PTSD, Optimism, Religious Commitment, and Growth as Post-Trauma Trajectories: A Structural Equation Modeling of Former Refugees

Hannah E. Acquaye

Refugees report several mental health challenges associated with pre-, peri-, and post-flight conditions. Some of these challenges include fear, anxiety, hypervigilance, hyperarousal, and nightmares—symptoms that could meet the diagnostic criteria for post-traumatic stress disorder (PTSD). Despite these challenges, some refugees also report psychological growth with nomenclature like post-traumatic growth, resilience, and benefit-finding. This study examined the directional relationship among war-related events, optimism, PTSD, religious commitment, and growth. Prior studies in traumatized samples have demonstrated that PTSD and growth can occur concurrently, while optimism and religiousness may enhance growth. The hypotheses undergirding this study posited that participants in this non-Western population could demonstrate concurrent PTSD and growth, while those with higher levels of optimism and religiousness would exhibit increased levels of growth compared to those with lower levels. For a sample of 444 former refugees, hypotheses were theoretically modeled to identify whether the data fit the model. Inspection of fit indices provided support for the hypothesized model. Implications for professional counselors are included and recommendations for future research are provided.

Keywords: refugees, post-traumatic growth, PTSD, optimism, religious commitment

Professional counselors who work with refugees, specifically refugees resettled as a result of war or conflict, hear their clients share the harrowing experiences encountered on their journeys toward safety (Clay, 2017; International Counseling and Community Services [ICCS], 2015). War-related internally displaced persons (IDPs) and refugees, more than immigrants or other displaced people, report suffering inhumane acts like ethnic cleansing (United Nations, 2017). Others describe running through forests to avoid warring tribal factions, defending themselves against wild animals and forces of nature, and going without food for days (Betancourt et al., 2015). These experiences can be traced through the precipitating events leading to their flight, the flight progression, and finally the pathways to resettlement. Each of these processes incurs a traumatic adjustment. Clients among this population have reported diverse somatic symptoms and physical challenges (Cline, 2013; Edge, Newbold, & McKeary, 2014), as well as difficulties associated with basic physiological needs (e.g., food, water, shelter; ICCS, 2015; Maslow, 1970). They have described symptoms that meet the criteria for diagnosing post-traumatic stress disorder (PTSD; American Psychiatric Association [APA], 2013; Zerach, Solomon, Cohen, & Ein-Dor, 2013), depression (APA, 2013; Praetorius, Mitschke, Avila, Kelly, & Henderson, 2016), anxiety (APA, 2013; ICCS, 2015; Praetorius et al., 2016), and bereavement (APA, 2013; ICCS, 2015).

Dated research has examined these conditions in refugees through the lens of psychopathology; however, studies spanning the past three decades have emphasized the *salutogenic* components of post-trauma experience (Antonovsky, 1987). *Salutogenesis* originates from the Latin *salus*, meaning "health," and was developed by Antonovsky (1987), who suggested that when people encounter stress, not all will have negative health outcomes. He therefore entreated researchers to use a strength-based lens instead of a deficit-based one in understanding human reactions to stress (Antonovsky, 1993). Although a strength-based perspective of post-trauma paths was not a new concept (Splevins,

Hannah E. Acquaye, NCC, is an assistant professor at Western Seminary. Correspondence can be addressed to Hannah Acquaye, 5511 SE Hawthorne Blvd., Portland, OR 97215, hacquaye@westernseminary.edu.

