

A TWO-PART INVESTIGATION: EXAMINING  
THE RELATIONSHIP BETWEEN SPIRITUALITY  
AND POSTTRAUMATIC GROWTH, AND THE  
MULTIDIMENSIONALITY OF  
POSTTRAUMATIC GROWTH

By

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Submitted to the Faculty of the  
Graduate College of the  
Oklahoma State University  
in partial fulfillment of  
the requirements for  
the Degree of  
DOCTOR OF PHILISOPHY  
December, 2006

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## ACKNOWLEDEMENTS

Many individuals have contributed to the process and completion of this dissertation. Without their dedication, sacrifices, and timely words of support and encouragement, my educational and professional aspirations may not have been realized.

Foremost, I give thanks and honor to my Lord and Savior Jesus Christ for providing shelter during the storms and for opening all the necessary doors that allowed me to realize my dreams. I would like to thank my family, including my wonderful wife, and three sons. I am truly blessed to have you in my life, and I am indebted for the sacrifices that you've made throughout my educational career. I owe much gratitude to my mentor and doctoral advisor, Dr. Teresa Bear, for her continual encouragement and support. Dr. Bear, I am forever thankful for the opportunity to have studied under you. I remain in awe of your gifted clinical and teaching abilities and your genuine approach to life. I would also like to thank the remaining members of my dissertation committee. Dr. Romans, thank you for willingly taking over as my dissertation chair. Your leadership, calm presence, and encouragement were greatly needed and appreciated. Dr. Boswell, your support, professionalism, and kind words of encouragement have meant more to me than you'll ever know. Dr. Barnes, thank you for your knowledge, direction, and commitment to my study.

Finally, I would like to thank all my friends and colleagues for their support. I share this achievement with you, especially Dr. McCarty for his encouragement and support as I rounded the final dissertation lap.

## DEDICATION

This work is dedicated in memoriam to my nephew Steven, whose spirit is with me everyday.

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## CHAPTER 1

### INTRODUCTION

“Suffering ceases to be suffering in some way at the moment it finds a meaning”

Victor Frankl, 1963

Since antiquity, an individual’s conception and experience of death has often been understood through his or her own religious beliefs and practices (Spilka, Hood, & Gorsuch, 1985). Parsons (1957) asserted “from the psychological point of view...religion has its greatest relevance to the points of maximum strain and tension in human life” (p.385). One such “maximum strain” is the death of a loved one. This loss may result in a grief reaction that can impact a bereaved family member or friend’s emotional, cognitive, physical and behavioral functioning for years (Balk, 1999). Feelings normally associated with the grief process include shock, denial, anger, guilt, sadness and acceptance.

To date, the majority of traumatology research tended to focus on the negative effects people experience following a stressful life event, including the loss of a loved one. These may include the symptoms associated with a major depressive disorder (Clayton, 1990), a posttraumatic stress disorder (Zisook, Schneider, & Schuchter, 1990), a substance abuse disorder, a psychotic disorder, physical illness, and even death (Stroebe, Schut, Finkenauer, 2001). Studying the negative effects of traumatic events is important. However, research efforts that tend to focus solely on such negative consequences paint an incomplete and potentially misleading picture of adjustment

following a highly disruptive life event (Updegraff & Taylor, 2000). Consequently, researchers have begun to systematically examine the ways in which stressful and traumatic life events provide opportunities for personal growth (Tedeschi & Calhoun, 1998; Park, Cohen & Murch, 1996). Studies which have examined coping with various life crises including divorce (Graff-Reed, 2004), breast cancer (Weiss, 2004; Cordova, Cunningham, Calson, & Andrykowski, 2001), war (Powell et al., 2003), and sexual assault (Frazier, Conlon, & Galser, 2003), to mention a few, have found self-reports of subsequent personal growth. Positive outcomes from such traumas have been termed “stress-related growth” (Park, Cohen, & Murch, 1996), “thriving” (O’leary & Ickovics, 1995), “adversarial growth” (Joseph, Linely, & Harris, 2005), “benefit-finding” (Affleck & Tennen, 1996), “transformational coping” (Aldwin, 1994) and posttraumatic growth (Tedeschi & Calhoun, 1996). From a review of the literature it appears that Tedeschi and Calhoun (1996) offer the most comprehensive model of personal growth from trauma. A second advantage of their model of personal growth is its emphasis on existential/spiritual factors. Therefore, this dissertation will utilize their model of posttraumatic growth.

Posttraumatic growth (PTG) is a possible explanation for the positive changes that many individuals may experience as the result of their struggle with a traumatic life event. Posttraumatic growth occurs from perceived changes within ones self, their worldview, or their relationships in comparison to their pre-trauma perceptions (Riley, 2003). For instance, bereaved individuals often report that due to the loss of a loved one, they have experienced perceived multiple benefits including; a positive change in their life priorities, improved marital relationships and satisfaction, increased compassion and

understanding of others, greater autonomy and independence, and an enhanced spiritual awareness (Calhoun & Tedeschi, 1989-1990; Shanfield & Swain, 1984; Yalom & Lieberman, 1991). Furthermore, Tedeschi and Calhoun (1998) found that individuals who recently lost a loved one, and who were actively struggling with the loss, were more likely to report growth due to the actual emotional and psychological pain involved in the bereavement process. In fact, Tedeschi and Calhoun (1995) contend that it is the actual process of struggling with a traumatic event that serves as the catalyst for personal growth.

Posttraumatic growth represents an important contribution to trauma research by delineating not only the adverse effects of trauma, but also illustrating the potential positive outcomes of trauma. Prior research in the area of posttraumatic growth has focused upon how variables such as personality traits (Norlander, Von Schedvin, Archer, 2005; Bewino, 2000; Sheikh, 2003; Heiland, 2004), gender (Milam, 2004; Bellizzi, 2004; Weiss, 2002) severity of posttraumatic symptoms (Maercker & Langer, 2001; Barton, 2005; Finch, 2004; Lev-Wiesel & Amir, 2003), length of time since the traumatic event (Sears, 2004; Evers et al., 2001; Bevvino, 2001; Cordova et al., 2001; Polatinsky & Esprey, 2000) and age (Widows & Jacobsen 2005; Milan, 2004) contribute to posttraumatic growth. There has been, however, relatively less research that examined whether posttraumatic growth represents a unitary construct or a multidimensional construct (Ho, Chan, & Ho, 2003; Sheickh & Marotta, 2005; Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Polatinsky & Esprey, 2000; Graff-Reed, 2004; Joseph, Linely, & Harris 2005; Weiss & Berger, 2006). A second intriguing question, that seems

to merit further investigation is, “How are posttraumatic growth and spirituality related?” (Bade, 2001; Walker, 2000).

### Posttraumatic Growth: A Unitary or Multidimensional Construct?

Tedeschi and Calhoun (1996) developed the Posttraumatic Growth Inventory (PTGI), a 21-item questionnaire that measures positive growth from trauma. The validation sample for the PTGI consisted of approximately 600 undergraduate students. Factor analysis of the PTGI revealed a multidimensional five-factor solution suggesting that posttraumatic growth is comprised of a collection of independent components. However, concerns have been raised whether the factor structure of the PTGI could be replicated with samples other than college students (Cohen, Cimboric, Armerli & Hettler, 1998; Tedeschi & Calhoun, 2004). In fact, an increasing number of studies have failed to replicate the original five-factor structure of the PTGI (Ho, Chan, & Ho, 2003; Sheikh & Marotta, 2005; Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Polatinsky & Esprey, 2000; Graff-Reed, 2004; Joseph, Linely, & Harris 2004; Weiss & Berger, 2006). Consequently, it remains uncertain whether posttraumatic growth is better understood as a unitary construct or as a collection of independent components.

### Religion, Spirituality, and Posttraumatic Growth

Over the past 30 years the fields of medicine and psychology have become increasingly interested in spirituality and religion as important components of physical and psychological health. Numerous studies have examined the relationships between spirituality/religion and mental or physical well-being (Cole, 2005; George, Ellison & Larson, 2002; Koenig, McCullough & Larson, 2001; Larson, Sweyers & McCullough, 1998; Thoresen, 1999; Thoresen, Harris & Oman, 2001). Religious involvement has

been associated with delayed physical disability among the elderly (Idler & Kasl, 1997). Also, several studies have found a negative correlation or lower rates of cervical cancer, heart disease, and mortality associated with higher levels of religiosity (Kessler, Kulcar, Zimolo, Gurgrevic, Goodwin, & Strnad, 1974; Oxman, Freeman, Manheimer, 1994). Additionally, Falot & Heckman (2005) and Doolittle & Farrell (2004) suggest that religion and spiritual involvement provide an important mechanism for coping with challenging and traumatic events. Thus, religion or spirituality may alleviate symptoms such as depression, anxiety or hostility, and lead one to a better quality of life and the experience of more positive emotions.

Within the field of psychology, research has tended to focus on how religion or spirituality can be used as coping skills during challenging life events (Hill & Pargament, 2003). The results of several studies indicate that trauma may in fact, lead to a deepening of a persons spiritual or religious beliefs (Casco & Santangelo, 2005; Pargament et al., 2005; Calhoun & Tedeschi, 2000; Siegel, Anderman & Schrimshaw, 2001). While these studies have demonstrated the possibility of increased spiritual/religious beliefs as an outcome of trauma; the question remains; how are spirituality and posttraumatic growth are related? Fortunately, there has been research that examined the relationship of spirituality or religiosity, and posttraumatic growth (Bade 2000; Walker, 2000; Calhoun, Cann, Tedeschi, & McMillan, 2000). Collectively, these studies found that being open to religious change, connecting on a spiritual level with others, finding comfort in church members and clergy, and a deepening of one's spiritual beliefs and involvement are all related to reports of posttraumatic growth. These studies have made a significant contribution by demonstrating the connection between spirituality, religiosity, and

posttraumatic growth. However, this research is not without limitations. A review of the research methodology utilized in these studies reveals problems such as limiting participation to college students, using small sample sizes, utilizing measures of religion that are primarily theistic in nature, and not elucidating the multidimensional relationship between religion/spirituality and growth. In an effort to further the body of research in the area of posttraumatic growth these limitations will be addressed by this study. Therefore this investigation will utilize a large sample diverse in age, explore the interrelationships between dimensions of spirituality and dimensions of posttraumatic growth, and will use a broad measure of spirituality, known as the Spiritual Involvement and Beliefs Scale-Revised (SIBS-R; Hatch, Burg, Naberhaus, & Helmich, 2001). The SIBS-R is a 22-item, four-factor (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight) self-report measure of spiritual involvement and spiritual beliefs, which is designed to measure spirituality across a broad spectrum of spiritual orientations. Hatch et al. (1998) contended previous instruments focused too largely on Judeo-Christian beliefs and failed to recognize that spirituality may exist separate from organized religion. A more thorough description of the SIBS-R can be found in Chapter 3.

### Purpose of the Study

The purpose of this study is to re-examine the component structure of scores on the PTGI with a sample that is larger, and more diverse in age, than the original validation sample, while simultaneously controlling for the type of adversity. A secondary goal of this study is to examine the relationship between posttraumatic growth and spirituality, or more specifically to obtain a detailed analysis of the possible

relationships among underlying factors of PTG (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, Appreciation of Life) and the factors attributed to spirituality (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight).

### Significance of the Study

The present study has potential significance to both empirical and clinical literature. First, re-examining the factor structure of the PTGI in a large, age diverse sample will add to the growing body of research exploring whether posttraumatic growth represents a unitary construct or is a multidimensional phenomena. This has important research implications including whether the growth process is best studied at the level of an overall construct, or as individual components. If the growth process is multidimensional, then it is important to clarify the number and types of growth components that exist and how characteristics of events and/or individual traits are associated with unique growth outcomes.

Finally, by examining several unanswered questions regarding the correlates of posttraumatic growth, this study will add to the growing empirical knowledge about how growth occurs following the death of a loved one. The examination of how one's spiritual involvement and beliefs is related to posttraumatic growth represents a relatively new area of research. A recent Gallup poll (Bishop, 1999) suggests that most Americans are spiritual, as seventy-two percent of those who were surveyed stated that their lives had meaning and purpose because of their faith. In addition, the survey revealed approximately 95% of Americans report a belief in God, with over two thirds belonging to a church, synagogue, or other religious institutions (Bishop, 1999). Given the

significance that spirituality has in many individuals' lives it is important to assess how spiritual involvement and beliefs may facilitate growth following the loss of those we love. If spirituality is found to be significantly related to posttraumatic growth there may be important clinical implications. For example, Calhoun and Tedeschi (1999) emphasize the importance of attending to a person's spiritual and existential themes during the process of psychotherapy. In particular, it would seem paramount to address topics related to mortality, life's meaning, the fundamental choices about how to live, and issues which are related to both traditional religious beliefs and broad spiritual themes (Calhoun & Tedeschi, 1999; Pargament, 1997; Yalom, 2002; Fromm; 1959; Maslow; 1964). Furthermore, by examining the possible interrelationships between spirituality and posttraumatic growth clinicians may better understand how one's spiritual beliefs and practices could facilitate the growth process.

#### Research Questions:

1. Can the five-factor structure of the PTGI be replicated in a sample that is larger and more diverse with regard to age than Tedeschi and Calhoun's original validation sample?
2. Can the four-factor structure of the SIBS-R be replicated in this study's sample?
3. What is the relationship between posttraumatic growth as measured by the PTGI, and spiritual beliefs and practices as measured by the SIBS?

#### Hypothesis:

H1: That the original five-factor structure of the Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) will be replicated in a more diverse sample regarding age.

H2: That the four-factor structure of the SIBS-R will be replicated in this study's sample



H3: That there is a meaningful positive relationship or intercorrelations between the dimensions of spiritual beliefs and practices as measured by the SIBS-R and, posttraumatic growth as measured by the PTGI.

#### Definition of Terms

Bereavement: the objective state involving the loss of a significant person by death (Stroebe, Hansson, Stroebe, & Schut, 2001).

Posttraumatic Growth: the experience of positive personal change a person experiences resulting from an encounter with a crisis or traumatic event (Calhoun & Tedeschi, 1999).

Relating to Others: a sense of increased compassion, closeness, and understanding of others, as measured by the PTGI (Tedeschi & Calhoun, 1996).

New Possibilities: refers to the development of new interests, and a perception of new opportunities that were not available prior to a traumatic event, as measured by the PTGI (Tedeschi & Calhoun, 1996).

Personal Strength: refers to feeling more vulnerable, yet stronger for having encountered a traumatic event, and a sense of increased self efficacy or self-reliance, as measured by the PTGI (Tedeschi & Calhoun, 1996).

Spiritual Change: increased understanding of spiritual matters and/or stronger religious beliefs following a traumatic event, as measured by the PTGI (Tedeschi & Calhoun, 1996).

Appreciation of Life: refers to a greater appreciation of ones life and priorities about what is important, as measured by the PTGI (Tedeschi & Calhoun, 1996).

Religiosity: refers to the degree to which individuals adhere to the prescribed beliefs and practices of a formal, organized religion.

Spirituality: for the purposes of this study spirituality is conceptualized as more inclusive and universal than religion and is defined broadly as a quest for understanding life's ultimate questions and the meaning/purpose of life.

Core Spirituality: refers to connection, meaning, faith, involvement and experience as measured by the SIBS-R (Hatch et al., 2001).

Spiritual Perspective/Existential: refers to the ability to find meaning in times of hardships, and examining actions for their reflection of personal values as measured by the SIBS-R (Hatch et al., 2001).

Personal Application/Humility: refers to the ability to focus on what needs to be changed in self rather than in others, and expecting nothing in return when helping others as measured by the SIBS-R (Hatch et al., 2001).

Acceptance/Insight: the ability to accept things that cannot be changed as measured by the SIBS-R (Hatch et al., 2001).

## CHAPTER II

### REVIEW OF THE LITERATURE

The review of the literature on posttraumatic growth includes the following sections:

- The Concept of Posttraumatic Growth
- Research on Posttraumatic Growth and Loss
- Posttraumatic growth: A Unitary or Multidimensional Construct?
- The Factor Structure of the Posttraumatic Growth Inventory
- The Relationship Between Religion or Spirituality, and Posttraumatic Growth

This chapter begins with an examination of the concept of posttraumatic growth.

This section is followed by a review of the empirical research, which has investigated posttraumatic growth and loss. The third section of this chapter will entail a critical review of the factor structure of the Posttraumatic Growth Inventory (PTGI). The fifth and final section of this review of literature will focus on studies, which have investigated the relationship between religiosity or spirituality and posttraumatic growth.

#### The Concept of Posttraumatic Growth

A growing body of research suggests that individuals who are struggling with a traumatic event, report both the symptoms of posttraumatic stress, and report positive psychological benefits (Affleck, Tennen, & Gershman, 1986; Collins, Taylor, & Skokan, 1990; Lechner, Zakowski, & Antoni, 2003; Stuhlmiller & Dunning, 2002; Lovejoy, 1995, 1991; Joseph, Williams, & Yule, 1993; Tedeschi & Calhoun, 1996). Various definitions

have been given to the positive benefits. These definitions include terms such as: stress-related growth (Ickovics & Park, 1998), thriving (O’Leary & Ickovics, 1995), perceived benefit (Affleck & Tennen, 1996), and posttraumatic growth (Tedeschi & Calhoun, 1995). While the terminology differs, each definition shares a similar theme. The uniting principle for each of these definitions is the belief that adversity can be the catalyst for personal growth. In other words, what doesn’t kill you makes you stronger.

