-worth would
differ based on the type of trauma experienced. These three core cognitive schemas were
measured using the WAS. The analyses to examine these differences were reliant on the
existence of a specific factor structure of the WAS, so prior to running analyses looking
at group differences, the factor structure of the WAS in this sample was examined. An
exploratory factor analysis using squared multiple correlations as priors was conducted
with this sample on the 32 items of the WAS. The eigenvalues and percentage of variance
accounted for by the first six factors from this analysis are presented in Table 3. These six
factors, which individually counted for 5% or more of the variance were retained for
further analysis (Hatcher, 1994).

Table 3. World Assumption Scale Factor Analysis: Eigenvalues and Cumulative
Percentages (N = 105)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Eigenvalue</th>
<th>Additional Percentage Accounted For</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.95</td>
<td>34.11</td>
<td>34.11</td>
</tr>
<tr>
<td>2</td>
<td>3.84</td>
<td>18.84</td>
<td>52.95</td>
</tr>
</tbody>
</table>
Table 3. World Assumption Scale Factor Analysis: Eigenvalues and Cumulative Percentages (N = 105) (continued)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Eigenvalue</th>
<th>Additional Percentage Accounted For</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2.70</td>
<td>13.26</td>
<td>66.21</td>
</tr>
<tr>
<td>4</td>
<td>1.74</td>
<td>8.55</td>
<td>74.76</td>
</tr>
<tr>
<td>5</td>
<td>1.37</td>
<td>6.74</td>
<td>81.50</td>
</tr>
<tr>
<td>6</td>
<td>1.18</td>
<td>5.79</td>
<td>87.29</td>
</tr>
</tbody>
</table>

Given Janoff-Bulman’s (1989a) description of the core cognitive schemas related to trauma as being related, an oblique rotation was used. According to Kahn (2006), it is important to examine the percentage of variance accounted for by a structure, the eigenvalues of factors, the scree plot, and interpretability of the factors when determining the factor structure of a measure. Based on the eigenvalues, variance accounted for, drop off in the scree plot, close relationship to Janoff-Bulman’s original factor structure, the factor structure found by Harris and Valentiner (2002), a conceptual evaluation of the material, and the interpretability of the factors, a five factor solution was deemed optimal for the WAS with this sample. With a five factor solution, all eigenvalues are over 1.0 and 81.5% of the variance is accounted for by the structure. Also, in the five factor solution, there were no cross-loadings of items (i.e., loading on more than one factor at .40 or higher) (see Table 4). In the other structures examined, there were cross loadings of items and/or the factor structures did not make conceptual sense. The ways in which the items loaded on the five factors in this factor structure is close in relationship to Janoff-Bulman’s original factor structure and is very close to the factor structure found
by Harris and Valentiner. In addition to these statistical issues, the item loadings of the
WAS items in the five factor structure made the most conceptual sense and was, in turn,
the most interpretable factor solution for the WAS with this sample.

Table 4. Item Loadings for the Five-Factor Structure of the WAS

<table>
<thead>
<tr>
<th>WAS 26</th>
<th>Factor 1 Benevolence</th>
<th>Factor 2 Justice</th>
<th>Factor 3 Luck</th>
<th>Factor 4 Random</th>
<th>Factor 5 Self-Worth</th>
<th>$h^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>.91 *</td>
<td>.08</td>
<td>.00</td>
<td>-.04</td>
<td>-.06</td>
<td>.84</td>
<td></td>
</tr>
<tr>
<td>WAS 25</td>
<td>.87 *</td>
<td>.07</td>
<td>.04</td>
<td>.02</td>
<td>.00</td>
<td>.80</td>
</tr>
<tr>
<td>WAS 4</td>
<td>.86 *</td>
<td>-.01</td>
<td>-.09</td>
<td>.16</td>
<td>.11</td>
<td>.76</td>
</tr>
<tr>
<td>WAS 5</td>
<td>.82 *</td>
<td>.01</td>
<td>.01</td>
<td>.20</td>
<td>.06</td>
<td>.69</td>
</tr>
<tr>
<td>WAS 9</td>
<td>.77 *</td>
<td>.12</td>
<td>-.06</td>
<td>-.04</td>
<td>.05</td>
<td>.67</td>
</tr>
<tr>
<td>WAS 30</td>
<td>.75 *</td>
<td>.03</td>
<td>.13</td>
<td>-.08</td>
<td>.09</td>
<td>.71</td>
</tr>
<tr>
<td>WAS 2</td>
<td>.53 *</td>
<td>-.24</td>
<td>.22</td>
<td>-.18</td>
<td>.16</td>
<td>.48</td>
</tr>
<tr>
<td>WAS 12</td>
<td>.48 *</td>
<td>-.13</td>
<td>.14</td>
<td>-.30</td>
<td>-.18</td>
<td>.36</td>
</tr>
<tr>
<td>WAS 19</td>
<td>.10</td>
<td>.76 *</td>
<td>-.20</td>
<td>.01</td>
<td>.04</td>
<td>.56</td>
</tr>
<tr>
<td>WAS 7</td>
<td>-.09</td>
<td>.73 *</td>
<td>-.07</td>
<td>.11</td>
<td>-.01</td>
<td>.48</td>
</tr>
<tr>
<td>WAS 29</td>
<td>.00</td>
<td>.71 *</td>
<td>-.10</td>
<td>.19</td>
<td>-.03</td>
<td>.46</td>
</tr>
<tr>
<td>WAS 11</td>
<td>.00</td>
<td>.67 *</td>
<td>.12</td>
<td>.14</td>
<td>-.22</td>
<td>.49</td>
</tr>
<tr>
<td>WAS 22</td>
<td>.07</td>
<td>.63 *</td>
<td>.06</td>
<td>.00</td>
<td>-.05</td>
<td>.43</td>
</tr>
<tr>
<td>WAS 23</td>
<td>-.04</td>
<td>.61 *</td>
<td>.05</td>
<td>-.05</td>
<td>.20</td>
<td>.49</td>
</tr>
<tr>
<td>WAS 20</td>
<td>.10</td>
<td>.53 *</td>
<td>.14</td>
<td>-.28</td>
<td>-.09</td>
<td>.47</td>
</tr>
<tr>
<td>WAS 14</td>
<td>.16</td>
<td>.50 *</td>
<td>-.15</td>
<td>-.05</td>
<td>-.06</td>
<td>.27</td>
</tr>
<tr>
<td>WAS 17</td>
<td>.01</td>
<td>.40 *</td>
<td>.27</td>
<td>-.17</td>
<td>.08</td>
<td>.38</td>
</tr>
</tbody>
</table>
Table 4. Item Loadings for the Five-Factor Structure of the WAS (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1 Benevolence</th>
<th>Factor 2 Justice</th>
<th>Factor 3 Luck</th>
<th>Factor 4 Random</th>
<th>Factor 5 Self-Worth</th>
<th>$h^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAS 27</td>
<td>-.03</td>
<td>.40 *</td>
<td>.30</td>
<td>-.06</td>
<td>.37</td>
<td>.60</td>
</tr>
<tr>
<td>WAS 16</td>
<td>.04</td>
<td>-.02</td>
<td>.82 *</td>
<td>.10</td>
<td>-.08</td>
<td>.65</td>
</tr>
<tr>
<td>WAS 32</td>
<td>-.02</td>
<td>-.01</td>
<td>.79 *</td>
<td>.22</td>
<td>-.05</td>
<td>.67</td>
</tr>
<tr>
<td>WAS 10</td>
<td>.13</td>
<td>-.09</td>
<td>.71 *</td>
<td>.21</td>
<td>-.11</td>
<td>.52</td>
</tr>
<tr>
<td>WAS 13</td>
<td>-.15</td>
<td>.31</td>
<td>.52 *</td>
<td>-.16</td>
<td>.25</td>
<td>.65</td>
</tr>
<tr>
<td>WAS 21</td>
<td>.21</td>
<td>-.10</td>
<td>.40 *</td>
<td>-.09</td>
<td>-.07</td>
<td>.19</td>
</tr>
<tr>
<td>WAS 24</td>
<td>-.10</td>
<td>.02</td>
<td>.04</td>
<td>.74 *</td>
<td>-.02</td>
<td>.58</td>
</tr>
<tr>
<td>WAS 6</td>
<td>.14</td>
<td>-.04</td>
<td>.18</td>
<td>.74 *</td>
<td>.05</td>
<td>.60</td>
</tr>
<tr>
<td>WAS 15</td>
<td>-.23</td>
<td>-.03</td>
<td>.23</td>
<td>.65 *</td>
<td>.12</td>
<td>.59</td>
</tr>
<tr>
<td>WAS 18</td>
<td>.08</td>
<td>-.08</td>
<td>-.09</td>
<td>.01</td>
<td>.83 *</td>
<td>.66</td>
</tr>
<tr>
<td>WAS 8</td>
<td>.07</td>
<td>-.5</td>
<td>-.19</td>
<td>.05</td>
<td>.75 *</td>
<td>.51</td>
</tr>
<tr>
<td>WAS 28</td>
<td>.07</td>
<td>.11</td>
<td>.07</td>
<td>.00</td>
<td>.63 *</td>
<td>.52</td>
</tr>
<tr>
<td>WAS 1</td>
<td>-.13</td>
<td>.34</td>
<td>-.01</td>
<td>-.11</td>
<td>-.07</td>
<td>.12</td>
</tr>
<tr>
<td>WAS 3</td>
<td>.17</td>
<td>.02</td>
<td>.01</td>
<td>.39</td>
<td>-.21</td>
<td>.19</td>
</tr>
<tr>
<td>WAS 31</td>
<td>.07</td>
<td>-.04</td>
<td>.12</td>
<td>-.27</td>
<td>.28</td>
<td>.22</td>
</tr>
</tbody>
</table>

