

The Measure of Posttraumatic Growth:

*An evaluation of the factor structure of the Posttraumatic Growth Inventory
in a South African sample*

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of the requirements for the Masters in Community-based Counselling Psychology
in the Faculty of Humanities, University of the Witwatersrand, Johannesburg.*

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*“What is emerging in the current century is a growing
recognition and appreciation of the resilience of the human
spirit, despite the impact of major catastrophes...”*

(Weiss & Berger, 2012, p.iv)

Abstract

More than a decade of research has indicated that individuals who have experienced traumatic events may report positive psychological changes as a result of their struggle to cope with the impact of the event. This cluster of changes has been labelled posttraumatic growth (PTG). Several measurement instruments have been developed to quantify such growth, one of the most widely used being the Posttraumatic Growth Inventory (PTGI) developed by Tedeschi and Calhoun (1996). The objective of the present study was to conduct a confirmatory factor analysis (CFA) of the PTGI on data yielded by a South African sample, to determine if the hypothesised factor structure showed appropriate fit in this context. Analyses were performed with three hypothesised models: the five factor model, the three factor model and the model of posttraumatic growth as a unitary factor. Whilst the results of the CFA did not provide overt support for the adequate fit of the models tested, it did yield a profile of PTG in the South African sample that is similar to that of samples from other countries of origin. The findings implied that the factorial validity of the PTGI is unclear and the inventory may require modification for use in the South African context. This highlighted the need for further investigation in order to provide a comprehensive exploration of the PTGI and its applicability in this context. This is in line with the current focus on the socio-cultural and contextual elements that may influence the perception of PTG.

Keywords: *posttraumatic growth, the Posttraumatic Growth Inventory, factor analysis, South African context*

1. The Concept of Posttraumatic Growth

1.1.Introduction

Not many individuals go through life untouched by suffering or adversity. It is estimated that 75% of all people experience some form of traumatic experience in their life, be it the loss of a loved one, accident, injury or illness, financial hardship and/or family troubles (Joseph, 2011). In turn, these experiences can result in a range of reactions. Exposure to traumatic or highly stressful life events may be associated with intense psychological distress and severe posttraumatic stress symptoms for many individuals. These traumatic stress reactions may be temporary or enduring (Bisson, 2007). Early studies focussed almost exclusively on the investigation of trauma, traumatic stress, posttraumatic stress disorder (PTSD) and coping with such negative after-effects (DSM-III, 1980). A paradigm shift to positive psychology strengthened the focus on eudemonic elements of well-being in all aspects of life, including trauma, in the latter part of the twentieth century (Joseph, 2011). Alongside the investigation of resilience and related coping abilities, researchers began to systematically examine the positive consequences of traumatic experiences (Joseph, Williams & Yule, 1993; Tedeschi & Calhoun, 1996). The study of posttraumatic growth has gained recognition over the past twenty years and is the subject of much scrutiny and debate – particularly with regard to the validity of perceptions of growth. Growth as a result of adversity is not a modern concept, as growth out of suffering has been observed and recorded since ancient times; rather, it is the quantitative and qualitative evaluation of the concept that is modern in its origin (Weiss & Berger, 2010). Furthermore, the majority of measurement instruments were conceptualised and developed in westernised, English-speaking populations (Weiss & Berger, 2010). This is

currently in flux, as research in countries across the globe has begun to focus on the contextualised understanding of posttraumatic growth.

For the purposes of this study, the focus will be the measurement of posttraumatic growth (PTG) by means of the Posttraumatic Growth Inventory (PTGI). The PTGI will be evaluated in terms of its factor structure as an applied measure of posttraumatic growth for individuals in the South African context. Contemporary research has begun to examine the impact of socio-cultural elements and of contextual characteristics on PTG, and in particular, how the cultural context shapes the perception of personal growth post-trauma (Weiss & Berger, 2010). It is likely that the outcome of exposure to trauma is influenced by the context in which the individual experiences the trauma. This may include the level of exposure of the individual to trauma, such as multiple traumatisations. Furthermore, given that several studies have examined posttraumatic growth in the South African context (for e.g., Moeti, 2010; Peltzer, 2000; Polatinsky & Esprey, 2000; Roe-Berning, 2009; Schmidt-Ehmcke, 2008; Walsh, 2011), it is vital to establish the usefulness of the PTGI as a measure of the construct within the South African setting.

1.2.Rationale

During the mid 1990's, the possibility of positive psychological growth after the experience of a traumatic life event became the focus of dedicated research and investigation (Tedeschi & Calhoun, 2004). Posttraumatic growth (PTG) was operationalised as the positive psychological and emotional changes experienced by individuals in the aftermath of a traumatic or highly stressful life event (Tedeschi & Calhoun, 2004). Reports of PTG have been established in diverse samples from many different countries of origin (Calhoun &

Tedeschi, 2006). Whilst the perception of PTG may not be unique to a westernised cultural worldview, it has been suggested that the manner in which PTG is manifested is shaped by elements of the socio-cultural setting (Calhoun, Cann & Tedeschi, 2010; Calhoun & Tedeschi, 2006). A few models of PTG have emerged from the burgeoning research to account for the process of how individuals' perceive growth through adversity. In addition, several measurement instruments were developed to quantify positive changes and PTG. The Posttraumatic Growth Inventory (PTGI) was developed by Tedeschi and Calhoun (1996) to quantitatively evaluate individuals' reports of psychological growth after their experience of a traumatic event. The PTGI is the most widely used measure of PTG to date (Brunet, McDonough, Hadd, Crocker & Sabiston, 2010; Lee, Luxton, Reger & Gahm, 2010). The measure assesses five domains of growth and its developers sought to encompass the quality of personal transformation that distinguished PTG from other similar concepts, such as resilience and hardiness (Tedeschi & Calhoun, 2004). Since Tedeschi and Calhoun (1996) developed their inventory and model of posttraumatic growth, research and practice in the arena of PTG and related concepts has gained momentum. Into the late 1990's and beyond, the evidence base for PTG has literally exploded and the construct has been widely examined from several angles. Studies have investigated the correlates and predictors of PTG, and also examined the validity and reliability of the measurement tools used to quantify PTG (Linley & Joseph, 2004). Whilst there is a substantial amount of supportive evidence in favour of the perception of PTG, it cannot be assumed to be a universal experience (Calhoun & Tedeschi, 2006). Further, the perception of PTG may not be valid across all settings and populations (Splevins, Cohen, Bowley & Joseph, 2010). The possibility exists that the conceptual framework of PTG is dependent on core elements of the growth experience that may be applicable to a wide range of samples from different contexts (Calhoun & Tedeschi, 2006). However, this requires additional empirical investigation and support. Within the field of

PTG, there are two fundamental debates that impact on the exploration of the construct of PTG:

- Firstly, the question of whether reports of growth after traumatic experiences represent actual psychological growth and change, or simply the illusion of personal change in the form of a recall bias, temporary coping strategy or distress tolerance (Frazier, Tennen, Gavian et. al, 2009b; Zoellner & Maercker, 2006);
- Secondly, and critically, that of the validity of existing measures of PTG given the specific characteristics of the measurement instruments, the theoretical formulation of the concept of PTG and the elements of PTG measured (Frazier et. al, 2009b).

The present study does not seek to corroborate individuals' reports of growth or to test the premise that growth is illusory as opposed to authentic. It is focussed on the most commonly used measurement instrument, that of the PTGI and the underlying factor structure of PTG that may be considered to be most useful for the South African context. Therefore, the study fits under the umbrella of the second critical debate in the field, that of the validity of the PTGI when used with a South African population. It is useful to bear in mind that reports of PTG within this study are accepted as valid and meaningful indicators of positive psychological changes for the individuals involved, but this may require further critical examination and debate.

1.3.The Aims of this study

As stated, this research aims to investigate the factor structure the PTGI as used within a South African sample exposed to a variety of stressful life events. Samples consisting of South African individuals have reported posttraumatic growth after a range of traumatic

experiences (Polatinsky & Esprey, 2000; Roe-Berning, 2009; Schmidt-Ehmcke, 2008; Walsh, 2011). However, the possibility that PTG may differ as a function of the number of reported trauma exposures has also been identified (Walsh, 2011). Within the Walsh undergraduate sample, the majority of individuals had experienced an average of at least two traumatic events. Reported traumatic events were classified in a broad manner, informed both by the criteria stipulated by the DSM-IV-TR (APA, 2000) and the understanding of trauma that underpinned Tedeschi and Calhoun's (1996) study. The results of Walsh's (2011) study indicated a high exposure to trauma amongst individuals in the South African sample. It suggested that that exposure to multiple traumatic events in this setting may have become normative to a certain extent and even characteristic of the average individual in the South African context. It is thus necessary to assess posttraumatic growth and the usefulness of the measurement instrument most commonly used to quantify growth, in order to evaluate whether it is applicable to a South African sample.

The broad social and physical context can be understood to have a significant impact on the individual's perception of growth. The available statistics indicate a high incidence of traumatic events such as crime, violence, torture, road accidents, of physical abuse, sexual abuse and/or rape, and of stressful life events such as poverty and chronic or acute life-threatening illnesses, for individuals in the South African context (Edwards, 2005; Kaminer & Eagle, 2010; Williams, Williams, Stein, Seedat, Jackson & Moomal, 2007). The impact of trauma is typically felt by individuals of all ages and across all sectors of South African communities; to the extent that the context is regarded as an 'ongoing traumatising environment' (Edwards, 2005). Evidence has indicated the link between such prevalence of trauma and post-traumatic stress, to the extent that PTSD is a potential public health concern (Edwards, 2005). Edwards (2005) has argued that the consequences of exposure to traumatic

events constitute a significant public health issue due to the large number of South African adults and children exposed to trauma on a chronic basis, the small number of same who have access to psychological and other forms of assistance, and the emotional and behavioural problems associated with posttraumatic stress that have a severe, often destructive impact on work and relationships with families and partners. Given the high rate of exposure to trauma and high levels of stress for individuals in this setting, it may be that greater exposure to trauma may have an impact on the individual's processing of the events and ability to derive meaning and perceive PTG during the coping process. Thus, PTG as a concept and as a process may have considerable value in terms of treatment and recovery, aiding therapists, counsellors and friends and family who offer social and emotional support to individuals who have been exposed to traumatic and highly stressful life events, and influence the manner in which individuals are able to assist these victims and survivors in their coping process.

“Inherent in PTG is the idea that individuals experiencing a traumatic event will grow beyond their pre-diagnostic levels of functioning.”

(Brunet, McDonough, Hadd, Crocker & Sabiston, 2010, p.831)

2. Literature Review

2.1.The Definition of Posttraumatic Growth

In their seminal article, Tedeschi and Calhoun (1996) defined PTG as the “group of specific positive changes across five domains involving the self, interpersonal relationships, and philosophy of life that occur in response to extremely negative experiences” (p. 215). The authors later refined their definition of PTG to incorporate the positive psychological changes that are experienced by the individual as a result of their struggle with a highly stressful life event (Tedeschi & Calhoun, 2004). Zoellner and Maercker (2006), in their Janus-face model of growth, defined PTG as “the subjective experience of positive psychological change as reported by an individual as a result of the struggle with trauma” (p. 628). PTG is thus conceptualised as a cluster of self-reported changes that are subjectively experienced by individuals and attributed to their traumatic experience. The experience of a highly stressful or traumatic life event is a precondition for the perception of growth (Tedeschi & Calhoun, 2004). Moreover, PTG is inextricably part of the struggle with coping and processing of the traumatic experience and its impact. Whilst the emphasis is typically on growth after a traumatic incident, recent studies have used the PTGI to examine growth after more positive, albeit challenging events, such as motherhood and the experience of graduate study at university or college (Anderson & Lopez-Baez, 2012; Taubman Ben-Ari, Findler & Sharon, 2011).

Several labels have been given to the concept of positive psychological growth after the experience of traumatic events: perceived benefits (McMillen, Smith & Fisher, 1997), benefit-finding (Tomich & Helgeson, 2004), stress-related growth (Park, Cohen & Murch, 1996),

adversarial growth (Linley & Joseph, 2004) and PTG (Tedeschi & Calhoun, 1996). Despite the sometimes interchangeable labels, there appears to be a measure of overlap between these concepts (Tedeschi & Calhoun, 1996). Common to all the concepts is the individual's self-reported experience of positive psychological growth after their exposure to traumatic or highly stressful life events (McMillen et al, 1997).

Psychological trauma can be defined as the damage or injury caused by the individuals experience of a range of different events: events such as abuse (sexual, physical, and emotional), war, illness, drug addiction, loss of a loved one, natural disasters and terrorism, inter alia (Kastenmüller, Greitemeyer, Epp, Frey & Fischer, 2012). This includes witnessing the event and being the victim or survivor of such an experience. Within the framework of PTG, the term 'traumatic event' is often used in a broader and more inclusive manner than the events determined by the criteria for a traumatic event in the DSM-IV-TR (APA, 2000) (Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). Tedeschi and Calhoun (2004) conceived of the stressful event as any experience or set of circumstances that significantly disrupts and challenges the individual's coping resources and belief systems. The experience of highly stressful life events and trauma typically leads to psychological distress and upsetting emotional responses for the individual (Calhoun et al, 2010; Calhoun & Tedeschi, 2006). The study of PTG does not discount the negative consequences of trauma but rather, highlights the beneficial outcomes of the traumatic experience that arise amidst the pain and suffering. PTG is believed to emerge from the individual's attempts to cope with the traumatic event, with their emotional, often distressing reactions to it, and with the impact it has had on their life (Tedeschi & Calhoun, 2004).

2.2.Evidence for PTG

Studies have examined PTG in samples that have experienced a diverse range of traumatic events and found that many individuals have reported psychological growth after their experience of event types (Linley & Joseph, 2004). These traumatic events have included:

- life threatening illness, HIV/AIDS and cancer (Bellizi et al., 2009; Brunet et al., 2010; Cheng, Wong & Tsang, 2006; Cordova, Giese-Davis, Golant, Kronenwetter, Chang Spiegel, 2007; Lechner, Antoni, Carver, Weaver, & Phillips, 2006; Morrill et al., 2008; Ransom, Sheldon & Jacobsen, 2008);
- interpersonal, community and criminal violence (Cobb, Tedeschi, Calhoun & Cann, 2006; Connor, Davidson, & Lee, 2003; Kleim & Ehlers, 2009);
- rape, sexual assault and sexual abuse (Frazier, Conlon & Glaser, 2001; Frazier, Tashiro, Berman, Steger & Long, 2004; Kunst, Winkel & Bogaerts, 2010; Updegraff & Marshall, 2005);
- war, terrorism and combat (Linley, Joseph, Cooper, Harris & Meyer, 2003; Maercker & Herrle, 2003; Powell, Rosner, Butollo, Tedeschi & Calhoun, 2003; Swickert, Hittner, DeRoma & Saylor, 2006);
- bereavement and loss (Engelkemeyer & Marwit, 2008; Polatinsky & Esprey, 2000; Znoj, 2006);
- natural and manmade disasters (Cryder, Kilmer, Tedeschi & Calhoun, 2006; McMillen et al, 1997);
- motor vehicle and transport accidents (Rabe, Maercker, Zoellner & Karl, 2006; Salter & Stallard, 2004); and
- personal or vicarious exposure to terrorism (Linley, Joseph, Cooper, Harris & Meyer, 2003), inter alia.

Individuals who have reported PTG typically belong to different socioeconomic classes, gender roles, age groups and occupational roles – from soldiers to college students to counsellors, adults and children, men and women, and from those who have had direct experience to those who have had indirect experience of trauma or stressful life events (Linley & Joseph, 2004; Zoellner & Maercker, 2006). These individuals have all experienced some form or type of traumatic event, and they have reported beneficial or positive changes in their lives after their struggle to cope with the event/s (Tedeschi & Calhoun, 2004).

In many of the samples, the events reported by participants have been self-reported and may not have been classified as a traumatic event according to the criteria stipulated by the DSM-IV-TR (APA, 2000), as the tendency in studies has been to use the concept of trauma more inclusively. According to the DSM-IV-TR (APA, 2000), an extreme traumatic stressor involves the direct personal experience of an event that involves actual or threatened death or serious injury, or threat to physical integrity, or the witnessing of such an event, or learning that a significant other has experienced such an event. A recent study specifically evaluated PTG as reported by individuals exposed to traumatic events that conformed to the DSM-IV-TR criteria, and the mean PTG score was reported to be low in comparison to other student samples (Osei-Bonsu, Weaver, Eisen, & Vander Wal, 2012). The authors noted that while an average of two traumatic events were reported by individuals, levels of distress associated with the events were low. Research in the South African context has followed the international trends and showed evidence of PTG in samples exposed to trauma. The reported mean PTGI scores have ranged from $M = 40.3 - 62.5$ (Peltzer, 2000; Polatinsky & Esprey, 2000; Roe-Berning, 2009; Schmidt-Ehmcke, 2008; Walsh, 2011), whilst international studies have yielded mean PTGI scores in the range of $M = 67.77 - 83.16$ (Powell et al., 2003). This may suggest that reported rates of PTG may be lower, on average, in South Africa.

2.3.The Theoretical Model of PTG

2.3.1. An Introduction to the Tedeschi and Calhoun (2004) Model of PTG

The Tedeschi and Calhoun (2004) model is the most comprehensive conceptual model of PTG and was developed in tandem with the Posttraumatic Growth Inventory. It has been described as a functional, mostly descriptive model of PTG as an outcome variable (Zoellner & Maercker, 2006), and is located within the social-cognitive framework. In this model, the psychological impact of the traumatic event is understood to ‘shatter’ or devastate the individual’s core set of assumptions about their world, themselves and their place in it (Tedeschi & Calhoun, 2004). The impact of the traumatic event is compared to the seismic impact of an earthquake (Tedeschi & Calhoun, 2004). Alongside the often overwhelming physical and emotional aspects of trauma – shock, distress, helplessness, fear, pain and/or grief, the individual’s cognitive schematic structures have been challenged and invalidated (Janoff-Bulman, 2004). The individual’s core assumptions under consideration include their beliefs, ideas and goals that combined together form the individual’s assumptive world (Janoff-Bulman, 2004). These relate to the self, the world and their place in their world, and include such fundamental beliefs that the world is a sustaining, secure place and that the individual is invulnerable to trauma or harm, for example – the assumptive world thus encompasses the core beliefs that constitute the individual’s guiding cognitive schema (Janoff-Bulman, 2004). In the process of coping with the emotional aftermath of the trauma, and in the process of rebuilding their assumptive world, individuals perceive that personal change has occurred in several areas of their lives.

The model of PTG is based on the assumption that cognitive processing is the catalyst for the experience of PTG. Cognitive processing occurs in the form of rumination about the traumatic event and the impact it has had on the individual's world, largely during the coping process (Tedeschi & Calhoun, 2004). This includes the recognition of positive aspects of the self and others, and the strengthening of beliefs, attitudes and relationships (Morris, Shakespeare-Finch, Rieck & Newbery, 2005). These aspects of positive personal growth appear to take place in multiple areas of the individuals' life and this underpins the view of PTG as multidimensional in nature (Morris et al., 2005).

Three broad dimensions of psychological growth were identified by Tedeschi and Calhoun (2004) in their model:

- Changes in perceptions of the self,
- Changes in interpersonal relationships, and
- Changes in life priorities or philosophy.

These dimensions represent the clusters of growth responses most commonly reported by individuals (Calhoun & Tedeschi, 2006). Central to PTG is the individual's perception of the impact of the trauma. The event or life experience must be sufficiently severe or challenging to invalidate and call into question the individual's core beliefs, and to have an emotional and psychological impact (Tedeschi & Calhoun, 2004). In fact, the perception of PTG is founded on a key paradox in that the individual's recognises positive psychological growth in the face of an increased awareness of their personal vulnerability and distress (Tedeschi & Calhoun, 2004). PTG is thus the positive outcome of an experiential and emotional process of coping in the aftermath of a stressful life event and is an individualised, subjective experience of growth. The individual's perception of the severity of the event and its impact is therefore critical to understanding their growth.

Several variables are assumed to influence the process of PTG. These variables include the individual's personality and character pre-trauma (including the individual's specific characteristics, personality attributes and coping styles), the social context within which the individual experiences the trauma and recovery process, the individual's cognitive processing of the impact of the event, and the individual's assimilation of the experience into their world view – referred to as the life narrative (Tedeschi & Calhoun, 2004). Other variables include social support, personality characteristics, coping styles, engagement in cognitive appraisal and cognitive processing (Linley & Joseph, 2004). The model also takes into account the traumatic event, including severity and time since the event, and the socio-cultural context within which the individual functions and lives. A diagram of the model is represented in Figure 1.