Tedeschi and Calhoun (1995) developed a comprehensive model of “posttraumatic growth” (PTG). This model explains the positive changes that may occur when an individual struggles with a major loss or trauma. The theory of PTG asserts that in order for growth to occur a traumatic event must be upsetting enough to create disequilibrium or present a challenge to a person’s basic schemas about the future, the world, or the self. Following traumatic events individuals often report three domains in which growth has occurred. These three domains include: 1) a change in their relationships with others, 2) a change in their sense of self, and 3) a change in their philosophy of life (Tedeschi & Calhoun, 1998). In order to assess these domains of posttraumatic growth, Tedeschi and Calhoun developed the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). The authors initially developed a 34-item version of the PTGI, which was derived from a literature review of individuals who reported perceived benefits following a variety of traumatic events. In their study Tedeschi and Calhoun administered a 34-item self-report questionnaire to 604 undergraduate students who had reported a significant negative life event within the past five years. Principal component analysis with varimax rotation resulted in 13 items being deleted from the questionnaire, and five factors emerging that accounted for 60% of the

variance in posttraumatic growth. The five factors or subscales of the PTGI include: New Possibilities (.84), Relating to Others (.85), Personal Strength (.72), Spiritual Change (.85), and Appreciation of Life (.67). The current version of the PTGI (Tedeschi & Calhoun, 1996) consists of 21, positively worded items, which utilize a five-point scale ranging from (0 = “I did not experience this change as a result of my crisis;” to 5 = “I experienced this change to a very great degree as a result of my trauma”). An acceptable internal consistency was demonstrated for both the full-scale (.90) and test-retest reliability of the PTGI (.71). This internal consistency was found to be stable over a two-month period. A detailed review of the studies that examined the factor structure of the PTGI is reviewed in detail later in this chapter.

Although trauma has the potential to fracture interpersonal relationships, an ever-increasing body of research suggests that traumatic events can also enhance our relationships with others. Affleck, Tennen, and Gershman (1986) found that approximately 20% of mothers of infants with severe prenatal complications reported the experience of closer family relationships as a result of their crisis. Similarly, research with cancer patients found that these patients reported increased sensitivity to others, increased efforts at improving relationships, and a willingness to accept help or utilize social supports following their diagnosis with cancer (Collins, Taylor, & Skokan, 1990; Lechner, 2003). In a similar vein, interviews with rescue workers from the 1989 Loma Prieta earthquake in Northern California revealed a deepening of the rescue workers relationships with others, following their shared experience of this natural disaster (Stuhlmiller, 1992). In addition, Lovejoy (1995) interviewed hurricane survivors and found an increase in reports of improved relationships with family and friends.

Individuals often report how traumatic events have led to changes in their sense of self. These changes include: feeling stronger and feeling more capable of meeting life challenges. These individuals reported such positive changes in spite of their realization that life may not be as safe and predictable as they once thought. However, many individuals report positive changes in their sense of self, such as feeling stronger and more capable of meeting future life challenges following a traumatic event. Andreasen and Norris (1972) found that some severely burned patients perceived themselves to be a better person as a result of their struggle with the trauma. Other individuals reported that as a result of their experience of trauma they have newfound skills and confidence (Stuhlmiller, 1992), feel stronger, and more confident (Thomas, DiGiulo, & Sheehan, 1991), feel more experienced about life (Joseph, Williams, & Yule, 1993), feel more self-assured (Collins et al., 1990), and have a more positive self-evaluation (Tedeschi & Calhoun, 1996).

Life crises can threaten or be destructive to an individual's view of "the self" or their worldview. During the post-trauma period individuals often engage in a rumination process, which calls into question many previously held assumptions. During this period of cognitive disequilibrium significant personal growth can occur, with regard to the third life domain, one's philosophy of life. Examples of growth in this domain include: changes in a person's priorities, an increased appreciation for life, and an increased sense of spirituality or religiosity. Joseph, Williams, and Yule (1993) indicated that as many as 94% of the survivors of a sinking cruise ship reported they no longer took life for granted. Also, 71 % of these same individuals reported that they now lived each day to the fullest. Likewise, Frazier, Conlon, and Glaser (2002) found that as many as 80% of

sexual assault victims reported an increased appreciation of life when they were questioned two weeks post assault.

### Research on Posttraumatic Growth and Loss

The death of a loved one is a significant life crisis for a bereaved individual. Acute distress is to be expected following the loss of a loved one. However, for some, the magnitude of their grief reaction is so extreme that they become “high risk” for numerous mental and physical health problems. For example, bereaved individuals are “at risk” for mental health complications including: clinical depression (Zisook, Schuchter & Judd, 1997; Clayton, 1990), anxiety related disorders including posttraumatic stress disorder (Figley, Bride, & Mazza, 1997), and impairment of their neuroendocrine system (Fletcher, 1996). In addition, the bereaved may experience disruptions in their social functioning (Bowlby, 1980), increased substance abuse, hallucinations, and even death (Stroebe, Schut, & Finkenauer, 2001). Recently some researchers have argued for the establishment of a distinct psychopathological diagnostic entity, complicated grief. (Horowitz, Siegel, Holen, Bonanno, Milbrath, Stinson, 1997; Ellifritt, Nelson, Walsh, 2003; Lichtenthal, Cruess, Prigerson, 2004).

The above-mentioned research demonstrates that severe stressors such as the death of a loved one can lead to a wide range of negative sequelae. However, researchers have also noted the beneficial effects of personal growth among bereaved individuals. An early example of posttraumatic growth from loss was reported by Maslow (1955) in his study of self-actualized individuals. Maslow noted that, “the most important learning experiences reported to me by my subjects were single life experiences such as tragedies,

deaths, traumata...which forced a change in the life-outlook of the person and consequently in everything he did” (p.23).

Tedeschi and Calhoun (1989-1990) interviewed 52 adults who had lost a spouse or parent. The purpose of the interview was to examine the ways in which their experience might lead to positive psychological gains. The majority of participants in their study reported changes in the area of self-perception, such as: feeling stronger, more mature, more independent, wiser, and more capable with regard to facing future crises. It appears the experience of loss led many of these participants to a greater acceptance of their own mortality, with 73% reporting being able to better accept their own deaths. Also, a large number of the participants reported that their experience with bereavement also led to fundamental changes such as: an increased appreciation of their social support system (83%), feeling more able to express their own emotions (60%), and a strengthening of their religious commitments (67%). Similarly, Nolen-Hoeksema (2000) investigated how the death of a close loved one can lead to positive change and growth. In this study 284 participants (18-84 yrs) were interviewed within one month of the death of a loved one, usually the cause of the death was the ravaging effects of cancer. Later, participants were re-interviewed at intervals of 6, 13, and 18 months after the loss. At the end of each interview, participants were asked: "Sometimes people who lose a loved one find some positive aspect in the experience. Have you found anything positive in this experience?" Sixty-five percent of the participants responded in the affirmative direction to this question at the 6, 13, and 18-month interview. Repeatedly these studies illustrate the potential for positive growth when we are faced with the death of those we love. It appears that the death of a loved one provides and opportunity for reprioritizing one's



goals, becoming more aware of the fragility of life, and the development of a more tolerant, patient, loving, and sensitive relationship with others. In other words a loved one's death can increase our awareness of the importance of our relationships.

In a further attempt to identify the positive life changes associated with grief, Lehman, Davis, DeLongis, Wortman, Bluck, Mandel, and Ellard (1993) interviewed 94 bereaved spouses and parents, 4-7 years after the sudden loss of a loved one. As part of the study, participants were asked three open-ended questions assessing life changes attributed to the loss of their spouse or child. Importantly, 74 of the participants reported at least one positive life change. These participants reported their experience with death had led to an increase in one's self-confidence (35%), an increased focus on enjoying the present (26%), an increased acceptance of mortality (23%), a greater appreciation of life (23%), an increased emphasis on family (19%), greater religiosity (15%), and an increased openness and concern for others (7%). In a related study of personal growth following the loss of a child, 397 bereaved adults were interviewed over an eight year period of time (Franz, Farrell, Trolley, 2001). The authors of this study analyzed data consisting of four open-ended questions, three of which examined dimensions of personal growth from grief. These questions were: 1) Despite the tragedy of death, is there anything positive or good that has come about as a result of the death? 2) What is the main thing you've learned so far from this experience? 3) Are there any ways in which you are now a different person than you were before the death? Overall, 84% of the participants reported positive consequences resulting from the loss of their loved one. Positive outcomes included: stronger relationships with family and friends, a greater

appreciation of life, increased compassion, self-reliance and independence, enhanced spirituality, and importantly, a decreased fear of death.

While these studies demonstrate the potential for personal growth resulting from loss, the studies for the most part, were based on qualitative inquiries (Lehman et al., 1993; Nolen-Hoeksema, 2000; Tedeschi & Calhoun, 1989-1990). Indeed, such qualitative investigations are crucial to our understanding of the growth process from loss; however, there is a need for studies that investigate personal growth from loss through the utilization of reliable, valid and empirically derived instruments. This lack of quantitative research in the area of posttraumatic growth from loss represents a significant gap in the body of literature. Therefore, one purpose of this study is to address the need for more quantitatively based research in the area of posttraumatic growth. While there is a paucity of quantitative research, there are exceptions to this dearth of quantitative studies. For example, Hogan, Greenfield, and Schmidt (2001) developed the Hogan Grief Reaction Checklist (HGRC) to measure the multidimensional nature of the bereavement process. Factor analysis of the HGRC in a sample of 586 adults who had experienced the death of an immediate family member revealed six factors, including a Personal Growth factor. The HGRC Personal Growth subscale measures a sense of having become more compassionate, tolerant, forgiving, and hopeful. Significantly, the Personal Growth subscale was negatively correlated to the other subscales of the HGRC including the subscales that measured Despair, Panic Behavior, Blame and Anger, Detachment, and Disorganization. The results of this study suggest that personal growth is an “integral and unique component of the bereavement process” (Hogan et al., 2001, p.6).

Similarly, Gamino, Easterling, and Sewell (2000) investigated adaptive responses to grief, as measured by the HGRC-Personal Growth subscale. Participants included 85 individuals who were grieving the death of a significant person in their life including either a child, spouse, parent, sibling, or other family member (e.g. grandparent). The reported causes of the loved ones deaths in this study included illness, accident, suicide, and homicide. Four significant predictors of personal growth were identified, as measured by the HGRC-Personal Growth subscale. These predictors were: seeing some good resulting from the death ( $\beta=.361$ ,  $p<.001$ ), having a chance to say goodbye ( $\beta=3.06$ ,  $p=.002$ ), intrinsic spirituality ( $\beta=.198$ ,  $p=.04$ ), and spontaneous positive memories of the deceased ( $\beta=.183$ ,  $p=.05$ ) ( $F(4, 80) = 11.26$ ,  $p=.001$ ).

A third quantitative study in this area was conducted by Polatinsky and Esprey (2000). This study utilized the Posttraumatic Growth Inventory (PTGI-Tedeschi & Calhoun, 1996) to assess personal growth in a sample of adults ( $N=67$ ) who were experiencing bereavement following the loss of a child. Reports of significant posttraumatic growth were found in this sample of bereaved mothers and fathers. PTGI mean scale scores for bereaved mothers and fathers were 83.47 and 79.72, respectively. Furthermore, greater growth was reported by younger parents and by parents whose children died from illness rather than from sudden, unanticipated injuries, such as accidents.

In summary, although the quantitatively based empirical validation of the perception of personal growth following loss is sparse; these studies, in combination with qualitative studies of personal growth and loss suggest that posttraumatic growth is a potential outcome following the loss of a loved one.

## Posttraumatic Growth: Unitary or Multidimensional?

Early attempts at measuring positive growth from traumatic events relied solely on qualitative data collection methods (Collins, Taylor, & Skokan, 1990; Affleck, Tennen, & Gershman, 1985; Affleck et al., 1987; Mendola, Tennen, Affleck, McCann, & Fitzgerald, 1990; McMillen, Zuravin, Rideout, 1995; Lehman, Davis, DeLongis, & Wortman, 1993). Recently, however, two paper-and-pencil measures of growth have been developed. These posttraumatic growth quantitative assessment instruments are the Posttraumatic Growth Inventory (PTGI: Tedeschi and Calhoun, 1996) and the Stress-Related Growth Scale (SRGS: Park et al., 1996). Importantly, while these instruments appear quite similar, initial factor analyses of these measures reveal that in fact there was a unidimensional solution for the SRGS and a multidimensional solution for the PTGI. However, the subsequent research with the SRGS and PTGI has produced mixed findings concerning the dimensionality of each growth measure. For example, findings from a recent study (Armeli, Gunthert, & Cohen, 2001) indicate that a revised version of the SRGS may be considered a multidimensional measure. A growing number of studies have also failed to replicate the original five-factor structure of the PTGI (Ho, Chan, & Ho, 2004; Sheick & Marotta, 2005; Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Polatinsky & Esprey, 2000; Graff-Reed, 2004; Joseph, Linely, & Harris 2004; Weiss & Berger, 2006).

Therefore, it remains uncertain whether posttraumatic growth is better understood as a unitary construct or as a collection of independent components. Cohen, Cimboric, Armeli, and Hettler (1998) suggest that the factor structure of these growth measures “might vary as a function of characteristics of the respondent population, the types of

crises experienced, and the time frame for growth assessment (p. 327). Tedeschi and Calhoun (2004), in sampling college undergraduates in developing the PTGI, also question whether the five PTGI domains will hold up in factor analyses utilizing differing samples of trauma victims. The question of whether posttraumatic growth represents a unitary construct or is multidimensional has important research implications. An investigation of this quandary could assist researchers in determining whether the growth process is best studied at the level of one global or overall construct, or as a cluster of individual components (Joseph et al., 2005). If posttraumatic growth is multidimensional, then it is unclear as to how many components and what type of components coalesce to produce posttraumatic growth. A second important area for investigation is whether characteristics of traumatic events and/or an individual's idiosyncratic traits are associated with unique growth outcomes, if posttraumatic growth, is in fact, a multidimensional construct (Cohen et al., 1998).

#### The Factor Structure of the Posttraumatic Growth Inventory

This section of the literature review examines studies that explore the multidimensionality of the PTGI. In general a majority of the research failed to reproduce the five-factor structure of the PTGI as found in Tedeschi and Calhoun's (1996) original validation study.

Joseph, Linely, and Harris (2005) attempted to address the question of whether adversarial personal growth is a multidimensional phenomenon. Adversarial growth refers to the ability to construe benefits from negative events. Their study included 176 adult participants (113 women and 63 men) ranging in age from 20 to 84 years. Participants were asked to rate the most upsetting event of their life on a seven-point

likert scale ranging from “not at all” (0) to “extremely upsetting” (6). In general, participants rated their recalled event as highly upsetting at the time of the event ( $M = 5.38$ ). Participants completed a battery of growth measures, which included the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), the Perceived Benefits Scale (PBS; McMillen & Fisher, 1998), and the Thriving Scale (TS; Abraido-Lanza, Guier, & Colon, 1998). Joseph et al., (2005) included these measures arguing that they represent the widest range of domains of personal growth. Collectively, the PBS, PTGI, and TS contain 20 positive change subscales. One subscale (material gain) from the PBS was excluded from analyses as this subscale was noted to represent an economic rather than a psychological outcome. To avoid inadvertently assessing the overlap among the three growth measures a principal component analysis with varimax rotation was performed on the 20 subscales, rather than at the individual item level. Initial results found three components with eigenvalues greater than 1.00 (10.35, 1.99, 1.76) accounting for 71% of the variance. However, a forced one-component solution was conducted after inspection of the scree plot showed only one component above a marked elbow criterion. Results indicated that all 20 subscales loaded greater than 0.54 on the one component, which suggest that posttraumatic growth can be best understood as a unidimensional phenomenon. When using this more conservative approach (Cattell’s scree method) posttraumatic growth emerged as a unitary construct, however, Joseph et al., (2005) also examined the three component solution found using the “less robust eigenvalues-greater-than-one” Kaiser criterion. Nine of the subscales loaded on the first component (enhanced interpersonal relationships and valuing of others, eight subscales loaded on component two (enhanced personal strength), and three subscales loaded on the third component

(enhanced personal strength). This is consistent with the three broad dimensions of growth (changes in perception of self, changes in relationships with others, and changes in philosophy of life) reported by Tedeschi and Calhoun (1995). Overall, Joseph et al., (2005) concluded the three multidimensional posttraumatic growth scales used in their study appear to assess the same broad construct of growth, with some evidence indicating three second-order components. Joseph et al.'s study is unique in being the first study to assess the dimensional structure of posttraumatic growth using multiple measures. Joseph et al.'s study also points to the need for further research assessing the dimensionality of growth with other samples.

Another study that found the PTGI to measure a unitary construct of growth was conducted by Polantinsky and Esprey (2000). In a sample of 67 bereaved parents Polantinsky and Esprey found the five underlying factors of the PTGI to be highly intercorrelated. Eight of the 10 pairwise intercorrelations were significant at  $p < .01$ . New Possibilities was intercorrelated with Relating to Others, Personal Strength, and Appreciation of Life. The Relating to Others factor was intercorrelated with Personal Strength, Appreciation of Life, and Spiritual Change. Personal Strength was intercorrelated with Appreciation of Life and Spiritual Change factors. Finally, Spiritual Change and New Possibilities were intercorrelated at  $p < .05$ . Due to the high number of intercorrelations among the PTGI subscales, Polantinsky and Esprey concluded in their sample of bereaved adults the PTGI appeared to have one underlying construct. A limitation of this study, however, was its small sample size. This limitation did not allow the authors of the study to conduct their own factor analysis in order to further explore the underlying structure of the PTGI. Despite reporting one underlying PTGI construct in

their sample, Polantinsky and Esprey carried out their analysis using the original five factors reported by Tedeschi and Calhoun (1996). As such it seems that only the PTGI total scores should be interpreted in this study.