Those WAS items that had a factor loading of at least .40 on a factor, with no cross loadings, were included in the final factor structure. Using this criterion, three WAS items (Items 1, 3, and 31) were eliminated from future analyses because they did not adequately load on any of the five factors. Items 1 and 3 were from the original factor of meaningfulness of the world and item 31 was from the original factor of self-worth. The
(Promax) rotated factor structure and factor loadings are presented in Table 4. The first factor included all eight items from Janoff-Bulman’s (1989a) original benevolence scale and was named “Benevolence.” The second factor included 7 items out of 12 items from Janoff-Bulman’s original meaningfulness scale and 3 items out of 12 items from the original self-worth scale related to justice and control and was named “Justice.” The third factor included 5 items out of 12 items from Janoff-Bulman’s original self-worth scale related to feeling lucky and was named “Luck.” The fourth factor included 3 items out of 12 items from Janoff-Bulman’s original meaningfulness scale related to randomness and was named “Randomness.” The fifth factor included 3 items out of 12 items from Janoff-Bulman’s original self-worth scale related to feelings of self-worth and was named “Self-Worth.” See Appendix E for more detailed information regarding the WAS items. The inter-factor correlations of these factors are included in Table 5.

Table 5. Inter-Factor Correlations for the WAS

<table>
<thead>
<tr>
<th></th>
<th>Factor 1 Benevolence</th>
<th>Factor 2 Justice</th>
<th>Factor 3 Luck</th>
<th>Factor 4 Random</th>
<th>Factor 5 Self-Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1 Benevolence</td>
<td>1.00</td>
<td>.18</td>
<td>.16</td>
<td>-.19</td>
<td>.30</td>
</tr>
<tr>
<td>Factor 2 Justice</td>
<td>1.00</td>
<td></td>
<td>.34</td>
<td>-.10</td>
<td>.24</td>
</tr>
<tr>
<td>Factor 3 Luck</td>
<td>1.00</td>
<td></td>
<td></td>
<td>.06</td>
<td>.35</td>
</tr>
<tr>
<td>Factor 4 Random</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td>-.07</td>
</tr>
<tr>
<td>Factor 5 Self-Worth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>
The five factor structure was used in all subsequent analyses. The internal consistencies for these 5 factors with this sample were as follows: .91 for Benevolence, .83 for Justice, .79 for Luck, .77 for Randomness, and .76 for Self-Worth.

A factor analysis was also conducted to examine the factor structure of the PTGI with the current sample. An exploratory factor analysis using squared multiple correlations as priors was conducted with this sample on the 21 items of the PTGI. The eigenvalues and percentage of variance accounted for by the first four factors from this analysis are presented in Table 6. These four factors, which individually accounted for 5% or more of the variance, were retained for further analysis (Hatcher, 1994).

Table 6. PTGI Factor Analysis: Eigenvalues and Cumulative Percentages (N = 105)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Eigenvalue</th>
<th>Additional Percentage Accounted For</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.44</td>
<td>64.43</td>
<td>64.43</td>
</tr>
<tr>
<td>2</td>
<td>1.78</td>
<td>12.13</td>
<td>76.56</td>
</tr>
<tr>
<td>3</td>
<td>1.21</td>
<td>8.23</td>
<td>84.79</td>
</tr>
<tr>
<td>4</td>
<td>0.90</td>
<td>6.13</td>
<td>90.92</td>
</tr>
</tbody>
</table>

An oblique rotation was used because Calhoun and Tedeschi (2006) describe the domains of posttraumatic growth as distinct but interrelated. Based on the eigenvalues, variance accounted for, scree plot, and interpretability of the factors, a one factor structure was optimal for the PTGI with this sample. Although a statistical argument could be made for a two-, three-, or four-factor structure, these factor structures were not interpretable. The pattern of factor loadings for the two-, three- and four-factor structures did not have definable characteristics and lacked conceptual sense. The data from the
The current study was also factor analyzed in terms of the original five-factor structure found by Tedeschi and Calhoun (1996). The items did not load as expected on to the five-factor structure. Therefore, a one-factor solution was deemed most appropriate. The one factor structure accounted for 64% of the variance and had an eigenvalue of 9.44. There was also a large drop-off on the scree plot between 1 and 2 factors. Subsequent analyses used a one-factor structure, or the total PTGI score. The internal consistency of the total PTGI with this sample was high (α = .94).