Cohen, Bowley, & Joseph, 2010), it had not yet been systematically and scientifically catalogued in the academic literature until the early 1990s. Since then, there has been a plethora of studies addressing people's strengths and resources despite hardships (Affleck & Tennen, 1996; Bonanno, 2004; Joseph & Linley, 2005; Tedeschi & Calhoun, 1996). Proponents of strength-based post-trauma paths have applied their unique nomenclature to signify the strength and benefit that clients report obtaining despite their encounters with diverse traumatic events. Terminologies such as *post-traumatic growth* (PTG; Tedeschi & Calhoun, 1996), *benefit-finding* (Affleck & Tennen, 1996), *stress-related growth* (Park, Cohen, & Murch, 1996), *thriving* (O'Leary & Ickovics, 1995), *resilience* (Bonanno, 2004; Connor & Davidson, 2003), and *adversarial growth* (Joseph & Linley, 2005) have been associated with this concept of meaningful positive change from a traumatic experience. The common theme among these writers is that there can be positivity and strength in places in which we expect weakness, illness, and pathology. Subsequent sections of this paper will address various outcomes known to follow a traumatic experience, connect them to theories associated with these experiences, and extract hypotheses to be tested.

Aftermath of Traumatic Experiences

When humans encounter traumatic experiences, they try to make meaning of them by using available resources. While some of these resources can be physical, others are psychological and emotional. Psychological and emotional resources could include inner narratives, religious communities, spirituality, connections with significant others, and nature. Optimism and religious commitment could also be included in the psychological and emotional resources that clients use to make meaning of their war-related traumatic experiences.

Trauma and psychopathology. Trauma is described as challenging experiences that push individuals beyond their normal ability to cope (APA, 2013; Ball & Stein, 2012). Trauma is ubiquitous, with research reporting that 60–80% of adults do experience at least one traumatic event (Simiola, Neilson, Thompson, & Cook, 2015). Traumatic experiences include robbery; terminal illness, for both the sufferer and loved ones; flooding; earthquakes; terrorist attacks; rape; and war-related events, for both civilians and the military. While many people who go through traumatic experiences may not have long-term negative repercussions, between 10–50% report various mental health challenges (Friedman, Resick, & Keane, 2014).

Studies on traumatic experiences in adults have collectively established that after a traumatic encounter, people report and exhibit various symptomatology of PTSD, including avoidance, intrusive thoughts, negative alterations in cognition and mood, and the tendency to live recklessly (APA, 2013). Individuals who experience the direct effects of these traumatic events are not the only ones affected. Research has identified long-lasting effects on significant others (Lahav, Kanat-Maymon, & Solomon, 2016; Zerach, 2015) and helpers (Baum, 2014) because of the regular contact with traumatized individuals. Terms like *secondary traumatization*, *vicarious traumatization*, and *compassion fatigue* (Jenkins & Baird, 2002) have been used to describe the reaction to emotional demands from trauma survivors' frightening and shocking images. Accordingly, significant others and helpers may sometimes react as if they themselves have gone through the traumatic events.

Based on the literature on war-related military and civilian populations, it is hypothesized that at least 10% of participants in the present study would meet the criteria for PTSD, with a cut-off point of 33 on the PTSD assessment instrument (Weathers et al., 2013).

Trauma and psychological growth. Another aftermath of a traumatic event is PTG (Tedeschi & Calhoun, 1996). The processes of rumination, meaning-making, and growth take place after the perceived shaking of a traumatized person's worldview (Calhoun & Tedeschi, 2014), and eventually

the person is able to put the event into perspective and gain a level of growth from the experience. In the words of the proponents, "PTG involves internal changes that can set the stage for changed behavior. There is variation in the degree to which personal changes can be noticed by others in terms of actions taken" (Tedeschi, Calhoun, & Cann, 2007, p. 399).

As a construct, PTG is seen as a legacy of trauma, containing "at least three broad categories of perceived benefits" identified by individuals and sometimes by the people in their lives (Tedeschi & Calhoun, 1996, p. 456). The three categories include changes in (a) self-perception, (b) interpersonal relationships, and (c) philosophy of life. PTG occurs when a person endures a traumatic event of seismic proportions that destroys some pivotal part of the person's worldview (Tedeschi & Calhoun, 2004). Theoretically, PTG has been conceptualized as both an outcome and a process (Zoellner & Maercker, 2006). PTG as an outcome represents substantial positive changes in cognitive and emotional life that could be the opposite of PTSD. The constructs are not two ends of the same continuum; PTG does not imply either an increase in well-being or decrease in distress. Although PTG and PTSD are distinct and independent constructs, prior studies suggest that both phenomena can coexist in traumatized individuals (Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003). These constructs have both been observed to be higher in females than males, even when trauma experiences are greater in males (Ball & Stein, 2012; Friedman et al., 2014).