Calhoun, Cann and Tedeschi (2010) revised the model of PTG to reflect the latest understanding of the concept – on the basis of new findings that had shaped contemporary knowledge of the processes involved in PTG. This revised, more detailed model is reproduced in Figure 2. In particular the role of rumination is elaborated and the proximate and distal socio-cultural factors that may influence PTG are included. The authors, among others, have begun to consider, in depth, the socio-cultural elements that may play a role in the development of PTG (Calhoun et al, 2010; Tedeschi & Calhoun, 2004; Weiss & Berger, 2010). This area has received a great deal of attention in recent years, with specific reference to samples from diverse socio-cultural contexts with varying levels of trauma exposure, and the potential factors that influence the process of PTG.

2.3.2. *Key Factors in the process of PTG*

Within the model, PTG is assumed to follow a common pathway for most individuals. In the conceptualisation of PTG, the individual has certain pre-trauma characteristics, such as age, gender, social status, life experience and personality traits that may have an impact on their coping with the traumatic event. The individual's characteristics play a vital role in the process of PTG – especially coping processes that individuals may use to deal with the traumatic event (Mystakidou, Tsilika, Parpa, Kyriakopoulos, Malamos & Damigos, 2008). These have included acceptance coping, re-evaluation of the meaning of the stressor, revision of priorities, relationships, and views of the self that constitute PTG, positive reinterpretation, and active coping, some of which have been associated with reports of higher levels of PTG in samples (Mystakidou et al., 2008).

Tedeschi and Calhoun (2004) conceptualised PTG as both a coping process and the outcome or product of the individual's emotional and cognitive struggle with the impact that the traumatic event has had on their life. When measured by the PTGI, PTG is conceived of as an outcome of an ongoing and often complex process (Tedeschi & Calhoun, 2004). Thus reports of PTG are the culmination of the process of making meaning and cognitive processing during which individuals have restructured and restored their shattered assumptions, beliefs and goals (Park & Helgeson, 2006). However, PTG is viewed as an ongoing process that may lead to fundamental changes in the individual's sense of self and identity, and "In this context, PTG is assumed to be a constructive component which is strengthened over time, the process being more accommodative than assimilative" (Kastenmüller et al, 2012, p.479). Much of the early research into the consequences of trauma focussed on the negative sequelae of exposure and on deficit-based models of coping (Hagenaars & van Minnen, 2010). The paradigm of

positive psychology has shifted this focus into a more balanced approach that is argued to be complementary to the understanding of PTSD and trauma, and to the treatment protocols of those individuals exposed to traumatic events (Hagenaars & van Minnen, 2010).

A key challenge within the field is that the process of PTG is extensively researched, but not explicitly understood as it is a complex and often individualised process. This is especially relevant in terms of the association between growth and distress, and the clinical utility of PTG. The experience of psychological distress is a necessary condition for the perception of PTG to occur. Emotional distress is believed to prompt the individual to reformulate his or her worldview in light of their experience and to restructure the assumptive world. As a result, PTG is assumed to develop after the primary resolution of the trauma (Tedeschi & Calhoun, 2004). However, the individual's perception of psychological growth does not prevent nor lessen any negative after effects of trauma, for it is out of the distress and processing of the impact that PTG is believed to arise. Therefore, PTG and psychological distress are deemed to co-exist (Tedeschi & Calhoun, 2004). In contrast, PTSD and PTG can be viewed as mutually exclusive reactions to trauma that may represent the adaptive and maladaptive forms of coping after the experience of a traumatic event (Hagenaars & van Minnen, 2010; Zoellner & Maercker, 2006).

This complex interplay between PTG and psychological distress may further explain the ambiguous and often contradictory research evidence that has shown both positive associations between PTG and posttraumatic stress, as well as negative associations between the outcomes, or even none at all (Hagenaars & van Minnen, 2010; Weiss & Berger, 2010). Some evidence has indicated that participants who reported growth were less likely to develop PTSD (Frazier et al., 2001; McMillen et al., 1997). Others have suggested that the

relationship between PTG and indicators of distress is curvilinear: that is, those who report low scores of PTG and those who report high levels of PTG have been found to be less likely to develop symptoms of PTSD or distress than those individuals who report moderate levels of PTG (Kleim & Ehlers, 2009; Lechner et al., 2006). The relationship between PTG and PTSD is complex and therefore most likely to be highly influenced by population and contextual variables as well as the course of time (Hagenaars & van Minnen, 2010).

PTG is also differentiated from normal maturational processes and personal developmental growth – it is specific to the experience of an extreme event and thus termed ‘posttraumatic’ (Kastenmüller et al., 2012; Tedeschi & Calhoun, 2004). PTG is distinguished from the concepts of resilience and sense of coherence in that the individual who has reported PTG is viewed as having surpassed their previous level of psychological functioning and awareness, to a level of psychological growth that is beyond their pre-trauma level of functioning and has included the ability to acknowledge the positive changes or benefits (Zoellner & Maercker, 2006). These changes may include developments in personal values and beliefs, enhanced relationships, new life goals, and a new sense of meaning in life (Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). In effect, PTG represents the cluster of changes and the overall effect of these perceived changes as reported by the individual, but the level of changes across domains may vary for individuals. Within the model of PTG, Tedeschi and Calhoun (2004) have sought to account for the cluster of changes most likely to be common to individuals who have experienced a traumatic event, and to highlight the individual, environmental and event-related variables that may have an impact on the process of growth post-trauma. Despite some lack of clarity with regard to specific components, it is a comprehensive and theoretically sound model that seeks to illuminate the process of and the pathways to PTG.

2.4.Key Factors in the Process of PTG

Subsequent research has sought to support or refute many of the elements of PTG within the model, particularly with reference to the elements of cognitive processing, emotions and pre-trauma personality variables (Peterson, Park, Pole, D'Andrea & Seligman, 2008; Taku, Cann, Tedeschi & Calhoun, 2009a; Zoellner & Maercker, 2006, *inter alia*). Several variables appear to be critical in the process of personal growth after trauma. These factors shall be briefly reviewed in order to provide a framework for understanding PTG, specifically with reference to PTG as reported by a South African sample.

2.4.1. Type of Event

It is theorised that the type of traumatic event experienced is not fundamental to process of PTG. Rather, the subjective experience of the event, and the subjectively experienced characteristics of the event, such as the feelings of helplessness, controllability, perceived threat, are believed to have a greater impact on PTG than the specific type of event (Linley & Joseph, 2004). That is, any traumatic event can lead to PTG. To some extent, it is suggested that the process of PTG is the same for all event types. To be clear, the type of traumatic event is presumed to have some impact on PTG. However, beyond the type of the event, it is the individual's struggle to cope and rebuild their assumptive world in the aftermath of the trauma that is considered critical for PTG (Tedeschi & Calhoun, 2004). Within the model, the impact of the event must be associated with sufficient distress to challenge the individual's core beliefs necessary for growth to arise. The disruption of the assumptive world is the principal factor of importance (Calhoun et al, 2010). It has been established that the greater the

perceived threat and the greater the severity of the event, the higher the levels of reported PTG (Linley & Joseph, 2004; Morris et al., 2005). PTG is believed to arise in the aftermath of highly distressing events – for it is the traumatic nature of the event that has prompted the cognitive processing that underpins the perception of PTG. This aspect of the model is the most open to variability, as it is difficult to define and to measure the assumptive world in retrospect, and to obtain pre-trauma measures, as the stressful event is by its nature unpredictable and unplanned (Morris et al., 2005). However, as Joseph (2011) has indicated: “trauma encompasses a landscape of human experience much wider than PTSD alone” (p. xv).

Current studies have focussed on the centrality of event, the degree to which the trauma has become a reference point and a core component of the individual’s identity and life experience (Groleau, Calhoun, Cann & Tedeschi, 2012). The centrality of the event has been linked to depression and PTSD, and also found to make a small but unique contribution to both distress and PTG (Groleau et al., 2012). It is evident from the literature that the experience of the traumatic event is the catalyst for the perception of growth, the trigger for the coping process and the cause of distress within the individual and must be considered when examining levels of PTG.

2.4.2. Emotional distress and PTSD

Research has documented a wide range of associations between PTG and psychological distress (Linley & Joseph, 2004). Some scholars have argued that PTG and psychological distress co-exist as mutual states of psychological well-being, rather than the opposite ends of a continuum of well-being (Linley & Joseph, 2004; Morris et al., 2005; Zoellner & Maercker,

2006). In line with this conceptualisation of PTG and distress as mutually exclusive, PTG is not considered to be the result of the resolution of distress, nor is it considered to be the mechanism to overcome posttraumatic stress symptoms (Tedeschi & Calhoun, 2004). The alleviation of distress may not be related to the development of PTG for some individuals (Linley & Joseph, 2004). Some have suggested that posttraumatic stress is the ‘engine’ of the transformative process that results in PTG (Joseph, 2011). The co-occurrence of PTG and emotional distress in many studies is often given as confirmation that PTG is an example of a self-presentation bias or illusory change as opposed to genuine growth (Frazier, Tennen, Gavian, Park, Tomich & Tashiro, 2009b; Helgeson, Tomich & Reynolds, 2006). These findings have implications for the clinical utility of the concept of PTG. The predictive value of PTG in terms of the treatment process and treatment outcome has not received much attention, until recent years when the concept was explicitly introduced in therapeutic settings (Fazio, 2009; Hagenaars & van Minnen, 2010; Tedeschi, 2011).

2.4.3. Severity of Event

A fundamental concern for researchers is that the perceived impact of the traumatic event for the individual is largely subjective (Wortman, 2004). As noted, the individual’s appraisal of the traumatic event is essential. The individual’s perceptions of the event and the impact that it has had on their life determines the degree to which they experience the event as traumatic (Morris et al., 2005).

Subjective ratings of the severity of the traumatic event, and perceptions of threat, have most often predicted PTG to a greater extent than objective ratings of the trauma severity and threat (Helgeson et al., 2006; Park & Helgeson, 2006). Thus, the experience of the traumatic event

has an impact on the individual's assumptive world and it is their assessment of the change and the means by which they have restructured their assumptive world, that is central to PTG. The focus is largely on the unique individual and their thought processes with regard to the event. The difficulty is the quantification of the subjective process along with the variables that contribute to growth.

2.4.4. Time since the Event

As PTG is conceived of as both a process and an outcome, time since the event is a key factor to be considered. Cognitive processing is central to the process of PTG, and this may take time to emerge and may also change in form over time (Tedeschi & Calhoun, 2004). In general, evidence has suggested that the greater the amount of time since the experience of the traumatic event, the higher the levels of PTG reported by individuals (Linley & Joseph, 2004; Morris et al., 2005). The greatest variability in reports of PTG has been established from the period of two weeks to two months after the traumatic event (Wortman, 2004). When assessed longitudinally, reports of PTG have been established as relatively stable over time and for extended periods of up to 8 years after the event (Affleck, Tennen, Croog & Levine, 1987; Linley & Joseph, 2004). PTG has even been reported more than 50 years after a traumatic event (Maercker & Herrle, 2003). Moreover, time since the traumatic event has emerged as a predictor of positive outcomes in that PTG is more likely to be related to positive affect and well-being and less depression when two or more years have elapsed since the traumatic event (Helgeson et al., 2006; Morris et al., 2005). Time since the trauma may be a valuable component in the process through which an individual perceives PTG. It is also possible that different domains of PTG, the core domains of positive changes related to the self, to the interpersonal relations and to philosophy of life, may develop at different time

periods after exposure to trauma, and that this may potentially influence the other domains of PTG, and thus the factor scores of PTG (Morris et al., 2005). In other words, PTG cannot be assumed to occur in the five domains at the same time or at all (Taku, Cann, Calhoun & Tedeschi, 2008). However, it is generally accepted that the more the individual engages in deliberate rumination and in processing of the trauma in order to construct a new assumptive world and to make sense of their experience, the more likely they are to report PTG (Taku et al., 2008). Thus, time to engage in such cognitive processing, and the emotional and supportive space to allow for this may be critical for the process of growth post-trauma.

2.4.5. Gender and Age

Women have typically reported report higher levels of psychological growth after exposure to trauma than males in research studies (Brunet et al., 2010; Linley & Joseph, 2004; Swickert & Hittner, 2009; Weiss, 2004). This was confirmed by small to moderate effect sizes in two meta-analytic studies of PTG (Helgeson et al., 2006; Vishnevsky, Cann, Calhoun, Tedeschi & Demakis, 2010). However, the results of some studies have been mixed or unclear (for e.g. Powell et al., 2003; Shakespeare-Finch & Enders, 2008). Kleim and Ehlers (2009) indicated that their predominantly male sample of assault survivors reported fewer positives changes, and suggested that gender may have accounted for this. Gender has emerged as significantly correlated with both social-support coping and PTG, and the presence of social support was established to be a key mediating variable in the relationship between gender and PTG (Swickert & Hittner, 2009). It has been suggested that women may be better able to make use of emotion focused coping strategies, more able to find and derive benefit from social support, and more likely to engage in discussion and cognitive processing that is essential for PTG (Wortman, 2004). However, more severe events and greater subjective perceptions of

stress are also linked to higher levels of PTG, and women tend to more frequently report symptoms of posttraumatic stress, emotional distress and acute responses to trauma - therefore, it may be that women are more predisposed to the type of cognitive and emotional processing that is essential to PTG (Vishnevsky et al, 2010). These differences were also established across measures of PTG, suggesting that this result was not merely a result of the inventory used. Of note, the researchers found that women reported incrementally more growth as the mean age of the sample increased, when compared to men (Vishnevsky et al, 2010).

Age is also a variable of interest in the study of PTG. In some samples, younger participants reported higher levels of PTG but this has not been consistently replicated (Linley & Joseph, 2004; Walsh, 2011). Some studies reported mixed evidence for an age effect (Morris et al., 2005; Shakespeare-Finch & Enders, 2008). In the Brunet et al. (2010) study of breast cancer survivors, age was significantly related to PTG in that older women were more likely to report higher scores of PTG. Therefore, gender and age may be variables of interest in the study of PTG, particularly in terms of the relationship of PTG to the demographic characteristics of the sample.

2.4.6. Socio-cultural Elements and influences

As PTG is typically assessed by means of self-report questionnaires such as the PTGI, many critics have suggested that these reports are not valid and do not reflect actual growth (Frazier & Kaler, 2006). Questions that probe trauma-related exposure may trigger participants thought processes of endurance, and encourage them to frame their response in accordance with a predominant cultural script for dealing with trauma or victimization and its

consequences (Peterson et al., 2008). It has been noted that “victims may emphasize silver linings in their lives because they believe that they should do so, whether these actually exist or not” (Peterson et al., 2008, p. 214). In particular, Bellizzi et al. (2010) have questioned the use of the PTGI in populations other than the North American population that was used to validate the measurement tool. The principal factors conceptualised in the model of PTG are embedded within the specific cultural and contextual characteristics of the individual’s social milieu, such as different attitudes or types of coping processes, cognitive processing, and access to social support. The difficulty, however, is to determine to what extent contextual differences shape PTG, and to isolate context-specific variables that lead to differentiation from those introduced by the nature and type of event, sample characteristics and so forth. In addition, the definition of ‘culture’ is extensive and is able to encapsulate many elements of individuals’ lived experiences (Weiss & Berger, 2010).

In a recent review of the cross-cultural applicability of PTG, the case was made that a “Western, individualised understanding of PTG appears to have permeated the items of the PTGI”, (Splevins et al., 2010, p. 266). The theoretical foundation of the model of PTG may reflect an implicit bias contained within the western individualistic point of view (Splevins et al., 2010). A specific example given was that of the “assumptive world”, a key theoretical principle underpinning the process of growth (Splevins et al., 2010). There is a lack of specificity of the core assumptions that are assumed to be shattered by the experience of trauma and this allows the model to be universally applicable and to reflect a sense of generalisability (Splevins et al., 2010). However, Splevins et al. (2010) have argued that even the most general beliefs that form the assumptive world inherently reproduce the characteristics of westernised thought. Therefore, the conceptual bedrock of the Tedeschi and Calhoun (2004) model of PTG has infused and influenced the primary measurement tool, the

PTGI. Calhoun et al. (2010) have acknowledged that cultural influences play a role in giving shape to the individual's assumptive world and the beliefs that determine to a large extent the way that the traumatic event is perceived – and thus, the processes that lead to PTG.

Aspects of the cultures, the factors and processes that may impact on coping and the growth-oriented processing of traumatic events, were identified by Tedeschi and Calhoun (2004) as both distal and proximate: distal included the more removed processes such as the media and popular role models, and proximate included the more personal elements, such as significant others that act as supportive role models for PTG, the primary reference group and their cultural practices and rituals for dealing with trauma (Weiss & Berger, 2010). That said, 'culture' is still a broad area that is difficult to quantify and operationalise, except in its more detailed constituent parts. Even the components of the model, such as the distal and proximate aspects of culture are quite complex in nature (Calhoun et al., 2010).

Social responses to trauma can be viewed as crucial to the process of PTG. These include the idioms of trauma, distress, coping and finding meaning in adversity – the social norms and rules that are held within the primary reference groups, and endorsed by individuals, that provide a guideline for dealing with the impact of the traumatic event (Weiss & Berger, 2010). A key question is the extent to which PTG is the result of the adherence to a socio-cultural script in which individuals are willing, and encouraged via peer influence, supportive others, religious faith and social media, to believe that benefits do emerge from traumatic and highly distressing events (Linley & Joseph, 2004). This argument can be extended to the influence of the social context with reference to the broad social views and narratives relevant to the experience of trauma and the process of PTG (Weiss & Berger, 2010). In turn, this may be shaped by the saturation of a socio-cultural milieu with multiple exposures to traumatic

events, to the extent that trauma has become normative in a context. In particular, it prompts the issue of whether the culture-specific elements and influences that shape and define the context further influence individual's reports of PTG. It has been acknowledged that a country's historical past, its broad societal values, its primary religions and the common stereotypical views on acceptable behaviour and reactions in particular stressful situations, do have an impact on the way individuals respond to traumatic events and cope with the impact thereof (Shakespeare-Finch & Morris, 2010).

Therefore, it is most likely that the historical past and current reality of the South African context will play a role in moulding the individual's perception of PTG. A recent study of a nationally representative sample indicated that, on average, an individual in the South African context has reported the experience of two or more traumatic events (Williams, Williams, Stein, Seedat, Jackson & Moomal, 2007). In terms of university students, the rates of exposure are the same (Schmidt-Ehmcke, 2008; Walsh, 2011). This is in stark contrast to the studies of the prevalence of traumatic events in an American undergraduate sample that suggested the majority (86%) had experienced one trauma (Frazier et al., 2009a).

Moreover, most studies have explored PTG in samples that have faced one discrete event, or within contexts characterised by a lifetime prevalence rate of one traumatic event (for a review, Linley & Joseph, 2004). Individuals who have experienced multiple traumas report more intense symptoms of depression, anxiety and stress (Vrana & Lauterbach, 1994). Increased exposure to trauma may also have an impact on the individual's perception of benefits and PTG. Within the South African context, many individuals have experienced multiple traumas and this has given rise to the notion of continuous traumatic stress (Kaminer & Eagle, 2010; Straker & Moosa, 1988). Multiple experiences of trauma and vicarious

traumatisation may further amplify the individual's experience of trauma, thereby continuing to shatter assumptions about a potentially safe and benevolent world. The latest results have also given credence to the possibility that the experience of multiple traumas may have an impact on the individual's perception of PTG (Walsh, 2011). In light of these possibilities, the measure of PTG within the South African context deserves attention. It is possible that the PTGI as conceptualised by Tedeschi and Calhoun (1996, 2004) is not entirely applicable to the characteristics of the South African context. PTG is not limited to those countries that are westernised or predominantly English-speaking, but there are likely to be differences in the degree and nature of PTG from country to country (Weiss & Berger, 2010), as shaped by the precise characteristics of each specific context – its culture and subcultures, its geographical and physical realities, and its peoples' ways of life, *inter alia*. The current state of this field of study in South Africa is such that there is a lack of clarity regarding the validity of the construct of PTG and to date, the factor structure of PTGI in the South African context.

2.5. The Posttraumatic Growth Inventory (PTGI)

A key measurement issue is whether PTG is multidimensional – representative of multiple domains of growth, or one-dimensional – a distinct perception of change taken as a whole (Park & Helgeson, 2006). There are more than seven primary measurement scales of growth, and these different instruments tend to produce dissimilar reports of growth and to yield a different number of growth domains, ranging from 1 to 8 (Linley & Joseph, 2004; Park & Helgeson, 2006). Some have argued that open ended questions are more likely to produce authentic reports of growth as measurement scales may lead individuals to inflate reported perceptions of change in order to comply with demand characteristics (Park & Helgeson,

2006). Others have argued for the need to assess both positive and negative changes that occur during the coping process in the aftermath of trauma (Joseph, 2011).