Table 7 provides information about the correlations between the measures used in this study.

Table 7. Correlation Matrix of the IES, WAS, and PTGI

<table>
<thead>
<tr>
<th></th>
<th>WAS Factor 2</th>
<th>WAS Factor 3</th>
<th>WAS Factor 4</th>
<th>WAS Factor 5</th>
<th>IES</th>
<th>PTGI</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAS Factor 1</td>
<td>.27*</td>
<td>.25*</td>
<td>-.20*</td>
<td>.34*</td>
<td>-.15</td>
<td>.27*</td>
</tr>
<tr>
<td>WAS Factor 2</td>
<td>.36*</td>
<td>-.05</td>
<td>.18</td>
<td>.00</td>
<td>.25*</td>
<td></td>
</tr>
<tr>
<td>WAS Factor 3</td>
<td>.27*</td>
<td>.24*</td>
<td>-.03</td>
<td>.22*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAS Factor 4</td>
<td>-.02</td>
<td>.07</td>
<td>.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAS Factor 5</td>
<td>-.17</td>
<td>.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>

Note. * p ≤ .05

The findings of this study as related to the a priori hypotheses will now be reviewed.
Hypothesis 1: Individuals’ core cognitive schemas affected by trauma, as measured by the WAS, will differ based on the type of trauma experienced.

To examine hypothesis one, group differences between sexual assault survivors and breast cancer survivors in their core cognitive schemas of benevolence, justice, luck, randomness, and self-worth were assessed. Any demographic variables significant at the .10 level were included as covariates in this analysis. The covariates of Support and Age were controlled for in this analysis because they were found to have a significant effect on WAS scores in preliminary analyses (Wilks’ lambda = .74, \(F(5, 73) = 5.11; p < .001\), and Wilks’ lambda = .88, \(F(5, 73) = 1.93; p = .10\), respectively). Results were analyzed using one-way MANCOVA, between-groups design. This analysis failed to reveal a significant multivariate effect for the type of trauma, Wilks’ lambda = .95, \(F(5, 73) = .74; p \geq .05\), indicating no significant group mean differences between sexual assault survivors and breast cancer survivors on the five core cognitive schemas measured by the WAS. Because the MANCOVA was not significant, no further analyses were appropriate. Based on these data, Hypothesis 1, which stated that an individual’s core cognitive schemas affected by trauma, as measured by the WAS, will differ based on the type of trauma experienced, was not supported.

Hypothesis 2: Individuals’ experience of posttraumatic growth, as measured by the PTGI, will differ based on the type of trauma experienced.

To examine Hypothesis 2, an ANCOVA was run assessing group differences between sexual assault survivors and breast cancer survivors on their total posttraumatic growth (see Table 8). The covariate of Support was controlled for in this analysis because it was found to have a significant effect on the Total PTGI score in preliminary analyses,
\[ F(11, 73) = 12.48; p < .001. \] The subsequent analysis was a one-way ANCOVA, between-groups design. This analysis of covariance revealed a significant effect for type of trauma, \( F(2, 94) = 31.79; p < .001. \) Breast cancer survivors (\( M = 87.4, 95\% \text{ confidence interval between 82.25 to 92.55} \)) scored significantly higher on the Total PTGI than sexual assault survivors (\( M = 67.11; 95\% \text{ confidence interval of 62.22 to 71.99} \)). The difference between breast cancer survivors and sexual assault survivors on total PTGI scores is large (\( d = 1.21 \)). Based on these data, hypothesis 2, which states an individual’s experience of posttraumatic growth, as measured by the PTGI, will differ based on the type of trauma experienced, was supported.

Table 8. Analysis of Covariance for PTGI

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma Type</td>
<td>1</td>
<td>9696.26</td>
<td>9696.26</td>
<td>31.79*</td>
<td>1.21</td>
</tr>
<tr>
<td>Support</td>
<td>1</td>
<td>4575.89</td>
<td>4575.89</td>
<td>15.00*</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>94</td>
<td>28671.18</td>
<td>305.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 97; * \( p < .001 \)

An interpretation and discussion of these statistical results will be presented in Chapter V.
CHAPTER V
DISCUSSION

This study was one of the next steps in posttraumatic growth research as suggested by researchers and theorists in the field of PTG and trauma recovery (e.g., Calhoun et al., 2000; Calhoun et al., 1998; Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995; Tomich & Helgeson, 2004). In this chapter, the results of this study reported in Chapter IV are discussed. The statistical findings related to differences in the core cognitive schemas related to trauma are explained as well as the differences between the two groups in their experience of posttraumatic growth. How these findings compare to previous research in this field is discussed. The implications of these findings are delineated. Finally, limitations to the current study are outlined and future directions for research in the field of posttraumatic growth are discussed.

Explanation of Findings

The results of this study reported in Chapter IV are explained. First, the results related to hypothesis one are discussed. Second, there is a discussion of the results related to hypothesis two.

Hypothesis One

Hypothesis 1 stated that sexual assault survivors’ and breast cancer survivors’ cognitive schemas related to trauma would differ, as measured by the WAS. These core
cognitive schemas were discussed as the schemas of meaningfulness of the world, benevolence of the world, and self-worth. An exploratory factor analysis conducted with this sample of sexual assault survivors and breast cancer survivors led to the determination that a five-factor solution was the most appropriate explanation of the cognitive schemas measured by the WAS, rather than the three-factor solution determined by Janoff-Bulman (1989a). The cognitive schemas as measured by the five-factor solution were related to benevolence, justice and control, randomness, luck, and self-worth. Because this factor structure was the most appropriate explanation, five subscales measuring these cognitive schemas were used in subsequent analyses to examine differences in individuals’ core cognitive schemas related to the type of trauma endured.

The hypothesis that the type of trauma experienced would be related to core cognitive schemas related to trauma was not supported. This finding indicates that the type of trauma endured was not related to differences in the core cognitive schemas that must be rebuilt following a traumatic experience. Although the type of trauma endured does not relate to differences in the core cognitive schemas measured by the WAS, the overall experience of a traumatic event may impact these cognitive schemas. It may be that core cognitive schemas are impacted by trauma, but unlike what was hypothesized in this study and by theorists in the field of trauma recovery (e.g. Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995), the nature of the traumatization does not differentially influence an individual’s beliefs about benevolence, justice, randomness, luck, or self-worth. This hypothesis was based on the work of researcher such as Janoff-Bulman (1989a), who found that individuals who had experienced a traumatic event saw the world as more malevolent and had lower self-worth than
individuals who had not experienced a traumatic event. Schwartzberg and Janoff-Bulman (1991) also found that individuals who had experienced a traumatic event (i.e., an undergraduate student whose parent died) saw the world as less meaningful than undergraduate students who had not lost a parent. However, the current study suggests that the type of trauma experienced may not impact cognitive schemas related to trauma so much as the experience of a traumatic event in general may impact cognitive schemas.