Based on these findings, it is hypothesized that both male and female participants can exhibit cohabiting symptoms of distress and growth, with females exhibiting higher PTSD and PTG scores. For the sake of this study, PTG is defined as the collective expression of growth and benefit that clients claim to gain after the type of cataclysmic event that challenges their existing worldviews (Calhoun & Tedeschi, 2014; Tedeschi & Calhoun, 1996, 2004).

Optimism. The concept of optimism is grounded in theory and research (Carver, Scheier, & Segerstrom, 2010) that explores what motivates people and how motivation is expressed behaviorally. Optimism is the belief, hope, and confidence that good things will happen in a person's life instead of bad things (Carver & Scheier, 2002; Rand & Cheavens, 2012). Carver, Scheier, Miller, and Fulford (2009) stated that optimists are not disillusioned, but rather they acknowledge the existence and importance of adversity and choose to identify both internal and external resources that can help them cope.

Relationships between optimism and trauma have been examined in diverse groups of individuals who have encountered adversity. Research has demonstrated that individuals who perceive they are able to cope have a positive outlook on life and expect good things to happen because they can control their environments (Benight & Bandura, 2004). There also is evidence that a person's disposition to optimism may be attributable to certain environmental factors (Broekhof et al., 2015). In the Broekhof et al. (2015) study, optimism was found to be inversely related with all subtypes of childhood trauma; however, important sociodemographic, clinical, and lifestyle characteristics moderated this inverse relation. Moreover, literature relates optimism to positive mood and good morale (Peterson & Steen, 2012). Positive mood and good morale lead to perseverance and effective problem solving (Fredrickson, 2001), which in turn lead to overcoming negative traumatic symptoms. People who are generally optimistic often explain causes of events that happen to them and use these explanations as a stepping stone toward growth from adversity (Peterson & Steen, 2012).

Additionally, optimistic or hopeful people are able to make informed decisions on their health based on provided information (Rand & Cheavens, 2012; Scheier & Carver, 1985). In a study on health and hope, high-hope women could perform better on a cancer facts test than their low-hope counterparts, even when controlling for previous academic performance. Not surprisingly, hope was inversely related to intentional attempts at self-harm because self-harm efforts are incompatible with

the physical health goals that hopeful and optimistic people strive to achieve. Although there are a few scattered studies on Asian populations, there are limited studies within non-Western populations on how optimism and pessimism relate to quality of life (Chang, Sanna, & Yang, 2003); thus, the present study will contribute to the literature by testing the construct of optimism across cultures.

Consequently, it is hypothesized that participants who report higher optimism, despite their shared traumatic experiences with those who report lower optimism, will report higher PTG scores.

Religious commitment. Religiousness, religiosity, and religious commitment are constructs that are often confused and sometimes used interchangeably with spirituality (Brownell, 2015; Pargament & Mahoney, 2012; Pargament & Maton, 2000). Spirituality is a continuous search for the sacred (Batson, Schoenrade, & Ventis, 1993). Religion can also be expressed as human practices and behaviors concerned with a search for the sacred—a search founded on dogma, traditional practices, and institutional regulations (McIntosh, Poulin, Silver, & Holman, 2011; Pargament & Maton, 2000). Spirituality is an individual experience and does not necessarily work in an institutional setup like religion does.

Even though past research has not distinguished between religiosity and spirituality (Pargament & Mahoney, 2012), current researchers are consistently contrasting the two, with some asserting that religion is dogmatic, restrictive, and institutional, whereas spirituality is subjective, personal, and life-enhancing (Brownell, 2015; King & Crowther, 2004; Pargament & Mahoney, 2012; Prati & Pietrantoni, 2009). In many studies, participants often identify themselves as both religious and spiritual, which is not surprising because both religiosity and spirituality can be expressed individually as well as socially, and both can either hinder or foster well-being (Pargament & Mahoney, 2012).