Within the Tedeschi and Calhoun model, PTG is conceptualised as a multidimensional psychological construct and its multidimensionality has been supported by empirical evidence (Morris et al., 2005; Tedeschi & Calhoun, 1996). It has also been viewed as one-dimensional (Park & Helgeson, 2006). Within the original development of the PTGI, Tedeschi and Calhoun (1996) identified and grouped the positive changes reported by participants into three broad dimensions of growth, as follows:

- **Perceived changes in the self:** positive changes within the individual's perception of him/herself, including enhanced personal strength and a sense of emotional growth.
- **Changed sense of relationships with others:** greater intimacy and closer relationships with others, a realisation of the importance of relationships and greater emotional sharing and support from family and/or friends.
- **Changes in philosophy of life:** a greater appreciation of life, openness to new possibilities and pathways in life, and a strengthening of religious and spiritual beliefs. (Tedeschi & Calhoun, 2004).

In the development of the PTGI, the authors extrapolated five core factors of growth:

- **Relationships with Others:** Individuals reported closer, more intimate relationships with others and more emotionally expressive interactions with others;

- **Personal Strength:** Individuals recognised their own personal strength in the coping process, alongside an increased awareness of their own vulnerability;
 - **New Possibilities:** Individuals found new possibilities as a result of the trauma, and new directions in work, personal goals and/or hobbies that have enhanced their life experience;
 - **Spiritual Growth:** Individuals reported an increased awareness of and engagement with salient existential questions, and a deepening of their religious or spiritual beliefs;
 - **Appreciation of Life:** Individuals perceived an increased appreciation for life in general and for the details of daily life, as well as a changed sense of priorities.
- (Tedeschi & Calhoun, 2004)

The subscales of the PTGI measure these five factors and yield five factor scores. The majority of studies have utilised the overall PTG score as well as the subscale scores (Linley & Joseph, 2004).

As a self-report measure, the PTGI has been criticised as it does not allow for the spontaneous reporting of negative responses or negative after-effects of the traumatic event (Linley & Joseph, 2004). The reliance on retrospective ratings of change has been shown to some extent to be influenced by recall bias (Ransom, Sheldon & Jacobsen, 2008). Within studies, lack of pre-existing or pre-trauma information about individual participants and the lack of objective indicators make it difficult to validate the changes that individuals have endorsed on the PTGI

(Linley & Joseph, 2004). Even with its sound psychometric properties and widespread use, it may be that the PTGI is not sophisticated enough to capture the conceptual nuances of PTG (Helgeson, Reynolds & Tomich, 2006).

2.6.Factor Structure of the PTGI

Despite its extensive use, the underlying factor structure of the PTGI is open to debate (Brunet et al., 2010; Osei-Bonsu et al., 2012). Several studies have directly assessed the factor structure of the PTGI in diverse populations and these have yielded inconsistent evidence. For the most part, the PTG has been conceptualised and measured as a unitary construct or as five correlated factors (Taku et al., 2008). Linley et al. (2007) have identified the need for additional investigation of the factor structure of the PTGI as the original five-factor model has not emerged as a consistently good fit across all indices. The three factor model of PTG has also showed moderate fit. Empirical support for the five factor model is most consistent in emerging evidence, according to a review of the following studies. Linley, Andrews and Joseph (2007) found that the five factor oblique model was a better fit for the data yielded by their pooled sample of 372 adults when compared to the three factor model. The five factors represented the five subscales of the PTGI and the three factors corresponded to the three broader domains of growth identified by Tedeschi and Calhoun (1996). It has been suggested that these three domains of growth represent the most common elements of PTG (Taku et al., 2008). Whilst considered a good fit to the data, the five factor model was not supported as a close fit across all the statistical indices used to assess model-data fit in confirmatory factor analysis (CFA) (Linley et al., 2007). The individuals in these samples had experienced a range of adverse events, and the heterogeneity of samples in terms of the diversity of trauma

exposure reported by individuals has been considered both one of the strengths and one of the limitations in PTG research (Brunet et al., 2010).

Brunet et al. (2010) examined the factor structure of the PTGI in a sample of 470 breast cancer survivors using CFA. The 21 items on the PTGI were hypothesised to represent the 5 latent factors of PTG, corresponding to the 5 subscales. All items loaded significantly on the factors as expected (Brunet et al., 2010). The five factor model was deemed to be a good fit and the results supported the presence of five distinct yet correlated dimensions of PTG (Brunet et al., 2010). Moreover, an examination of treatment and personal characteristics amongst the cancer survivors further suggested that PTG is measured in a similar manner across groups in terms of the five factor model, despite differences in age, treatment, and length of time since diagnosis (Brunet et al., 2010). The authors concluded that there was strong evidence in support of the PTGI as a measure of five interrelated dimensions of PTG.

Taku et al. (2008) conducted a systematic analysis of five models to ascertain the best underlying structure of the PTGI. The five distinct models were tested using CFA, considered more robust than the exploratory nature of other analyses. The samples were pooled from 14 American studies and consisted of 926 participants from 17 to 85 years of age who had faced a diverse array of stressful life events (Taku et al., 2008). The sample reported a mean PTG score of $M = 53.04$ ($SD = 24.17$). The model of PTGI with five first-order factors and a single second-order factor showed good fit (Taku et al., 2008). However, the oblique model of five inter-correlated first-order factors showed the best fit to the data set and supported the robustness of the five factor structure of the PTGI in that sample. The authors concluded that the PTGI has good construct validity - regardless of the method of statistical analyses used, the five factor structure appeared to be 'relatively robust' (Taku et al., 2008). They further

argued that the five separate factors as measured by the subscales of the PTGI can be used meaningfully to interpret PTG, although it was also noted that these separate factors may be differentially susceptible to underlying processes that may impact on the process of growth (Taku et al., 2008). Most importantly, the results indicated that the PTGI has high factorial validity.

A large sample of combat-exposed U.S. soldiers' was assessed for PTG in order to investigate the factor structure of the PTGI in military research (Lee, Luxton, Reger & Gahm, 2010). This more homogenous sample included 3 537 active duty soldiers and the total PTG mean score was $M = 52.04$ ($SD = 22.98$) (Lee et al., 2010). On the basis of several fit indices, both the models of PTGI as five latent factors and of PTGI as a single higher-order model yielded reasonable model-data fit. This supported the five factor structure of the PTGI in a military population (Lee et al., 2010).

In terms of different settings, Morris et al. (2005) investigated the multidimensional nature of PTG among a sample of 219 Australian undergraduates who reported a range of stressful life events. The most commonly reported traumatic event was the death of a family member (Morris et al., 2005). Three additional items were added to the questionnaire to strengthen the factor of Spiritual Change within the sample and to ensure that a minimum of 3 items represented each factor (Morris et al., 2005). Exploratory analyses were performed via principal components analysis with varimax rotation, in line with the original investigation performed by Tedeschi and Calhoun (1996) to validate the PTGI. The analyses replicated the five factor structure of the original PTGI and supported the construct of PTG as multidimensional in nature (Morris et al., 2005). A distinct contrast was noted in the subscale scores in comparison to the U.S. samples, particularly in the dimension of Spiritual Change

(Morris et al., 2005). Again, the authors raised the possibility that cultural differences may influence the perception of growth.

Whilst there is strong support for a five factor model of PTG, a number of studies have provided conflicting evidence and yielded different dimensions of growth. A sample of individuals with early stage breast cancer yielded a one-dimensional model of PTG (Sears, Stanton & Danoff-Burg, 2003). Thus, PTG was conceptualised as a unitary factor corresponding to the overall score of PTG. Powell, Rosner, Butollo et al. (2003) conducted a study of PTG among individuals exposed to severe, ongoing stress during war. The sample consisted of 136 former refugees and displaced individuals from Yugoslavia who completed a translated Bosnian version of the original PTGI (Powell et al., 2003). The data supported a three factor model of PTG and the factor structure of the original PTGI was not reproduced. The factors identified were almost equivalent to the three domains of growth initially identified in the development of the PTGI (Powell et al., 2003). They were labelled as a changed sense of relationships, a changed philosophy of life, and changes in self/positive life attitude. Many of the items reportedly cross loaded in unexpected ways (Powell et al., 2003).

Another study that yielded inconclusive results was that of a large undergraduate sample ($N = 372$) by Osei-Bonsu et al. (2012). Students who reported the experience of a traumatic event according to criterion A of the DSM-IV-TR 'traumatic event' were included in the study. However, confirmatory factor analysis showed mixed support for the five-factor model. While the relative fit of the model was within the defined limits, the other indices did not meet the criteria required, and as a result, an exploratory analysis was conducted. This generated a possible eight-factor model (Osei-Bonsu et al., 2012). The authors identified the new factors as New Path/Emotional Connectedness, Relating to Others, Personal Strength, Spiritual

Change, Compassion and Change, Appreciation of Life, New Opportunities and Positive Outlook (Osei-Bonsu et al., 2012). However, even the new factors did not improve the overall model-data fit and exploration of other models showed that the unitary and three-factor models may well apply to the data (Osei-Bonsu et al., 2012). In their discussion of the factor structure of the PTGI, the authors noted that two subscales (or factors) have limited items, being Spiritual Change and Appreciation of Life with 2 and 3 items, respectively. According to Osei-Bonsu et al. (2012), a “factor with fewer than three items can be considered weak and unstable [16]” (p.2). Further, the moderate to high correlations among the factors suggest that the subscales measure overlapping constructs, as opposed to distinct dimensions, and it may be more efficient if the PTGI was represented by less than the five factors of the original model. This study provided additional evidence in support of alternative factor models, including the unitary and three-factor structures (Osei-Bonsu et al., 2012).

A study of PTG in Chinese cancer survivors yielded a distinct factor structure of a Chinese translation of the PTGI (Ho, Chan & Ho, 2004). This study found four factors applicable to Chinese individuals with cancer: Self, Interpersonal, Spiritual and Life Orientation. These differences may be the artefacts of the translation of the original PTGI into Chinese (Ho et al., 2004), but could also be seen to represent the three broad dimensions of PTG as proposed by Tedeschi and Calhoun (1996). The authors suggested that these dimensions of growth may reflect more universal aspects of PTG – the core elements of PTG – that are not subject to the influence of culture (Ho et al., 2004). Therefore, the dimensions of growth may present and manifest in a distinctive manner as a function of culture.

The lack of consistent replication of the factor structure of the PTGI may indicate that the theoretical concept of PTG as measured is in fact dissimilar across the diverse setting and

samples (Splevins et al., 2010). It is possible that the differences in the context in terms of social and cultural factors, disparities in samples and the range of experiences that individuals in those contexts have faced, may have contributed to the range of factor structures confirmed in studies of the PTGI. That is, any of the factors thought to contribute to PTG. The inconsistency of results may thus be related to methodological issues or suggest that the factor structure of the PTGI may vary as a result of the culture and context of the population. Given the experience of multiple traumatisations within the South African context and the proliferation of recent scholarly interest in the construct of PTG in South Africa, it is important to explore the factor structure of the PTGI as the most commonly used instrument to assess PTG in South African samples. To date, there is no published examination of the factor structure of PTG as measured by the PTGI in a South African sample.

2.7.Traumatic Stress and the South African Context

The consequences of a traumatic event for most individuals involve some degree of psychological and emotional distress. For the majority, the traumatic experience will be “assimilated without the development of a pathological response. If this is unsuccessful, post-traumatic stress disorder can develop with pathological fear structures characterised by excessive response elements”, such as persistent re-experiencing of the trauma, continual avoidance of trauma-related cues and increased arousal (Bisson, 2007, p.789). Cognitive theories of posttraumatic stress also emphasise the impact of the event on pre-existing beliefs about the world, and the difficulties that the individual may encounter integrating the traumatic event into the schematic structures that allow them to make sense of their world (Bisson, 2007) – that being the assumptive world which is fundamental to the process of PTG.

Specific traumatic event types, specifically violent assault, rape and torture, more often result in posttraumatic stress disorder (PTSD), and women have been found to be at greater risk for developing PTSD (Kaminer & Eagle, 2010). Studies have consistently established the elevated risk that women have for developing PTSD even though they may report a slightly lower exposure to trauma overall, with greater experience of violent and sexual assault (Olf, Langeland, Draijer & Gersons, 2007). High levels of exposure to trauma are found across many communities and socio-economic circumstances in the South African context (Edwards, 2005; Williams et al., 2007). Individuals may also experience ongoing or continuous traumatic stress in that they are living in violence-prone communities, or exacerbated by violence or abuse within the home, severe economic deprivation and poverty. Individuals in these circumstances may not be able to maintain a sense of safety either in or outside of the home, and for many, the trauma is not a '*past*' event, but a likely occurrence (Kaminer & Eagle, 2010). The increased exposure to trauma is also linked to higher levels of psychological distress and depression (Edwards, 2005; Kaminer & Eagle, 2010; Suliman, Mkabile, Fincham, Ahmed, Stein & Seedat, 2009; Williams et al., 2007). Furthermore, impediments identified within the coping and recovery process after exposure to trauma have included the lack of social support as well as the prevalence of life stressors and/or multiple experiences of trauma (Joseph, 2011).

Within the South African context, individuals may be exposed to many different types of stressful or traumatic life events, one after the other or over many years. Significant threats to health include high rates of cancer, tuberculosis, HIV/AIDS, and malaria (AVERT, 2009; National Cancer Registry, 2007; Statistics SA, 2006). The prevalence rates of life-threatening illnesses such as cancer, AIDS, tuberculosis, malaria and others are higher than global

averages (Department of Health, 2009). Levels of interpersonal violence, crime and criminal violence are exceptionally high – South Africa is considered to have one of the highest rates of murder and interpersonal violence in the world (Altbeker, 2007). Motor vehicle accidents affect many commuters, and the road death toll amounts to more roughly 10 000 fatalities per year (Arrive Alive, 2011; RTMC, 2005, 2008). A high proportion of individuals in South Africa have been exposed to traumatic events of varying degrees of threat, within their homes and communities, in direct and indirect forms (Kaminer & Eagle, 2010). This may be compounded by other stressful life events, such as divorce, poverty, unemployment, work-related stress, domestic violence, substance abuse, and bereavement. Therefore, individuals may be exposed to multiple traumatic experiences, and this has implications, given the negative cumulative effect of such trauma exposure for individuals (Williams et al., 2007).

The average South African adult will report the experience of two or more traumatic events in their lifetime. Roughly 75% of South Africans have experienced a single traumatic event, and more than half (56%) have experienced multiple traumatic events (Williams et al., 2007). Types of traumatic events that are likely to lead to PTSD occur frequently or commonly in the South African context and there is a high degree of exposure of individuals across settings, to the extent that this is considered to be a significant contributory factor to the high incidence of PTSD in South Africa (Edwards, 2005). The incidence of exposure is applicable to children, the student population and adults. South African research has indicated high rates of exposure of secondary and tertiary students to traumatic events, especially violence (Edwards, 2005). One study found that, on average, the undergraduate sample had experienced two or more traumatic events (Walsh, 2011). This is in stark contrast to the studies that have focused on samples exposed to a single, once-off event (Helgeson et al., 2006). Moreover, the compound, negative impact of trauma has been established, with victims of multiple traumas more likely

to experience elevated levels of distress (Williams et al., 2007). The greater the number of traumas experienced by individuals, either in childhood or adulthood, and the increased severity and impact of traumatic events, the greater the chance that the individual will manifest symptoms of PTSD (Edwards, 2005). Individuals also face ongoing challenges in the recovery process in the event of exposure to multiple traumas and thus require a specific understanding of the manifestation of traumatic stress as a result of continuous or multiple exposures to trauma (Kaminer & Eagle, 2010).

Given this evidence for the varying nature of traumatic stress according to single or multiple event exposure, it is possible that perceptions of growth may also be influenced by the number of severe traumatic events experienced by the individual. The experience of multiple traumas may overwhelm the individual's coping capacity and in turn, their ability to perceive growth. Multiple exposures to trauma may lead to a compounding of loss and trauma referred to as "a pile-up of losses", or a complete destruction of the assumptive world that may render the individual unable to endorse high levels of growth (Janoff-Bulman, 2004). It has been noted that culture and the context in which trauma occurs may have an impact on PTG (Weiss & Berger, 2010; Calhoun et al., 2010). It may be that the unique context of South Africa, as shaped by diverse cultures, and violent, often divisive social and political history, may have an impact on the manner in which individuals experience and cope with trauma, and find meaning in their traumatic event. The South African context has a high rate of exposure to trauma for the majority of its inhabitants, from varying communities and social classes. Multiple exposures to trauma may also impact on perceptions of growth. The present study aims to examine the underlying model of PTG as measured by the PTGI, as applied to a sample of individuals who live within South African communities, and who have experienced one or more traumas. The aims will be discussed in detail below.

2.8. The Present Study

The primary aim of this study is to examine the PTGI as a measure of PTG *in the South African context*. This will take the form of an analysis of the factor structure of the PTGI as a measure of PTG in a South African sample.

A secondary aim of the research will be to evaluate PTG as reported by the sample and to elaborate on the specific profile of PTG as yielded by the data of the sample. Differences in PTG will also be explored according to gender and age of participants. The association between PTG and indicators of traumatic stress will be examined for a possible linear relationship. The measure of traumatic stress will not be used to diagnose posttraumatic stress disorder (PTSD), but to indicate the levels of traumatic stress reported by individuals in relation to their experience of trauma.

In light of these aims, the variables within the study will be:

- The overall score of PTG as yielded by the PTGI;
- The five factors of PTG determined by the subscales of the PTGI;
- The indicators of traumatic stress, being the scores of the IES-R;
- Gender and age of participants.

2.8.1. Research Questions

The primary aim of the study is to examine the factor structure of the PTGI based on data from a South African sample. However, before this can be evaluated, the following aspects of PTG within the specific sample will be examined:

- 2.8.1.1. Does PTG vary according to the gender of participants? It is hypothesised that women will report higher levels of PTG as is evident from the literature. In order to test this hypothesis, a sufficient number of men and women must have completed questionnaires to make this comparison possible.
- 2.8.1.2. Does PTG vary according to age of participants? The data will also be examined for an age effect. As results have been largely inconsistent, there is no hypothesis of possible results. The data will be examined for any evidence of a relationship, given the range of ages of participants.
- 2.8.1.3. Is there a correlation between PTG and indicators of traumatic stress as measured by the scores on the IES-R? It is hypothesised that there will be a relationship between the PTG scores and IES-R scores, and that this will be positive. This research question will test whether there will be a positive relationship between psychological distress, as measured by the scores of the IES-R, and reports of PTG in the South African sample. As noted in the literature review, the relationship between distress and growth is complex and open to variability within studies and samples.

Once the preliminary questions have been evaluated, the factor structure of the PTGI will be tested as follows:

2.8.1.4. The initial analysis will evaluate if the data from the South African sample fits the model of PTG as five correlated factors as proposed in the original model developed by Tedeschi and Calhoun (1996).

2.8.1.5. The data from the South African sample will be further examined to assess if it supports the model of PTG as one single, overall factor, as is most often used in the research;

2.8.1.6. And finally, in the event that the prior theoretically-based models are not supported by analysis, the data will be examined to assess if it supports the model of PTG as a three factor model, according to the theoretical understanding of the core elements of psychological growth after exposure to trauma.

2.8.2. *Summary*

Several recent studies have examined the factor structure of the PTGI and tested the model using evidence from diverse samples of individuals who have experienced an array of traumatic events. This evidence has both supported and contradicted the five factor structure of the PTGI. Given the numerous variables hypothesised to contribute to the perception of growth in the Tedeschi and Calhoun (2004) model, it is possible that the factor structure of the PTGI will not be replicated in the South African sample. This may be due to the nature of traumatic experience in South Africa, in that it is anticipated that individuals will have had exposure to multiple traumatic events, particularly interpersonal and criminal violence. The analysis of the factor structure will offer evidence for the applicability of the PTGI as a

measurement instrument in the South African context and allow for a closer examination of the validity of PTG as a construct in the South African context. The resultant evidence and understanding of the factor structure will add to the current knowledge base of PTG in the South African context.

With regard to the sample characteristics, the study of these will enhance the foundation of research knowledge regarding the variables associated with PTG. Evidence has supported a positive relationship between reports of PTG and scores on traumatic stress measures (Tedeschi & Calhoun, 2004), as well as a curvilinear association between growth and distress. Furthermore, female participants have typically reported higher levels of growth post-trauma (Tedeschi & Calhoun, 1996; Park & Helgeson, 2006). To investigate the sample characteristics, PTG will be examined in relation to traumatic stress reported by participants and their age and gender. This will also allow for greater understanding of the sample within which the factor structure of the PTGI will be examined.