On the other hand, the core cognitive schemas related to trauma, particularly as measured by the WAS, may not be affected by the experience of a traumatic event. In this study, differences were not found between the two groups (i.e., sexual assault survivors and breast cancer survivors) in their views of benevolence, justice, randomness, luck or self-worth. Because of the cross-sectional design of this study, one cannot say that these cognitive schemas changed as a result of experiencing the trauma. The participants in this study may have held similar views about benevolence, justice, and so forth, prior to being sexually assaulted or being diagnosed with breast cancer. In other words, this study may not have found a difference between the two groups on these cognitive schemas because these cognitive schemas may not always be affected by the experience of trauma. Callhoun et al. (1998) concluded that cognitive schemas were not affected by the experience of trauma when they did not find significant differences in assumptive worlds based on the level of stressfulness of the critical life event experienced. The belief that experiencing a trauma does not impact assumptive worlds runs counter to the findings of other researchers (e.g., Harris & Valentiner, 2002; Tomich & Helgeson, 2002), though, who found changes in assumptive worlds specifically for sexual assault survivors or breast cancer survivors in comparison to a control group.
The findings in this study that core cognitive schemas related to trauma, as measured by the WAS, do not differ between sexual assault survivors and breast cancer survivors also diverge from the results found by Matthews and Marwit (2003-2004) and Gluhoski and Wortman (1996). Matthews and Marwit examined differences in core cognitive schemas, using the WAS, in parents who lost a child through accident, murder, or illness and did find differences between the groups in their views of the world as benevolent, the world as meaningful, and the self as worthy. This raises the possibility that the trauma types examined in the current study, sexual assault and breast cancer, do not differentially affect the core cognitive schemas measured by the WAS but that other trauma types do. In the current study, two traumas that affect the self were examined. In the Matthews and Marwit study, the traumas that were researched were other-focused (i.e., death of a child in three different ways). Gluhoski and Wortman made a distinction between traumas that were self-focused and other-focused and did find differences between the two groups. This difference in trauma distinction may be one explanation for the difference in results between the current study and other studies (Gluhoski & Wortman; Matthews & Marwit).

In summary, the findings of the current study with these samples indicate there is not a link between the type of trauma experienced and the core cognitive schemas related to trauma (benevolence, justice, randomness, luck, and self-worth as measured in this study). One explanation for this finding is that trauma itself triggers changes in these cognitive schemas, but that the type of trauma experienced does not matter. Another explanation is that these core cognitive schemas are in fact not affected by trauma and that sexual assault survivors and breast cancer survivors held similar views about the
world and self prior to being traumatized. Another alternative explanation for the fact that the null hypothesis was not rejected is that the distinction made between trauma types in this study (i.e., human perpetrated versus medical trauma) is not a distinction that leads to differences in the core cognitive schemas. It may be that if other distinctions were made between trauma types, such as self-focused trauma versus other-focused trauma, differences in core cognitive schemas based on trauma type that are not evident in this study would be found. The discussion now turns to the second hypothesis.

**Hypothesis Two**

Hypothesis two stated there would be group differences between sexual assault survivors and breast cancer survivors in their experience of posttraumatic growth, as measured by the PTGI. More specifically, it was hypothesized that sexual assault survivors and breast cancer survivors would experience growth in different domains of posttraumatic growth. The domains of posttraumatic growth measured by the PTGI in other studies (e.g., Jaarsma et al., 2006; Morris et al., 2005; Tatu et al., 2008; Tedeschi & Calhoun, 1996) include a greater appreciation for life, new priorities, an increased sense of personal strength, better relationships with others, and spiritual change. The current study was going to examine differences between sexual assault survivors and breast cancer survivors in these five domains to assess trauma-specific growth. Prior to this examination, however, an exploratory factor analysis of this sample was conducted, particularly because the focus of this study was reliant on the factor structure of the PTGI. As noted in chapter IV, the factor structure of the PTGI as found by Tedeschi and Calhoun and verified by Jaarsma et al., Morris et al. and Tatu et al. was not found with this sample in this study. The most appropriate factor structure for the PTGI with this
sample in this study was a single factor. In other words, it is most valid in the current study with this sample, to think of posttraumatic growth as a global construct that includes each of the domains noted above.

With this in mind, sexual assault survivors’ and breast cancer survivors’ total score on the PTGI was analyzed. Prior to this analysis, the two trauma groups were compared on several demographic variables (i.e., race, age, partner status, participation in therapy, experience of support, total IES scores). Any significant differences between the trauma groups were controlled in subsequent analyses if the demographic variable covaried with the outcome variable (i.e., Total PTGI score) to ensure that any differences found between the two groups were related to the type of trauma endured. Once controlling for these variables (Support in this instance), a test of hypothesis two revealed that breast cancer survivors scored significantly higher than sexual assault survivors on the PTGI, indicating that breast cancer survivors experience more posttraumatic growth than sexual assault survivors do. Most notably, these findings indicate that the type of trauma experienced does in fact correlate with the amount of posttraumatic growth experienced. This study initially set forth to examine the specific domains of growth, but what can be said from these findings is that, in this sample, breast cancer survivors experienced more posttraumatic growth overall than sexual assault survivors and that the effect size of the difference between the two groups is large. So, this study indicates that the type of trauma experienced does in fact influence posttraumatic growth. Weiss (2002) reported the average score on the total PTGI was 60.2 for breast cancer survivors and 46.0 for the breast cancer survivors’ husbands. Cordova et al. (2001) reported the average score on the total PTGI was 64.1 for breast cancer survivors and 56.3 for healthy
controls. Comparing these scores to the average total PTGI scores in the current study (87.4 for breast cancer survivors and 67.1 for sexual assault survivors), it is important to note, that although breast cancer survivors scored significantly higher than sexual assault survivors on the posttraumatic growth inventory, both trauma groups did appear to experience posttraumatic growth.