In the discourse on PTG, religious coping is identified as a strong predictor of growth and partially shares the same descriptions as spirituality (McIntosh et al., 2011; Prati & Pietrantoni, 2009). However, Joseph (2011) cautioned against the assumption that higher PTG indicates higher religiosity. His caution has received corroboration from a qualitative study in Australia (Barrington & Shakespeare-Finch, 2013), in which participants in a grounded theory study described a decrease in religious commitment as indicative of psychological growth. The researchers surmised that participants whose trauma was related to their religious faith probably needed a shift in worldview about religion. Such a shift sometimes required lowered religious commitment to ensure psychological growth. This Australian study is in line with Joseph's (2011) observation that growth could mean a decrease in religious commitment for one person and an increase for another.

In another research study, a sample of 54 students who had experienced major traumatic events took part in a study that examined the association between event-related rumination, pursuit of religion and religious involvement, and PTG (Calhoun, Cann, Tedeschi, & McMillan, 2000). Despite the study's inability to determine longitudinal direction of effect, results provided evidence that openness to religious change independently predicted the amount of reported growth in the participants. In yet another study on the role of spirituality and religiosity in the physical and mental health after collective trauma, religiosity and spirituality were found to be highly correlated (McIntosh, et al., 2011). Religiosity, like spirituality, predicted higher levels of positive affect. Interestingly, religiosity, but not spirituality, predicted lower incidence of mental ailments.

Overall, with respect to physical health, religiosity was associated with decreased incidence of musculoskeletal ailments three years after the traumatic experience. Psychologically, religiosity was correlated with lower incidence of mental ailments, positive affect, and fewer cognitive intrusions three years after the 9/11 attacks. In sum, religious commitment has been found to enhance psychological growth after a traumatic experience. It is therefore hypothesized that participants in this

study who endorse greater levels of religious commitment will have higher PTG scores.

There are contradictory results concerning the relationship between PTSD symptoms and PTG in traumatized populations. While some studies reported a positive relationship between PTG and PTSD (Hussain & Bhushan, 2011), others reported a negative relationship (Kimhi, Eshel, Zysberg, & Hantman, 2010). Proponents of the positive relationship suggested that higher distress symptoms lead to high growth. Contrarily, those who reported the negative relationship reported that distress predicts growth. Other studies have found no relationship between distress and PTG (Widows, Jacobsen, Booth-Jones, & Fields, 2005). Yet, others have identified a curvilinear relationship (Kleim & Ehlers, 2009; Kunst, 2010), in which results have indicated that higher scores of PTG are related to mild PTSD symptoms and vice versa.

Post-traumatic distress and growth need not be mutually exclusive. Results of several studies have indicated that it is possible for both PTSD symptoms and positively perceived effects of the trauma experience to coexist, even in war-related traumatized populations (Powell et al., 2003). In these studies, participants may have experienced the trauma to a greater degree; however, they reported that using their internal resources, like optimism and spirituality, contributed to their positive perception of the experience. Based on the literature reviewed, this study is situated on the following hypotheses:

1. Between 10–50% of participants will meet the diagnostic criteria for PTSD. Furthermore, both males and females will exhibit co-occurring PTSD and PTG, with females showing higher scores in both PTSD and PTG than males.
2. Those who report high optimism, despite the war-related experiences, will have higher PTG scores than those with low optimism.
3. Those with high optimism will also score high on religious commitment.
4. Those with high religious commitment will score higher on PTG.

In sum, the objective of this paper was to identify post-traumatic trajectories within a sample of former war-related IDPs in a developing country. In the process of assessing the trajectories, the study will also establish reliability of Western-based instruments in a non-Western population.