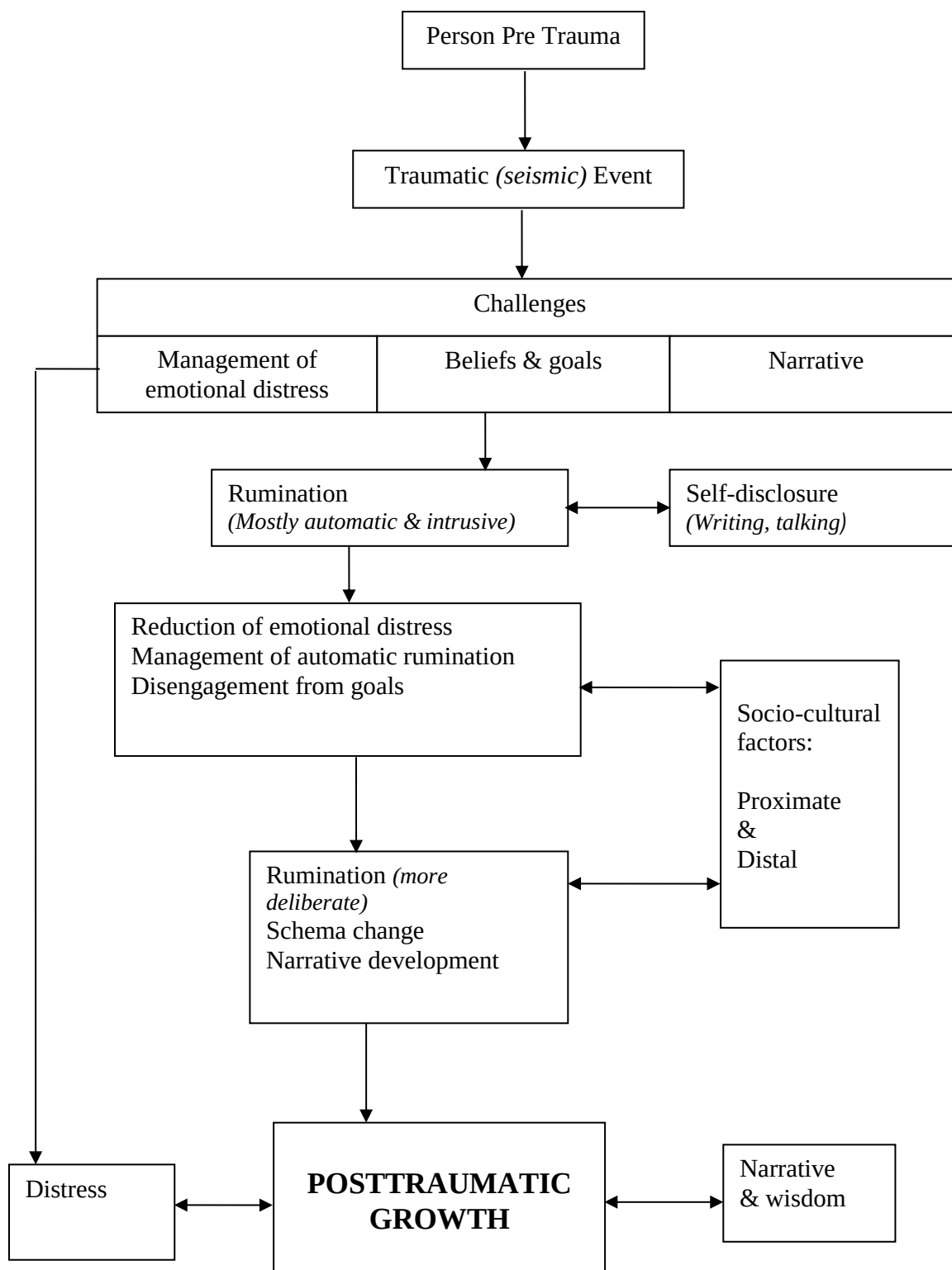


Figure 1. Model of PTG (1996)

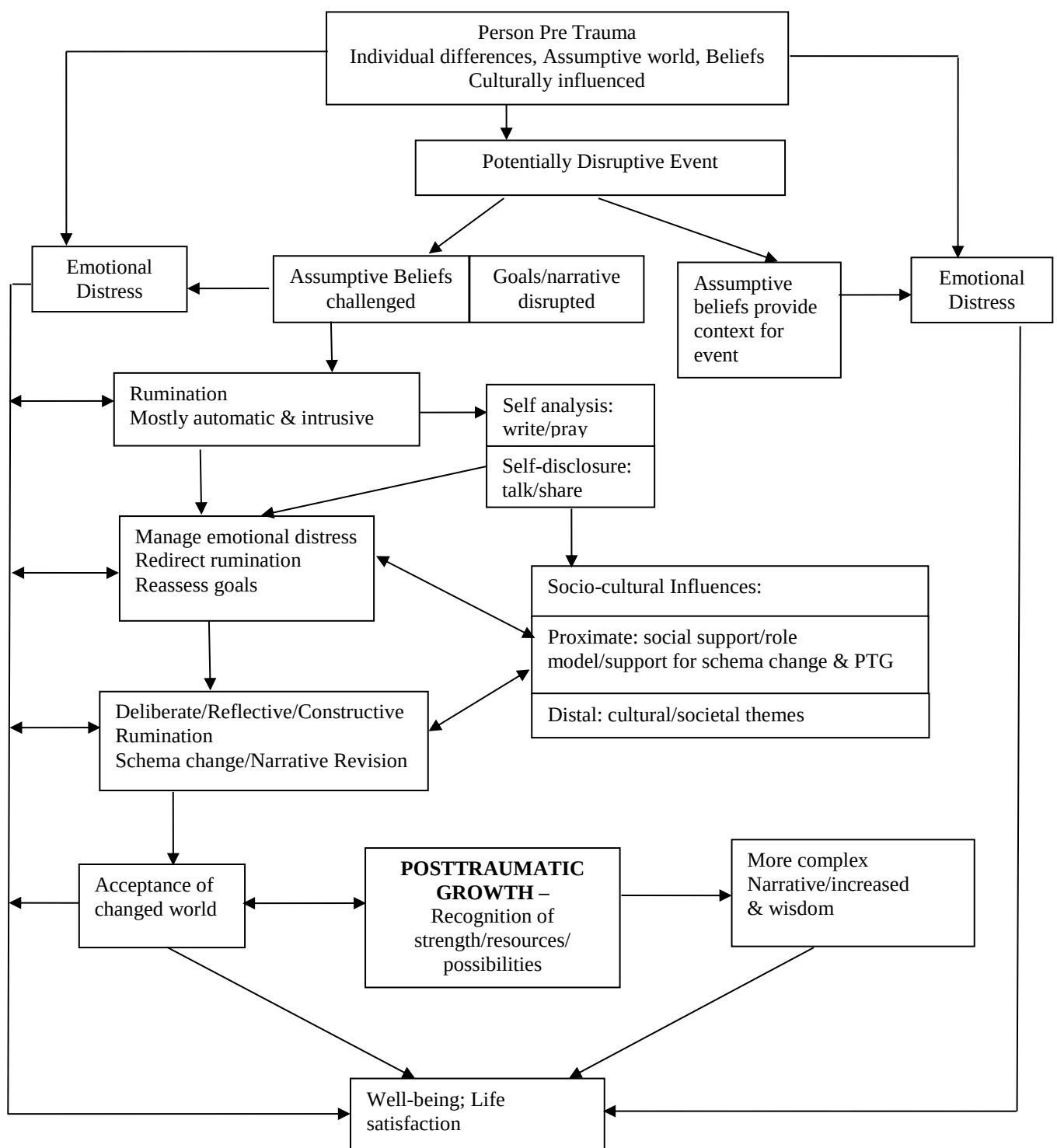


Figure 2. Model of PTG (2010)

“... it appears that to trauma survivors the changes reported are quite real. The particular benefits described may even be elements of a developing wisdom...” (Tedeschi & Calhoun, 1996, p.468)

3. Methodology

3.1. Sample and Sampling

A power analysis indicated that a minimum of 200 participants was required in order to provide a sample size sufficient to detect small to moderate effect sizes. Factor analysis is highly sensitive to sample size, and smaller samples are more prone to sampling error (Albright & Park, 2009). In order to meet this requirement, the final sample consisted of two separate samples collected by the same researcher and pooled for the data analysis. The first sample, sample A, consisted of a convenience sample of students from the University of Witwatersrand ($n = 95$). The second sample, sample B, consisted of a self-selected convenience sample of volunteers sourced from the community who had experienced a traumatic event ($n = 136$) (Roe-Berning, 2009). All participants were 18 years or older and the age range spanned from 18 years to 79 years of age. The overall sample consisted of 231 participants.

The mean age of sample A was 21 years. In terms of gender, 84.2% were female ($n = 80$) and 15.8% were male ($n = 15$). The sample was ethnically diverse. Of the sample, 60% were white, 24% were black, 4% Coloured and 11% Indian, and one participant indicated mixed heritage. The mean age of sample B was 39 years. In terms of gender of sample B, 104 participants were women (76.5%) and 32 were men (23.5%). When pooled together, the overall mean age was 31.6 years ($N = 231$). The final sample had 184 female (80%) and 47 male (20%) participants. This corresponded to other mixed samples in which the majority of volunteers were women. The descriptive characteristics of the sample will be discussed in further detail in the Results section.

Each participant in the sample was asked to voluntarily complete a standard pack of questionnaires. These included a biographical information sheet, the PTGI, the Impact of Events Scale-Revised (IES-R) and information about the exposure to trauma or Traumatic Stress Schedule (TSS). The information sheet indicated that participation was entirely voluntary and emphasised that individuals were able to withdraw at any point in the process. As the questions about trauma may have triggered emotional responses related to previous traumatic experiences and/or exposed vulnerabilities within individuals, contact details for counselling services available both on-campus and off-campus for students, and those available for community participants, were included in the resource sheet. There were no benefits or disadvantages to participation in the study. All participants completed the inventories anonymously and were not required to provide any identifying information. Completion of the questionnaires was taken as consent to participate. The required ethics clearance was obtained from the Faculty of Humanities Human Research Ethics Committee before data collection was undertaken. The ethics clearance protocol is contained in Appendix 1.

3.2.Design

This is a quantitative study of the underlying factor structure of the PTGI in a South African sample. Data was collected by means of self-report questionnaires. These required roughly 10 to 15 minutes to complete and after collection, were stored safely in sealed boxes or file format. The questionnaires were scored and processed by the researcher, and the data was cleaned and examined for suitability. Thereafter, confirmatory factor analysis and correlation analyses were conducted using SAS 9.1.

3.3.Measures

3.3.1. Participant Forms

Participants received a standard pack of questionnaires for completion. The information sheet described the purpose of the study, the nature of participation and described how the data would be used and reported. The information requested in the biographical information sheet was essential to describe the sample and compare it to the original sample used by Tedeschi and Calhoun (1996).

3.3.2. The Posttraumatic Growth Inventory

The Posttraumatic Growth Inventory was developed by Tedeschi and Calhoun (1996) to calculate individuals' reports of PTG. The original PTGI measures the extent to which individuals perceive psychological growth as a result of their experience of trauma (Tedeschi & Calhoun, 1996). It is widely used in research, and has been used both as a screening instrument and clinical tool. There are several adapted versions of the PTGI, including a short form and a Japanese version (Cann et al., 2010; Taku et al., 2007). The PTGI is a 21-item scale. Individuals rate each item on a scale from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this to a very great degree as a result of my crisis). The PTGI yields an overall score of PTG as well as scores for each subscale. The PTGI consists of five subscales: Relating to Others (7 items), New Possibilities (5 items), Personal Strength (4 items), Spiritual Change (2 items) and Appreciation of Life (3 items). The subscales were derived from the three broad domains of PTG as identified by Tedeschi and Calhoun (1996),

and provide the basis for the scores for each of the five factors of PTG. However, the number of items for the subscales of Spiritual Change and Appreciation of Life are very small and this has been criticised as a weakness of the factor structure (Taku et al., 2008).

The PTGI was developed and validated on a sample of American college students who reported a range of distressing life events, assessed by the Traumatic Stress Schedule (TSS), including, robbery, criminal assault, bereavement, inter alia (Tedeschi & Calhoun, 1996). Research evidence has reported sound psychometric properties for the PTGI. The internal consistency of $\alpha = .90$ is satisfactory and the factors yield significant internal consistency (Tedeschi & Calhoun, 1996). The test-retest reliability of $r = .71$ is acceptable (Tedeschi & Calhoun, 1996). It was noted from the original sample that women were more likely to report PTG than men, and that the individuals who experienced more severe trauma were more likely to report PTG than those who had not (Tedeschi & Calhoun, 1996). Independent studies have supported the multidimensional nature of PTG as composed of five factors (Brunet et al, 2010; Morris et al, 2005; Mystakidou et al., 2008).

3.3.3. The Impact of Events Scale-Revised (IES-R)

The Impact of Events Scale- Revised (IES-R) is a 22-item self-report measurement scale developed to evaluate the individual's subjective distress or symptomatic stress profile for a specific traumatic event (Weiss & Marmar, 1997). It is a screening instrument designed to assess subjective distress in line with DSM-IV criteria and is used widely in research and practice (Weiss & Marmar, 1997). The IES-R provides a reliable measure of three symptom clusters of traumatic stress: intrusion, avoidance and hyper arousal (Beck, Grant & Read, 2008). Individuals are asked to rate each item on a scale of 0 (not at all) to 4 (extremely),

during the period after their experience of a stressful life event. Summing the item scores provides an overall score of subjective distress.

The scale has sound psychometric properties, with internal consistency of the three subscales reported to be high and satisfactory evidence of validity (Hutchings & Devilly, 2005; Weiss & Marmar, 1997). The IES-R has been widely used in South African studies to gather evidence about PTSD and traumatic stress. In a local study by Peltzer (2000), the scale showed evidence of good internal consistency and reliability – with coefficient alphas of 0.95 for the total scale, and 0.91, 0.83 and 0.83 for the Hyper arousal, Intrusion and Avoidance subscales respectively.

3.3.4. The Traumatic Stress Schedule

Participants in sample A were asked to complete the Traumatic Stress Schedule (TSS), developed by Norris (1990), to indicate the type and number of traumas they had experienced. The TSS is a brief screening interview with ten questions that describe a range of traumatic experiences, including interpersonal violence, natural disasters and accidental injury. It allows individuals to indicate the specific traumatic events that they have experienced, whether they experienced it themselves or witnessed it, and to provide a time period for when it occurred. The TSS has been used as a screening instrument in both South African and international studies (for e.g. Norris & Hamblen, 2004; Schmidt-Ehmcke, 2008; Walsh, 2011). It was not intended nor used as a measure of posttraumatic stress. It was used to quantify the total number of traumatic events experienced by the participants. The TSS is a well-established measure with good reliability and validity (Norris & Hamblen, 2004). Participants in sample

B were asked to provide additional information about their exposure to trauma and a rating of perceived severity of the event/s.

3.4.Procedure

Volunteers in sample A were recruited from psychology lectures at the University of Witwatersrand. Students were given a brief explanation of the purpose of the study and invited to participate. The study was described as an examination of stressful life events as experienced by South African students. For the community sample, a snowball sampling method was used to advertise the study and explain its basic purpose. Individuals were invited to share their experiences in an evaluation of the impact of traumatic events. The standard questionnaire pack included the measures discussed above, being the participant information sheet, the demographic information sheet, the PTGI, the IES-R, the TSS or trauma exposure questions, and a resource sheet. These are reproduced in Appendices 2 to 7.

3.5.Analysis

The data was examined for incomplete information and possible outliers, and thereafter inspected to ensure that it fulfilled the criteria for multivariate analyses. Data from two questionnaires were excluded due to missing information. The final sample consisted of 231 participants.

3.5.1. Factor Analysis

Factor analysis is a technique that falls within the scope of structural equation modelling (SEM), described as a general statistical modelling technique extensively used in behavioural sciences and often visually represented as a path diagram (Hox & Bechger, 1998). It can be defined as a set of “methods used to elaborate how underlying constructs influence the responses on a number of measured variables” (DeCoster, 1998, p.1). This method of analysis is based on the assumption that the covariance between a set of observed variables is accounted for by a hypothesized structure or number of underlying latent factors (Hox & Bechger, 1998). These factors include the influence of both common and unique underlying factors that have an impact on each observed response or variable of the measurement tool (DeCoster, 1998). In order to assess the factor structure of the PTGI, as based on the model of PTG, the pattern of correlations between the observed measures was examined. The type of factor analysis selected for this purpose was confirmatory factor analysis (CFA) which tested whether the specified set of constructs (here the model of PTGI and the factors determined to underlie the PTGI) was influencing the responses in a predicted manner (DeCoster, 1998). The hypothesis of the original factor structure as developed by Tedeschi and Calhoun (1996) was tested against the data collected in this study (Hox & Bechger, 1998). The parameters of the model and the fit of the model were assessed via multivariate analysis (Hox & Bechger, 1998).

3.5.2. Main Analyses

The model of PTG is based on an existing hypothesis of the factor structure of the PTGI. Several studies have shown support for a stable solution of the five factor structure (Morris et

al., 2005; Taku et al., 2008). A confirmatory factor analysis is the most appropriate method to determine the parameters of the model and to examine whether the data yielded by the sample fits the model of PTG. The initial studies of the PTGI were exploratory and thus used data driven techniques, such as principal component analysis to establish the factor loadings of the PTGI (Brunet et al., 2010; Tedeschi & Calhoun, 1996). However, for the purposes of this study and given that the hypothesised factor structure of the items of the PTGI is available, confirmatory factor analysis was selected in order to examine how the data, provided by the South African participants, fits the hypothesised relationships and factor loadings as specified by the PTGI (Brunet et al., 2010). It has been noted this type of analysis is sensitive to sample size.

To proceed with the analyses, it was necessary to define the models of PTG in terms of the factors and of the nature of the loadings between the factors. The path diagrams are presented in Figures 3 and 4. In accordance with the conventions of path diagramming, the latent variables or factors are represented as circles. The items (y1 – y21) are indicated by boxes and represent the observed scores (Linley et al, 2007). The arrows drawn between the factors and the items represent the factor loadings, and the double-headed arrows between the factors are correlations. The error associated with measurement is represented with an arrow (ϵ) for each item.

Analysis was conducted in several steps. Once covariance between each of the variables was obtained, diagrammatically represented and coded, the data was analysed according to the maximum likelihood estimation to assess the variance of factor loadings as per the model. There is not one single measure that is able to successfully establish the goodness of fit for the model and the data (Albright & Park, 2009; Hooper, Coughlan & Mullen, 2008) Therefore, a

combination of techniques was used to evaluate the model adequacy. This included, among others and according to recommendations, the chi-squared (χ^2) measure of goodness-of-fit test that is highly sensitive to sample size (DeCoster, 1998). The root mean square error of approximation (RMSEA) is defined as the estimate of the discrepancy per degrees of freedom in the model (DeCoster, 1998). The other indices selected were the goodness of fit index (GFI), Normed-Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Residual (RMR).

The comparison of factor structures was conducted for three hypothesised models of PTG. This included the model of PTG as a single overall factor of PTG and PTG as five latent factors that correspond to the subscales. An additional model of three factors of PTG that correspond to the three domains of growth was also extracted according to the theoretical suggestions by Calhoun and Tedeschi (2006) (Taku et al., 2008). Path diagrams to specify the hypothesised models of PTG are presented in Figures 3 and 4, and thereafter the results of these analyses are examined.