Powell et al. (2003) conducted a more rigorous examination of the factor structure of the PTGI. The aim of this study was to examine the degree to which posttraumatic growth was reported among people exposed to several years of war in an area of the former Yugoslavia. A secondary aim of the study included assessing whether the factor structure of the PTGI would hold for their particular sample. Their study included two samples. The first sample included 75 former refugees, who between the years 1991 and 1995 took refuge outside of the former sovereign country of Yugoslavia for more than twelve months. The second sample included 75 formally displaced adults in Sarajevo who did not take refuge outside the former sovereign country of Yugoslavia. In this study, subjects completed a translated version of the Posttraumatic Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997), the Checklist for War Related Experiences (Powell et al., 1998), and a translated version of the PTGI. The authors of the study note that the PTGI went through three cycles of translation, a pilot administration with small groups, an adaptation, and a back-translation. Powell et al. adjusted the Likert scale of the PTGI to a five-point scale in an effort to maintain consistency between all questionnaires used in the study. The item scores were corrected by multiplying by  $5/4$  to make them comparable to the original PTGI. Powell et al., (2003) reported that with the exception of Item 1 ("My aims in life changed in comparison with before the war.") on the PTGI, the five original factors demonstrated acceptable alpha and item-total correlations. Item 1 correlated very low (.09) with its intended subscale (factor 5), and with all other items.



The translation of Item 1 was also reported as being problematic and was subsequently deleted from further analyses. An exploratory principal components analysis was conducted with the remaining 20 PTGI items, with criterion for extraction = eigenvalue > 1, followed by a varimax rotation. The resulting solution produced three factors that accounted for 57.93% of the total variance. The three new factors were titled: 1) Changes in Self/Positive Life Attitude, 2) Philosophy of Life, and 3) Relating to Others. These three factors explained 21.23, 18.64, and 18.06% of the variance, respectfully. As a result, the authors of this study concluded the three-factor solution found in their sample was more similar to the three broad categories of posttraumatic growth identified by Tedeschi and Calhoun, as opposed to the original five PTGI factors. All additional analyses were subsequently compared to the new three factors, as well as the PTGI total score. This study represents an important contribution to the literature as it examined the utility of the PTGI with a more diverse sample, than Tedeschi and Calhoun's (1995) original validation sample. A particular strength of this study was the fact that Powell et al., (2003) used the same factor analytic technique (i.e. principal components analysis) that Tedeschi and Calhoun used in the development of the PTGI. This study was limited, however, by a small sample size for conducting a factor analysis; as well as the modification performed to the Likert scale and scoring methods utilized in the original PTGI study. As such, the authors of the study note that caution should be taken when comparing the results of this study with the other studies of PTG that can be found in the literature.

Ho et al, (2003) developed a Chinese version of the PTGI as part of their examination into posttraumatic growth in Chinese cancer survivors. Participants

included 188 ethnic Chinese cancer patients (32 males, 156 females). Participants were recruited from three hospitals and one community centre in Hong Kong. The participants ranged in age from 26 to 69 years, and all had passed the five-year disease free from cancer criterion. Measures in this study included The Chinese Hospital Anxiety and Depression Scale (Leung et al., 1993), the Chinese Mini Mental Adjustment to Cancer Scale (Watson, Greer & Young, 1988), the General Health Questionnaire (Shek, 1987), and The Chinese Version of the PTGI (Ho et al., 2003). The Chinese Version of the PTGI was developed using a procedure of translation and back-translation. Confirmatory factor analysis was used to examine the goodness-of-fit of the five-factor structure proposed by Calhoun and Tedeschi (1996) in the Chinese version of the PTGI. Significantly, the results showed that the original five-factor structure of the PTGI did not hold for Ho et al.'s sample of Chinese cancer patients. Secondly, Ho et al. conducted exploratory factor analysis with varimax rotation to examine the factor structure of the Chinese version of the PTGI. Fifteen of the original items were kept based on the following criteria: 1) loadings exceeded 0.5 on one factor without loading higher than 0.4 on another factor, and 2) the difference between items loading on two factors were larger than 0.3. Four factors emerged accounting for 59.93% of the variance. The four factors were named: 1) Self (7 items, 25.11% of the variance), 2) Spiritual (3 items, 11.28% of the variance), 3) Life Orientation (2 items, 11.25% of the variance), and 4) Interpersonal (3 items, 12.29% of the variance). Additional analyses confirmed the four-factor structure found in the exploratory factor analysis. Ho et al.'s exploratory four-factor solution was also reduced to a second-order, two-factor solution with one factor representing items from the interpersonal factor and the other, which they titled the

Intrapersonal factor, including items from the Self, Spiritual, and Life-Orientation factors. In conclusion Ho et al. determined that the Chinese version of the PTGI represents a dichotomous model of interpersonal and intrapersonal dimensions of growth. The limitations noted by the authors of this study, involved including only high functioning cancer survivors who had passed the five-year disease-free interval, thus limiting the generalizability of findings to other groups.

More recently, Weiss and Berger (2006) conducted a study involving the translation of the PTGI into Spanish. The aim of the study was to adapt and validate a Spanish translation of the PTGI in order to assess posttraumatic growth following the immigration process. Based on the literature, Weiss and Berger asserted that the immigration process is a particularly stressful experience, which is characterized by loss and unpredictability, and therefore, represents an opportunity for growth. Participants included 100 Latina women who had immigrated to the United States within the past 1-10 years ( $M = 5.07$ ). Participants ranged in age from 23-79 ( $M = 36.84$ ); and had immigrated from 1 of 16 different countries. Participants completed a sociodemographic questionnaire and the Spanish version of the PTGI. The Spanish version of the PTGI was developed using a procedure of translation and back translation. The technical equivalence of the Spanish version of the PTGI was assessed through field-testing. The Spanish version of the PTGI maintained all 21 original items and replicated the original numbering and coding systems. In keeping with the original PTGI validation study, Weiss and Berger (2006) tested the factor structure of the Spanish PTGI by analyzing the data using a principal components analysis with varimax rotation. The solution yielded three factors, which accounted for 66.7% of the variance. Thirteen of the original 21

PTGI items loaded differentially on the three factors. The first factor, titled Philosophy of Life, was comprised of items from the original Spiritual Change and Appreciation of Life subscales and accounted for 23.9% of the variance. Items in the second factor, titled Self/Positive Life Attitude, were derived from the original Personal Strength and New Possibilities factors and accounted for 23.4% of the variance. Finally, the third factor, titled Interpersonal Relationships, included items from the original Relating to Others scale and accounted for 19.4% of the variance. Overall, Weiss and Berger (2006) were unable to replicate the original five-factor structure of the PTGI. In a conclusion that was similar to Powell et al. (2003), Weiss and Berger found that their three-factor solution was compatible with the three domains (self, interpersonal relationships, and philosophy of life), as conceptualized by Tedeschi and Calhoun (1996). Weiss and Berger offered several hypotheses for the different factor structure for their 13-item Spanish version PTGI. These hypotheses included: 1) cultural factors in the translation process, 2) a differing stressor event, and 3) a more diverse population when compared to the original validation sample. Weiss and Berger concluded that further research was needed to examine the factor structure of the PTGI. A particular strength of this study was the exhaustive translation process the authors undertook to create a Spanish equivalence of the PTGI. This study was strengthened by Weiss and Berger using the same statistical procedures as in the original PTGI validation study. This allowed for a less confounding comparison of the underlying PTG factors in the two studies. The inclusion of only female participants represented a limitation of this study; and thus reduced its generalizability. Another limitation of this study involved the low number of total participants from which

to conduct a factor analysis. While meeting the minimum requirements to perform a factor analysis, Weiss and Berger recommend caution in interpreting the results.

Perhaps the most seminal work to date examining the factor structure of the PTGI was conducted by Sheikh and Marotta (2005). The purpose of their study was to re-examine the component structure of the PTGI in a sample that was inherently different from the original validation sample, with regard to the variables of gender and age. Sheikh and Marotta (2005) controlled for type of adversity by selecting participants ( $n = 124$ ; 27 women, 97 men) with a history of cardiovascular disease. Participants ranged in age from 36 to 87 years (mean age = 67), and the average length of time since their diagnosis was five years. Participants predominantly described their ethnic origin as white (90%), with 10% describing themselves as Black or African American.

Participants completed a sociodemographic questionnaire and the PTGI (Tedeschi and Calhoun, 1996). The mean score on the PTGI in Sheikh and Marotta's (2005) sample was 56.84, compared to the mean PTGI score of 81.94 in Tedeschi and Calhoun's study. All five PTGI subscales were significantly related with each other, and with the total score. Internal consistency estimates for the PTGI subscale scores were higher in Sheikh and Marotta's sample as compared to Tedeschi and Calhoun's data. This was particularly true on the subscales measuring Personal Strength ( $\alpha = .90$  compared to  $.72$ ) and Appreciation of Life ( $\alpha = .88$  compared to  $.67$ ). Consistent with the previous studies which examined the factor structure of the PTGI (Powell et al., 2003; Tedeschi and Calhoun, 1996); Sheikh and Marotta (2005) performed a principal component analysis with varimax rotation to examine the structure of the scores on the PTGI for their sample. Separate analyses using both the Kaiser rule (eigenvalues greater than 1: Kaiser, 1958),

and the Cattell (1996) “scree” method were performed. Using the Kaiser rule two components were extracted, with 19 of the 21 PTGI items loading on the first component. Two items made up the second component, which interestingly were the only two items that comprised the Spiritual Change subscale of the PTGI (“A better understanding of spiritual matters” and “I have a stronger religious faith”). There were also eight items with structure coefficients on both components. Sheikh and Marotta concluded that the first component appeared to represent a “g-variable for PTG, comprising overall positive life changes” (p.72). The second component, accounted for only 17% of the variance, and was considered to be more representative of a spiritual change element.

Due to the number of complex items loading on both components in the initial analysis, Sheikh and Marotta performed an additional component analysis with oblique rotation (direct oblimin). The oblique rotation yielded a clearer, more interpretable result. Two similar components emerged; however, there was only one complex item that loaded on both components, compared to eight complex items in the varimax rotated solution. The two items from the original PTGI Spiritual Change subscale almost exclusively made up the second component in the oblique rotated analysis. Concerned about the potential for over extraction using the Kaiser method, Sheikh and Marotta performed an additional principal component analysis using the Cattell (1966) “scree” method. Their findings were similar to the previously reviewed study by Joseph et al., (2005); in that by utilizing a more conservative approach only one predominant component emerged, and this component accounted for 56.2% of the variance.

Overall, the results of Sheikh and Marotta’s study do not support a factorial invariance of the PTGI. The component structure of scores on the PTGI emerged as

markedly different in the Sheikh and Marotta's sample compared to the scores in the original study. In Tedeschi and Calhoun's (1996) original validation study, five distinct PTGI components emerged, which accounted for 62% of the variance. Only one component emerged in Sheikh and Marotta's study, and this component accounted for 56.2% of the variance. While a second spirituality component was extracted using the Kaiser method, this resulted in many complex items with structure coefficients on both components. Subsequently, Sheikh and Marotta concluded that "the most parsimonious explanation may be that the PTGI taps into a generalized growth construct" (p.74), and recommend that further research is needed into the component structure that underlies the PTGI.

In reviewing the literature to date, only one study has been found that successfully reproduced the five-factor structure of the PTGI. This study was a dissertation titled the *Positive Effects of Stressful Life Events: Psychological Growth following Divorce*. In this study Graff-Reed (2004) examined the relationship between adjustment to divorce and subsequent psychological growth. A major goal of this study, as stated by Graff-Reed, was to examine both the dimensionality of the Posttraumatic Growth Inventory (Tedeschi and Calhoun, 1996) and a short-form of the Stress-Related Growth Scale (Park et al., 1996). Participants included 140 (46 male, 94 female) adults who were either divorced or had filed for divorce, and who were parents of at least one child under the age of 18. A principal components factor analysis followed by varimax rotation was performed on the 21 items of the PTGI. Fifteen of the 21 items loaded greater than .55 on at least one factor without loading greater than .4 on any other factor. The resulting solution produced five factors (eigenvalues greater than .96), which

accounted for 71% of the total variance. Nineteen of the 21 factor loadings in Graff-Reed's study were consistent with those reported in Tedeschi and Calhoun's (1996) original validation study of the PTGI. In general, the five-factor model fit the data,  $X^2_{(115)} = 182.7, p = .000$ . Thus this study confirmed the multi-dimensionality of the PTGI in a sample of divorced adults. One limitation of this study was Graff-Reed's decision to use an eigenvalues  $> .96$  criterion in the factor analysis. It's unclear whether the Graff-Reed study would have found the same five-factor solution, had he utilized the same Kaiser rule (eigenvalues greater than 1) that was used as in the original Tedeschi and Calhoun's (1996) PTGI study.

From the review of the literature that has examined the factor structure of the PTGI, it appears that several of the studies (Joseph et al., 2005; Sheikh & Marotta, 2005; Polantinsky & Esprey, 2000) point toward the conclusion that the PTGI taps into one broad underlying dimension of personal growth. While some studies (Powell et al., 2003; Ho et al., 2003) were unable to reproduce the original five-factor structure of the PTGI; there were studies which identified underlying factors that were similar to the three broad categories of posttraumatic growth originally identified by Tedeschi and Calhoun. One study (Graff-Reed, 2004) replicated the five-factor structure of the PTGI, in a sample more diverse than Tedeschi and Calhoun's original validation sample. In summary, this review of research has revealed that the multidimensionality of posttraumatic growth as measured by the PTGI remains unclear. It is clear, however, that additional research that examines the factor structure of the PTGI is warranted.



## The Relationship Between Religion or Spirituality, and Posttraumatic Growth

The connection between religious or spiritual beliefs and practices and the phenomenon of posttraumatic growth has been demonstrated in the literature (Bade 2000; Walker, 2000; Calhoun, Cann, Tedeschi, & McMillan, 2000). The next section of this review takes a closer look at the research examining the relationship between posttraumatic growth and religion/spirituality. Research addressing the question proposed in Chapter One is examined: What is the relationship between participants' spiritual beliefs and practices as measured by the SIBS-R, and posttraumatic growth as measured by the PTGI?

The evidence base that documents the links between religion or spirituality, and mental and physical health is sound. Numerous studies within the medical field have examined the relationship between spirituality and physical health or well-being (George, Ellison & Larson, 2002; George, Larson & Koenig, 2000; Larson, Sweyers & McCullough, 1998; Miller & Thoresen, 2003; Thoresen, Harris & Oman, 2001; Thoresen, 1999; Cole, 2005). Likewise, there are numerous studies which have shed light on how our religious or spiritual beliefs provide an important mechanism for dealing with challenging or traumatic events. Thus, it has been well established that our religious or spiritual practices play a major role in alleviating symptoms of depression, anxiety and hostility; as well as playing a role in having a better quality of life and more positive emotions (Fallot & Hechman, 2005; Park, Cohen, & Murch, 1996; Pargament, 2004). Conversely, research suggest that trauma may lead to a deepening of person's spiritual or religious beliefs when that person has traumatic events such as the terror of war (Khouzam & Kissmeyer, 1997), serious illnesses (Siegel & Schrimshaw, 2000),

Holocaust survivors (Carmil, & Breznitz, 1991), or childhood trauma (Ullman, 1982).

Thus, it appears that spirituality and trauma have a reciprocal relationship. Such research has led us to more detailed examinations of how our spiritual or religious beliefs and practices are related to positive changes following adverse life events, and more specifically how traumas can lead to posttraumatic growth.

A handful of in-depth interviews and qualitative investigations in the current literature address the relationship between religious or spiritual variables and growth following trauma. On the other hand there are several quantitative studies that have provided idiographic evidence supporting the notion that religious beliefs can facilitate posttraumatic growth. For example, Falot (1997) interviewed women with multiple traumas and extensive abuse histories. Falot subsequently reported that spirituality, especially seeing God as trustworthy, was central to these women's survival and recovery. In a similar vein, Parapully, Rosenbaum, Van Den Daele and Nzewi (2002) interviewed 16 parents whose children had been murdered. These parents reported who reported that spirituality, including faith in God, belief in an afterlife, praying, and going to church contributed to their growth experience. Also, Siegel and Schrimshaw (2000) examined the perceptions of stress-related growth among an ethnically diverse sample of 54 women living with HIV/AIDS. Interviews revealed that 83% of the women reported positive growth in at least one life domain including spirituality. Many of the women reported a deepening of their faith and a sense of peace as a result of their life threatening diagnosis.

A small but growing number of quantitative empirical studies have also examined the relationship between religion or spirituality and posttraumatic growth. Of these,

several measured growth using the Stress-Related Growth Scale (SRGS; Park et al, 1996). This is a 50-item measure with a single factor interpretation. Given that the major aim of the present study is to explore the multidimensional relationship between spirituality and posttraumatic growth, research that has utilized the SRGS will be briefly reviewed. However, due to the nature of this study, a more thorough and critical examination of studies that explore the relationship between religion or spirituality and posttraumatic growth as measured by the multi-factor PTGI (Tedeschi and Calhoun, 1996) will follow.

In an attempt to validate the Stress-Related Growth Scale; Park, Cohen, and Murch (1996) examined the relationship between intrinsic religiousness and stress-related growth in a sample of 256 introductory psychology students. Intrinsic religiousness was defined as having a deep faith and personal relationship with God and “the degree to which religion serves as an individual’s framework for meaning” (p.96). Park et al. (1996) administered the SRGS at two 6-month intervals and reported Cronbach alphas of .78 and .80 at Time 1 and Time 2, between intrinsic religiousness and stress-related growth. This suggests that possessing a strong religious orientation to life is related to experiencing growth during stressful times. Koenig, Pargament, and Nielsen (1998) assessed the relationship between specific positive and negative religious coping behaviors and health status, including stress related growth among general medical patients (n=577). Overall, Koenig et al. found that all 12 types of positive religious coping measured in the study were significantly related to stress related growth, as measured by the SRGS. Utilizing a sample of college students, Pargament and Koenig, and Perez (2000) developed the Measure of Religious Coping (RCOPE) and reported that

among college students, greater levels of stress-related growth were significantly related to greater use of all positive religious coping methods. The RCOPE is a 100-item measure of religious coping methods from Judeo-Christian religious orientations (Bade, 2000). The RCOPE was validated on an undergraduate sample (n=540) and a confirmatory factor analysis on a sample of elderly hospitalized patients (n=551) revealed that the RCOPE consists of 17 religious coping factors. The instrument purportedly measures “the full range of religious coping measures, including potentially helpful and harmful religious experiences” (Pargament et al., 2000, p.1.). Collectively these studies appear to demonstrate a strong connection between many aspects of religious coping and the uni-dimensional construct of stress-related growth.