To understand why breast cancer survivors experience more posttraumatic growth than sexual assault survivors, the concept of support may need to be looked at further. The possibility that breast cancer survivors are more likely to seek or receive support than sexual assault survivors is something that theorists (e.g. Janoff-Bulman, 1992; McCann et al., 1988; McMillen et al., 1997; Tedeschi & Calhoun, 1995) have discussed as a possibility and it may have had an impact on the results of this current study. Tedeschi and Calhoun theorized that those events that lead to more social support are more likely to elicit more posttraumatic growth than those events that do not tend to illicit social support. The concept of support was measured by three items that addressed whether an individual thought she had people to talk to, people to express her emotions with, and whether she felt she could count on other people. Although there was not a significant statistical difference between the groups in their experience of support as measured by these three items, “Support” was a significant predictor of PTGI scores, so it was included as a covariate in the analyses of group differences in posttraumatic growth. Future studies should include a more extensive measure of support to understand more fully how an individual’s experience of support differs based on the type of traumatic event endured. Future studies should also examine more specifically what role one’s subjective experience of support has on posttraumatic growth.
Another explanation for the results in the current study may be that sexual assault survivors are more likely to engage in behavioral self-blame (Hill & Zautra, 1989; Janoff-Bulman, 1979, 1989b) than breast cancer survivors. Behavioral self-blame, which is blaming one’s past behaviors for the occurrence of an event (Janoff-Bulman, 1989b), is a common response to being sexually assaulted and allows sexual assault survivors to regain a sense of control (Janoff-Bulman, 1979; Ullman, 1997). When a person engages in behavioral self-blame, it may have a negative impact on the ability to positively reinterpret the traumatic experience, resulting in posttraumatic growth. The role that blame has in different traumatic events and the subsequent positive reinterpretation of the trauma is an area of future research that may help explain the current study’s results.

It is important to also look at other ways in which sexual assault survivors and breast cancer survivors differ when trying to understand the results of the current study. As noted throughout this study, the distinction has been made between sexual assault being a human perpetrated trauma and breast cancer being a non-human perpetrated trauma, or medical trauma. Another difference between the traumatic events is that sexual assault is often a more discrete, time-limited, traumatic event and breast cancer is a more ongoing, possibly recurring, traumatic event. It may be that the duration of the traumatic event has an impact on posttraumatic growth, with those events that are more ongoing, such as breast cancer, affording an individual more time to ruminate about the event and positively construe aspects of what has happened. Future research should examine this possibility more fully.

In summary, the findings from the current study indicate there is a link between the type of trauma experienced and posttraumatic growth. One explanation for the finding
that breast cancer survivors experience more posttraumatic growth than sexual assault survivors is that breast cancer survivors may experience more support than sexual assault survivors, resulting in more posttraumatic growth. Another possible explanation is that sexual assault survivors may be more likely to engage in behavioral self-blame than breast cancer survivors, negatively impacting their ability to positively reinterpret the assault and experience posttraumatic growth. Finally, it may be that breast cancer survivors have more time to positively reinterpret the traumatic event because breast cancer is more of an ongoing, possibly recurring, traumatic event, rather than sexual assault, which is more discrete and time-limited.

**Implications of Findings**

The examination of trauma-specific growth has been called for by theorists and researchers in the domains of trauma recovery (e.g., Calhoun et al., 2000; Calhoun et al., 1998; Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995; Tomich & Helgeson, 2004). As noted earlier, Tedeschi and Calhoun argued that PTG is not a “unitary phenomenon” and future research should consider that “individuals facing one kind of difficulty may evidence growth in areas that differ from those experienced by individuals facing difficulty of a different kind” (p. 118). In addition to the trauma-specific growth, Janoff-Bulman noted, “the possibility that specific changes [in assumptions] experienced may also, in part, reflect the nature of the victimization” (p. 75). The current study was a needed piece of research in the study of posttraumatic growth. The theorists and researchers in this field (e.g., Calhoun et al., 2000; Calhoun et al., 1998; Gluhoski & Wortman, 1996; Janoff-Bulman, 1992; Tedeschi & Calhoun, 1995; Tomich & Helgeson, 2004) have noted the need for research into trauma-specific growth
and the impact of trauma type on the core cognitive schemas associated with trauma. Also, examining the dimensionality of PTG has become a needed focus of trauma research (Park & Lechner, 2006). Based on these calls for future research, the current study can be seen as one of the next important steps in posttraumatic growth research.

The results from the current study indicate that the type of trauma experienced does correlate with posttraumatic growth. Although both sexual assault survivors and breast cancer survivors experienced posttraumatic growth to an extent, breast cancer survivors experienced more posttraumatic growth. These findings support the theory that the type of trauma experienced does influence the extent to which posttraumatic growth occurs. The current study examined posttraumatic growth as a “unitary phenomenon.” Because the exploratory factor analysis revealed that a one-factor structure for the posttraumatic growth measure was the most appropriate factor structure with this sample, trauma-specific growth in domains of posttraumatic growth was not examined. This observation of posttraumatic growth as a global construct with the instrument used in this study, rather than having specific domains, is important to the theory of posttraumatic growth. PTG theory and Calhoun and Tedeschi’s (2006) model of PTG assume that PTG consists of different domains and that the PTGI can be used as a multi-dimensional measure. The current study, as well as other research (e.g., Polatinsky & Esprey, 2000; Sheikh & Marotta, 2005), does not support these claims. The current study triggers questions about the appropriateness of using the PTGI as a multi-dimensional measure and the factor structure of the PTGI should be examined further, with other populations, to gain a better understanding of the theory of dimensionality within posttraumatic growth.
In addition to the findings related to trauma-specific growth, differences in an individual’s core cognitive schemas related to trauma were examined. There were no group differences on the two different trauma group’s core cognitive schemas. These findings discredit Janoff-Bulman’s (1992) theorizing that the nature of the trauma endured influences the cognitive schemas related to meaningfulness of the world, benevolence of the world, and self-worth. The experience of a trauma itself may trigger changes in these cognitive schemas, but with this sample, the nature of the trauma did not correlate with differences in core cognitive schemas.

The findings from the current study that the type of trauma experienced is not related to individual’s core cognitive schemas but is related to the amount of posttraumatic growth experienced has important implications for Calhoun and Tedeschi’s (2006) Model of Posttraumatic Growth (Figure 1). In this model, Calhoun and Tedeschi hypothesized that one of the paths to experiencing posttraumatic growth is through changes in an individual’s core cognitive schemas. This implies that differences in posttraumatic growth would also be reflected in differences in the core cognitive schemas. In the current study, there were no differences between trauma groups in the core cognitive schemas even though there were differences in posttraumatic growth. The findings of this study may refute Calhoun and Tedeschi’s contention that posttraumatic growth occurs as the result of challenges to an individual’s assumptive world. Further, more detailed examination of this path in the Calhoun and Tedeschi Model of Posttraumatic Growth is warranted to better understand the link between cognitive schemas and posttraumatic growth. These findings also highlight the need to examine an
individual’s core cognitive schemas and posttraumatic growth pre- and post-trauma to better understand how things change with the experience of a traumatic event.

The results of the current study not only have theoretical implications, they also have clinical implications. More fully understanding the impact of a traumatic event on an individual’s cognitive schemas about benevolence, justice, randomness, luck and self-worth is beneficial in helping individuals recover from traumatic experiences. By recognizing that individuals can positively reinterpret traumatic events and experience posttraumatic growth, counseling psychologists may be able to help individuals move toward this experience of growth. The findings from the current study are that breast cancer survivors experience more posttraumatic growth than sexual assault survivors. This indicates that there is something about a medical trauma, rather than a human-perpetrated trauma, that influences an individual’s experience of posttraumatic growth.