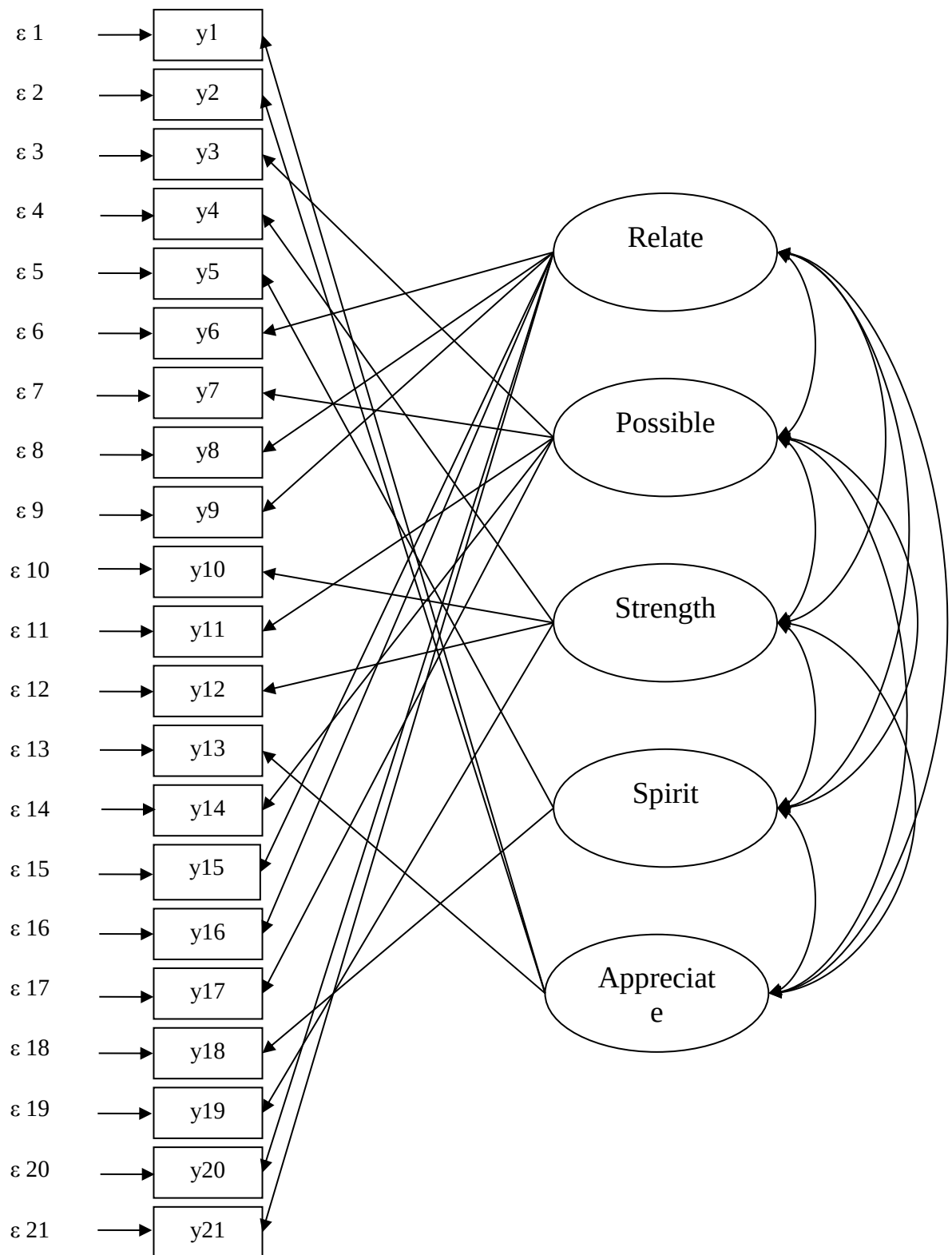


Figure 3. Path diagram of the Five factor model

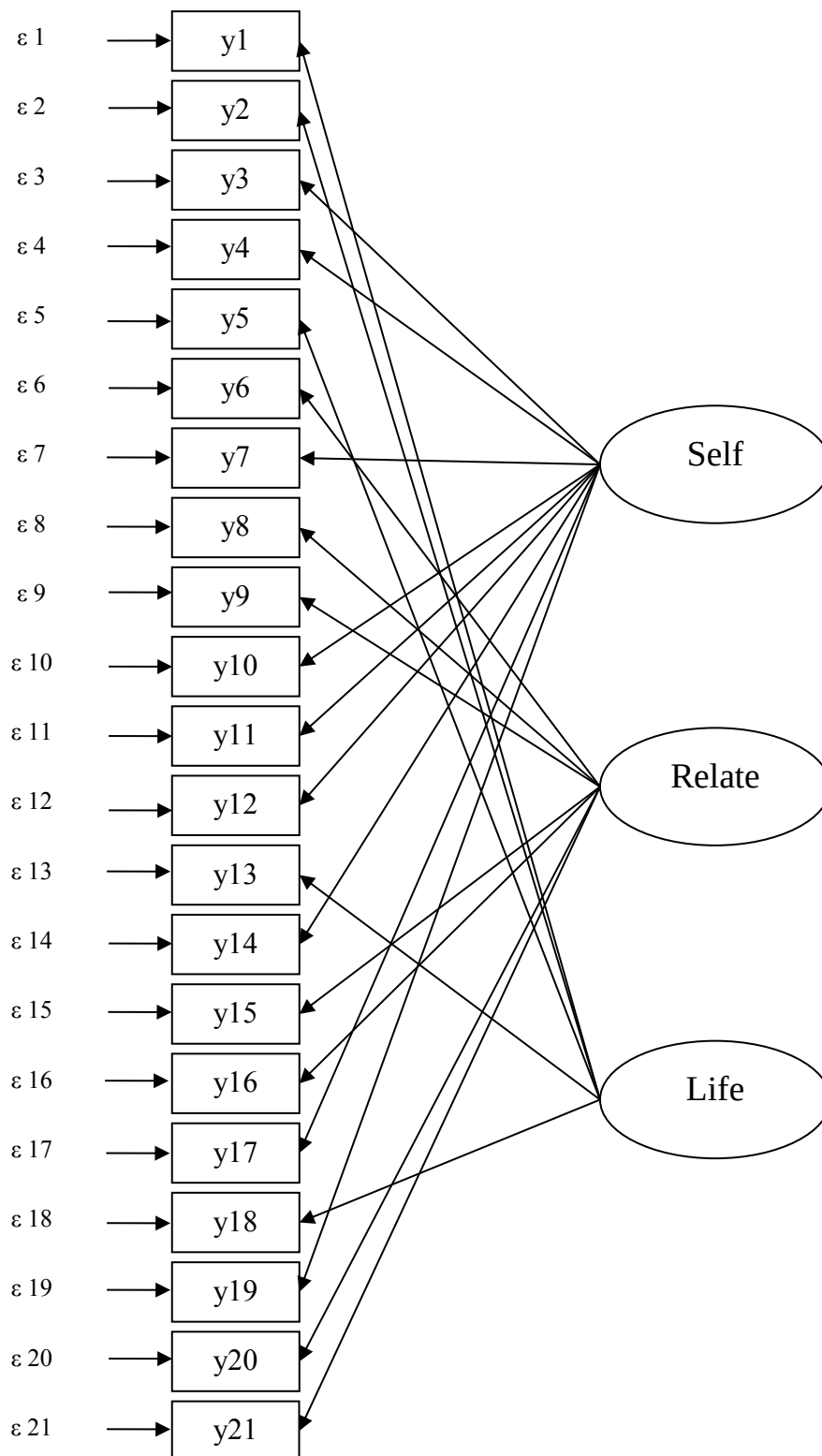


Figure 4. Path diagram of the Three factor model

*“...this enthusiasm has been dampened by two controversies concerning
(a) whether PTG and related constructs reflect genuine positive
changes, and (b) whether the manner in which growth has been measured
is valid. To the extent that the resolution of the first controversy
turns on the conclusions of the second controversy...”*

(Frazier, Tennen, Gavian, Park, Tomich & Tashiro, 2009, p.912)

4. Results

4.1.Introduction

Correlational and multivariate analyses were performed using SAS 9.1. The final sample consisted of 231 participants. The data set did not show any evidence of missing data or outliers for PTG scores. Missing and anomalous data for the other variables (TSS and traumatic exposure) were random and infrequent.

4.2.Scores of PTG

PTG has been reported in samples that have faced a wide range of traumatic events, and has been found in South African student and community samples. This sample was similar in that all participants reported some degree of PTG. In this study, sample A reported a moderate level of PTG ($M = 64.69$, $SD = 19.19$) as did sample B ($M = 57.78$, $SD = 25.32$). A moderate PTGI score falls in the range from 58 to 70, and scores are rated as high from 80 and above, with the total range of 0 to 105 (Tedeschi & Calhoun, 2007). Overall, the mean PTG score for the sample was $M = 61.24$, $SD = 22.26$. This represented a moderate score and is similar to that reported in other South African studies (Roe-Berning, 2008; Schmidt-Ehmcke, 2008; Walsh, 2011). Descriptive statistics are reported in Tables 1, 2 and 3.

Table 1: Descriptive statistics for sample A (n = 95)

Variable	<i>M</i>	<i>SD</i>
Age	21.14	2.35
IES-R	48.02	17.45
PTG	64.69	19.19
Relate (RO)	20.35	7.82
Possible (NP)	14.2	6.35
Strength (PS)	13.93	4.51
Spirit (SC)	5.76	3.28
Appreciate (AOL)	10.46	3.37

The subscales are identified as follows:

Relate (RO) – Relating to others

Possible (NP) – New possibilities

Strength (PS) – Personal strength

Spirit (SC) – Spiritual change

Appreciate (AOL) – Appreciation of life

Table 2: Descriptive statistics for sample B (n = 136)

Variable	<i>M</i>	<i>SD</i>
Age	38.96	11.96
IES-R	48.76	20.16
PTG	57.78	25.32
Relate (RO)	20.08	9.89
Possible (NP)	10.97	6.81
Strength (PS)	11.82	5.15
Spirit (SC)	4.89	3.64
Appreciate (AOL)	10.01	4.39

Table 3: Descriptive statistics for the complete sample (N = 231)

Variable	<i>M</i>	<i>SD</i>
Age	31.63	12.79
IES-R	48.46	19.05
PTG	60.62	23.20
Relate (RO)	20.19	9.07
Possible (NP)	12.30	6.82
Strength (PS)	12.69	4.99
Spirit (SC)	5.25	3.52
Appreciate (AOL)	10.20	4.00

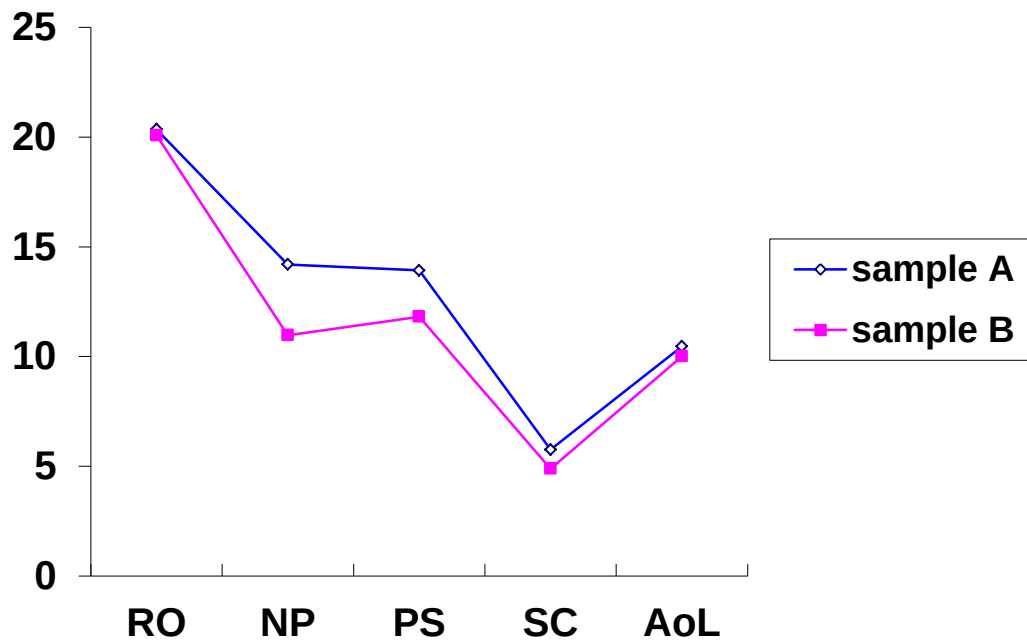
4.3.A Profile of PTG: Subscale scores

By plotting the means of each sample, it is evident that the two samples have reported similar subscales scores (see figure 6). Two of the subscales: New Possibilities and Personal Strength showed marked differences, and these will be discussed in the comparison of the two samples below. The subscale score are tabulated in Table 4.

Table 4: PTG Subscale Scores

Subscale	Sample A (n = 95)		Sample B (n = 136)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Relating to Others	20.35	7.82	20.08	9.89
New Possibilities	14.20	6.40	10.97	6.81
Personal Strength	13.93	4.51	11.82	5.15
Spiritual Change	5.76	3.28	4.89	3.64
Appreciation of Life	10.46	3.37	10.01	4.39

Figure 6: Plotted Graph of PTG subscale scores



4.4. Traumatic stress

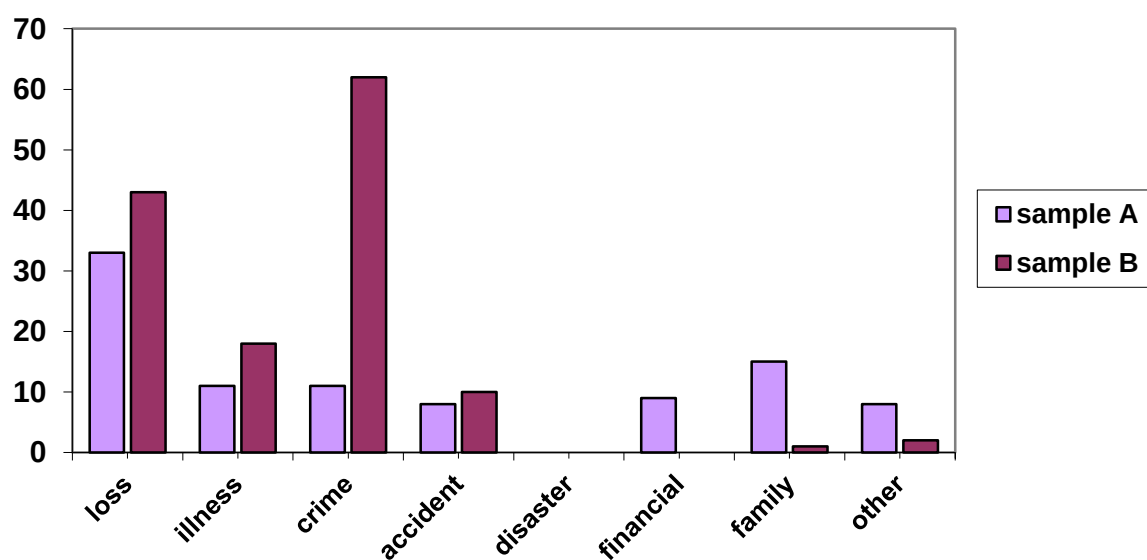
Of note, both samples reported similar and relatively high levels of traumatic stress symptoms. For sample A: the mean score on the IES-R was $M = 48.02$, $SD = 17.45$, and for sample B: $M = 48.76$, $SD = 20.16$. Scores of 33 and above are considered to be indicative of the presence of posttraumatic stress symptoms (Creamer et al., 2003). The mean score of $M = 48.02$ indicated that participants reported high levels of symptomatic distress associated with a specific event, on average. This has implications for the mental health, well being and coping of South Africans who have faced such traumatic events and who have coped in the face of such high levels of traumatic stress. Mostly, it suggested that, on average, a high degree of traumatic stress was experienced by participants in this sample.

In examining the specific types of exposure and of traumatic events as reported by participants, the numbers and percentages for each sample according to events specified on the PTGI, are presented in Table 5. Types of events as reported by participants of each sample are graphically represented in the bar diagram in Figure 7. For sample A, a convenience sample of students, the most commonly reported event was the loss of a loved one (35%), followed by the burden of family responsibility (16%). There were no reports of natural or manmade disaster and the lowest reported events were that of accident or injury (8%) as well as non-specific other (8%). For sample B, a self-selected sample of adults who completed the questionnaire in relation to their experience of a traumatic event, nearly half of the sample reported the traumatic experience of crime and violence (45%), followed by the loss a loved one (32%) as the most commonly reported traumas. There were no reports of natural or manmade disaster or financial hardship as the traumatic event under consideration. The lowest reported event was that of family responsibilities (0.7%). This list does not establish whether these participants have in addition experienced crime, violence and loss – it merely indicates the event that they have kept in mind when completing the PTGI and possibly, the most salient event for these participants at the time. However, there is a suggestion of a different exposure profile between the two samples, possibly related to the age of each sample and/or the method of sampling.

Table 5: Type of events for each sample and in total

Type of Event	Sample A	%	Sample B	%	Total
	(<i>n</i> = 95)		(<i>n</i> = 136)		(<i>N</i> = 231)
Loss of a loved one	<i>n</i> = 33	35%	<i>n</i> = 43	32%	76
Chronic/acute illness	<i>n</i> = 11	12%	<i>n</i> = 18	13%	29
Violent/abusive crime	<i>n</i> = 11	12%	<i>n</i> = 62	46%	73
Accident/injury	<i>n</i> = 8	8%	<i>n</i> = 10	7%	18
Natural/manmade disaster	<i>n</i> = 0	-	<i>n</i> = 0	-	-
Financial hardship	<i>n</i> = 9	9%	<i>n</i> = 0	-	9
Family responsibilities	<i>n</i> = 15	16%	<i>n</i> = 1	0.75%	16
Other	<i>n</i> = 8	8%	<i>n</i> = 2	1.25%	10

Figure 7. Bar diagram of event types



With regard to exposure to trauma, 77% ($n = 73$) of the student sample had experienced two or more traumatic events. Ratings of perceived severity of traumatic events for sample B indicated that more than half of the individuals in the community sample ($n = 75$ or 55%) had experienced feeling a severe threat to their health, their safety and/or their well-being. When the samples were combined, 33.33% of the participants had experienced the loss of a loved one, 31.60% had been exposed to crime or violence, 12.55% had experienced chronic or acute illness, and 7.79% reported accident or injury. This accounted for 85.27% of the overall sample. The other quarter of the sample reported additional stressful life events they had experienced as traumatic (according to the operational definition of this study) and this included financial hardship and family responsibilities.

4.5. Parametric assumptions

The parametric assumptions for data analysis were tested before proceeding to statistical analyses. A standard assumption is that the sampling distributions of the means of the key variables are normal and the assumption of normality was tested for the primary variables. The Shapiro Wilk's W is reported in Table 6. The scores of PTG did not emerge as normal, given the significant Shapiro Wilk's result ($W = 0.97$, $p < .0001$). The same result was found for the IES-R: $W = 0.96$, $p < .001$. This can be understood in light of the fact that the sample had high exposure to traumatic events, as noted by the events reported. Thus, the sampling distributions of the means did not emerge as normal and cannot be assumed to be normal for the specific sample. Skewness and kurtosis were examined and found to show variability from $+ 1.00$ to $- 1.00$ for both variables. PTG ranged from $- 0.56$ to $- 0.27$, and the IES-R from $- 0.47$ to $- 0.21$. The linearity of relationships between the scores for PTG and the IES-R was confirmed via scatterplots.

Table 6: Tests of normality

Variable	Shapiro Wilk's W	p
PTG	0.97	$p < .0001$
IES-R	0.96	$p < .001$

4.6.Comparison of the Samples

As the data was pooled to provide sufficient sample size, it was necessary to compare the two samples in terms of age, the impact of events and scores of PTG. A one way ANOVA was performed as an elementary measure of the analysis of significant differences between the two samples. As is evident from the table below, there are significant differences between the two samples. There was a significant age effect ($F_{(1, 229)} = 205.23$, $p < .0001$). There were no significant differences on indicators of traumatic stress, being the IES-R scores. PTG scores showed evidence of significance differences in the means. This result $F_{(1, 229)} = 5.06$, $p < .05$, suggested that there were noteworthy differences in the means of the two samples, and this must be kept in mind when evaluating the factor analyses. The differences are most apparent in two subscales: New Possibilities ($F_{(1, 229)} = 13.22$, $p < .0003$, and Personal Strength ($F_{(1, 229)} = 10.31$, $p < .01$). Therefore, the greatest amount of difference between the two samples lies within their ability to perceive new possibilities for their lives and their assessment of their personal strength. This divergence may furthermore be linked to the significant difference in the age of the samples, or other unidentified variations in sample characteristics.

Table 7: Comparison of the two samples

Dependent Variable	F value	Pr > F
Age	205.23	$p < .0001$
IES-R	0.08	<i>ns</i>
PTG	5.06	$p < .05$
RO	0.05	<i>ns</i>
NP	13.22	$p < .001$
PS	10.31	$p < .01$
SC	3.44	<i>ns</i>
AOL	0.70	<i>ns</i>

ns – Not significant

4.7.Preliminary analyses

Further analyses were conducted to assess the correlations between the variables of age, PTG, IES-R scores, and the subscale scores of the PTGI. Results did not demonstrate evidence of a significant relationship to age and the variables selected – being PTG and IES-R. The IES-R scores were significantly correlated with PTG ($r = 0.31$, $p < .0001$) in a moderate positive association. Four of the subscales of the PTGI – Relating to Others, New Possibilities Personal Strength and Appreciation of Life – were positively correlated with the IES-R scores ($r = 0.24 - 0.34$, $p < .001$). Only the Spiritual Change subscale showed no significant association with the IES-R scores. Furthermore, the inter-correlations among the subscales and PTG were relatively high ($r = 0.78 - 0.89$, $p < .0001$), except for the Spiritual Change subscale which was substantially lower ($r = 0.49$, $p < .0001$). The correlation matrix is reproduced in Table 8.