Calhoun, Cann, Tedeschi, and McMillan (2000) sought to examine the relationship between religious beliefs and posttraumatic growth. The participants in this study were 54 college students (35 females, 19 males) who reported experiencing a major traumatic event within the past three years. Religiousness was measured by The Quest Scale, which “was designed to measure the degree to which an individual’s religion involves a responsive dialogue with existential questions (Batson, Schoenrade, & Ventis, 1993, p. 169, as cited in Calhoun et al., 2000). The scale is made up of 12-items with three factors including Readiness (a readiness to face existential questions, .69), Doubt (a self-criticism and perception of religious doubt as positive, .77), and Openness (an openness to religious change, .59). Religious participation was measured by: 1) whether participants were currently attending religious services, 2) how often they attend services, and 3) how important religion was in their lives. Seventy-two percent of the participants reported attending religious services several times per year. The Posttraumatic Growth

Inventory was used to measure the degree of positive changes reported by participants following their traumatic event. Overall, Calhoun et al. (2000) found that openness to religious change was the only aspect of religiousness significantly related to posttraumatic growth. Religious participation was not related to reports of posttraumatic growth. The results of this study suggest that individuals who hold less rigid religious beliefs are more likely to experience growth following a traumatic event. This study is an important contribution to the literature as it represents the first study to test directly the relationship between religiousness and posttraumatic growth. However, several important methodological limitations were noted. For example, Calhoun et al. (2000) report possible problems with lack of power in interpreting significant results due to the small sample size. Additionally, there were limitations with regard to the generalizability of the results beyond the limited sample of college age students. Finally, the results of this study were limited to how religiousness is related to posttraumatic growth. These findings do not explain how broader spiritual beliefs may be related to posttraumatic growth.

Walker (2000) addressed this limitation by attempting to investigate the relationship between growth from stress and spiritual beliefs, stating, “no direct correlation of PTG and spirituality has been attempted” (p.2). In an attempt to determine who is most likely to experience growth from trauma Walker examined demographic variables including age, gender, severity of trauma, time since crisis, field of study, religious participation, and the personal importance of spirituality. A random sample of 600 students was drawn from the student directory of an online university for this study. Participants were 172 distance education graduate students (95 female and 75 male).

Participants completed the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1995:1996) and a revised version of the Spiritual Involvement and Beliefs Scale (SIBS-R; Hatch, Burg, & Naberhaus, 2001). The SIBS-R is a 22-item measure that assesses spirituality across a broad range of spiritual orientations and has four factors (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight).

Walker found a significant positive relationship between posttraumatic growth and the strength of a person's spiritual beliefs and involvement. The association between PTG and spirituality was stronger for: women, those in human services or the field of psychology, for participants practicing a formal religion, individuals reporting severe trauma, and for those endorsing spirituality as highly important in their lives. This study makes an important contribution with regard to examining the effects of ones' spiritual beliefs and the experience of trauma; however there were several important methodological limitations that cause for concern, some of which were noted by the author (Walker, 2000). To begin with, the sample was drawn from a pool of graduate students which tended to produce a constricted age range with the majority of participants being middle aged and in mid-career. Participants were also highly educated; therefore results of this study may be difficult to generalize to other groups that are less educated, younger, and perhaps of lower SES. Another limitation noted by Walker is the inability to show direction of causality between spirituality and PTG given the correlational nature of this research. An important methodological limitation not reported by the author includes the measurement of trauma. Participants were asked to rate their perception of the severity of the traumatic event on a scale of 1-10, with no inclusion of a

psychometrically researched scale to measure trauma symptoms. Additionally, participants were not screened for actually being involved in a traumatic event and it appears that some participants may not have had any trauma history. Finally, merely reporting that a relationship was found between spirituality and PTG leaves one wondering which specific aspects of spirituality and PTG are related.

A more detailed analysis between religious coping and dimensions of PTG was conducted by Bade (2000) who examined the relationship among specific religious coping methods and different types of PTG outcomes. The participants in this study included 241 (150 women and 89 men, two did not specify gender) individuals recruited from Christian churches throughout Texas. Measures in this study included a five-item version of the Mental Health Inventory (MHI-5; as described in Berkwell et al., 1991) to assess current level of distress, the RCOPE (Pargament, Koenig, et al., 1998) to obtain a comprehensive description of religious coping and activities, and the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) to measure positive outcomes resulting from negative life experiences. Overall, results from this study support the conclusion that there is a connection between religious coping methods and the various ways people grow as a result of experiencing a crisis. Five simultaneous multiple regression analyses were performed to evaluate the influence of religious coping methods on posttraumatic growth. The predictors were the RCOPE scales, while the criterion variable in each analysis was one of the PTGI scales. The combination of all the religious coping methods was significantly related to each area of posttraumatic growth (New Possibilities ( $R^2=.37$ ), Relating to Others ( $R^2=.33$ ), Personal Strength ( $R^2=.18$ ), Appreciation of Life ( $R^2=.22$ ), Spiritual Change ( $R^2=.31$ )).

In an attempt to clarify the overall relations between religious coping methods (RCOPE factors) and PTG (PTGI factors) Bade (2000) conducted a canonical correlation. The canonical analysis identified three statistically significant roots accounting for approximately 95% of the shared variance between the canonical variates. However, Bade reported despite being statistically significant the redundancy indices for the second and third roots were too small (.01-.03) for a clear interpretation. The first root, labeled Religious Coping and Posttraumatic Growth, consisted of positive loadings on all the PTGI scales and all the RCOPE scales, with the exception of Reappraisal of God's Power and Interpersonal Religious Discontent. Bade interpreted the second and third roots as tentative interpretations given the small redundancy indices of each root. The second root consisted of positive, moderately sized loadings of Relating to Others (PTGI), Religious Helping (RCOPE), and Seeking Support from Clergy/Members (RCOPE) and smaller, negative loadings of Interpersonal Religious Discontent (RCOPE). Bade labeled this root Interpersonal Relationships suggesting that personal growth in relationships is associated with providing support to others, connecting on a spiritual level with others, and taking comfort in church members and clergy during stressful events. The third root consisted of positive loadings of Spiritual Change (PTGI), Benevolent Religious Reappraisal (RCOPE), and Spiritual Connection (RCOPE), as well as a smaller, negative loading on Reappraisal of God's Power (RCOPE). Bade labeled the third root Spiritual Growth and Faith to reflect the spiritual deepening and connection in times of crisis.

In summary, the results in Bade's (2000) study suggest that increases in religious coping are positively related with each of the five PTG domains. The results of this study add to the small, but growing body of literature examining the relationship between



religious coping and PTG. Particularly important was the attempt to capture the relationship between each component of religious coping with the various components of PTG. A limitation of this study, which was noted by the author includes possible selection bias due to recruiting participants solely from church congregations. Another limitation included using a religious measure (RCOPE) that was designed from a Judeo-Christian perspective, and therefore may have inadvertently excluded those holding spiritual rather than religious coping and beliefs. Finally, Bade reported high intercorrelations among the five subscales of the PTGI, which could indicate one underlying PTG construct for her sample. Despite the high intercorrelations Bade performed data analyses without assessing whether the five-factor structure of the PTGI held for her sample.

In summary, this review of the research reveals a small, yet growing body of evidence that suggests a positive relationship exists between religion or spirituality and posttraumatic growth. In other words, religious or spiritual dimensions such as: having faith in God, belief in an afterlife, praying, going to church (Parpapully et al. (2002), viewing God as trustworthy (Fallot, 1997), and being open to religious change (Calhoun et al., 2000) were related to posttraumatic growth (Bade, 2000). In addition, connecting on a spiritual level with others, taking comfort in church members and clergy, and a deepening of spiritual beliefs were also related to reports of posttraumatic growth (Bade, 2000).

It should be noted, however, that there were some noteworthy limitations in these studies. First, most of the studies recruited college students to participate in their research, and thereby limited the generalizability of their findings. Second, with the

exception of Walker (2000) each study measured religious coping strategies and participation, primarily within the context of Judeo Christian beliefs and faith. This is problematic in that this limitation potentially excluded persons with broader spiritual beliefs, and excluded individuals with differing faiths, from the investigation of how such spiritual beliefs may contribute to posttraumatic growth. As noted, Walker (2000) fortunately took a more inclusive approach by examining the ways in which broad spiritual beliefs contribute to posttraumatic growth; however the generalizability of this study's results were limited by the restricted sample of "distance graduate students" who were recruited for the study. In addition, while Walker did find that a broad measure of spiritual involvement was significantly predictive of posttraumatic growth, the study fell short, by not further analyzing the different factors related to spirituality and posttraumatic growth. As a result, additional research is needed to examine the relationship between spirituality, as a separate construct from religion, and posttraumatic growth. Furthermore, an in depth analysis of spirituality and posttraumatic growth is needed to further clarify how different aspects of spirituality are related to posttraumatic growth. A final limitation, which was not previously noted, was the lack of distinction between the terms religion and spirituality. A cursory review of the literature reveals that some of the researchers viewed the two constructs as indistinguishable; while others contended that religion and spirituality were uniquely different (Corbett, 1990; May, 1982; Richards & Berbin, 1997, as cited in Graham, Furr, Flowers, & Burke, 2001). In general, religion was referred to as an integrated set of beliefs and activities; while spirituality was defined as the meaning gained from life experiences, and which may or may not be theistic in nature. Nevertheless, the distinction between spirituality and

religion is conspicuously absent from the empirical research on posttraumatic growth, and therefore remains an important need for future research (Shaw, Joseph, & Linley, 2005).

### Summary

In summary, this chapter reviewed: the literature on the concept of posttraumatic growth, the studies which have examined posttraumatic growth from loss, the dimensionality of posttraumatic growth, the studies which have examined the factor structure of the Posttraumatic Growth Inventory, and the role of religiosity or spirituality and posttraumatic growth.

## CHAPTER III

### METHODOLOGY

This chapter discusses the methodology used in this two part investigation of the dimensionality of posttraumatic growth, and the relationship between spirituality and posttraumatic growth. The chapter discusses the study's methodology including information regarding the participant characteristics, the instruments used to measure posttraumatic growth and spirituality, procedures, the method of data collection, the study's proposed statistical analyses, and a restatement of study's questions, goals, and hypotheses.

#### Background information for Collection of Data

The proposed data to be used in this study is archival data. It was collected by a research team at Oklahoma State University investigating posttraumatic growth in survivors of law enforcement officers killed in the line of duty, and used here with the permission of the principle investigator Teresa Bear, Ph.D.

#### Participants

The participants in the original study were the 1,087 survivors of law enforcement officer who have been killed in the line of duty (Table 1). The participants were recruited through their membership in the national organization of Concerns of Police Survivors (COPS). A total of 9,228 questionnaires were mailed nationwide to members of COPS

and 1,204 questionnaires were returned (13%). A total of 1,087 questionnaires remained after removing incomplete questionnaires. Two hundred and forty-eight of the participants were male (22.9%) and 833 were female (76.6%). Six of the participants did not indicate their gender. The age of the participants ranged from 19 to 86 and the mean age was 48.7 years. The relationship of the participants to the deceased officer included: 220 (20.2%) parents, 115 (10.6%) children, 339 (36.2%) spouses, 228 (21.0%) siblings, 45 (4.1%) coworkers, and 84 (7.7%) participants who indicated “other” as their relationship status. The nature of the officer’s death was reported by the participants and included the following: 590 (54.3%) deaths due to felonious assault, 432 (39.7%) accidental deaths, 23 (2.1%) deaths due to friendly fire, and 1 (0.1%) suicide. Forty-one of the participants did not indicate the nature of the officer’s death. The mean length of time passed since the officer’s death was 9.7 years. Of the 337 spouses who indicated length of marriage, the mean was 12.2 years, with a range of less than 1 year to 40 years.

### Instrumentation

Participants in the original study completed the following forms and assessment instruments: a demographic data sheet, the Posttraumatic Growth Inventory (PTGI), the Orientation to Life Scale (SOC: Sense of Coherence; Antonovsky, 1993), the Spiritual Involvement and Beliefs Scale-Revised (SIBS-R), and a Posttraumatic Stress Symptom Checklist developed for the original study. The SOC and Posttraumatic Stress Checklist were not included in the current study and therefore information regarding these measures will not be expanded upon in the following section.

### Demographic Data Sheet

Participants completed a demographic data sheet, which included information regarding the relationship between the participant and the deceased officer, the nature of the officer's death, length of time since the death, participation in COPS-sponsored activities, and utilization of mental health services. Additional demographic information requested included participant age, gender, and race, and one item assessing stress due to the events of September 11, 2001.

### Posttraumatic Growth Inventory

The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) was used to measure positive growth from trauma. Tedeschi and Calhoun began development of the PTGI in 1996 with an initial 34-item questionnaire. The 34-item questionnaire was administered to approximately 600 undergraduate students who reported a significant negative life event within the past five years. Principal component analysis with varimax rotation resulted in 13 items being deleted, with five factors emerging accounting for 60% of the variance. The five factors (subscales) include: Relating to Others (e.g. "A sense of closeness with others"), New Possibilities (e.g. "I developed new interests"), Personal Strength (e.g. "A feeling of self-reliance"), Spiritual Change (e.g. "I have a stronger religious faith"), and Appreciation of Life (e.g. "My priorities about what is important in life"). The current version of the PTGI (Tedeschi & Calhoun, 1996) consists of 21, positively worded items, with a 0-5 response choice (0 = "I did not experience this change as a result of my crisis;" and 5 = "I experienced this change to a very great degree as a result of my trauma").

Both the full scale and the separate subscales of the PTGI have demonstrated good internal reliability, with a full-scale internal consistency estimated at  $\alpha = .90$  and with internal consistency of the separate subscales ranging from  $\alpha = .67$  to  $.85$ . Each of the five factors demonstrated adequate internal consistency: New Possibilities (.84), Relating to Others (.85), Personal Strength (.72), Spiritual Change (.85), and Appreciation of Life (.67). The discriminant validity of the PTGI subscales was supported by their differential relationship with other constructs (e.g., spiritual growth was the only subscale that correlated with a measure of religious participation). This analysis of separate subscales allows for an examination of personal growth in various areas of functioning (Cohen, et al., 1998). The test-retest reliability of the PTGI over a two-month period was adequate (.71).

#### Spiritual Involvement and Beliefs Scale-Revised (SIBS-R)

The original 39-item version of the SIBS was designed to measure spirituality across a broad spectrum of spiritual orientations; and to assess actions as well as beliefs (Hatch et al., 1998). The authors of the SIBS proposed that previous instruments, including the Spiritual Well-Being Scale (Bufford, Paloutzian, & Ellison, 1991), were too narrowly focused on Judeo-Christian religion and that such instruments failed to recognize that spirituality may exist separate from organized religion.

Since first being published in 1998 the SIBS has undergone several revisions, with the most recent version resulting in the 22-item SIBS-R used in the current study. While the SIBS-R has not been formally published, initial evaluation of the instrument appears promising. Pilot –testing of the SIBS-R was conducted on a sample of recovering alcoholics (N=193). Test-retest reliability for the SIBS-R was .93 after seven

days. The SIBS-R coefficient alpha was found to be at .92. The correlation for the sum of original 39-item version with the sum of the 22-item version was .984, indicating virtual replication of the total score while taking less time for the respondent to complete (Hatch et al., 2001). The SIBS-R also retained all four factors (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight) from the 39-item version.

The SIBS-R is a 22-item self-report measure of spiritual involvement and beliefs. The first 21 items use a seven-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree.” The final item on the scale asks respondents to rate their level of spirituality on a seven-point Likert scale, with 7 being the “most spiritual.” Content areas covered by the SIBS-R include: ability to find meaning, acceptance, application of beliefs and values, belief in something greater than oneself, fulfillment, gratitude, hope, joy, love, meditation, connection to nature, prayer, relationship with spiritual and physical health, relationship with someone who could provide spiritual guidance, serenity, service, spiritual experiences, spiritual growth, and spiritual writings.

### Procedure

The participants were recruited through membership of Concerns of Police Survivors (COPS), a national, non-profit organization that offers emotional and moral support to spouses, parents, children, siblings, other family members, and others who are affected by police line-of-duty deaths. A total of 9,228 questionnaires were mailed nationwide to members of COPS. Survivors who experienced the death of their officer during 2001 were not asked to participate in this study in an effort to avoid intruding upon their grief. A total of 1,087 questionnaires were returned for a return rate of 13%.



Despite the small response rate, the demographics of the participants were comparable to the demographics of the entire COPS mailing list, suggesting that the sample of returned questionnaires is representative of the national membership of COPS.

Each participant completed a packet of self-report questionnaires including a demographic data sheet, the Posttraumatic Growth Inventory, a Posttraumatic Stress Symptom Checklist, the Orientation to Life Scale, and the Spirituality Involvement and Beliefs Scale. It was anticipated that the total time required to complete the questionnaires would be approximately 25 minutes. All information provided by the participants was kept confidential. Informed consent to participate in the study was explained and implied upon the participants' return of the completed survey packet. Questionnaires were identified by number and were color-coded to facilitate data entry and analysis.