Earlier in this discussion, the possibility that this difference was the result of more support for breast cancer survivors than sexual assault survivors was presented. Clinicians should consider this and help clients find ways to increase their support system when dealing with a traumatic event. Another reason proposed for sexual assault survivors experiencing less posttraumatic growth than breast cancer survivors was that sexual assault survivors may engage in more behavioral self-blame than breast cancer survivors. This explanation should be considered and clinicians should work with trauma victims to minimize the amount of behavioral self-blame they engage in order to foster posttraumatic growth. Some reasons for the different experience of posttraumatic growth for these trauma groups were presented. Why breast cancer survivors experience more posttraumatic growth than sexual assault survivors will be an important question to
continue to explore so that counseling psychologists can help individuals not only recover from a traumatic experience, but feel like they have experienced growth.

Limitations

In the current study, there were several demographic variables that were not assessed that may play a role in individuals’ cognitive schemas related to trauma, and in their experience of posttraumatic growth. Most notably, this study did not assess participants’ religious affiliation and/or spiritual practice, socioeconomic status, or education level. Because these demographic variables were not assessed, it is hard to know what role they may play in any group comparisons undertaken. Also, as noted earlier, information was not gathered about whether breast cancer survivors had ever been sexually assaulted. It is possible that some of the sample had experienced both traumatic events, which would impact the results. It can be noted that none of the sexual assault survivors reported being diagnosed with breast cancer, though. In addition, the vast majority of both sample groups (i.e., 91.8% of the breast cancer survivors and 92.7% of sexual assault survivors) were European American, which limits the generalizability of these findings to other racial groups. Also, the sample consisted of all female participants, because of the trauma types studied. Differences in cognitive schemas and posttraumatic growth may arise when looking at the differences between men and women. Another potential limitation to the current study is how the participants were recruited. All participants in the current study conducted the surveys on-line. Also, many of the participants were recruited from listservs for survivors (e.g., Susan G. Komen survivor message boards, SARNCO survivor listserv, SA-Ohio listserv). There may be a self-selection process in terms of study participation. The possibility exists that individuals
who are on listservs or message boards for survivors may be more inclined to positively reinterpret the traumatic event, leading to higher levels of posttraumatic growth.

The current study also had notable statistical limitations. Because of missing data, participants who partially completed the surveys were eliminated from statistical analyses. The elimination of participants with missing data, participants less than one year from assault or diagnosis, and/or participants who did not experience the event as traumatic (i.e., scored less than or equal to 19 on the IES) resulted in a smaller sample size than was initially anticipated when data collection ceased. With the decreased sample size, there was a decrease in power for the current study. Also, the sample size is on the cusp for appropriately conducting factor analyses in this study (e.g., five participants per item on a measure) (Kahn, 2006). There is the possibility that the factor structures of the PTGI and WAS were compromised because of the sample size reduction after data were gathered.

Another pertinent issue is the validity of the measures used. Neither measure (the WAS or the PTGI) was found to have the expected structure (i.e., 3 factor structure for the WAS and 5 factor structure for the PTGI). Because of these instrumentation issues, it is difficult to know definitively that the current study is examining the core cognitive schemas that it was purporting to examine. The factor structure of the WAS found in the current study, while close to the factor structure found by Harris and Valentiner (2002), will need to be replicated with other samples to verify the factor structure of the WAS used in this study. It will be important to verify the factor structure in cross-cultural samples to ensure that the cognitive schemas purported to be impacted by trauma are cross-culturally valid. Also, the current study called into question the dimensionality of
the PTGI, triggering the need further investigation into the factor structure of the PTGI and the multi-dimensionality of PTG overall. The current study, along with other investigations in this area, can only be as good as the quality of the instrumentation involved in the research permit it to be. Finally, the current study was a cross-sectional design, which makes it difficult to know how an individual’s cognitive schemas and experience of posttraumatic growth have changed over time. The limitations to this study addressed in this section lead to a discussion about future directions of research that should be considered.

**Future Directions**

The current study was one of the next logical steps in the field of posttraumatic growth. The findings of this study bring about several future areas for research in this field. Studies that look at cognitive schemas and levels of posttraumatic growth pre- and post-trauma would be helpful in understanding the impact of the trauma on an individual’s view of the world and self, as well as highlight the impact a traumatic event has on the domains of posttraumatic growth, such as relationships with others and appreciation for life. To look at changes in cognitive schemas and posttraumatic growth over time, longitudinal research will need to be conducted. It would also be beneficial in future research to include a control group or comparison group in addition to the trauma groups being studied in order to examine whether changes in PTG and cognitive schemas are trauma-specific or can be generalized to any traumatic event. The factor structure of the PTGI and the WAS will also need to be re-examined further. In this study, the most appropriate way to view PTG was a global construct because the five-factor structure was not statistically confirmed with this sample. This finding is contrary to the findings of other researchers in this field (e.g.,
Jaarsma et al., 2006; Morris et al., 2005; Taku et al., 2008; Tedeschi & Calhoun, 1996) but comparable to the findings of other researchers (e.g., Polatinsky & Esprey, 2000; Sheikh & Marotta, 2005). Further research should be done to verify the factor structure of the PTGI and the dimensionality of PTG. The factor structure for the WAS found in this study differed from the three factor structure expected based on Janoff-Bulman’s research (1989a) but was very similar to the five-factor structure found by Harris and Valentiner (2002). Future research should also verify the factor structure of the WAS so that more can be said about the cognitive schemas that are impacted by trauma.

As mentioned earlier, future research should look at what role blame has on an individual’s experience of posttraumatic growth. Depending on the nature of the traumatic event, blame may negatively affect an individual’s ability to positively reinterpret the experience, thereby influencing the amount and type of posttraumatic growth that occurs. Future research should also look at differences in cognitive schemas and posttraumatic growth for different trauma groups. The current study examined differences between sexual assault survivors and breast cancer survivors. Other groups of trauma survivors that could be examined are natural disaster survivors, terrorism survivors, and individuals living with HIV/AIDS. Not only should different trauma groups be researched, but how the magnitude of the traumatic experience affects an individual’s cognitive schemas and posttraumatic growth should also be explored. Another important area of future research is on the link between cognitive schemas and posttraumatic growth. The current study looked at these areas separately, but it will be important to understand how changes in cognitive schemas influence one’s experience of posttraumatic growth. As noted by Calhoun and Tedeschi
(2006), “One of the most promising areas in which more work needs to be done is in the ways in which cognitive factors are connected to growth” (p. 17).