Table 8: Correlation matrix for PTG, subscale scores and IES-R

Variable	IES-R	PTG	RO	NP	PS	SC	AOL
IES-R	1.000	0.31	0.25	0.27	0.24		0.34
		p< .0001	p< .0001	P< .0001	p< .001		p< .0001
PTG		1.000	0.89	0.86	0.79	0.49	0.78
			p< .0001	P< .0001	p< .0001	p< .0001	p< .0001
RO			1.000	0.65	0.57	0.49	0.65
				P< .0001	p< .0001	p< .0001	p< .0001
NP				1.000	0.68	0.43	0.57
					p< .0001	p< .0001	p< .0001
PS					1.000	0.40	0.53
						p< .0001	p< .0001
SC						1.000	0.43
							p< .0001
AOL							1.000

Subscales: RO – Relating to others; NP – New possibilities; PS – Personal strength; SC – Spiritual change; AOL – Appreciation of life

4.8.Age and Gender

To examine the relationship of age and gender with the indicators of traumatic stress and PTG, one way ANOVAs were calculated. The results indicated that gender accounted for significant differences on the IES-R scores ($F_{(2, 228)} = 17.17, p < .0001$). Age, nevertheless, was not significant. Significant differences according to gender were found for all subscales of the PTGI and results are tabulated in Table 9. As noted in the original sample of Tedeschi and Calhoun (1996) and in other studies of posttraumatic stress, gender may be a crucial factor in terms of the impact of the traumatic event and the perception of PTG (Vishnevsky et

al., 2010). The magnitude of the association revealed is moderate but does imply that gender has a role to play in the process of coping after trauma, with specific reference to the impact of events. Female participants also reported higher levels of traumatic stress and PTG. Gender is thus an important variable to consider when interpreting the results of PTG and traumatic stress in a sample of South African origin.

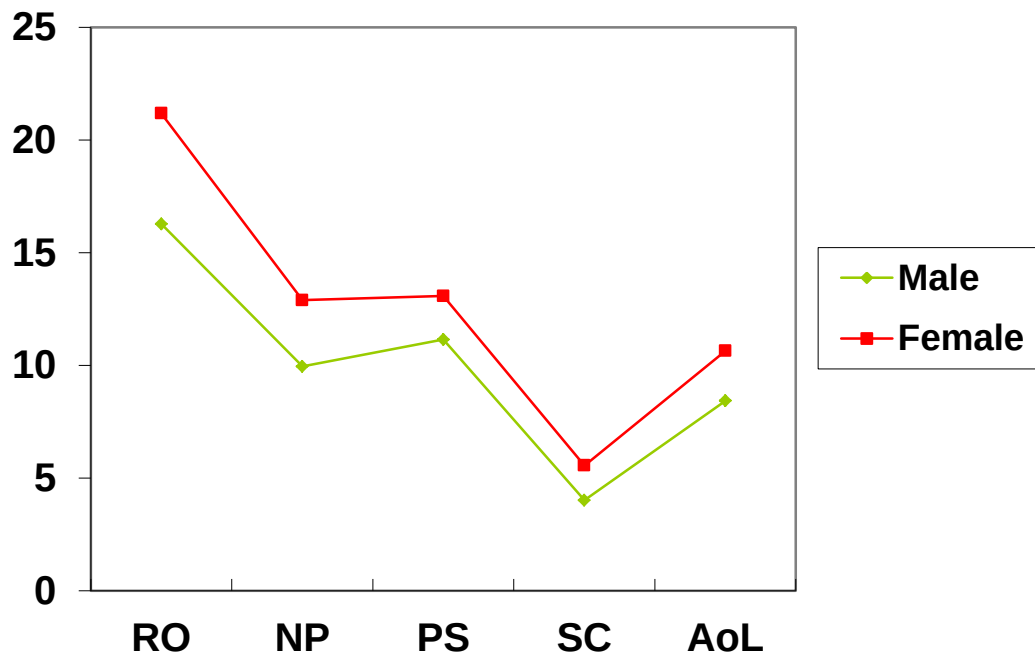
Table 9. Gender differences

Variable	<i>df</i>	F Value	p
Relate (RO) – gender	2, 228	11.37	p< .001
Possible (NP) – gender	2, 228	7.38	p< .01
Strength (PS) – gender	2, 228	5.90	p< .05
Spirit (SC) – gender	2, 228	7.40	p< .01
Appreciate (AOL) – gender	2, 228	12.24	p< .001

Table 10. Means according to gender

Variable	Male (<i>n</i> = 47)		Female (<i>n</i> = 184)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
IES-R	38.51	22.18	51.00	17.34
Relate (RO)	16.28	9.70	21.19	8.65
Possible (NP)	9.96	6.83	12.90	6.70
Strength (PS)	11.15	5.26	13.08	4.86
Spirit (SC)	4.02	3.21	5.56	3.53
Appreciate (AOL)	8.43	4.37	10.65	3.78

Figure 8. Plotted graph of subscale scores according to gender



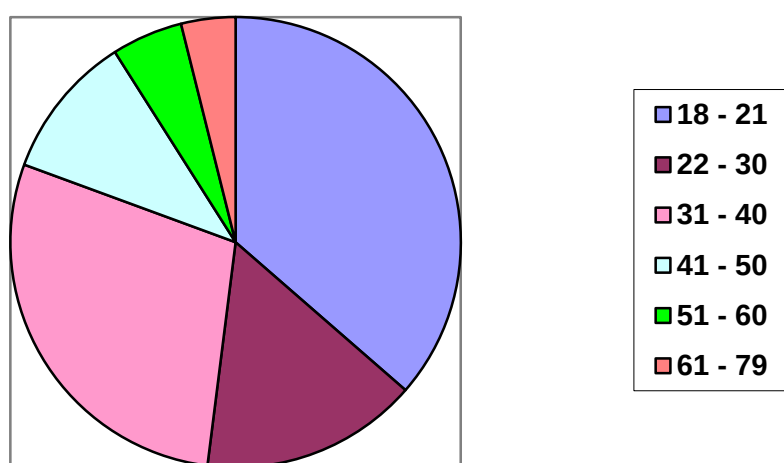
With regard to age, the results of the ANOVA did not indicate a significant association between the age of participants in this sample and PTG. Much of the research has shown inconsistent evidence for an age effect (Linley & Joseph, 2004). The distribution of age categories in this sample may have contributed to the lack of results; while there was a broad age range, from 18 to 79 years of age, the majority of participants fell within the 18 to 29 age category (50.6%). A breakdown of ages is presented in Table 11 and graphically depicted in a pie chart in Figure 9.

Table 11: Age of participants

Age range	<i>n</i>	% of sample
18 – 29	117	50.6
30 – 39	61	26.4
40 – 59	44	19
60 – 79	9	4

The largest group of participants represented the stage of early adulthood, followed by the group in middle adulthood. This is consistent with evidence that has demonstrated that youth and young adults are exposed to high levels of trauma and often multiple incidents, in this context (Kaminer & Eagle, 2010; Suliman, Kaminer, Seedat & Stein, 2005; Suliman et al., 2009).

Figure 9. Visual representation of age ranges



4.9.Factor Analyses

The comparison of samples indicated variation in PTG between the two samples. In response and in an attempt to avert complications associated with this outcome, several other available archival data sets that used the same measures were considered and tested. However, the findings were similar and showed significant variability between samples. It was decided to proceed with the factor analysis of the two initial samples albeit with the acknowledgement of the differences and any potential impact. The covariance analyses were estimated by means of maximum-likelihood of estimation (ML), an acceptable and frequently used normal theory

estimator in these types of analyses (Taku et al., 2008). ML estimation is based on the assumptions of continuous, normal observed variables but is relatively insensitive to non-normality (Muthén & Kaplan, 1985). Therefore, the sample was judged to be adequate, given sufficient sample size, moderate to high inter-correlations among the variables, and lack of outliers, combined with the strong theory base from which to extract the hypothesised structure. To compare the three hypothesised models, the models were specified in path diagrams and CFAs were conducted. The data is ordinal data from a Likert-type scale, but it is possible to use ordinal data for factor analysis (Muthén & Kaplan, 1985).

As noted, there is not one single method to determine model adequacy. Therefore, a combination approach was adopted, and a mix of absolute fit and incremental fit indices are reported (Hu & Bentler, 1999). Absolute fit indices establish the degree of fit of the *a priori* model to the data generated by the sample (Hooper et al., 2008). It is a comparison of the data-model fit with ‘no specified model’ (Hooper et al., 2008). The most fundamental indicators of model adequacy are as follows: chi-squared test, Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI) and Root Mean Square Residual (RMR), inter alia. Incremental fit indices are comparative or relative fit indicators and make use of the comparison of the chi-square statistics to a baseline model (Hooper, et al., 2008). These include the Normed-Fit Index (NFI) and Comparative Fit Index (CFI).

In terms of model adequacy, a non-significant chi-square value and values greater than 0.90 for the GFI, CFI and NFI are considered to indicate acceptable model fit (Hooper, et al. 2008). Values greater than or equal to 0.95 for the GFI, CFI and NFI indicate good model fit (Hooper, et al. 2008). A RMSEA with 90% confidence intervals was also calculated, whereby a value of less than 0.07 is acceptable and less than 0.05 is suggestive of a good fit (Hooper et

al., 2008; Steiger, 1990). A small RMR is an acceptable threshold for a good model (Hooper et al., 2008). Models as specified and tested are presented as path diagrams in Figures 3 and 4. The oval shapes represent the latent variables or factors. The items of the PTGI are represented as boxes. The arrows represent the factors loadings between the latent variables and items; double headed-arrows symbolize correlations between the factors (Linley et al., 2007; Taku et al., 2008).

4.9.1. The Single Factor model

The model of PTG as a single, unitary factor represented by the overall score was first tested and the set of fit indices are reported below in Table 12. The criteria for adequate model fit and good model fit, according to Hooper et al. (2008) and used by Linley et al. (2007) are presented alongside the values yielded for the fit indices. The results across all selected indices, indicated poor model fit for the single factor model of PTG. The GFI, CFI and NFI did not exceed $> .90$, and the RMR and RMSEA did not fall below $.07$ and $.05$ respectively. In addition, the chi square (χ^2) was significant at $p < .0001$. Therefore, the criteria did not meet requirements as stipulated and the unitary factor model did not show sufficient evidence of usefulness or plausibility for the data of the present sample.

Table 12: Fit indices for the Single factor model

Index		Criteria	
		For adequate fit	For good fit
Goodness of fit index (GFI)	0.734	> .90	> .95
GFI adjusted for degrees of freedom	0.674	> .90	
Root mean square residual (RMR)	0.241	< .05	
RMSEA	0.120	< .07	
90% confidence level	(0.111- 0.128)		
Comparative fit index (CFI)	0.756	> .90	> .95
Chi square (χ^2) (df)	807.72 (189)	<i>ns</i>	<i>ns</i>
	p< .0001	p > .05	
NFI	0.706	> .90	> .95

ns – Not significant

4.9.2. The Five factor model

The model of PTG as five inter-correlated variables represented by the five subscales of PTG was tested. This model specified five latent variables with items loading onto the five factors as follows:

Factor 1 – Relating to Others (Relate) of seven items (6, 8, 9, 15, 16, 20)

Factor 2 – New Possibilities (Possible) of five items (3, 7, 11, 14, 17)

Factor 3 – Personal Strength (Strength) of four items (4, 10, 12, 19)

Factor 4 – Spiritual Change (Spirit) of two items (5, 18)

Factor 5 – Appreciation of Life (Appreciate) of three items (1, 2, 13).

The fit indices for this model are tabulated below in Table 13. Results indicated evidence of a moderate fit, or emerging fit, of the data to the five factor model, although the results do not exceed the criteria stipulated for the specific indices. The results of the GFI, CFI and NFI can be seen to be approaching the level of 0.90 specified for adequate fit. The RMR and RMSEA scores also presented within close range to the values of .07 and .05 required. Thus, apart from the significant χ^2 , the results appear to almost endorse the possibility of the five factor model as a means to interpret the data from this sample.

Table 13: Fit indices for the Five factor model

Index		Criteria	
		For adequate fit	For good fit
Goodness of fit index (GFI)	0.827	> .90	> .95
GFI adjusted for degrees of freedom	0.777	> .90	
Root mean square residual (RMR)	0.063	< .05	
RMSEA	0.088	< .07	
90% confidence level			
Comparative fit index (CFI)	0.876	> .90	> .95
Chi square (χ^2) (df)	494.18 (179)	<i>ns</i>	<i>ns</i>
	p< .0001	p> .05	
NFI	0.820	> .90	> .95

ns – Not significant

4.9.3. *The Three factor model*

Finally, the model of PTG as represented by the three broad growth dimensions postulated to be the most common or core elements of PTG was calculated and tested for model adequacy. This model specified a correlated, three factor model of PTG as tested by Powell et al. (2003) and Linley et al. (2007). Thus, it was hypothesised, according to the theory developed by Calhoun and Tedeschi (1996, 2004) and in line with the three factor model tested by Taku et al. (2008), that three dimensions could be calculated by summing the items as follows:

Factor 1 – Changes in perception of self (Self), eight items (3, 4, 7, 10, 11, 12, 14, 17, 19)

Factor 2 – Changes in interpersonal relationships (Relate), nine items (6, 8, 9, 15, 16, 20, 21)

Factor 3 – Changes in philosophy of life (Life), five items (1, 2, 5, 13, 18)

Outcomes are displayed in Table 14. The results of the analyses showed poor model fit for the three factor model, as the scores across the indices did not meet or exceed the required values. The GFI and CFI scores may be viewed as reasonably close to the levels required. However, this was not supported by the other indices or chi square result. Therefore, the model did not show sufficient or consistent evidence of approaching fair fit.

Table 14: Fit indices for the Three factor model

Index		Criteria	
		For adequate fit	For good fit
Goodness of fit index (GFI)	0.792	> .90	> .95
GFI adjusted for degrees of freedom	0.742	> .90	
Root mean square residual (RMR)	0.069	< .05	
RMSEA	0.102	< .07	
Comparative fit index (CFI)	0.825	> .90	> .95
Chi square (χ^2) (df)	628.20 (186)	<i>ns</i>	<i>ns</i>
	p< .0001	p> .05	
NFI	0.771	> .90	> .95

ns – Not significant

4.9.4. Summary of factor analyses

Table 15 indicates the key fit indices for the three models. The reported values did not meet the criteria for all three models. For the first model, the one factor model, the values for the GFI, CFI and NFI were not greater than 0.90 and thus indicated poor fit. The chi-square was highly significant at the $p < .0001$ level and further suggested lack of fit. The other indices also did not meet the threshold levels. The analyses of the five factor model yielded similar results. A significant chi-square value and values less than 0.90 for the GFI, CFI and NFI suggested inadequacy of the five factor model for the data. Nonetheless, results for this model were closer to the threshold values than the other models. Finally, the three factor model yielded values that did not meet the criteria as the GFI, CFI and NFI were less than the recommended 0.90 and the chi-square was significant. This suggested that the three models did not

demonstrate good fit, according to the analyses performed. Although, the five factor model reported values approaching the cut-off values as specified: for example, CFI of 0.876 (> .90). It is possible that with a bigger sample or more homogenous sample, this may have achieved significance.

Table 15: Fit Indices for three models

Model	χ^2 (df)	p	GFI	CFI	RMR
1 factor	807.72 (189)	p< .0001	0.734	0.756	0.241
5 factor	494.18 (179)	p< .0001	0.827	0.876	0.063
3 factor	528.20 (186)	p< .0001	0.792	0.825	0.070

4.10. Summary

In summary, the data indicated that the sample did perceive PTG and reported exposure to a range of traumatic events, many of which were associated with high levels of traumatic stress as measured by the IES-R. The factor analysis yielded results for the indices that suggested poor model adequacy. Although, the five factor model was modestly endorsed by scores that almost reached the cut-off criteria for adequate fit, and showed emerging fit. The three different models were tested in keeping with the premise that the current factor structure of the PTGI may not be wholly valid for a South African sample. That is, recent theoretical advances have suggested the possibility that the one, three or five factor structure of the PTGI may not yield a plausible match for the data provided by the South African sample. This possibility has been suggested by current research that has indicated that contextual factors and multiple experiences of trauma may impact on the manner in which trauma is experienced

and processed in a specific context, and ultimately influence PTG (for e.g., Weiss & Berger, 2010; Calhoun et al, 2010). Further exploration of the underlying reasons for the lack of fit and exploratory analyses to generate a more appropriate factor structure is, however, beyond the scope of this study. The subscales of the PTGI showed evidence of high inter-correlations, as anticipated and in accordance with the literature. Of note, gender differences were apparent in both the scores of PTG and traumatic stress. The profile of PTG, conceived of and measured as a multidimensional construct, may provide vital data for understanding the context-specific nature of PTG in terms of correlates and of sample characteristics.

*“... it remains to be seen if the five domains hold up on factor
analyses of various samples of trauma survivors...”*
(Tedeschi & Calhoun, 2004, p.6)

5. Discussion

5.1. PTG and related variables

The present study sought to examine PTG within a South African sample, with specific reference to the relationship of PTG with the variables of age, gender and the impact of the traumatic events, and with the aim to examine the factor structure of the PTGI according to three proposed models. The results yielded by the statistical analyses will be discussed in light of the current knowledge base of PTG as reported in the literature.

Each participant in the present study reported some degree of PTG, from a score as low as one to as high as 103 on a possible range of 0 – 105 on the PTGI. The mean scores were indicative of moderate levels of growth, similar to that found by Morris et al. (2005) in an Australian sample, and in other South African studies (Powell et al., 2003; Schmidt-Ehmcke, 2008; Walsh, 2011). This evidence has confirmed that individuals in South African samples do perceive PTG, psychological growth that they have attributed to their experience of a traumatic life event. Given the high levels of exposure of South African individuals to a variety of traumas, such as violent crime, illness and motor vehicle accident, and often multiple experiences of trauma, this has important implications for the healing and recovery process, for the processing of traumatic experiences and for clinical practice. The moderate level is also consistent with evidence that cultures and subcultures may vary in the levels of overall PTG reported by individuals who have experience trauma (Weiss & Berger, 2010). Thus, individuals in the South African context do report PTG, but it is possible that PTG is shaped by socio-cultural and individual factors that are both common and unique to cultures and settings.

But what does a moderate level of growth actually mean? This connects to the primary question of the validity of reports of growth: at which point or level are scores on the PTGI associated with lasting and authentic positive personal growth for individuals who have experienced trauma. The value of different scores of PTG has been raised as a methodological issue – as it has been debated and queried “whether a score of 1 on the PTGI equates to growth” (Morris et al., 2005, p.582). A specific cut-off score is perhaps necessary to meaningfully capture personal growth. This may call for the examination of individual scores and the meaning attributed to these in order to quantify cut-off scores and to assess the degree to which individuals perceive that change and personal growth has occurred. This may further enhance the clinical utility of the inventory. At present, the self-reported score is considered a subjective measure of PTG.

While these scores are suggestive of psychological growth, it is critical to question the point at which the PTGI determines that positive and beneficial changes have occurred for the individuals who have experienced a stressful life event. It is difficult to reflect on whether these scores of PTG are representative of actual growth in the absence of baseline measures, or a comparison to a sample of non-trauma exposed individuals. One study that used the transition to college as a traumatic event, found that PTG scores of $M = 60.42$ ($SD = 16.61$) compared with samples that had faced more conventionally-accepted traumatic events such as bereavement and illness (Anderson & Lopez-Baez, 2011). These authors further suggested that the PTGI can be considered as a measure of personal growth, not merely adversarial growth. This is in direct contrast to Tedeschi and Calhoun’s (1995, 2004) assumption that PTG is directly related to the severity and impact of a traumatic event. Others have indicated that samples with normal life stressors reported significantly lower levels of PTG suggestive

of the fact that events associated with more severe threat and psychological distress are more likely to lead to perceptions of PTG (Linley & Joseph, 2004; Tedeschi & Calhoun, 2006) – in line with this research, severity of event is considered to be a predictor of PTG. In the current study, PTG was significantly related to the experience of distress measured by IES-R scores in a positive manner (although the magnitude was moderate; $r = 0.31$, $p < .0001$). This is similar to that found in other studies, such as Australian undergraduates in the Morris et al. (2005) study of PTG ($r = .37$, $p < .001$, $N = 219$). Therefore, those who experienced the greatest levels of distress also reported the higher levels of PTG. The positive correlation between PTG and IES-R scores implies that growth and distress co-occur as proposed by theory (Hagenaars & van Minnen, 2010; Tedeschi & Calhoun, 2004). Due to the cross sectional nature of study, causality cannot be established, but it is assumed, in line with the theoretical propositions, that individuals are required to have experienced a traumatic event that is sufficiently distressing in order to shatter their assumptive world, and in the process of rebuilding, perceive growth in several areas of their lives. Based on this assumption, it seems likely that the experience of distress is necessary for PTG to occur. However, current research has argued that the relationship between growth and distress is more complicated than a simple, linear relationship and that the association is best represented by a curvilinear relationship (Joseph, Murphy & Regel, 2012).