#### Research Goals:

The major goals of this study were to: (a) re-examine the component structure of scores on the PTGI with a sample which was more diverse in age, than the original validation sample; while controlling for type of adversity; and (b) to determine the component structure of scores on the SIBS with the current study's sample and c) determine the relationship between each measure in the study, and more specifically to obtain a more in-depth analysis of possible relationships among the underlying factors of PTG (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, Appreciation of Life) and spirituality (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight)

Research Questions:

1. Can the five-factor structure of the PTGI be replicated in a sample that is larger and more diverse with regard to age than Tedeschi and Calhoun's original validation sample?
2. Can the four-factor structure of the SIBS-R be replicated in this study's sample?
3. What is the relationship between posttraumatic growth as measured by the PTGI, and spiritual beliefs and practices as measured by the SIBS?

Hypothesis:

H1: That the original five-factor structure of the Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) will be replicated in a more diverse sample regarding age.

Analysis: A principle components factor analysis will be used to test hypothesis 1.

H2: That the four-factor structure of the SIBS-R will be replicated in this study's sample.

Analysis: A principle components factor analysis will be used to test hypothesis 2.

H3: That there is a meaningful positive relationship or intercorrelations between the dimensions of spiritual beliefs and practices as measured by the SIBS-R and, posttraumatic growth as measured by the PTGI.

Analysis: The appropriate measures of association will be used to test this hypothesis to determine the nature and magnitude of the relationship between the PTGI and the SIBS-R.

## CHAPTER IV

### RESULTS

The purpose of this chapter is to present the statistical analyses utilized to test the three hypotheses in this study. The analyses examined the following research questions and hypotheses:

#### Research Questions:

1. Can the five-factor structure of the PTGI be replicated in a sample that is larger and more diverse with regard to age than Tedeschi and Calhoun's original validation sample?
2. Can the four-factor structure of the SIBS-R be replicated in this study's sample?
3. What is the relationship between posttraumatic growth as measured by the PTGI, and spiritual beliefs and practices as measured by the SIBS?

#### Hypothesis:

H1: That the original five-factor structure of the Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) will be replicated in a more diverse sample regarding age.

Analysis: A forced five-factor principle components analysis will be used to test hypothesis 1.

H2: That the four-factor structure of the SIBS-R will be replicated in this study's sample.

Analysis: A forced four-factor principle components analysis will be used to test hypothesis 2.

H3: That there is a meaningful, positive relationship or intercorrelations, between the dimensions of spiritual beliefs and practices as measured by the SIBS-R and, posttraumatic growth as measured by the PTGI.

Analysis: The appropriate measures of association will be used to test this hypothesis to determine the nature and magnitude of the relationship between the PTGI and the SIBS-R.

#### Preliminary Analyses

Prior to performing the principal components analysis, several psychometric properties of the 21-item PTGI were obtained for the current study. The means and standard deviations of the sample on the 21-item PTGI total and subscale scores are presented in Table 2. Tedeschi and Calhoun (1996) did not report standard deviations for the PTGI in their study, so variability comparisons cannot be made with the current sample. The PTGI total scores were calculated as the sum of the item scores. Overall, the mean score on the PTGI total score for the sample in the current study was 58.92, compared to Tedeschi and Calhoun's corresponding mean of 81.94. The magnitude of the difference between these means (i.e., effect size) was large ( $d=.97$ ). However, because the two samples were not homogeneous with regards to age, and adequate information was not available to calculate the pooled standard deviation for the two samples, this effect size measure should be interpreted with caution.

A reliability analysis was also conducted to examine the internal-consistency of the 21-item PTGI. The overall reliability coefficient (Cronbach's alpha) for the 21 items was  $\alpha = 0.94$  which is consistent with the overall alpha value ( $\alpha = 0.90$ ) reported by Tedeschi and Calhoun (1996). The internal consistency estimates for the scores on all

subscales was also examined, and these were as follows: Relating to Others ( $\alpha = 0.83$  and  $0.85$ , in the present study and in Tedeschi and Calhoun's study respectively); New Possibilities ( $\alpha = 0.79$  and  $0.84$ ); Personal Strength ( $\alpha = 0.80$  and  $0.72$ ); Spiritual Change ( $\alpha = 0.86$  and  $0.85$ ); and Appreciation of Life ( $\alpha = 0.83$  and  $0.67$ ). Overall, the internal consistency estimates for scores on the PTGI are similar in the present study compared with the values reported in Tedeschi and Calhoun's study. The only noteworthy difference is the higher alpha value obtained on the Appreciation of Life subscale in the current study.

Correlations among the five PTGI subscales (Table 3) were examined to determine the extent to which they were interrelated. All five subscales were significantly related with each other and the total score. The lowest correlation was  $0.46$  for Appreciation of Life and Spiritual Change, whereas the highest correlation was  $0.74$  for New Possibilities and Personal Strength. Finally, the correlations of each subscale with the total PTGI were also high, ranging from  $0.68$  (Spiritual Change and total PTGI) to  $0.89$  (Relating to Others and total PTGI).

#### Principal Components Analysis

A principal components analysis (PCA) was employed to test hypothesis 1. This hypothesis stated that the underlying factor structure of the original PTGI could be replicated in a sample more diverse (i.e., age) than Tedeschi and Calhoun's (1996) validation sample. Prior to performing the PCA the suitability of the data for factor analysis was assessed. The recommended ratio of at least five cases to each variable was verified. The PTGI has 21 items and the total number of cases in this study was 1,086. A 51.5 to 1 ratio of cases to variables was calculated which exceeds the requirement of at

least five cases to each variable. Inspection of the correlation matrix revealed the presence of coefficients of 0.30 and above between the variables supporting the factorability of the correlation matrix (Tabachnick & Fidell, 2000). Principal component analysis requires that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy be greater than 0.50 for each individual variable as well as the set of variables. Examination of the anti-image correlation found each individual variable to be greater than 0.50 supporting their retention in the analysis. In addition, the overall KMO measure of sampling adequacy for the set of variables included the analysis was .940, which exceeds the minimum requirement of 0.50. Finally, Bartlett's Test of Sphericity was performed to determine whether the data were suitable for factor analysis. Bartlett's Test of Sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. Principal component analysis requires that the probability associated with Bartlett's Test of Sphericity be less than the level of significance ( $p < 0.001$ ). The probability associated with Bartlett's Test of Sphericity for the PTGI items is ( $p = .000$ ), further indicating the appropriateness of factor analysis for this data set.

To examine the original five-factor structure of the PTGI in the current sample, a forced five-factor, principal components analysis, with varimax rotation was performed. The complete rotated principal component matrix is presented in Table 3, which shows the factor loadings for all items of the PTGI. The forced five-factor principal component analysis explained 67.4 % of the total variance.

Inspection of complete rotated matrix (Table 4) reveals a number of differences in the factor structure compared to Tedeschi and Calhoun's (1996) original PTGI validation study. These include: 1) most strikingly, in the current analysis the first factor, "Relating

to Others,” accounted for 45.49 % of the total variance, as compared to 17% in the original study, 2) “New Possibilities” is the second factor in the original study; however, in the current analysis Factor II consists of three items from the “Personal Strength” factor, and only two items from the “New Possibilities” factor, 3) Factor III in Tedeschi and Calhoun’s study is “Personal Strength”, whereas in the current study, Factor III consists of three items for the original “Appreciation of Life” factor, and one item from the original “Relating to Others” factor, and 4) “Spiritual Change” is the fourth factor loading in the original PTGI study, however, in the current analysis “New Possibilities/Personal Strength loads on the fourth factor, and “Spiritual Change” loads on Factor V. Overall, four of the original five PTGI factors loaded differentially. There were also a number of complex items with structure coefficients loading .40 or higher on more than one component (such as Items 4, 11, 17 and 17), and several items (e.g., 15, 16, and 17) with structure coefficients less than .50.

Although differences between factor structures for the current sample, as compared to Tedeschi and Calhoun’s sample were found, several noteworthy similarities did emerge. First, the Relating to Others factor loaded on the first factor in each sample. Moreover, six of the seven items from the original Relating to Others factor loaded similarly in the current study. With the exception of item # 16 from the original Relating to Others factor; all three of the original items from the Appreciation of Life factor loaded similarly in the current study. Finally, the Spiritual Change factor was comprised of the same two items in both the current study, as well as the original validation study.

Next, the eigenvalues and the total variance explained by the forced, five-factor principal component analysis was examined in comparison to the original PTGI

validation study (Table 5). Tedeschi and Calhoun (1996) reported using the Kaiser (1958) rule (i.e., “eigenvalues greater than 1.00”) as the sole criterion for deciding on the number of PTGI factors to extract. In the current analysis, only four components were extracted according to the Kaiser rule, which explained 63% of the variance. The fifth factor had an eigenvalue of .918, which falls under the 1.00 or greater criteria. The first factor extracted accounted for 45.49 % of the total variance, whereas the second factor only accounted for 7.27 % of the variance. In comparison, the entire five component solution in Tedeschi and Calhoun’s (1996) validation study accounted for 62% of the variance.

It is important to note, however, that the Kaiser rule used by Tedeschi and Calhoun in developing the PTGI has been criticized for overextracting too many components, and for not producing consistently accurate results (Merenda, 1997). For example, Linn (1968) found that the Kaiser rule overestimated the correct number of factors 66% of the time (as cited in Hayton, Allen, & Scarpello (2004). Additionally, Zwick and Velicer (1986) demonstrated that the Kaiser rule was correct only 22% of the time, and recommended that the Kaiser rule no longer be utilized as the sole or even primary means for deciding the number of factors to retain. Therefore, in the current analysis, several additional criteria were employed to assess the dimensionality of the PTGI. These include: 1) examining the PTGI item-total correlations, 2) examining the forced, five-factor correlation matrix, 3) inspection of the Cattell scree plot test, and 4) examining the factor loadings for a forced, one-factor PTGI solution.

The overall reliability coefficient for the forced, five-factor solution was .94, and the item-total correlations ranged from .54 to .77 (Table 6). Furthermore, a review of the



factor correlations presented in Table 7 indicated moderate correlations among all 5 factors, suggesting redundancy across the factors. Next, the Cattell scree plot was examined, which is considered a strong indicator of the number of components to extract (Merenda, 1997). Visual inspection of the scree plot, presented Figure 1, revealed that only one predominant component represents the most parsimonious solution for the PTGI in the current study. The plot revealed a clear break between the first component and the gradual trailing of the remaining components. The examination of the scree plot suggested a single-factor solution for the PTGI. Lastly, a forced 1-factor, principal components analysis was performed. Inspection of the factor loadings for the forced, one-factor solution (Table 8) shows all the PTGI items loading of the first factor; ranging from .58 to .81. These moderate factor loadings provide further support for a single-factor solution for the PTGI. Overall, these results indicate that the PTGI is measuring one construct, posttraumatic growth, with the current sample.

A principal components analysis (PCA) was employed to test hypothesis 2. This hypothesis stated that the underlying factor structure of the original SIBS-R could be replicated in the current study's sample. Similar to the PTGI, the suitability of the data for performing a PCA with the SIBS was assessed. The recommended ratio of at least five cases to each variable was verified. A 51.5 to 1 ratio of cases to variables was calculated which exceeds the requirement of at least five cases to each variable. Inspection of the correlation matrix revealed the presence of coefficients of 0.30 and above between the variables supporting the factorability of the correlation matrix (Tabachnick & Fidell, 2000). Examination of the anti-image correlation found each individual variable to be greater than 0.50 supporting their retention in the analysis. In

addition, the overall KMO measure of sampling adequacy for the set of variables included the analysis was .959, which exceeds the minimum requirement of 0.50. Finally, Bartlett's Test of Sphericity was performed to determine whether the data were suitable for factor analysis. Principal component analysis requires that the probability associated with Bartlett's Test of Sphericity be less than the level of significance ( $p < 0.001$ ). The probability associated with Bartlett's Test of Sphericity for the PTGI items is ( $p = .000$ ), further indicating the appropriateness of factor analysis for this data set.

To examine the original four-factor structure of the SIBS-R in the current sample, a forced four-factor, principal components analysis, with varimax rotation was performed. The complete rotated principal component matrix is presented in Table 5, which shows the factor loadings for all the SIBS-R items. The forced four-factor principal component analysis explained 62% of the total variance.

Inspection of complete rotated matrix (Table 9) revealed that 4 of the original 22 SIBS-R items loaded differentially on the four factors. The first factor, titled "Core Spirituality," included one item from the original "Spiritual Perspective/Existential" factor. Items in the second factor, titled "Spiritual Perspective/Existential," came from two original factors—"Acceptance/Insight" and "Core Spirituality." The third factor, titled "Personal Application" was comprised of the two items from the original scale. The only two items in the fourth factor, titled "Acceptance/Insight" on the original SIBS-R stemmed from two separate factors—"Spiritual Perspective/Existential," and "Core Spirituality." There were also two complex items with structure coefficients

loading .40 or higher on more than one component (i.e., items 7 and 18), and one item (i.e., item 17) with a structure coefficient less than .50 on all four factors.

While some differences were found between factor structures for the current sample, as compared to Hatch et al.'s (2001) sample, a number of similarities did emerge. To begin, each of the four factors in both studies loaded in the same sequence. Impressively, 12 of the original 16 SIBS-R items loaded similarly on factor 1, Core Spirituality, in both studies. Additionally, both items from factor 3, Personal Application/Humility, loaded the same in the present study, as compared to the original validation study.

Next, the eigenvalues for the forced, four-factor principal component analysis were examined in comparison to the original SIBS-R validation study (Table 10). Hatch et al., (2001) applied the Kaiser (1958) rule (i.e., "eigenvalues greater than 1.00") as the sole criterion for deciding on the number of PTGI factors to extract. In the current analysis, only three components were extracted according to the Kaiser rule, with eigenvalues of 9.08, 1.83, and 1.09 respectively. The fourth factor had an eigenvalue of .93.

As previously noted, the Kaiser rule has been criticized for overextracting too many components, and for not producing consistently accurate results (Merenda, 1997). Therefore, additional criteria were considered in examining the underlying SIBS factor structure. First, inspection of Table 11 revealed that 18 of the 21 SIBS items were reasonably correlated with each other, ranging from .39 to .83. The three remaining items demonstrated low correlations from .15 to .21. The overall reliability coefficient for the forced, four-factor SIBS was .92. Next, the Cattell scree plot test was examined

for the forced, four-factor principal component analysis of the SIBS-R. Visual inspection of the scree plot, presented Figure 2, revealed that only one predominant component represents the most parsimonious solution for the SIBS-R in the current study. The plot revealed a clear break between the first component and the gradual trailing of the remaining components. Finally, a forced, one-factor principal components analysis was performed on the 21-item SIBS (Table 12). The forced one-factor solution accounts for 43.2% of the variance. Moreover, all but 3 items loaded high (.40 or greater) on the first factor, and based on the analysis of the four-factor solution these three items did not load as expected. Collectively, these results suggest that the SIBS-R appears to be measuring one broad construct of spirituality in the current sample.

Results from this study do not support a factor invariance for either the SIBS-R, or the PTGI. The set of independent variables measuring spirituality (SIBS factors), and the set of dependent variables (PTGI factors) representing posttraumatic growth were both reduced to single components. Therefore, a Pearson correlation was conducted to test hypothesis 3. A significant positive relationship was found between the overall SIBS-R and PTGI scores ( $r = .364, p < .01$ ). This suggests that individuals with stronger spiritual beliefs and practices evidence significantly more posttraumatic growth than individuals with less developed spiritual beliefs and practices. No additional analyses could be conducted to further elucidate the possible interrelationships that may exist between spirituality and posttraumatic growth.

## CHAPTER V

### DISCUSSION

The three goals of this study were: 1) re-examine the component structure of scores on the PTGI with a sample which was more diverse in age, than the original validation sample; while controlling for type of adversity; and 2) to determine the component structure of scores on the SIBS-R with the current study's sample, and 3) determine the relationship between each measure in the study, and more specifically to obtain a more in-depth analysis of possible relationships among the underlying factors of PTG (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, Appreciation of Life) and spirituality (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight). This section will provide a discussion of the study's results with regard to the existing literature, and to the three hypotheses outlined in the previous chapters. In addition, the limitations of the current study and suggestions for possible future research regarding posttraumatic growth, and posttraumatic growths relationship with spirituality will be discussed.

Traumatic events such as being diagnosed with cancer or facing the death of a loved one, are, by definition, some of the most painful and challenging experiences that a person will experience during the course of their lifetime. While the feeling of pain, fear, and loss are undeniable, it may be how we react to these events that holds the key to our future. Guided by our hope, spirituality, and the research on posttraumatic growth we may come to see that the misfortune of today can lead us to the personal growth of

tomorrow. For, if we persevere, traumatic events may lead to a greater appreciation or thankfulness for the experience of being alive.

The concept of posttraumatic growth is based upon the principle, that when traumatic events are “upsetting enough” to cause a person to struggle in their response to the event, the resulting disequilibrium, is in truth, an opportunity for growth. For example, while trauma can lead to social withdrawal or attempts to avoid intimacy in our interpersonal lives, traumatic events such as losing a loved one can also lead to an increased sensitivity or empathy for others and increased appreciation for our social support system of family and friends (Collins et al., 1990; Lechner et al., 2003).

From a similar perspective, traumatic events can lead to a transformation of our perception of “self.” For example, as we struggle to surmount or create meaning from a painfully traumatic event such as death, we are also setting the stage to feel more capable of meeting similar challenges in the future (Thomas, DiGiulo, & Sheenhan, 1991).

A third area of potential growth is a change in one’s worldview or philosophy of life. In response to a traumatic event a person may change their priorities, their appreciation of life, or develop an enhanced sense of spirituality or religious beliefs. For example, survivors of a potentially lethal event, an event during which they faced their own death reported, “that they no longer took life for granted” (Joseph et al. 1993).

For most, the death of a loved one is an especially grievous event, an experience that is complete with the potential for psychiatric and medical problems. However, for the bereaved there also exists the potential for positive changes in their life. Examples of such changes include: a renewed emphasis upon living in the moment, a greater

appreciation for family and friends, an enhanced sense of spirituality, and importantly, a decreased fear of their own death (Franz, Ferrell, & Trolley, 2001).