Conclusion

The current study examined trauma-specific posttraumatic growth as well as differences in the core cognitive schemas of benevolence, justice, randomness, luck, and self-worth. Sexual assault survivors and breast cancer survivors were compared on the PTGI and the WAS. Breast cancer survivors and sexual assault survivors did not differ in their cognitive schemas related to benevolence, justice, randomness, luck, and self-worth. Breast cancer survivors did experience more posttraumatic growth than sexual assault survivors. The current study was one of the next steps in research in the field of posttraumatic growth and trauma recovery. As a result of the current study, there is a clearer understanding of the impact of trauma-type on the global construct of posttraumatic growth and the core cognitive schemas related to trauma. The current study also implies that posttraumatic growth is a unitary construct, indicating the need for further research on the dimensionality of posttraumatic growth.
REFERENCES


APPENDICES
APPENDIX A

INFORMED CONSENT FOR INTERNET SURVEY

**Title of Study**: Investigating the existence of trauma-specific growth: A comparison of two populations.

**Introduction**: You are invited to participate in a research project being conducted by Amanda Warbel, M.A., a student in the Department of Counseling, at The University of Akron. In order to decide whether or not you should agree to be part of this study, you should understand enough of its risks and benefits to make an informed judgment. This process is known as informed consent. This consent form gives you detailed information about the research study.

**Purpose**: The purpose of the current study is to investigate the effect a traumatic experience has on your thoughts about the world and self and on several areas of potential growth. It is estimated that 100 individuals will participate in this study.

**Procedures**: During the course of this study, you will be asked to complete this online survey. It is estimated that it will take twenty minutes to complete this survey.

**Risks and Discomforts**: To complete the survey, you will be asked to recall a traumatic experience you have experienced. Recalling the traumatic experience may cause emotional distress. If you experience emotional distress as a result of completing this survey, you are asked to contact the project coordinator, Amanda Warbel, M.A. at
614-266-8496, or Charles Waehler, Ph.D., at 330-972-6701, so that proper mental health services in your area can be initiated.

**Benefits:** You may receive no direct benefit from your participation in this study, but your participation may help us better understand how experiencing a traumatic event can lead to psychological growth.

**Right to refuse or withdraw:** Your participation in this research is voluntary and you may refuse to participate, or may discontinue participation at any time, without penalty or loss of benefits to which you are otherwise entitled.

**Anonymous Data Collection:** All responses to this survey will be kept confidential. Your name or identity will not be linked in any way to the research data.

**Confidentiality of Records:** All collected data will be kept confidential and no identifying information will be included in the collected data.

**Who to contact with questions:** If you have any questions about your participation in this study, you may call Amanda Warbel, M.A. at 614-266-8496 or Charles Waehler, Ph.D., at 330-972-6701. This project has been reviewed and approved by The University of Akron Institutional Review Board. If you have any questions about your rights as a research participant, you may call the IRB at (330) 972-7666 or 1-888-232-8790.

**Acceptance:** I have read this entire form and I understand it completely. All of my questions regarding this form or this study have been answered to complete satisfaction. I agree to participate in this research.

I understand that by completing the attached survey I am giving my consent to participate in this study.
Overview

Thank you for participating in this research project. The primary purpose of this project is to examine how experiencing different traumatic events may influence an individual’s thoughts about the world and the self. This project also examines how experiencing different traumatic events may influence an individual’s experience of posttraumatic growth. Posttraumatic growth is defined as, “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). When individuals experience a traumatic event, they may tend to experience positive changes in their life as a result of finding ways to deal with the trauma. The results of this research may help counseling psychologists further understand an individual’s experience following survival of a traumatic event, enhancing counseling services for trauma survivors.

Confidentiality

No identifying information was gathered and your responses to the survey are completely anonymous.
Important Reminders

If you have any questions regarding this study or your participation in this study, please contact Amanda Warbel, M.A., at 614-266-8496, or Charles Waehler, Ph.D., at 330-972-6701.

If you experience emotional distress as a result of completing this survey, you are asked to contact the project coordinator, Amanda Warbel, M.A. at 614-266-8496, or Charles Waehler, Ph.D., at 330-972-6701, so that proper mental health services in your area can be initiated.
APPENDIX C

IMPACT OF EVENT SCALE

(HOROWITZ ET AL., 1979)

Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you after you were [sexually assaulted/diagnosed with breast cancer]. If they did not occur, please mark the “not at all” column.

1. I thought about it when I didn’t mean to.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

2. I avoided letting myself get upset when I thought about it or was reminded of it.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

3. I tried to remove it from memory.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

4. I had trouble falling asleep or staying asleep because of pictures or thoughts about it that came into my mind.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

5. I had waves of strong feelings about it.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

6. I had dreams about it.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

7. I stayed away from reminders of it.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often

8. I felt as if it hadn’t happened or it wasn’t real.
☐ Not at all    ☐ Rarely    ☐ Sometimes    ☐ Often
9. I tried not to talk about it.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often

10. Pictures about it popped into my mind.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often

11. Other things kept making me think about it.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often

12. I was aware that I still had a lot of feelings about it, but I didn’t deal with them.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often

13. I tried not to think about it.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often

14. Any reminder brought back feelings about it.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often

15. My feelings about it were kind of numb.
☐ Not at all ☐ Rarely ☐ Sometimes ☐ Often
APPENDIX D

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 [ ], using the following scale.

1 = I did not experience this change as a result of …
2 = I experienced this change to a very small degree as a result of …
3 = I experienced this change to a small degree as a result of …
4 = I experienced this change to a moderate degree as a result of …
5 = I experienced this change to a great degree as a result of …
6 = I experienced this change to a very great degree as a result of …

1. My priorities about what is important in life.
   □ 1 □ 2 □ 3 □ 4 □ 5 □ 6
   None Very Small Small Moderate Great Very Great
   Degree Degree Degree Degree Degree Degree

2. I’m more likely to try to change things which need changing.
   □ 1 □ 2 □ 3 □ 4 □ 5 □ 6
   None Very Small Small Moderate Great Very Great
   Degree Degree Degree Degree Degree Degree

3. An appreciation for the value of my own life.
   □ 1 □ 2 □ 3 □ 4 □ 5 □ 6
   None Very Small Small Moderate Great Very Great
   Degree Degree Degree Degree Degree Degree

   □ 1 □ 2 □ 3 □ 4 □ 5 □ 6
   None Very Small Small Moderate Great Very Great
   Degree Degree Degree Degree Degree Degree
5. A better understanding of spiritual matters.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

6. Knowing that I can count on people in times of trouble.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

7. A sense of closeness with others.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

8. Knowing I can handle difficulties.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

9. A willingness to express my emotions.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

10. Being able to accept the way things work out.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

11. Appreciating each day.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

12. Having compassion for others.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree

13. I’m able to do better things with my life.

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6

None  Very Small  Small  Moderate  Great  Very Great
Degree  Degree  Degree  Degree  Degree  Degree
14. New opportunities are available which wouldn’t have been otherwise.

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15. Putting effort into my relationships.

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16. I have a stronger religious faith.

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17. I discovered that I’m stronger than I thought I was.

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18. I learned a great deal about how wonderful people are.

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19. I developed new interests.

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20. I accept needing others.

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21. I established a new path for my life.

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APPENDIX E

WORLD ASSUMPTIONS SCALE

(JANOFF-BULMAN, 1989A)

Using the scale below, please select the number that indicates how much you agree or disagree with each statement. Please answer honestly.