Further, the Spiritual Change subscale showed the weakest evidence of all subscales. This may be due to the lack of items loading onto this factor, or even possibly due to lack of applicability to the South African sample. It could be that Spiritual Change is weakest of the factors and may need to be altered or adapted for the South African sample. Spiritual and religious orientation is construed as a key element of an individual's worldview that determines beliefs within the assumptive world, and of the socio-cultural considerations that

impact on reactions to traumatic events and PTG (Weiss & Berger, 2010). Therefore, some items developed to measure this specific domain of PTG may be considered to be extraneous to the prevailing, shared socio-cultural expectations of the context (Weiss & Berger, 2010).

A notable finding is the high level of traumatic stress reported by individuals in the sample. This is consistent with the elevated levels of distress reported by individuals who have faced severe or multiple traumas and who are also exposed to high levels of daily life stress (Kaminer & Eagle, 2010; Williams et al., 2007). This emphasizes that individuals in the South African context, particularly those self-selected as having experienced a trauma and those randomly sampled, have been exposed to significant life stressors and moreover, have experienced high levels of emotional distress as a result. In turn, perhaps, they engage with the necessary cognitive processing essential for the reporting of PTG as they grapple with coping with their trauma and the impact it has had on their life. The question is the extent to which PTG is a coping mechanism that enables the individual to continue to live and make sense of a world in which the reality includes the high likelihood of exposure to some form of trauma or life stressors. The high levels of traumatic stress may be specifically related to the severity of traumatic events and the types of events, and this may require additional exploration. Furthermore, it has implications for the treatment and access to psychological support and counseling services. With so many individuals experiencing such high levels of distress, and a large sector of the population having extremely limited access to such services, particularly in the public sector, it seems possible that many individuals are coping without therapeutic support. This may add credence to the suggestion that PTSD and traumatic stress are a public health concern in South Africa.

There is also a need to consider both positive and negative consequences to trauma, and to not overlook the distress and negative emotional effects of the experience. It may be useful to explore the manner in which growth and distress are related for South African survivors of traumatic experiences. This is especially true as PTG and distress are not considered to be opposite ends of a continuum, but rather to co-exist as independent states of well-being (Mystakidou et al., 2008). The indication of a weak linear relationship between PTG and the IES-R scores may function as part of the more complex, underlying relationship representative of an inverted U-shape, or curvilinear, as suggested in the literature (Tedeschi & Calhoun, 2004). An analysis of the explicit relationship between PTG and traumatic stress could add to the understanding of this complex association.

As anticipated, and consistent with the findings of other studies, gender emerged as a significant variable in the process of PTG. Female participants reported higher mean levels of PTG and traumatic stress. It has been suggested that greater sensitivity to stress and higher levels of psychological distress, may underpin the significance of gender as a predictor of PTG (Hungerbuehler, Volrath & Landolt, 2011). Women are more likely to report distressing symptoms and to develop PTSD (Vishnevsky et al., 2010). It has been proposed that the different cognitive and affective style of processing of the psychological distress, in terms of the ability to deal with and talk about distressing feelings and the impact of the experience, may contribute to the development of PTG in women (Hungerbuehler et al., 2011). Whilst the results showed a significant difference between males and females, the elevated number of female participants may have confounded these results. The positive finding in this study was in line with additional research on gender differences in PTG, which showed that regardless of the inventory used, small to moderate effect sizes were established with women reporting higher levels of PTG than men (Vishnevsky et al, 2010). PTG as reported by female

participants may not be influenced by the measurement scale but perhaps reflective of certain characteristics of female participants, such as those, associated with the tendency to engage in deliberate rumination, or the types of events that women are exposed to and that have an impact on the factors and processes that contribute to PTG (Vishnevsky et al, 2010). It may be instructive to examine the processes that underlie the female participants' perception of growth, and to combine a measure of their PTG with an anecdotal study of their reports of the traumatic event, in terms of both positive and negative consequences, and the processes by which they have come to terms with and made sense of the experience. Female participants reported higher levels of traumatic stress and PTG in this study. This is notable but must be interpreted with caution as a significantly higher number of female participants completed the questionnaires (84.2%). This may have confounded the results or introduced response bias. However, there may also be characteristics associated with the coping processes employed by females that influence their ability to report PTG and make meaning out of their experience of a traumatic event. It has been demonstrated that social support and marital support play a vital role in the coping processes associated with PTG, and this may enable female survivors to perceive PTG more easily (Brunet et al., 2010).

Age did not emerge as a significant variable in terms of PTG or IES-R scores. It would be interesting to compare the levels of PTG in the younger cohort to those in middle adulthood and then old age, to examine if PTG varies according to the number of traumatic experiences and age. However, it may also be that PTG may reach a maximum level or plateau after the coping processes are triggered by the first traumatic event, and this may be further compounded by the characteristics of the individual, the environment and the event.

5.2. Factor structure of the PTGI

A confirmatory factor analysis of the PTGI using a sample of 231 individuals indicated that three specific models of PTG – that of a unitary factor, of three factors, and of five inter-correlated factors – did not overtly meet the criteria for model adequacy within the South African sample. The results showed that the hypothesized models of the PTGI did not fit the data well according to the fit indices selected. Good model fit does not prove that the model is accurate or correct, but rather suggests that it is plausible (Lei & Wu, 2007). On the whole, whilst the indices showed that the five factor structure did not provide adequate fit, the results were promising and showed an emerging profile that nearly reached the prescribed threshold values. With this in mind, and in light of the overall evidence of poor model-data fit in the present study, further factor analytic studies are required to replicate this study and generate new findings. Exploratory analyses of South African data may assist researchers to develop a variety of possible models that may yield closer model-data fit is necessary albeit beyond the scope of this present study.

The PTGI has been extensively used in the study and evaluation of PTG around the world since its development, and has yielded scores of PTG in South African studies (Brunet et al., 2010). It has also been widely subjected to analyses of its principal factor structure. The findings of the present study did not fully support any of the three models tested, although the five factor structure of the PTGI showed the closest approximation of model fit. These findings are inconsistent with studies using CFA that have yielded support for the five factor structure and suggested that this is the most robust structure of the model (Brunet et al., 2010; Taku yet al., 2008). Researchers have proposed that CFA is a stronger technique than exploratory analysis such as principal components analysis, when investigating models with

regard to factorial validity; yet it was unable to reflect the hypothesised structure of the PTGI with the sample used here. Other studies have found similar contrasting results with alternative factor models (Ho et al., 2004; Osei-Bonsu et al., 2012; Splevins et al., 2010). It is notable that the lack of support for the five factor model has emerged from samples with distinctive environmental or event-related factors. It is therefore necessary to replicate this study with a new, perhaps larger sample of South African individuals and to conduct exploratory factor analyses for theory development in the event that the new data does not conform to the five factor structure. Alternatively, further research should explore which of the constrained parameters, if left free to roam, would result in a better model fit for the five factor model (Stapleton, 1997). According to Stapleton (1997), “when a confirmatory analysis fails to fit the observed factor structure with the theoretical structure, the researcher can evaluate ways to improve the model by exploring which parameters might be freed that had been fixed and which might be fixed that had been freed. The computer packages can be utilized to change parameters one at a time in order to determine what changes offer the greatest amount of improvement in the fit of the model” (no page specified).

With regard to the three factor model of PTG, it was noted that different studies have used different methods to formulate the potential three factors. The present study made use of the three factors of Self, Relate and Life – as tested by Taku et al. (2008) and formulated according to Tedeschi and Calhoun’s (2006) theoretical proposition of three core domains of PTG. However, Powell et al. (2003) omitted one item from their study and Linley et al. (2007) specified a correlated three factor model of Changes in self/positive life attitudes (Change), Relating to others (Relate) and Philosophy of life (Philosophy) based on Tedeschi and Calhoun’s (1996) exploratory analysis. Therefore, the studies appear to be testing different theoretical formulations of the core elements of PTG. It may be that further work is

required in order to clearly understand the core dimensions of PTG, and the degree to which these core elements are influenced by person factors and contextual factors.

The five subscales showed moderate to high levels of inter-correlations, suggestive of modest internal consistency ($r = 0.78 - 0.89$, $p < .0001$) as found in other studies (Taku et al., 2008). This is most evident when the Spiritual Change subscale is excluded, and may indicate that this subscale, as it stands, may not be reliable in the South African context. The inter-correlations support the idea that PTG is multidimensional and made up of these several highly related dimensions. But the factor analyses did not support the distinctiveness of the five separate factors. To a certain extent, the factors or subscales have not have meaningfully represented PTG in this sample, according to the current formulation and structure of the measure at this point in time.

The results of this study are in line with other studies that have failed to replicate the factor structure of the PTGI (Splevins et al., 2010). The authors have suggested that the PTGI may be not be measuring the same theoretical construct in the different samples, and that cultural differences in the conceptualisation of the items and constructs may be responsible for the unanticipated and unique loadings on items in the different studies (Splevins et al., 2010). Splevins et al. (2010) have argued that the Western response bias, a type of socially desirable need to endorse the positive and progressive life story in the face of challenge or adversity, may be the complicating factor. However, given the characteristics of the South African context as noted, there may be fundamental differences in the factors of the PTGI that are more applicable to a South African sample. In fact, given the outcome of this study, the PTGI appears to require closer examination in terms of the factors derived from the theoretical

understanding of PTG, and of the items selected and the way in which they are worded, for South African samples.

The Spiritual Change subscale showed some evidence of the weakest correlations and lowest mean scores in terms of representing this specific aspect of growth for individuals in this sample. However, no conclusive understanding of the differences can be reached without further study. A complicating factor is that of timing. This is especially relevant with regard to the extent to which PTG occurs across all five identified domains of growth and in what time periods (or if at all, in some cases for either one or more of the domains) (Taku et al., 2008). It is possible that growth occurs as a process over time and may be differentially exhibited in the domains of growth at distinct time periods or highly dependent on their milieu and social support. Or it may be that PTG is different in contexts that have high prevalence of multiple traumatisations, such as South Africa.

Therefore, it is possible to speculate that the context of multiple traumatisation may have had a significant influence on the extent to which individuals are able to recognise and/or attribute positive psychological changes to their experience of a traumatic event. It may even be as simple as the wording of certain items that require modification. The other possibility that has been raised is that the idea of spirituality as informed by traditional healing practices and a diversity of religious belief systems within South Africa may have an impact on the Spiritual Change subscale and that processes associated with growth in this dimension may be unique, forged by the context as a whole and particularly prone to influence when measured by the PTGI.

Whilst the factor structure was not effectively reproduced in this study, it is possible to understand the findings in respect of the current literature on PTG. The data as analysed here does appear to approximate the structure of the five factors to a limited extent. This may suggest that there are certain common elements of PTG that are tapped by the PTGI. These may be elements that are applicable universally to many individuals and thus samples from different contexts. But certain elements in the growth process may be more prone to influence from the socio-cultural context, shaped by the milieu in which the traumatic experience takes place and in which cognitive processing occurs and meaning is derived. It is possible that the influence of these elements may render the five factor structure inadequate for the sample, and equally so for the unitary structure and three factor structure. This would confirm the idea “that personal growth probably has a common core” (Tedeschi & Calhoun, 2004, p.14), and may occur via diverse pathways and for different reasons. The authors concluded that the five factors reflect or capture the common core of personal growth after the experience of trauma. Perhaps in this sample, the common core of PTG is highly similar to that of other samples, but key elements of the South African sample and context have shaped the expression of PTG and adversarial growth.

Anderson and Lopez-Baez (2008) have suggested that the five, three and one factor models can equally be applied and used to meaningfully interpret data from a sample according to the factor loadings of those items, given the results of their study with college students. In fact, they have argued that “the results of the EFAs seem to suggest that no single factor structure among the five best reflects the structure of all growth” (Anderson & Lopez-Baez, 2008, p.224). This implies that the factor structure of the PTGI may be variable and highly dependent on the sample characteristics. Further, the authors have argued that it is possible to demonstrate the practical value of factor structure of the PTGI, even if not specific (Anderson

& Lopez-Baez, 2008). Based on the results in the present study, it may be likely that the five factor structure continues to be the most useful and significant for the South African population, and may be meaningfully used with adults. However, it does require further investigation of possible differences in the factor structure that may elicit or highlight the elements unique to the South Africa context that shape and alter the expression of PTG in the South African context. This consideration of the contextualised use of this measurement inventory is relevant for the current need to develop reliable and valid measures of PTG that are more sensitive to socio-cultural elements and influences (Weiss & Berger, 2010).

It must be acknowledged that the methodology of this study may have confounded the results to a certain degree. The two samples were pooled and not very large in number, with apparent differences between the profiles of PTG. It is an established practice in many of the studies to pool data, some from as many as fourteen samples (Taku et al., 2008). In some of the studies, the researchers have considered and assessed potential sampling differences, and in others, the samples have been used without reported evaluation or overt factor comparison of the samples. Therefore, the results must be interpreted with caution as the two studies had different aims and samples. It can be confirmed that the scoring of the PTGI and IES-R was precisely the same for both studies, and the PTGI as reproduced was identical. The motivation of participants may have been different and also represented a different age and socio-economic cohort. After careful consideration of the results, and evaluation of the samples, it also seems likely that the South African context has an impact on the way that PTG is perceived and expressed by individuals. This line of thinking reflects the changes in the way that PTG is conceived and studied in the literature and research studies. In the beginning, the emphasis was on the systematic evaluation of growth and then the identifiable correlates of growth. Now, as researchers and clinicians learn more about PTG, so its complexity is

revealed. Recently, the impact of socio-cultural characteristics and of the socio-cultural context on the perception of PTG, has received attention. In particular, for example, Tedeschi and Calhoun's model of PTG (2004) has evolved to reflect the complexity of the pathways to PTG, specifically the influence of proximate and distal elements of the social and cultural context (Calhoun et al., 2010).

Further, the PTGI has been translated and adapted for different countries and samples – these versions have included additional, context-specific items, such as in the PTGI-Greek version and the PTGI for an Australian sample (Morris et al., 2005; Mystakidou et al., 2008). In the Morris et al. (2005) study, the spiritual change factor was strengthened with extra items and additional items loading onto the factor. It is possible that adaption may be required for the South African context, based on additional studies and given that the factor structure may be somewhat comparable but not adequate or identical. Therefore, the results of the present study are in contrast to studies that endorsed the relatively robust five factor structure of the PTGI, in both the original and modified instruments (Morris et al., 2005). Studies supportive of the factor structure also yielded five factors regardless of rotation method used and the type of factor analytic method employed. PTG does appear to be multidimensional as opposed to a single outcome (Morris et al., 2005), but the question remains as to which factors can most meaningfully capture the elements of personal psychological growth after trauma exposure for individuals in the South African context. Weiss and Berger (2010) have noted that there is a specific need for a multicultural (and cross contextual) perspective in the PTG research in order to attend to both the universal (etic) and culture-specific (emic) elements of the traumatic exposure and the coping process in the aftermath. The authors have acknowledged that this need poses considerable theoretical, methodological and practical challenges for research.

5.3. Strengths and Limitations

As with all research in the social sciences and the complexity of the human psyche being studied, this study was subject to certain limitations. One of the strengths of the present study was the diverse and heterogeneous sample of individuals who volunteered to participate. With the pooled data from two samples, the study was able to test a larger and more diverse overall sample. However, this was also a limitation of the study. The data sets were collected independently and pooled from a heterogeneous collection of individuals. Both samples were derived from research projects that were shaped by different methodology and collection methods (Linley et al., 2007). In addition, the micro-context of each sample was diverse, in that one sample represented a student sample and the other a community sample. The participants are taken from dissimilar samples in terms of age, types of traumatic exposure, social class, and life experiences. This heterogeneity may have been a weakness. It may be necessary to examine whether the three or five factor models would be replicated with a more homogenous sample that has faced one specific trauma, such as violent crime or loss of a loved one. That said, previous researchers including those in the trauma field have suggested that the student population may be representative of the greater population in various aspects of the trauma experience (for example, Frazier et al., 2009a).

It appears that the greatest challenge may have been the age differences in the pooled samples, as age is associated with PTG, albeit in an inconsistent manner. However, it is important to note that factor analysis does not examine relationships between variables but rather examines the consistency of particular latent traits or variables within a measure. As such, it is not so much the between subject differences that are important but the within

subject consistency within the measure. Therefore, pooling different samples may be possible, as in this present study. It does require that it be acknowledged, however, that bias can result from the pooling of data from different samples, taken at different points in time and different populations, which can affect factor analyses, especially exploratory analyses (Suhr, 2006). The potential means to control for such bias in factor analysis is to compare the factor structures of the covariance matrices to ensure that the subsamples are homogenous in terms of PTGI items (Garson, n.d.). In this way, the homogeneity of the structure of the PTGI items is of greatest concern. This would require an explicit comparison measures method to compare the factor structures of the two samples of interest (Garson, n.d.). In this study, this was not explicitly addressed. Studies of other inventories have suggested the use of a test of equality of the covariance matrices in order to examine whether the subsamples that form the larger database are homogenous concerning the structure of the test items (van der Gaag, Cuijpers, Hoffman et al., 2006). This may be a consideration for future research that involves the pooling of data from several samples.

The results of the initial comparison of the two samples, along with other archival data, implied that the profile of PTG may be distinct for particular samples and for specific types of events. The initial analyses revealed that the samples were not directly comparable in terms of age and PTG and hinted at a pattern of results associated with each specific sample. This provides an interesting avenue for future research, to compare the characteristics and factors associated with different samples who report PTG, both in the South African context and elsewhere.

As the study is based on a convenience sample, the possible bias introduced by such a sample must be considered. Those who volunteered to complete the forms may be individuals who

have experienced greater post-trauma growth and thus be willing to share it. This may have been due to several personal traits or processes, such as deliberate cognitive processing of their experiences, the facilitation of growth through greater, more available social support, or the presence of personality characteristics that perhaps rendered some individuals more able to perceive growth, or less avoidance in thinking about and dealing with the trauma and its impact. Any number of factors may have influenced the growth process, especially those associated with the cognitive processing necessary for PTG. The motives of those who offered to participate and share their experiences may have predisposed them to greater growth, or willingness to indicate growth, whether real or illusory. It is complicated to fully understand the effects of selection bias on the results, but with a concept such as PTG that is open to the effects of response bias, it is an important consideration. In addition, this was a small to moderate sample size for a factor analysis, although it did meet the criteria of 25 participants per item on the PTGI. The results should be interpreted with caution given these limitations. The sample did include a range of individuals of differing ages, races and home languages and types of traumas, but it is not wholly representative of the South African population and the results may not be generalisable to the population as a whole. However, the data may be representative of a context that is considered to be a continual traumatising environment (Edwards, 2005).

This study was subject to limitations of retrospective, cross sectional research, similar to the vast majority of studies conducted on PTG. The validity of retrospective self-reports has been repeatedly questioned and some studies have indicated that these reports are subject to inaccurate recall (Anderson & Lopez-Baez, 2008; Ransom, Sheldon, & Jacobsen, 2008). There is also a possibility that PTG is partly founded on the self-enhancing bias that is necessary for coping and for alleviating distress – the so-called illusory side to PTG

(Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). This has been suggested as the counterpoint to the authentic personal change and growth that occurs in PTG. The stability of PTG over time has been questioned, and it has been noted that reports of PTG may change over time (Zoellner & Maercker, 2006). The validity of these reports of psychological growth offered by individuals may also be questioned. Researchers have debated whether reports of PTG indicate genuine growth. The study did not make use of a means to quantify or validate the accounts of growth or perceptions of post-trauma changes and did not include supporting evidence from observers or significant others to verify the self-reported changes (Anderson & Lopez-Baez, 2008). A further consideration is the limited evidence for the validity of the PTGI for measuring PTG in the South African context (Anderson & Lopez-Baez, 2008). Additional investigation of the PTGI may be necessary, and beneficial, in order to establish its usefulness and psychometric soundness.