While these qualitative studies are reassuring, quantitative studies of posttraumatic growth are rare. From a review of the literature, there appears to be a dearth of quantitatively based investigations of posttraumatic growth. Clearly there is a need for research endeavors that utilize reliable, valid, empirically based instruments to measure the important phenomenon of potential posttraumatic growth. Therefore, one purpose of this study is to add to the quantitatively based body of research on posttraumatic growth.

Tedeschi and Calhoun (1996) developed one such assessment named the Posttraumatic Growth Inventory, or the PTGI. However, there have been conflicting results regarding whether the PTGI is a multidimensional quantitative measure of posttraumatic growth, or is in fact, measuring a unitary construct of traumatic growth. It is possible that the PTGI is measuring a unitary construct of PTG, and the multidimensional construct that has been proposed is an artifact or a product of a less stringent or robust factor analytic technique.

The research which has investigated this question of dimensionality has for the most part, found agreement with Tedeschi and Calhoun's (1996) three broad domains of posttraumatic growth; the change in perception of self, worldview, and philosophy of life. To date, however, there has been only one study that replicated Tedeschi and Calhoun's five-factor structure of the PTGI (Graff-Reed, 2004). Therefore, a purpose of this study is to further the investigation of the dimensionality of growth. This study examines whether the five-factor structure of the PTGI will be replicated in a larger, more

demographically diverse sample than the original college age sample utilized by Tedeschi and Calhoun in their validation study.

The relationship between religious beliefs or spirituality and our physical and mental health is well established in the literature. However, in addition to playing a major role in alleviating our psychiatric or medical symptoms; our spiritual or religious beliefs also play a significant role in our ability to develop a better quality of life and our ability to experience more positive emotions (Fallot & Hechman, 2005; Park, Cohen, & Murch, 1996; Pargament, 2004; Rudnick, 1997). Of particular interest, is the reciprocal relationship between traumatic experiences and our spirituality. Interestingly, it appears that our spirituality may deepen or grow during our struggle to cope with a traumatic event; and that our religious or spiritual beliefs are important components in coping with traumatic events (Bade, 2000; Walker, 2000).

In an attempt to further elucidate how spiritual beliefs are related to posttraumatic growth, Walker (2000) attempted to determine who would most likely experience growth from trauma. Therefore, Walker examined demographic variables such as age, gender, severity of trauma, time elapsed since the trauma, religious participation, and the importance of spirituality in a person's life, as variables which could predict posttraumatic growth. Utilizing the PTGI and the Spiritual Involvement and Beliefs Scale-Revised or SIBS-R (Hatch, Burg, & Naberhaus, 2001), Walker found that indeed a significant positive relationship existed between posttraumatic growth and the strength of a person's spiritual beliefs. Walker's (2000) study, however, had several methodological limitations including: 1) possible problems with generalizability, 2) a lack of directionality, or causality in describing the relationship between spirituality and



posttraumatic growth, 3) the lack of a reliable, valid instrument to measure trauma, and 4) a lack of investigating the identified dimensions of spirituality and posttraumatic growth.

In an attempt to address this last limitation, Bade (2000) attempted to determine the interrelationships among the dimensions of religious coping methods (RCOPE factors) and posttraumatic growth (PTGI factor) through conducting a canonical correlation. Bade's results suggested that increased religious coping was positively related to each of the PTGI domains. However, a limitation of this study was the possible selection bias due to recruiting participants solely from church congregations and the use of a religious measure, the RCOPE, which was designed from primarily a Judeo-Christian perspective. As a result of these conditions, the study may have inadvertently excluded individuals with broader spiritual rather than religious beliefs or individuals of different faiths. Finally, Bade reported high intercorrelations among the five subscales of the PTGI, which could point toward an underlying unitary posttraumatic growth construct for her sample. Therefore, an additional goal of this study was to investigate the possible interrelationships that may exist between the dimensions of the broad construct of spirituality, and dimensions of posttraumatic growth.

The following hypotheses were formulated and tested in this study:

Hypothesis:

- H1: That the original five-factor structure of the Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) will be replicated in a more diverse sample regarding age. This hypothesis addresses the dimensionality of the PTGI and the generalizability of the five-factor structure of the PTGI to samples other than the original validation age sample.
- H2: That the four-factor structure of the SIBS-R will be replicated in this study's sample.

This hypothesis addresses the dimensionality of the SIBS-R and the generalizability of the four-factor structure of the SIBS-R to the current sample

H3: That there is a meaningful, positive relationship or intercorrelations, between the dimensions of spiritual beliefs and practices as measured by the SIBS-R and, posttraumatic growth as measured by the PTGI.

### Conclusions

Hypothesis 1 was not supported after an evaluation of the study's results. An examination of the statistical analysis revealed that Tedeschi and Calhoun's (1996) proposed five-factor structure of the PTGI was not replicated in this study's sample, which was more diverse with regard to age. The current study subjected the 21-item PTGI to a forced five-factor, principal components analysis, followed by varimax rotation. Importantly, both this study and Tedeschi and Calhoun's (1996) study utilized the Kaiser rule of, "eigenvalues greater than 1" (Kaiser, 1958), as the criterion for extracting components (factors) during the principle components analysis. This study's forced, five-factor solution accounted for 67% of the variance. However, applying the Kaiser rule resulted in only 4 factors with eigenvalues greater than 1.00, which accounted for 63% of the variance: 1) Relating To Others (eigenvalue = 9.55), 2) Personal Strength (eigenvalue = 1.53), 3) Appreciation of Life (eigenvalue = 1.12), and 4) New Possibilities (eigenvalue = 1.03). The fifth factor, Spiritual Change, had an eigenvalue of .92, and therefore, according to the Kaiser rule, did not hold as a separate factor in the current study.

The majority of studies to date examining the factor structure of the PTGI have reported using only the Kaiser rule (1958) to determine the number of factors to extract.

Consistent with the current study, prior researchers have mostly found a multidimensional factor solution for the PTGI when using the Kaiser (1958) “eigenvalues greater than 1” criterion. While it is common for researchers to use the K1 rule to determine the number of factors to retain, it is important to note that a number of studies have demonstrated that the K1 rule is inaccurate and tends to overfactor (Horn, 1965; Silverstein, 1987). Perhaps the Kaiser rule of “eigenvalues greater than 1” is not an adequate and therefore accurate threshold for extracting true dimensions, or factors, when the question concerns the dimensionality of a construct. Due to limitations of the Kaiser rule, additional factor retention methods were utilized to further the study’s search for the factor structure of the PTGI, including: examining the PTGI item-total correlations; examining the forced, five-factor correlation matrix; inspection of the Cattell scree plot test; and examining the factor loadings for a forced, one-factor PTGI solution.

A review of the item-total correlations and the factor correlation matrix indicated moderate correlations between all the PTGI items, and across all five factors, suggesting a single factor solution. Furthermore, consistent with Sheikh and Marotta’s (2005) findings, a visual inspection of the Cattell (1966) scree plot in the current study revealed only one predominant component for the Posttraumatic Growth Inventory (PTGI). Finally, inspection of the factor loadings for the forced, one-factor solution revealed moderate factor loadings for all the PTGI items on the first factor; ranging from .58 to .81. These moderate factor loadings provide further support for a single-factor solution for the PTGI. Consequently, the results of this study do not support the factorial invariance of the PTGI. Rather, with this sample and by using a more conservative factor

retention criterion such as the Cattell scree test, it appears that the PTGI reflects a unidimensional, more generalized factor of growth.

Several additional explanations may be offered for the unidimensional factor structure found in the current study including; type of trauma, time lapsed since the trauma, and differences in samples. The type of traumatic event was controlled in the present study by including only participants who experienced the death of a family member or co-worker. The types of traumas reported in Tedeschi and Calhoun's (1996) sample were varied and included bereavement, injury-producing accidents, separation or divorce of parents, relationship breakups, criminal victimizations, academic problems, and unwanted pregnancies. Therefore, it is possible that the dimensionality of the PTGI may vary according to the types of traumas reported.

The length of time since the traumatic event may have affected the unidimensional factor structure found in the current study. Joseph, Linely, and Harris (2005) suggest that research examining the temporal course of posttraumatic growth may reveal differences in its structure with the passage of time. Participants in the current study reported an average of 9.7 years since the death of a loved one, whereas participants in Tedeschi and Calhoun's (1996) study experienced a negative life event within the previous five years. One would expect differences in patterns of posttraumatic growth for individuals who had recently experienced the death of a loved one, compared to someone whose loss was 10 years ago or longer. For example, longitudinal studies found that the period of 2 weeks to 2 months accounted for the most changes in PTG, with overall reported benefits remaining stable over a period of three years (Frazier et al., 2001; McMillen et al., 1997). Additionally, Fromm, Andrykoski, and Hunt (1996) found

patients who survived a bone marrow transplant more than five years reported the fewest positive outcomes. It appears that over time the positive benefits reported following a traumatic event may decrease with time, thereby leading to less complex factor solutions of growth.

Finally, sample characteristics may have contributed to the different structure of growth found in the current study. Tedeschi and Calhoun obtained their five-factor structure by utilizing a sample of college students, 92% of which ranged from 17 years to 25 years in age. In contrast, this study's more diverse sample ranged in age 19 years to 86 years of age, with a mean = 58.7 years old. College students represent a unique sample with regard to their age, socioeconomic status, level of education, access to support resources, and fewer reported traumas than other segments of the population (Higgins, 2000). Regarding age, several studies have found that younger participants reported higher scores on the PTGI compared to older participants (Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Widows; Bellizzi, 2004) and for college students versus adults (Calhoun et al., 2000; Cordova et al., 2001).

Hypothesis 2 was not supported after an evaluation of the study's results. An examination of the statistical analysis revealed that Hatch et al.'s (2001) proposed four-factor structure of the SIBS-R was not replicated in this study's sample. The current study subjected the 21-item SIBS-R to a forced four-factor, principal components analysis with Kaiser normalization, followed by varimax rotation. This study's forced, four-factor solution accounted for 62% of the variance. However, only three factors were retained according to the Kaiser rule, accounting for 57% of the variance: 1) Core Spirituality (eigenvalue = 9.08), 2) Spiritual Perspective/Existential (eigenvalue = 1.83),

and 3) Personal Application/Humility (eigenvalue = 1.09). The fourth factor, Acceptance/Insight, had an eigenvalue of .93, and therefore, according to the Kaiser rule, did not hold as a separate factor in the current study.

Due to previously noted limitations of the Kaiser rule, additional factor retention methods were utilized to further assess the underlying factor structure of the SIBS-R, including: examining the PTGI item-total correlations; inspection of the Cattell scree plot test; and examining the factor loadings for a forced, one-factor SIBS-R solution. A review of the item-total correlations indicated low to moderate correlations among most of the SIBS-R items. Visual inspection of the Cattell (1966) scree plot revealed only one predominant component for the SIBS-R. Finally, the forced, one-factor solution revealed high factor loadings (.40 or greater) for 18 of the 21 SIBS-R items on the one factor. Furthermore, the three remaining SIBS-R items with factor loadings less than .40 did not load as expected when the initial forced, four-factor solution was examined. Considering these results collectively, the decision was to interpret a one-factor solution for the SIBS-R. Therefore, it appears that the SIBS-R reflects a unidimensional, generalized factor of spirituality in the current study.

Hypothesis 3 postulated that there would be an intercorrelation or interrelationship among the dimensions or factors of spirituality as measured by the SIBS-R, and the dimensions or factors of posttraumatic growth as measured by the PTGI. However, this study was unable to fully test this hypothesis due to the set of independent variables (SIBS-R factors) representing the dimensions of spirituality being reduced to a single component during the principal component analysis. Furthermore, the set of dependent variables (PTGI factors) representing the dimensions of posttraumatic growth

was also reduced to a single component. Consequently, only a Pearson correlation analysis was able to be performed to measure the relationship between the overall constructs of spirituality and posttraumatic growth.

Results from the Pearson correlation analysis found that individuals with more well developed, or stronger spiritual beliefs and practices, did evidence significantly more posttraumatic growth than individuals with less developed spiritual beliefs and practices. However, while the relationship between spirituality and posttraumatic growth was found to be positive and significant, this relationship was only of moderate strength in the current study ( $r = .364, p < .01$ ). A possible explanation for the moderate strength of the relationship in this study could be the average length of time since the experience of the traumatic event. In the current study, on the average, it had been 9.7 years since the participants had experienced the traumatic event of losing a loved one.

This finding is consistent with the previous studies that examined the relationship between spirituality and posttraumatic growth and the effect length of time since the traumatic event has on this relationship. For example, in a sample of distance education graduate students Walker (2000) found that individuals who reported experiencing a traumatic event within the past three years demonstrated the strongest relationship between spirituality and posttraumatic growth. Similarly, Tedeschi and Calhoun (1996) found that posttraumatic growth and religious participation were significantly associated in a sample that experienced a traumatic event within the past three years. Therefore, the moderate strength of the relationship in this study could be, in part, accounted for by the average of 9.7 years since the traumatic event.

## Implications of the Results

A primary purpose of this research was to re-examine the component structure of scores on the PTGI with this large, demographically diverse (i.e., age) sample in comparison to the original PTGI validation sample. As noted, prior research examining the factor structure of the PTGI has produced mixed findings regarding whether it is measuring a unitary or multidimensional construct. This study's answer to whether the PTGI is measuring a unitary or multidimensional construct is: It depends upon the factor retention criteria; for example, whether the research utilizes the Kaiser rule (K1 rule), or more conservative factor retention criteria (i.e., Cattell's scree method). The results from this study reveal the PTGI is measuring a unitary growth construct when the more conservative factor retention criterion of the Cattell scree method is utilized. However, if the less robust K1 rule is employed as the factor retention criteria, than this study's answer is the PTGI is measuring a four-factor, multidimensional construct.

These findings have several important implications. From a research perspective, certain methodological issues need to be considered to better understand the underlying structure of PTGI. With few exceptions, most research examining the factor structure of PTGI has used the Kaiser rule to determine the number of components to extract. As previously noted the Kaiser rule tends to over-extract factors, resulting in less than satisfactory results. More reliable and consistent methods are needed to determine the number of PTGI components to extract in future research. Furthermore, researchers or clinicians need to use caution when interpreting PTGI results beyond the overall construct level. Researchers cannot simply assume that the factorial invariance of the PTGI will hold for their particular samples. Clinicians cannot be assured that the



interpretation of the PTGI subscales is valid when making treatment decisions with victims of trauma or the bereaved. These concerns are especially pertinent when an individual or sample differs significantly from Tedeschi and Calhoun's (1996) original validation study, particularly with regard to the age of participants, the time since the traumatic event, and the type of trauma encountered. As previously noted, several authors have suggested that the factor structure of the PTGI might vary as the respondent population and the types of traumatic events differ from sample to sample.

A second goal of this study was to examine the relationship between spirituality and posttraumatic growth. Prior research has demonstrated that having faith in God, belief in afterlife, praying, viewing God as trustworthy (Fallot, 1997), connecting with others on a spiritual level, or a deepening of spiritual beliefs were positively related to posttraumatic growth (Bade, 2000). The results of the present study add to this growing body of research demonstrating a connection between spirituality and posttraumatic growth.

These findings have important clinical and training implications. Clinicians are likely to address spiritual matters in psychotherapy. As previously mentioned, approximately 95% of Americans report a belief in God, with over two-thirds belonging to a church, synagogue, or other religious institutions (Bishop, 1999). Additionally, in a survey conducted by Steere (1997) 81% of participants reported wanting spiritual practices and beliefs integrated into counseling. Calhoun and Tedeschi (1999) emphasize the importance of clinicians attending to spiritual and existential themes in psychotherapy that addresses the effects of trauma and posttraumatic growth. These include issues related to mortality, life's meaning and purpose, fundamental choices about how to live,

and issues related to both traditional religious beliefs and broad spiritual themes (Calhoun & Tedeschi, 1999; Pargament, 1997; Yalom, 2002; Fromm; 1950; Maslow; 1964). When the traumatic event involves death, as does the present study, addressing such existential and spiritual questions seems especially important as one's own mortality is likely to be challenged (Yalom & Lieberman, 1991).

Also, in light of these findings, there appears to be a need to incorporate religious and spiritual issues into graduate level training programs. Traditionally, training programs have often neglected issues of spirituality and religion (Miller, 1999). Shafranske and Maloney (1990) reported that as few as 5% of clinical psychologists surveyed had any spiritual or religious training in their graduate programs. Given the importance spirituality seems to play in posttraumatic growth, graduate training programs would be well served to increase their students' awareness of the values of spirituality during the therapeutic process.

### Limitations

There are several notable limitations to this study. First, this study depended upon archival data that was collected on a sample of convenience. The response rate in the original study was not optimal (13%) and all of the participants were members of a national organization which offers numerous outreach and bereavement services. It is possible that these individuals may differ from other bereaved adults who did not participate in the study, or from individuals who are not part of a similar organization. The homogenous nature of this largely female, Caucasian sample makes the generalizability of these findings questionable.

Second, posttraumatic growth was assessed at a single point in time, yet research has shown differences in growth outcomes as length of time since the traumatic event increases (Sears, 2004; Evers et al., 2001; Bevvino, 2001; Cordova et al., 2001; Polatinsky & Esprey, 2000). Consequently, the current findings represent a temporal snapshot of participants' self-reported growth, which may not accurately portray ones full potential for posttraumatic growth. Furthermore, the retrospective, self-report nature of this study introduces the possibility of inaccurate recall of the participants' experiences of posttraumatic growth. The average time since the traumatic event was an average of 9.7 years in the current study, which may have altered participants' appraisal of the event over time. Third, due to the correlational nature of this study, a causal relationship between spirituality and posttraumatic growth couldn't be clearly established. Fourth, due to the cross-sectional design of this study, longitudinal effects such as changes over time couldn't be established. Fifth, as mentioned earlier, due to the effect that a more or less stringent or factor retention criterion had upon determining the dimensionality of posttraumatic growth in this study; the question of whether posttraumatic growth represents a unitary or multidimensional construct, as measured by the PTGI, was not clearly established. However, elucidating the dilemma posed by the selection of the factor retention criterion was also a contribution of this study.