1 = Strongly Disagree  
2 = Moderately Disagree  
3 = Slightly Disagree  
4 = Slightly Agree  
5 = Moderately Agree  
6 = Strongly Agree

1. Misfortune is least likely to strike worthy, decent people.

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2. People are naturally unfriendly and unkind.

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3. Bad events are distributed to people at random.

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4. Human nature is basically good.

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5. The good things that happen in this world far outnumber the bad.
   □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
   Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
   Disagree  Disagree  Disagree  Agree  Agree  Agree

6. The course of our lives is largely determined by chance.
   □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
   Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
   Disagree  Disagree  Disagree  Agree  Agree  Agree

7. Generally, people deserve what they get in this world.
   □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
   Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
   Disagree  Disagree  Disagree  Agree  Agree  Agree

8. I often think I am no good at all.
   □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
   Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
   Disagree  Disagree  Disagree  Agree  Agree  Agree

9. There is more good than evil in the world.
   □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
   Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
   Disagree  Disagree  Disagree  Agree  Agree  Agree

10. I am basically a lucky person.
    □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
    Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
    Disagree  Disagree  Disagree  Agree  Agree  Agree

11. People’s misfortunes result from mistakes they have made.
    □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
    Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
    Disagree  Disagree  Disagree  Agree  Agree  Agree

12. People don’t really care what happens to the next person.
    □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
    Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
    Disagree  Disagree  Disagree  Agree  Agree  Agree

13. I usually behave in ways that are likely to maximize good results for me.
    □ 1  □ 2  □ 3  □ 4  □ 5  □ 6
    Strongly  Moderately  Slightly  Slightly  Moderately  Strongly
    Disagree  Disagree  Disagree  Agree  Agree  Agree
14. People will experience good fortune if they themselves are good.

<table>
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<tr>
<th>Strongly Disagree</th>
<th>Moderately Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Moderately Agree</th>
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15. Life is too full of uncertainties that are determined by chance.

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<th>Strongly Disagree</th>
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16. When I think about it, I consider myself very lucky.

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17. I almost always make an effort to prevent bad things from happening to me.

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18. I have a low opinion of myself.

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19. By and large, good people get what they deserve in this world.

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20. Through our actions we can prevent bad things from happening to us.

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21. Looking at my life I realize that chance events have worked out well for me.

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22. If people took preventative actions, most misfortune could be avoided.

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23. I take the actions necessary to protect myself from misfortune.

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24. In general, life is mostly a gamble.

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25. The world is a good place.

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26. People are basically kind and helpful.

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27. I usually behave so as to bring about the greatest good for me.

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28. I am very satisfied with the kind of person I am.

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29. When bad things happen, it is typically because people have not taken the necessary actions to protect themselves.

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30. If you look closely enough, you will see that the world is full of goodness.

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31. I have reason to be ashamed of my personal character.

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32. I am luckier than most people.

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APPENDIX F

DEMOGRAPHIC QUESTIONNAIRE

SEXUAL ASSAULT SURVIVORS

1. What is your age? ______

2. Please mark your race/ethnicity:
   - European American
   - Latina
   - African American
   - Native American
   - Asian American
   - Multiracial
   - Other: ________________

3. Please mark your partner status:
   - Single
   - Married
   - Partnered
   - Separated
   - Widow
   - Other: ________________

4. How long has it been since you were sexually assaulted?
   - Less than 1 year
   - 1 to 2 years
   - 3 to 5 years
   - More than 5 years

5. I had people to talk to about my worries concerning being sexually assaulted.
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - Strongly
   - Moderately
   - Slightly
   - Slightly
   - Moderately
   - Strongly
   - Disagree
   - Disagree
   - Disagree
   - Agree
   - Agree
   - Agree

6. I felt free to express all my feelings about being sexually assaulted to those close to me.
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - Strongly
   - Moderately
   - Slightly
   - Slightly
   - Moderately
   - Strongly
   - Disagree
   - Disagree
   - Disagree
   - Agree
   - Agree
   - Agree

7. There are people I can count on whenever I want to talk about my experience with being sexually assaulted.
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - Strongly
   - Moderately
   - Slightly
   - Slightly
   - Moderately
   - Strongly
   - Disagree
   - Disagree
   - Disagree
   - Agree
   - Agree
   - Agree
8. Have you engaged in therapy to address issues related to being sexually assaulted?
   □ Yes          □ No

9. Have you ever been diagnosed with breast cancer?
   □ Yes          □ No

10. How did you learn about this survey?_______________________________
APPENDIX G

DEMOGRAPHIC QUESTIONNAIRE

BREAST CANCER SURVIVORS

1. What is your age? ______

2. Please mark your race/ethnicity:
   - European American
   - Latina
   - African American
   - Native American
   - Asian American
   - Multiracial
   - Other: _______________

3. Please mark your partner status:
   - Single
   - Married
   - Partnered
   - Separated
   - Widowed
   - Other: _______________

4. How long has it been since you were diagnosed with breast cancer?
   - Less than 1 year
   - 1 to 2 years
   - 3 to 5 years
   - More than 5 years

5. I had people to talk to about my worries concerning being diagnosed with breast cancer.
   - Strongly Disagree
   - Moderately Disagree
   - Slightly Disagree
   - Slightly Agree
   - Moderately Agree
   - Strongly Agree

6. I felt free to express all my feelings about being diagnosed with breast cancer to those close to me.
   - Strongly Disagree
   - Moderately Disagree
   - Slightly Disagree
   - Slightly Agree
   - Moderately Agree
   - Strongly Agree

7. There are people I can count on whenever I want to talk about my experience with being diagnosed with breast cancer.
   - Strongly Disagree
   - Moderately Disagree
   - Slightly Disagree
   - Slightly Agree
   - Moderately Agree
   - Strongly Agree
8. Have you engaged in therapy to address issues related to being diagnosed with breast cancer?
   □ Yes        □ No

9. How did you learn about this survey? __________________________________________
December 11, 2007

Amanda Warbel
Counseling
The University of Akron
Akron, OH 44325-5007

Ms. Warbel:

Your request for exemption for the protocol entitled "Investigating the Existence of Trauma-Specific Growth: A Comparison of Two Populations" was approved on December 11, 2007. The IRB application number assigned to this project is 2007-072. The protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 - Research conducted in established or commonly accepted educational settings, involving normal educational practices.
☐ Exemption 2 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.
☐ Exemption 3 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 2, but subjects are electors or appointed public officials or candidates for public office.
☐ Exemption 4 - Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.
☐ Exemption 5 - Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.
☐ Exemption 6 - Tests and field quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study's design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact the IRB to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. If the research is being conducted for a master's thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

[Signature]
Sharon McVey
Associate Director

☐ Approved consent forms attached

Cc: Charles Wachtel, Advisor
Rebecca Hall, Chair

Office of Research Services and Sponsored Programs
Akron, OH 44325-5109
330-972-7985 • 330-972-8281 Fax
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