An area that requires greater investigation is individual's reports of the nature of their traumatic experiences and the number of traumas that they have experienced in total. There was a lack of additional and detailed information for individuals in this sample. Participants completed the PTGI with one specific event in mind and indicated the type of event. However, on the TSS, many individuals went on to report multiple experiences of trauma, as many as eight or ten in some instances. Within this study, it was not possible to isolate the traumatic experience that had initiated or contributed to PTG, as many individuals appeared to have experienced multiple instances of trauma. Therefore, PTG may also be the outcome of the cumulative effects of stressful life experiences. Further, only one sample indicated the perceived severity of the experience they reported in their completion of the questionnaires. These elements may be worthy of additional investigation in order to elaborate the degree to which PTG is related to the severity of traumatic events and multiple traumatisation. It may

be possible that individuals are able to perceive PTG at moderate levels of exposure, but once overloaded by multiple experiences, they may be subject to the “pile-up of losses” and be rendered unable to perceive PTG (Janoff-Bulman, 2006). This may be particularly relevant in the South African context.

A question raised by the present study is the impact of multiple traumas on levels of PTG; that is, whether the individual has experienced one or more than one trauma, severe or not so severe, recent or distant, has a significant influence on the levels of PTG. This requires further evaluation, specifically with respect to item relevance and factors of the PTGI (Linley et al., 2007). For example, the Spiritual Change subscale showed the lowest reported levels in the sample and lack of inter-correlations, suggestive of a misfit with the sample perhaps made worse by the small number of items. The possibility of applicability of wording and of items representative of the subscales may be an area that requires future investigation. It is highly likely that the distinctiveness of the South African context may have an impact on the way in which PTG is perceived and expressed. This uniqueness is forged by the political and social history of the country, by the current high levels of crime and violence and vestiges of racial inequality that continue as a result of apartheid history. On a positive note, there are many icons who demonstrate personal growth through adversity. Notably, former president Nelson Mandela may act as a profound and highly visible role model for PTG. Other role models have included well-known South Africans such as Desmond Tutu, Mmamphelle Ramphela, Natalie Du Toit, and survivor Alison Botha, among many others who have provided a role model for overcoming adversity. It has been observed that “the availability of role models in one’s own social groups may be as influential, and perhaps more influential, than the distal broad societal themes” (Weiss & Berger, 2010, p. 5). Given the possibility of a unique,

culturally shaped PTG, in-depth evaluation of the PTGI may yield indicators for adapting the inventory to enable it to more fully capture the essence of PTG for South African individuals.

5.4.Implications for Future Research

Despite the limitations, this study is able to make a contribution in terms of suggesting that the factor structure of the PTGI and the construct of PTG may not be wholly applicable to survivors of trauma in the South African context. Therefore, the concept and the measurement inventory require further examination in order to clarify the process of positive psychological growth in the wake of trauma and to further enhance current knowledge of how individuals in South African communities make sense of the impact of trauma on their lives.

It is necessary to fully examine the concept of PTG in light of socio-cultural contexts and influences. A key factor is how to assess the impact of the socio-cultural context. The need to investigate the consistency and validity of PTG across cultural settings has been noted, and the present study forms part of the body of research with this aim (Taku et al., 2008). However, further evaluation is also called for, especially in replicating this study and conducting exploratory analyses in order to determine the factors most applicable or relevant to the South African context. This may also necessitate a process whereby poorly suited items of the measure are re-evaluated with the aim of changing the wording or removing them altogether. In a sense, this may suggest the need to adapt the PTGI to fit the South African context, as in other countries that require translation or revision. However, this will ultimately require additional exploration and validation of the results found here.

It is also noted that different samples, including the two samples used in the present study and others considered for the study, show distinct variability and similarity in characteristics and this too is worthy of further investigation. As suggested, it may be that PTG is best represented by specific core elements as well as characteristics that are shaped by the individual's life experience and the context in which they have lived and experienced the traumatic events.

This study, like many others, has showed evidence that individuals report PTG after a variety of experiences considered traumatic or highly stressful. These include violent, interpersonal and criminal violence, the loss of a loved one and financial hardships. Even so, individuals who have experienced multiple traumatisations may be able to perceive growth. Given the context in which individuals are exposed to multiple traumas, more detailed, qualitative study of the impact that multiple experiences of traumatic events have on the individual's reports of growth may be beneficial. Many individuals have experienced two or more traumatic events in the average South African sample. Further, prevailing theory suggests that PTG and distress are related in a curvilinear manner, such that exceptionally high levels of distress actually render the possibility of PTG less likely for these individuals. The concept of PTG is becoming more and more integrated into clinical practice, based on recent evidence that PTG can be facilitated to enable survivors of trauma to share their experiences, make sense of it and perceive positive changes that aid the healing process. The study of PTG is valuable for both clinical and theoretical purposes, and may be a useful tool for counsellors and therapists dealing with trauma victims on the South African context. It also suggests the need to ensure that all communities have access to such services.

“...it seems so simple to ask people whether they have experienced something positive from their traumatic event. However, the thought process underlying a person’s response may be much more complicated.”

(Helgeson, Reynolds & Tomich, 2006, p. 813)

6. Conclusion

6.1. The complexity of PTG

Within this study, individuals within a South African sample reported moderate levels of PTG after the experience of a diverse range of trauma. These reports of growth did not appear to ameliorate the negative effects of the experience of trauma, as the majority reported high levels of traumatic stress related to the trauma. Individuals who reported a greater impact of the event in terms of traumatic stress reported higher levels of PTG. As this research was cross sectional in nature, it was not possible to examine causality or to establish the degree to which growth and distress are simultaneous, related processes or distinct processes. Moreover, the reported traumatic events varied widely, from sudden, short term stressors to long term traumatic events, and many reported multiple experiences of trauma. The high levels of traumatic stress coincide with the results of other South African studies and suggest that the individuals in the sample have experienced severe symptoms of stress post-trauma. This provided further support for the need to address PTSD as a broader mental health concern, and for clinicians to consider the possibility of PTG when treating those who have experienced trauma.

Despite years of research, the adaptive role of PTG remains unclear, and the validity of reports of PTG are repeatedly questioned. This is a valuable area of enquiry especially with respect to clinical utility of the concept of PTG. The complexity of PTG is well established, particularly as PTG is a subjective perception of change that has specific meaning for the individual and may not be easily evaluated by means of self-report or observable behavioural changes.

6.2.Factor structure in a South African sample

Researchers have illustrated the need for additional and possibly alternative exploration of the PTGI as the five factor model had not been consistently supported in research, and the three factor model has also shown to be plausible in some studies (Weiss & Berger, 2010; Linley et al., 2003, Splevins et al., 2010). There is evidence for alternative factor structures of the PTGI, as suggested by the result of widespread studies (for e.g. Powell et al., 2003; Linley et al., 2007; Osei-Bonsu et al., 2012). Some authors have pointed to the limited items of some of the subscales and the evidence for high correlations among subscales as areas of weakness in terms of factor structure of the PTGI. This study is situated within this area of investigation. The findings of the present study called into question the stability of the five factor structure of the PTGI. Whilst this to some extent challenges the robustness of the five factor structure of the PTGI when applied to a South African sample, it is noted that the model fit was verging on adequate. Methodological and sample limitations may have influenced the results. Lack of fit may have been related to specific items within the inventory that are not relevant or suitable for the South African sample. Specifically, the Spiritual Change factor was found to be dissimilar to that suggested by the initial studies of the PTGI. Future studies may need to assess the specific items that are not appropriate for the context, and how these can be reworded or altered to become more relevant for the population being examined. The possibility also exists that the lack of evidence was to some extent related to certain characteristics of the sample and the context in which individuals who have experience trauma, are required to cope and make sense of the impact of the experience. Therefore, it is recommended that the factor structure of the PTGI is assessed in another sample of South African individuals in order to validate the results. In the event that the factor structure is once

again not supported, exploratory analyses may be conducted to evaluate the factors that may be more appropriate for the South African context. There may be additional models of PTG that have not been considered in this study. The current literature has suggested that certain elements of PTG may be common across all cultures and samples, but that other fundamental components may be prone to cultural variation.

In summary, the findings of the present study have indicated some concern about the factor structure of the PTGI and the structure of the PTGI as a valid measure of multidimensional PTG for this sample. Further replication of the factor analysis as well as more in-depth exploratory analyses may be required in order to provide more conclusive evidence relevant to the South African context. Most certainly, the present study highlighted the reports of PTG – that individuals who have experienced multiple, often highly traumatic events, do perceive positive psychological growth in the process of coping with the experiences.

*“This area of traumatology research provides the opportunity to
redefine the ‘victims’ of trauma as individuals capable of adaptation
and personal growth rather than merely surviving” (Morris et al.,
2005, p.584)*

7. References

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*“Despite the intense efforts to apply the most recent
theoretical and methodological approaches to the study of
posttraumatic growth, an understanding of this phenomenon is
still in its infancy...”*

(Weiss & Berger, 2010, no page specified)

8. Appendices

8.1. Appendix 1

Ethics clearance form

University of the Witwatersrand, Johannesburg
Faculty of Humanities – Postgraduate Office

Private Bag 3, Wits 2050, South Africa • Tel: +27 11 717 8202 • Fax: +27 11 717 4037



Student Number: 8801913H

MS S ROE-BERNING
P O Box 591271
Kengray
2100

9 May 2012

Dear Ms Roe-Berning

APPROVAL OF PROPOSAL FOR THE DEGREE OF MASTER OF ARTS BY COURSEWORK AND RESEARCH REPORT IN COMMUNITY BASED COUNSELLING PSYCHOLOGY

I am pleased to be able to advise you that the readers of the Graduate Studies Committee have approved your proposal entitled "*The measure of post traumatic growth*". I confirm that Dr E Price has been appointed as your supervisor in the Psychology Department.

The research report is normally submitted to the Faculty Office by 15 February, if you have started the beginning of the year, and for mid-year the deadline is 31 July. All students are required to RE-REGISTER at the beginning of each year.

You are required to submit 2 bound copies and one unbound copy plus 1 CD in pdf (Adobe) format of your research report to the Faculty Office. The 2 bound copies go to the examiners and are retained by them and the unbound copy is retained by the Faculty Office as back up.

Please note that should you miss the deadline of 15 February or 31 July you will be required to submit an application for extension of time and register for the research report extension. Any candidate who misses the deadline of 15 February will be charged fees for the research report extension.

Kindly keep us informed of any changes of address during the year.

Note: All MA and PhD candidates who intend graduating shortly must meet your ETD requirements at least 6 weeks after your supervisor has received the examiners reports. **A student must remain registered at the Faculty Office until completion of degree.**

Yours sincerely

Julie Poyser

Julie Poyser
Senior Faculty Officer
Postgraduate Division
Faculty of Humanities
Private Bag X3
Wits, 2050
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8.2. Appendix 2

Participant information sheet



School of Human and Community Development
Private Bag 3
WITS, 2030, JOHANNESBURG
South Africa
Tel (011) 717 4500 Fax (011) 717 4559

Dear Student,

MY NAME is Shelley Roe-Berning and I am completing a Masters Degree in Community-based Counselling Psychology at Wits University. As a part of my degree, I am conducting a research study with a focus on the way that individuals experience, cope with and make sense of difficult events that they may have experienced at some point in their life. This research will contribute to our understanding of how South African people cope with and emotionally process difficult events and can help to enrich interventions used in the South African context.

I WOULD like to invite you to participate in my study – this will mean completing the attached questionnaires. This should take about 10 minutes. There are no right or wrong answers, and all I ask is that you choose the answer that most closely describes your feelings and experiences as a person. So it's not like a test at all!

YOUR PARTICIPATION is entirely voluntary and you can withdraw at any point along the way. You will not be disadvantaged by not completing the questionnaires. Depending on whether or not you are signed up for a course that allows for extra credit, you **may receive extra credit** for your participation, which may be applied as a nominal percentage of points towards one of your courses as per the lecturer and the school's policy. Lastly, you **WILL NOT** be asked for any identifying information whatsoever at any point– so no names, identity numbers or student

numbers. You will remain completely anonymous, even to the researcher, as there is no way of matching your responses to you as a person.

THE COMPLETED questionnaires will only be seen by myself, and I will collate the information personally. The completed forms will be kept secure in a double locked cabinet. The results from the questionnaires will only be used as scores and looked at in relation to the scores from other questionnaires. So there will be no way to identify you personally. However, this also means that I will not be able to give individual feedback. If you are interested in the findings of the study, a one-page summary of the results will be emailed to you on request if you contact me via email after March 2013. The results of the study will be analysed and written up in the form of a research report for examination for degree purposes, and for an article for publication in a journal.

IF YOU would like to participate, please take a questionnaire pack and answers the questions using a pen or pencil. Once you have completed the questionnaires, kindly place them in the sealed box, either available at the back of the class straight after this lecture, or else in the psychology department office. I will collect all questionnaires from the boxes to ensure that the information is kept secure. If you do return a questionnaire, this will be taken as your consent to participate in this study.

In answering some of the questions, you may need to recall or think about some difficult circumstances or events in your life. If any of the questions cause you distress in any way, please seek assistance at the Emthonjeni Centre on 011 717 4513, and on Thursdays for a walk-in clinic, or the CCDU on West Campus on 011 717 9140. Details for additional counselling services will be provided in the resource sheet at the end of the questionnaire pack. If you have any other questions, please contact me via email: shellrb@mweb.co.za.

Regards,

Shelley Roe-Berning

082 564 7077

shellrb@mweb.co.za

Supervisor: Dr Esther Price

011 717 4517

Esther.Price@wits.ac.za

8.3.Appendix 3

Demographic information sheet

Basic Information Sheet

Please fill in the following information:-

Age: _____

Gender: male _____ / female _____

Race:

(this is for statistical purposes only)

White _____ Black _____ Asian _____ coloured _____ Indian _____ mixed heritage _____

Other _____ (please specify)

Home language: _____

Year of study: _____

Course: _____

8.4. Appendix 4

Posttraumatic Growth Inventory (PTGI)

Questionnaire 1

Before answering the following questions, please focus on one traumatic or life altering event that has occurred in your life.

Please indicate the type of experience you are thinking of:

- ☐ Loss of a loved one
- ☐ Chronic or acute illness
- ☐ Violent or abusive crime
- ☐ Accident or injury
- ☐ Natural/manmade Disaster
- ☐ Financial hardship
- ☐ Family responsibilities/difficulties
- ☐ Other

Any extra information about the event you want to add?

When did it happen?

- ☐ in the last 6 months to a year
- ☐ 1 - 2 years ago
- ☐ 2 - 5 years ago
- ☐ More than 5 years ago

Please read the statements below carefully and then indicate with a cross/tick the degree to which the change reflected in the question is true in your life as a result of your crisis. Please use the following scale:

0 = I did not experience this change.

1 = I experienced this change to a very small degree.

2 = I experienced this change to a small degree.

3 = I experienced this change to a moderate degree.

4 = I experienced this change to a great degree.

5 = I experienced this change to a very great degree.

1. I changed my priorities about what is important in life.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

2. I have a greater appreciation for the value of my own life.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

3. I developed new interests.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

4. I have a greater feeling of self-reliance.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

5. I have a better understanding of spiritual matters.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

6. I more clearly see that I can count on people in times of trouble.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

7. I established a new path for my life.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

8. I have a greater sense of closeness with others.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

9. I am more willing to express my emotions.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

- 0 = I did not experience this change.
 1 = I experienced this change to a very small degree.
 2 = I experienced this change to a small degree.
 3 = I experienced this change to a moderate degree.
 4 = I experienced this change to a great degree.
 5 = I experienced this change to a very great degree.

10. I know better that I can handle difficulties.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

11. I am able to do better things with my life.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

12. I am better able to accept the way things work out.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

13. I can better appreciate each day.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

14. New opportunities are available which wouldn't have been otherwise.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

15. I have more compassion for others.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

16. I put more effort into my relationships.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

17. I am more likely to try to change things which need changing.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

18. I have a stronger religious faith.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

19. I discovered that I'm stronger than I thought I was.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

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

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

21. I better accept needing others.

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

8.5. Appendix 5

Impact of Events Scale-Revised (IES-R)

Questionnaire 2

Below is a list of difficulties that people sometimes have after stressful life events.

Please read each item, and then indicate how you felt during the **SEVEN DAYS** after your particular stressful life event. With your experience in mind, please rate how much were you distressed or bothered by these difficulties.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Any reminder brought back feelings about it	0	1	2	3	4
I had trouble staying asleep	0	1	2	3	4
Other things kept making me think about it	0	1	2	3	4
I felt irritable and angry	0	1	2	3	4
I avoided letting myself get upset when I thought about it or was reminded of it	0	1	2	3	4
I thought about it when I didn't mean to	0	1	2	3	4
I felt as if it hadn't happened or wasn't real	0	1	2	3	4
I stayed away from reminders about it	0	1	2	3	4
Pictures about it popped into my mind	0	1	2	3	4
I was jumpy and easily startled	0	1	2	3	4
I tried not to think about it	0	1	2	3	4
I was aware that I had a lot of feelings about it, but I didn't deal with them	0	1	2	3	4
My feelings about it were kind of numb	0	1	2	3	4
I found myself acting or feeling as those I was back at that time	0	1	2	3	4
I had trouble falling asleep	0	1	2	3	4
I had waves of strong feelings about it	0	1	2	3	4
I tried to remove it from my memory	0	1	2	3	4
I had trouble concentrating	0	1	2	3	4
Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart	0	1	2	3	4
I had dreams about it	0	1	2	3	4
I felt watchful or on-guard	0	1	2	3	4
I tried not to talk about it	0	1	2	3	4

8.6. Appendix 6

8.6.1. The Traumatic Stress Schedule (TSS) (for the student sample)

Questionnaire 3

Please tick the answer that applies to you.

1. Did anyone ever take, or attempt to take, something from you by force or threat of force, such as in robbery, mugging, smash-and-grab or hold-up?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

2. Did anyone ever beat you up or attack you?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

3. Did anyone ever make you have sex by using force or threatening to harm you? This includes any type of unwanted sexual activity.

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

4. Did a close friend or family member ever die because of an accident, homicide or suicide?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

5. Have you ever been hijacked, or has someone close to you been hijacked?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

6. Were you ever in a motor vehicle accident serious enough to cause injury to one or more passengers?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

7. Did you ever serve in combat?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

8. Did you ever suffer injury or property damage because of fire?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

9. Did you ever suffer injury or property damage because of a severe weather event or either a natural or manmade disaster?

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

10. Did you experience any other events not mentioned above? If so, please specify the type of event in the space below.

☐ yes ☐ no ☐ witnessed it happening to someone else

If yes, when? ☐ 0-3 months ago ☐ 3-6 months ago ☐ 6-12 months ago ☐ 12-18 months ago
☐ > 18 months ago

Did it happen once ☐ or more than once ☐ ?

8.6.2. Trauma exposure questions for the community sample

INFORMATION SHEET

Before you proceed, please indicate that you are willing to provide this information voluntarily and that you understand that all information is strictly confidential.

Yes ☐

No ☐

Please provide some biographical information about yourself and the difficult life experience that you have faced:

Age _____

Gender Male ☐ Female ☐

Your Stressful Life Event:

Please describe the type of difficult event that you have experienced:

When did it happen to you?

Do you have a specific date? _____

Please indicate by means of a cross, how you felt about this event with regard to the threat to yourself and/or your health:

1	2	3
Mild threat to life and / or health	Moderate threat to life and / or health	Severe threat to life and / or health

Anything else you would like to add.

We all have a story to tell, all have had our share of difficulties and heartaches... Thank you for sharing your information. All details and responses are strictly confidential and will be used for research purposes only.

8.7.Appendix 7

The Resource sheet

And finally.... 😊

Dear Student,

THANK YOU for participating in my research study.

I WOULD like to give you some additional information about my research. The purpose of my study is to examine the way individuals respond to stressful and traumatic life events and in particular, the questionnaire used to measure these responses. Taking part in this research may have reminded you of some difficult events that you have experienced at some point in your life. If this participation has caused you any emotional distress whatsoever, if it has evoked reminders of traumatic or stressful events in your life and you are feeling troubled, please speak to someone. The following counselling services are recommended – you can contact the services and ask for an appointment with a counsellor:

These facilities are located on the Wits campus –

1. Emthonjeni Centre – 011 717 4513
2. CCDU – 011 717 9140

There are also reputable off-campus services –

3. FAMSA – 011 788 4784/5
4. Lifeline – 011 728 1347

YOUR ASSISTANCE has been extremely valuable – thank you!

Regards,

Shelley Roe-Berning
shellrb@mweb.co.za

*“... in the midst of great psychological pain, there can also
be new perspectives on life that are valuable to the
survivor, including a new recognition of
one’s personal qualities and a deeper and more
satisfying connection to others.”
(Joseph, 2011, p.20).*