#### Opportunities for Future Research

Further study into the component structure that underlies the PTGI is clearly warranted. Cohen, Cimboric, Armeli, and Hettler (1998) have suggested that the factor structure of growth measures "might vary as a function of characteristics of the respondent population, the types of crises experienced, and the time frame for growth

assessment (p. 327). Therefore, future factor analytic studies are needed with various samples of trauma survivors to assess the underlying component structure of PTGI. Longitudinal studies regarding the PTGI would be helpful in assessing whether the intervening variable “time since the traumatic event” affects the component structure of the PTGI. Perhaps most evident from the current study is the need for more methodically sound factor analytic techniques. As was demonstrated in the current study and reported elsewhere, the Kaiser rule is often inaccurate and tends to overfactor. However, the majority of studies assessing the PTGI factor structure to date have relied solely on the Kaiser rule to determine the number of factors to extract. More conservative factor retention criterion such as the Cattell scree test and examination of the factor correlation matrix will provide a more accurate assessment into the underlying component structure of the PTGI.

While this study was unable to examine the interrelationships between spirituality and posttraumatic growth; an investigation of these interrelationships remains an area for future research. Further research delineating religiosity factors from spirituality factors is warranted. This would allow for a better understanding of the relative contributions of the two differing sets of variables to posttraumatic growth, and could serve to compare the benefits of religiosity to the benefits of spirituality, and the particular dimensions of spirituality with regard to posttraumatic growth.

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## APPENDIX A: Tables

Table 1

Demographic Characteristics of Participants

Variable	n	%
Gender	N=1,081*	
Male	248	22.9
Female	833	76.6
Ethnicity	N=1,074*	
European American/Caucasian	926	85.2
African American/African	45	4.1
Hispanic American/Hispanic	43	4.0
Native American/American Indian	42	3.9
Asian American/Asian	11	1.0
Other	7	0.6
Relation to Deceased Officer	N=1,085*	
Parent	220	20.2
Child	115	10.6
Spouse	339	36.2
Sibling	228	21
Coworker	45	4.1
Other	84	7.7
Nature of Death	N=1,046*	
Felony Assault	590	54.3
Accident	432	39.7
Friendly Fire	23	2.1
Suicide	1	0.1

\* Totals less than 1,087 indicate missing data

Table 2

## Sample Means and Standard Deviations on PTGI Total Score and Subscale Scores

PTGI Subscale	Score Range	Present Study		Tedeschi & Calhoun (1996)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Relating to Others	0-35	19.24	8.75	26.49	---
New Possibilities	0-25	12.16	6.80	20.94	---
Personal Strength	0-20	12.15	5.39	17.90	---
Spiritual Change	0-10	5.41	3.43	8.29	---
Appreciation of Life	0-15	9.96	4.10	13.45	---
Total PTGI	0-105	58.92	23.85	81.94	---

Data for the 21-item PTGI

Dashes indicate unavailable data



Table 3

Correlation Matrix for the Five PTGI Subscales and PTGI Total

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Subscale*	1	2	3	4	5	Total PTGI
1	1.0					
2	.67**	1.0				
3	.64**	.75**	1.0			
4	.54**	.49**	.51**	1.0		
5	.63**	.64**	.61**	.46**	1.0	
PTGI Total	.89**	.88**	.85**	.68**	.80**	1.0

---

\* Subscale 1 = Relating To Others; 2 = New Possibilities; 3 = Personal Strength; 4 = Spiritual Change; 5 = Appreciation Of Life

\*\* . Correlation is significant at the 0.01 level

Table 4

## Factor Loadings of the PTGI Items in the Five-Factor Model-Varimax

PTGI ITEM	Factor				
	I	II	III	IV	V
<b><u>Relating to Others</u></b> (45.49% of the variance)					
20. I learned a great deal about how wonderful people are. (RO) <sup>a</sup>	<b>.795</b>	.219	.098	.087	.165
6. Knowing that I could count on people in times of trouble. (RO)	<b>.791</b>	.111	.098	.071	.127
21. I accept needing others. (RO)	<b>.737</b>	.240	.188	.174	.139
8. A sense of closeness with others. (RO)	<b>.656</b>	.118	.349	.249	.142
9. A willingness to express my emotions. (RO)	<b>.546</b>	.297	.233	.237	.081
15. I have more compassion for others (RO)	<b>.418</b>	.201	.354	.189	.340
<b><u>Personal Strength/New Possibilities</u></b> (7.62% of the variance)					
10. I know better that I can handle difficulties. (PS)	.244	<b>.800</b>	.173	.190	.082
19. I discovered That I'm stronger than I thought I was. (PS)	.312	<b>.712</b>	.177	.163	.190
12. I am better able to accept the way things work out (PS)	.217	<b>.621</b>	.202	.220	.318
11. I am able to do better things with my life. (NP)	.284	<b>.540</b>	.450	.317	.176
17. I am more likely to change things which need changing. (NP)	.238	<b>.457</b>	.450	.317	.176
<b><u>Appreciation of Life</u></b> (5.35% of the variance)					
2. An appreciation for the value of my life. (AL)	.202	.174	<b>.776</b>	.157	.111
1. My priorities about what is important in life. (AL)	.125	.142	<b>.755</b>	.197	.124
13. Appreciating each day (AL)	.323	.398	<b>.597</b>	.121	.174
16. I put more effort into my relationships. (RO)	.404	.250	<b>.482</b>	.241	.199
<b><u>New Possibilities/Personal Strength</u></b> (4.91% of the variance)					
14. I have new opportunities which would not have been available otherwise. (NP)	.256	.171	-.023	<b>.778</b>	.129
3. I developed new interests. (NP)	.163	.097	.370	<b>.712</b>	.073
7. I established a new path for my life. (NP)	.177	.238	.261	<b>.696</b>	.190
4. A feeling of self-confidence. (PS)	.000	.469	.237	<b>.585</b>	.070
<b><u>Spiritual Change</u></b> (4.37% of the variance)					
18. I have a stronger religious faith. (SC)	.216	.197	.129	.109	<b>.878</b>
5. A better understanding of spiritual matters. (SC)	.211	.193	.217	.198	<b>.825</b>

<sup>a</sup> Abbreviations for the original PTGI subscales: RO = Relating to Others; NP = New Possibilities; AP = Appreciation of Life; SC = Spiritual Change.

Table 5

Variance Associated with the PTGI Factors using Kaiser Rule (N=1087)

Measure %	Factor	Eigenvalues	% Variance	Cumulative
PTGI	<b>1</b>	<b>9.55</b>	45.49	45.49
	<b>2</b>	<b>1.53</b>	7.27	52.75
	<b>3</b>	<b>1.12</b>	5.35	58.10
	<b>4</b>	<b>1.03</b>	4.91	63.01
	<b>5</b>	0.92	4.38	67.38

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

Table 6

PTGI Item-Total Correlations

PTGI Item	Item-Total Correlation
1	.561
2	.603
3	.590
4	.564
5	.623
6	.535
7	.649
8	.668
9	.615
10	.655
11	.773
12	.661
13	.669
14	.538
15	.626
16	.674
17	.701
18	.558
19	.675
20	.609
21	.663

Table 7

PTGI Forced, Five-Factor Correlation Matrix

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Factor	1	2	3	4	5
1	1.0				
2	.46**	1.0			
3	.44**	.46**	1.0		
4	-.44**	-.41**	-.47**	1.0	
5	.46**	.34**	.34**	-.42**	1.0

---

Extraction Method: Principal Component Analysis

\*\*Correlation is significant at the 0.01 level

Table 8

PTGI Factor Loadings for the Forced, One-Factor Model-Varimax

PTGI Items	Component 1
11	.807
17	.743
13	.742
16	.718
19	.717
8	.709
21	.703
12	.702
10	.698
7	.686
15	.668
9	.660
5	.657
20	.652
2	.648
3	.629
4	.608
1	.605
18	.600
14	.579
6	.579

Table 9

## Factor Loadings of the SIBS-R Items in the Four-Factor Model-Varimax

SIBS ITEM		Factor			
		I	II	III	IV
<b>Core Spirituality</b> (43.22% of the variance)					
16. My spiritual understanding continues to grow.	(CS) <sup>a</sup>	<b>.839</b>	.228	.142	.051
13. My relationship with a higher power helps me love others more completely.	(CS)	<b>.836</b>	.194	.212	.076
12. I have joy in my life because of my spirituality.	(CS)	<b>.810</b>	.244	.158	.144
14. Spiritual writings enrich my life.	(CS)	<b>.807</b>	.163	.114	.092
15. I have experienced healing after prayer.	(CS)	<b>.789</b>	.121	.085	.064
21. I examine my actions to see if they reflect my values.	(SP/E)	<b>.788</b>	.171	.122	.126
20. I solve my problems without using spiritual resources.	(CS)	<b>.754</b>	.047	.015	.094
19. I have been through a time of suffering that led to spiritual growth.	(CS)	<b>.751</b>	.296	.125	.031
8. I have a personal relationship with a power greater than myself.	(CS)	<b>.745</b>	.162	.119	.115
3. A person can be fulfilled without pursuing an active spiritual life.	(CS)	<b>.719</b>	-.126	-.039	-.014
9. I have had a spiritual experience that greatly changed my life.	(CS)	<b>.710</b>	.176	.048	.113
6. Prayers so not really change what happens.	(CS)	<b>.693</b>	.105	.029	-.063
5. I have a relationship with someone I can turn to for spiritual guidance.	(CS)	<b>.558</b>	.246	.110	.121
<b>Spiritual Perspective/Existential</b> (8.70% of the variance)					
4. I find serenity by accepting things as they are.	(A/I)	-.032	<b>.756</b>	.075	-.045
2. I can find meaning in times of hardship.	(CS) & (SP/E)	.316	<b>.706</b>	-.073	.206
18. In difficult times, I am still grateful.	(CS) & (SP/E)	.282	<b>.481</b>	.477	.144
7. In times of despair, I can find little reason to hope.	(SP/E)	.240	<b>.470</b>	.118	.129
<b>Personal Application/Humility</b> (5.21% of the variance)					
10. When I help others, I expect nothing in return.	(PA/H)	.084	-.050	<b>.872</b>	-.010
17. I focus on what needs to be changed in me, not on what needs to be changed in others.	(PA/H)	.189	.411	<b>.564</b>	.153
<b>Acceptance/Insight</b> (4.42% of the variance)					
11. I don't take time to appreciate nature.	(SP/E)	-.040	.062	.139	<b>.886</b>
1. I set aside time for mediation and/or self-reflection.	(CS)	.363	.271	-.052	<b>.556</b>

<sup>a</sup> Abbreviations for the original SIBS subscales: CS = Core Spirituality; SP/E = Spiritual Perspective/Existential; PA/H = Personal Application/Humility; A/I = Acceptance/insight

Table 10

Variance Associated with the SIBS-R Factors Using the Kaiser Rule (N=1087)

Measure	Factor	Eigenvalues	% Variance	Cumulative
SIBS	<b>1</b>	<b>9.08</b>	43.22	43.22
	<b>2</b>	<b>1.83</b>	8.70	51.92
	<b>3</b>	<b>1.09</b>	5.21	57.13
	4	0.93	4.42	61.55

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization



Table 11

SIBS Item-Total Correlations

SIBS Item	Item-Total Correlation
1	.47
2	.51
3	.53
4	.21
5	.58
6	.60
7	.39
8	.72
9	.68
10	.21
11	.15
12	.83
13	.83
14	.78
15	.74
16	.83
17	.42
18	.50
19	.76
20	.67
21	.77

Table 12

Factor Loadings of the SIBS-R Items for the Forced, One-Factor Model-Varimax

SIBS Items	Component 1
13	.89
16	.87
12	.87
14	.83
21	.82
19	.81
15	.79
8	.77
9	.73
20	.72
6	.66
5	.63
3	.61
2	.54
18	.53
1	.50
17	.44
7	.42
10	.23
4	.22
11	.15

## APPENDIX B: Figures

Figure 1  
Scree Plot of Eigenvalues for PTGI

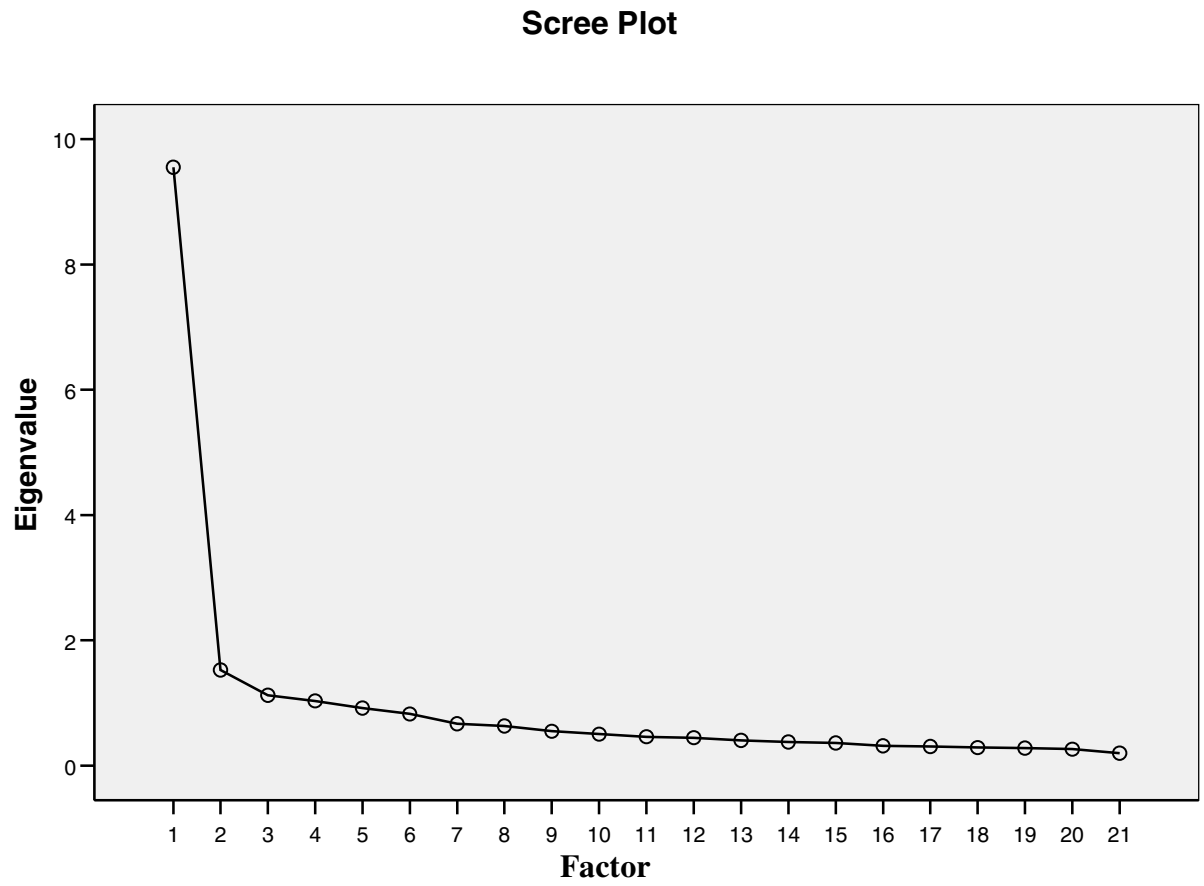
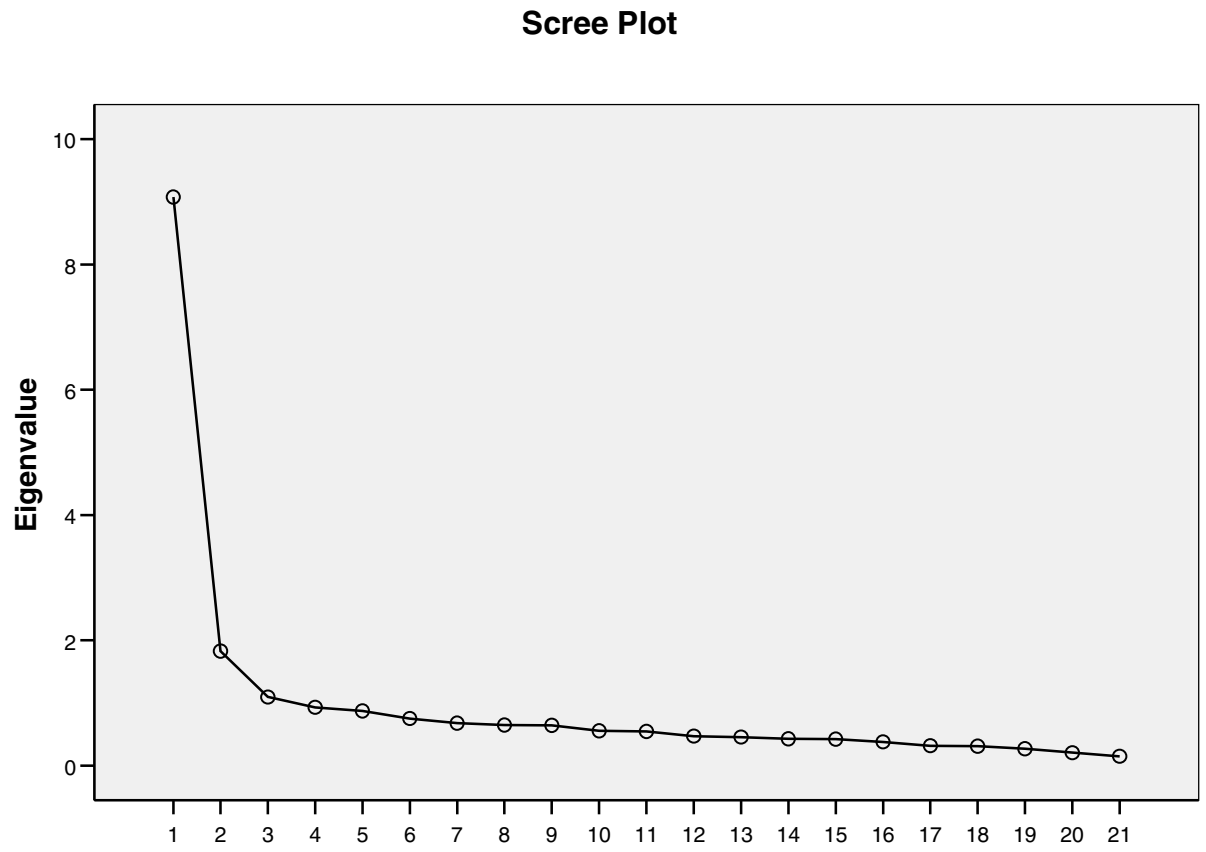