Method

Participants

Participants for the study were adults from the West African country of Liberia who, because of the decade-long civil conflict, became IDPs or refugees. The only West African country not colonized by any of the European colonial masters (i.e., Britain, France, and Portugal), Liberia became a known republic in the 1820s. This occurred when freed slaves were brought from the Americas to the coast of Liberia. The indigenous people inhabiting the land prior to the arrival of the freed slaves were dissatisfied with how the latter, referred to as *Americo-Liberians*, governed the land (Gerdes, 2013; Verdier et al., 2008). This dissatisfaction festered until its culmination in an over decade-long civil conflict (1989–2003). It is estimated that more than 10% of the population died in the civil conflict (Verdier et al., 2008).

This study used a multi-stage sampling method (Fraenkel, Wallen, & Hyun, 2015). In the initial stage, criterion sampling was used for adult Liberians who were known to be former refugees and IDPs. The number of participants gained after the first sampling stage was less than the expected 500 participants. Snowball sampling was therefore employed to reach the target sample size. Because Liberia has no database of residents, participants had to be contacted face-to-face at community meetings, colleges, churches, and mosques.

Procedures

All procedures of the university's institutional review board were followed; informed consent was provided in both verbal and written form and undertaken via individual and group formats. Additionally, local healers and pastors were introduced to participants in anticipation of traumatic memories culled up from the questions on some of the instruments. The incorporation of local healers and pastors was consistent with research in similar areas and cultural practices (Van Dyk & Nefale, 2005).

Procedural criteria for inclusion were determined prior to data collection. Participants had to be 18 years of age or older, able to read and understand English at the eighth-grade level, and old enough during the war to have remembered the flight. Participants were thereafter given the informed consent and research package, which had been printed and numbered. Participants who preferred to complete the instruments in group format stayed after class or a church service for this activity. Others chose to take it home and bring it back to the researcher at an agreed-upon place. Announcements were made to participants to provide contacts they could recommend who fit the procedural criteria.

When all of the 500 packages had been distributed, data collection stopped. Of packets given, 444 were completed and returned, demonstrating an 88.8% response rate. Statistical power was estimated at .80 for this model using the SAS syntax provided by MacCallum, Browne, and Sugawara (1996). Based on this syntax, a sample size of 200 (df = 179) was considered adequate. Our sample size of 444 was therefore acceptable for an effect size of .80.

Instruments

Six instruments were given to participants. They were the Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), the War Trauma Screening Index (WTSI; Layne, Stuvland, Saltzman, Djapo, & Pynoos, 1999), the Revised Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994), the Religious Commitment Inventory (RCI-10; Worthington et al., 2003), the Post-Traumatic Stress Checklist for DSM-5 (PCL-5; Weathers et al., 2013), and a demographic questionnaire.

PTGI. The PTGI is a 21-item scale that measures positive changes that occur in people's lives because of crises. The scale comprises five subscales (factors). The subscales and sample questions are: (a) relating to others (e.g., I more clearly see that I can count on people in times of trouble); (b) new possibilities (e.g., I developed new interests); (c) personal strength (e.g., I know better that I can handle difficulties); (d) spiritual change (e.g., I have a stronger religious faith); and (e) appreciation of life (e.g., I can better appreciate each day). Each item is rated on a 6-point Likert-type scale ranging from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). The range of possible scores a participant can obtain is from 0 to 105. The PTGI has demonstrated high internal consistency (α = .90; test-retest reliability = .71) and acceptable construct validity (Calhoun et al., 2000). The instrument is not correlated with measures of social desirability (Baker, Kelly, Calhoun, Cann, & Tedeschi, 2008). PTGI scores for the Liberian sample demonstrated high internal consistency (α = .93), providing support for the cross-cultural nature of the instrument in consistently measuring the construct of PTG.

WTSI. The WTSI is a 35-item dichotomously scored self-report instrument. The instrument was used to measure participants' experiences during the Liberian war, and it was chosen because of its simplicity in assessing what participants saw, touched, or had done to them. Sample questions include, "During the war, did a bullet ever come so close to you that you could have been seriously hurt or killed?" and, "During the war, did you eyewitness someone being killed?" The highest score a person can obtain is 35. There is currently no reported psychometric evaluation of this instrument. On a cursory look, the instrument seems to be divided into broad categories consisting of (a) attack to self; (b) attack to loved one; (c) forced displacement; and (d) witnessing trauma. These four factors were

therefore used as part of the structural equation modeling (SEM) procedure. Reliability analysis of the 35 items for the Liberian sample demonstrated high internal consistency (α = .90).