Figure 2  
Scree Plot of Eigenvalues for SIBS-R



## APPENDIX C: DEMOGRAPHIC FORM

Demographic Information

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

Race: (please check all that apply):

_____ African American	_____ African American
_____ European American/Caucasian	_____ Hispanic/Hispanic American
_____ Native American	_____ Other _____

C.O.P.S. Activities you have participated in (Please check all that apply):

- \_\_\_\_\_ The National Police Survivors’ Seminar
- \_\_\_\_\_ “C.O.P.S. Kids” activities during National Police Week
- \_\_\_\_\_ Professional Counseling through “C.O.P.S. Kids”
- \_\_\_\_\_ “C.O.P.S. Kids” Summer Camp
- \_\_\_\_\_ Outward Bound ® for Young Adults
- \_\_\_\_\_ Siblings Retreat
- \_\_\_\_\_ Spouses Getaway
- \_\_\_\_\_ Parents Retreat
- \_\_\_\_\_ Adult Children’s Retreat
- \_\_\_\_\_ Chapter/National Teambuilding and Trainings
- \_\_\_\_\_ Benefits Assistance
- \_\_\_\_\_ Parole Letter Writings Campaigns
- \_\_\_\_\_ Use of grief literature
- \_\_\_\_\_ Payments from the Japanese/American Friends of Law Enforcement Foundation
- \_\_\_\_\_ Requests for counseling resources at the grass-roots efforts level
- \_\_\_\_\_ COPS Assistance for National Travel Week Travel
- \_\_\_\_\_ COPS Participation Awards for Participating in Hands-on Programs
- \_\_\_\_\_ “The Trauma of Law Enforcement Training”

What is your relationship to the deceased Officer?

_____ Mother	_____ Father
_____ Daughter	_____ Son
_____ Wife	_____ Husband
(_____ Years of Marriage )	(_____ Number of Children)
_____ Sister	_____ Brother
_____ Co-worker	_____ Police Partner
_____ Other (please specify): _____	

How much time has passed since the Officer's death?

\_\_\_\_ Years

\_\_\_\_ Months

What was the nature of the Officer's death?

\_\_\_\_ Accident

\_\_\_\_ Felonious Assault

\_\_\_\_ Friendly fire

\_\_\_\_ Suicide

\_\_\_\_ Other (please specify): \_\_\_\_\_

What mental health services have you utilized since the Officer's death?

\_\_\_\_ Family Therapy

\_\_\_\_ Group Therapy

\_\_\_\_ Individual Therapy

\_\_\_\_ Marital Therapy

\_\_\_\_ Other (please specify): \_\_\_\_\_

\_\_\_\_ None



## APPENDIX D: MEASURES

## Posttraumatic Growth Inventory

Developed by Richard G. Tedeschi, Ph.D., and Lawrence G. Calhoun, Ph.D.

Instructions: Indicate for each of the statements below the degree to which this change occurred in you life as a result of your crisis, using the following scale.

0 = I *did not* experience this change as a result of my crisis.

1 = I experienced this change to a *very small degree* as a result of my crisis.

2 = I experienced this change to a *small degree* as a result of my crisis.

3 = I experienced this change to a *moderate degree* as a result of my crisis.

4 = I experienced this change to a *great degree* as a result of my crisis.

5 = I experienced this change to a *very great degree* as a result of my crisis.

- \_\_\_ 1. I changed my priorities about what is important in life.
- \_\_\_ 2. I have a greater appreciation for the value of my own life.
- \_\_\_ 3. I developed new interests.
- \_\_\_ 4. I have a greater self-reliance.
- \_\_\_ 5. I have a better understanding of spiritual matters.
- \_\_\_ 6. I more clearly see that I can count on people in times of trouble.
- \_\_\_ 7. I established a new path for my life.
- \_\_\_ 8. I have a greater sense of closeness with others.
- \_\_\_ 9. I am more willing to express my emotions.
- \_\_\_ 10. I know better that I can handle difficulties.
- \_\_\_ 11. I am able to do better things with my life.
- \_\_\_ 12. I am better able to accept the way things work out.
- \_\_\_ 13. I can appreciate each day.
- \_\_\_ 14. New opportunities are available which wouldn't have been otherwise.
- \_\_\_ 15. I have more compassion for others.
- \_\_\_ 16. I put more effort into my relationships.
- \_\_\_ 17. I am more likely to change things which need changing.
- \_\_\_ 18. I have a stronger religious faith.
- \_\_\_ 19. I discovered that I'm stronger than I thought I was.
- \_\_\_ 20. I learned a great deal about relationships.
- \_\_\_ 21. I better accept needing others.

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## Spiritual Involvement and Beliefs Scale – Revised (SIBS – R)

How strongly do you agree with the following statements? Please circle your response.

	Strongly Agree	Agree	Mildly Agree	Neutral	Mildly Disagree	Disagree	Strongly Disagree
1. I set aside time for mediation and/or self-reflection.	7	6	5	4	3	2	1
2. I can find meaning in times of hardship.	7	6	5	4	3	2	1
3. A person can be fulfilled without pursuing an active spiritual life.	7	6	5	4	3	2	1
4. I find serenity by accepting things as they are.	7	6	5	4	3	2	1
5. I have a relationship with someone I can turn to for spiritual guidance.	7	6	5	4	3	2	1
6. Prayers so not really change what happens.	7	6	5	4	3	2	1
7. In times of despair, I can find little reason to hope.	7	6	5	4	3	2	1
8. I have a personal relationship with a power greater than myself.	7	6	5	4	3	2	1
9. I have had a spiritual experience that greatly changed my life.	7	6	5	4	3	2	1
10. When I help others, I expect nothing in return.	7	6	5	4	3	2	1
11. I don't take time to appreciate nature.	7	6	5	4	3	2	1
12. I have joy in my life because of my spirituality.	7	6	5	4	3	2	1
13. My relationship with a higher power helps me love others more completely.	7	6	5	4	3	2	1
14. Spiritual writings enrich my life.	7	6	5	4	3	2	1
15. I have experienced healing after prayer.	7	6	5	4	3	2	1
16. My spiritual understanding continues to grow.	7	6	5	4	3	2	1

17. I focus on what needs to be changed in me, not on what needs to be changed in others.	7	6	5	4	3	2	1
18. In difficult times, I am still grateful.	7	6	5	4	3	2	1
19. I have been through a time of suffering that led to spiritual growth.	7	6	5	4	3	2	1
20. I solve my problems without using spiritual resources.	7	6	5	4	3	2	1
21. I examine my actions to see if they reflect my values.	7	6	5	4	3	2	1

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Hatch, R. L., Burg, M. A., Naberhaus, D. S., & Hellmich, L. K. (2001). The Spiritual Involvement and Beliefs Scale – Revised. Unpublished test, University of Florida.

APPENDIX E: INSTITUTIONAL REVIEW BOARD APPROVAL

Oklahoma State University Institutional Review Board  
**Request for Determination of Non-Human Subject or Non-Research**

*Federal regulations and OSU policy require IRB review of all research involving human subjects. Some categories of research are difficult to discern as to whether they qualify as human subject research. Therefore, the IRB has established policies and procedures to assist in this determination.*

**1. Principal Investigator Information**

First Name: Peter	Middle Initial: C.	Last Name: Ciali
Department/Division: APPLIED HEALTH & EDUC PSYCHOLOGY		College: Graduate
Campus Address:		Zip+4:
Campus Phone:	Fax:	Email:
<b>Complete if PI does not have campus address:</b>		
Address: 17614 E. 46 St.		City: Tulsa
State: OK	Zip: 74134	Phone: (918) 286-6355

REC'D UPO  
AUG 29 2006

**2. Faculty Advisor (complete if PI is a student, resident, or fellow)  NA**

Faculty Advisor's name: Teresa Bear, Ph.D.	Title: AST PROF
Department/Division: APPLIED HEALTH & EDUC PSYCHOLOGY	College: Graduate
Campus Address: 2415 Main Hall OSU Tulsa	Zip+4: 74106
Campus Phone: (918) 594-8516 Fax:	Email: <a href="mailto:teresa.bear@okstate.edu">teresa.bear@okstate.edu</a>

**3. Study Information:**

A. Title

**A Two Part Investigation: Examining the Relationship between Spirituality and Posttraumatic Growth, and the Multidimensionality of Posttraumatic Growth**

B. Give a brief summary of the project. (See instructions for guidance)

I will be using archival data as part of my dissertation project. The purpose of my dissertation is to examine the relationship between posttraumatic growth (PTG) and spirituality, and more specifically to obtain a detailed analysis of possible relationships among underlying factors of PTG (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, Appreciation of Life) and spirituality (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight). A secondary goal of my dissertation is to reexamine the component structure of scores on the Posttraumatic Growth Inventory with a sample more diverse in age and gender from the original validation sample.

C. Describe the subject population/type of data/specimens to be studied. (See instructions for guidance)

**Archival Data** (including 1,087 adult members of Concerns of Police Survivors (COPS), a national, non-profit organization that offers emotional and moral support to spouses, parents, children, siblings, other family members, and others who are affected by police line-of-duty deaths).

Oklahoma State University Institutional Review Board  
**Request for Determination of Non-Human Subject or Non-Research**

4. **Determination of "Research".**

**45 CFR 46.102(d):** *Research* means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy whether or not they are conducted or supported under a program which is considered research for other purposes.

**One of the following must be "no" to qualify as "non-research":**

- A. Will the data/specimen(s) be obtained in a systematic manner?  
 No  Yes
- B. Will the intent of the data/specimen collection be for the purpose of contributing to generalizable knowledge (disseminating the knowledge obtained outside of Oklahoma State University, e.g., presentation or publication)?  
 No  Yes (for dissertation)

5. **Determination of "Human Subject".**

45 CFR 46.102(f): *Human subject* means a living individual about whom an investigator (whether professional or student) conducting research obtains: (1) data through intervention or interaction with the individual or (2) identifiable private information. Intervention includes both physical procedures by which data are gathered (for example venipuncture) and manipulations of the subject or the subject's environment that are performed for research purposes. Interaction includes communication or interpersonal contact between investigator and subject. Private information includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical record). Private information must be individually identifiable (i.e., the identity of the subject is or may be ascertained by the investigator or associated with the information) in order for obtaining the information to constitute research involving human subjects.


- A. Does the research involve obtaining information about living individuals?  
 No  Yes  
**If no, then research does not involve human subjects, no other information is required.**  
**If yes, proceed to the following questions.**

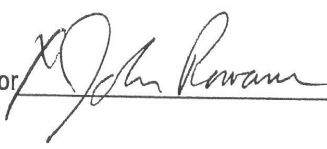
**All of the following must be "no" to qualify as "non-human subject":**

- B. Does the study involve intervention or interaction with a "human subject"?  
 No  Yes
- C. Does the study involve access to identifiable private information?  
 No  Yes
- D. Are data/specimens received by the Investigator with identifiable private information?  
 No  Yes
- E. Are the data/specimen(s) coded such that a link exists that could allow the data/specimen(s) to be re-identified?  
 No  Yes  
If "Yes," is there a written agreement that prohibits the PI and his/her staff access to the link?  
 No  Yes

Oklahoma State University Institutional Review Board  
**Request for Determination of Non-Human Subject or Non-Research**

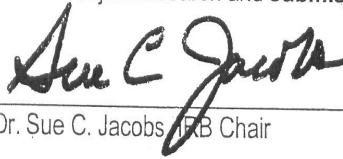
6. Signatures

Signature of PI  Date 7/23/06

Signature of Faculty Advisor  Date 8/28/06  
(If PI is a student)

Based on the information provided, the OSU-Stillwater IRB has determined that this research **does not** qualify a human subject research as defined in 45 CFR 46.102(d) and (f) and **is not subject to oversight by the OSU IRB.**

Based on the information provided, the OSU-Stillwater IRB has determined that this research **does** qualify as human subject research and **submission of an application for review by the IRB is required.**

  
Dr. Sue C. Jacobs IRB Chair

8/29/06  
Date



## VITA

Peter C. Ciali

Candidate for the Degree of

Doctor of Philosophy

Thesis: A TWO-PART INVESTIGATION: EXAMINING THE RELATIONSHIP BETWEEN SPIRITUALITY AND POSTTRAUMATIC GROWTH, AND THE MULTIDIMENSIONALITY OF POSTTRAUMATIC GROWTH

Major Field: Educational Psychology; Specialization area: Counseling Psychology

### Biographical:

Education: Received Bachelor of Arts degree in Psychology from Oral Roberts University, Tulsa, Oklahoma in 1991, and completed the requirements for the Master of Science with a major in Applied Behavioral Studies with a specialization in Community Counseling at Oklahoma State University, Stillwater, Oklahoma, 2000. Completed the requirements for the Doctor of Philosophy at Oklahoma State University in December, 2006.

Experience: 2005-present, Family Counselor, Family & Children's Services; 2004-2005, Psychology Intern, Sharp Mesa Vista (APA Accredited) San Diego, California; 2003-2004, Outpatient Counselor, Shadow Mountain Behavioral Health Services, Tulsa, Oklahoma; 2002-2003, Doctoral Practicum, Green Country Behavioral Health Services, Inc., Muskogee, Oklahoma; 2002-2004, Assistant Clinic Director, Counseling Psychology Clinic, Oklahoma State University, Tulsa, Oklahoma; 2001-2003; Graduate Assistant, Oklahoma State University, Tulsa, Oklahoma; 2001-2002, Doctoral Practicum, Youth Services of Tulsa, Tulsa, Oklahoma; 1999-2000, Master's Practicum, Day Spring Services of Oklahoma, Tulsa, Oklahoma; 1999-2003, CARS Counselor, Youth Services of Tulsa, Tulsa Oklahoma; 1998-1999, Home-Based Counselor, Day Spring Services of Oklahoma, Tulsa, Oklahoma; 1997-1998, Home-Based Counselor, Children's Medical Center, Tulsa, Oklahoma; 1996-1997, Family Focus Counselor/Case Manager, Therapeutic Interpretations, Sapulpa, Oklahoma, 1992-1996 Mental Health Technician, Shadow Mountain Hospital, Tulsa, Oklahoma.

Professional Memberships: American Psychological Association (APA), Graduate Student Affiliate; Division 17 (Counseling Psychology)

Name: Peter C. Ciali

Date of Degree: December, 2006

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: A TWO-PART INVESTIGATION: EXAMINING THE  
RELATIONSHIP BETWEEN SPIRITUALITY AND  
POSTTRAUMATIC GROWTH AND THE MULTIDIMENSIONALITY  
OF POSTTRAUMATIC GROWTH

Pages in Study: 120

Candidate for the Degree of Doctor of Philosophy

Major Field: Educational Psychology with and emphasis in Counseling Psychology

Scope and Method of Study: Posttraumatic growth explains the positive changes that may occur when an individual struggles with a major loss or trauma. Utilizing archival data, the primary purpose of this study was to reexamine the component structure of scores of the Posttraumatic Growth Inventory (PTGI), with a larger sample that was more diverse in age, from Tedeschi and Calhoun's (1996) original validation study. Participants included 1,087 survivors of law enforcement officers who have been killed in the line of duty. The participants were originally recruited through their membership in the national organization of Concerns of Police Survivors (COPS). A second goal of this study was to determine the component structure of scores of the Spiritual Involvement and Beliefs Scale-Revised (SIBS-R; Hatch et al., 2001) with this study's current sample. The final goal of this study was to determine the relationship between each measure in the study, and more specifically to obtain a more in-depth analysis of possible relationships among the underlying factors of PTG (Relating to Others, New Possibilities, Personal Strength, Spiritual Change, Appreciation of Life) and spirituality (Core Spirituality, Spiritual Perspective/Existential, Personal Application/Humility, Acceptance/Insight).

Findings and Conclusions: A forced, five-factor principal component analysis (PCA) revealed a four-factor solution for the 21-item PTGI. Furthermore, a forced, four-factor PCA found a three-factor solution for the SIBS-R. However, after examining each instrument with more conservative factor retention criteria (i.e., Scree plot test), the decision was to interpret a one-factor solution for both the PTGI and SIBS-R. Consequently, a Pearson correlation analysis was performed to measure the relationship between the overall constructs of spirituality and posttraumatic growth. Results from the Pearson correlation analysis found that individuals with more well developed, or stronger spiritual beliefs and practices, did evidence significantly more posttraumatic growth than individuals with less developed spiritual beliefs and practices. The relationship between spirituality and posttraumatic growth was found to be positive, and significant ( $r = .364, p < .01$ ). Implications for future research are discussed.

ADVISOR'S APPROVAL: John Romans, Ph.D.

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