LOT-R. The LOT-R is a 10-item scale that evaluates dispositional optimism. The instrument has four fillers (items 2, 5, 6, and 8), thereby leaving only six items to be used for analysis. Three items are reverse coded (items 3, 7, and 9) before undertaking any analysis. Each item is rated on a 5-point Likert-type scale, ranging from 0 (strongly disagree) to 4 (strongly agree). Sample items include "In uncertain times, I usually expect the best" and "If something can go wrong for me, it will." The LOT-R has acceptable internal consistency (α = .78), test-retest reliability (α = .60–.79), and discriminant (r = .48–.50) and convergent (r = .95) validity (Scheier et al., 1994). Reliability of the 6-item scale in the Liberian sample was modest (α = .49).

RCI-10. The RCI-10 measures the degree to which a person stands up for his or her religious values. The 10-item scale is measured on a 5-point Likert-type scale, ranging from 1 (not at all true of me) to 5 (totally true of me). The RCI-10 has two factors—intrapersonal and interpersonal religious commitment. The intrapersonal religious commitment assesses an equivalent of personal commitment not related to the social component of religious faith. Interpersonal, on the other hand, measures the social component associated with organized religious faith. Sample items include "Religious beliefs influence all my dealings in life" and "I spend time trying to grow in understanding of my faith." A cut-off score of 38 and above is needed to identify a highly religious person. Evidence indicates that people who score more than one standard deviation above the mean view the world in terms of their religious worldview (Worthington et al., 2003). Evidence of reliability for the norm groups was high, and both construct and criterion-related validity were similarly high (Worthington et al., 2003). Internal consistency for the Liberian sample in this study was acceptable (α = .84).

PCL-5. The PCL-5 measures distress symptoms after a traumatic experience. The 20-item instrument is ranked on a 5-point Likert-type scale ranging from 0 (not at all) to 4 (extremely). The scale comprises four subscales, consistent with the DSM-5 PTSD Clusters B, C, D, and E. The subscales and sample questions are: Cluster B, or *Intrusion* (e.g., repeated, disturbing, and unwanted memories of the experience); Cluster C, or *Avoidance* (e.g., avoid memories, thoughts, or feelings related to the experience); Cluster D, or *Negative Alterations in Cognition and Mood* (e.g., having strong negative feelings such as fear, horror, anger, guilt, or shame); and Cluster E, or *Alterations in Arousal and Reactivity* (e.g., taking too many risks or doing things that could cause you harm). Psychometric properties for the instrument demonstrated high internal consistency (α = .91), two-week test-retest reliability (α = .95), and convergent validity (r = .87; Wortmann et al., 2016). Results of reliability analysis for the Liberian sample demonstrated a high internal consistency (α = .92).

Data Analysis

Data were analyzed with three programs. SPSS (version 24; IBM, 2016) was used for descriptive statistics to understand participants' demographics. SPSS was used to assess reliability of instruments and to answer the first research question. Finally, SPSS was used to extract the correlation matrix that was the foundation of both the confirmatory factor analysis (CFA) and SEM. SAS (SAS Institute, 2015) and AMOS (version 23; Arbuckle, 2014) were used for both the CFA and SEM.

The Hypothesized Model

Figure 1 represents the hypothesized model based on hypotheses extracted from the literature. It is hypothesized that all participants experienced the 10-year civil war. It is hypothesized that between 10–50% of participants will meet the diagnostic criteria for PTSD. It is also hypothesized that

PTSD and PTG can co-occur in participants. It is further hypothesized that those who report higher optimism scores will have higher PTG scores. Finally, it is hypothesized that those who report higher religious commitment scores will have higher PTG scores.
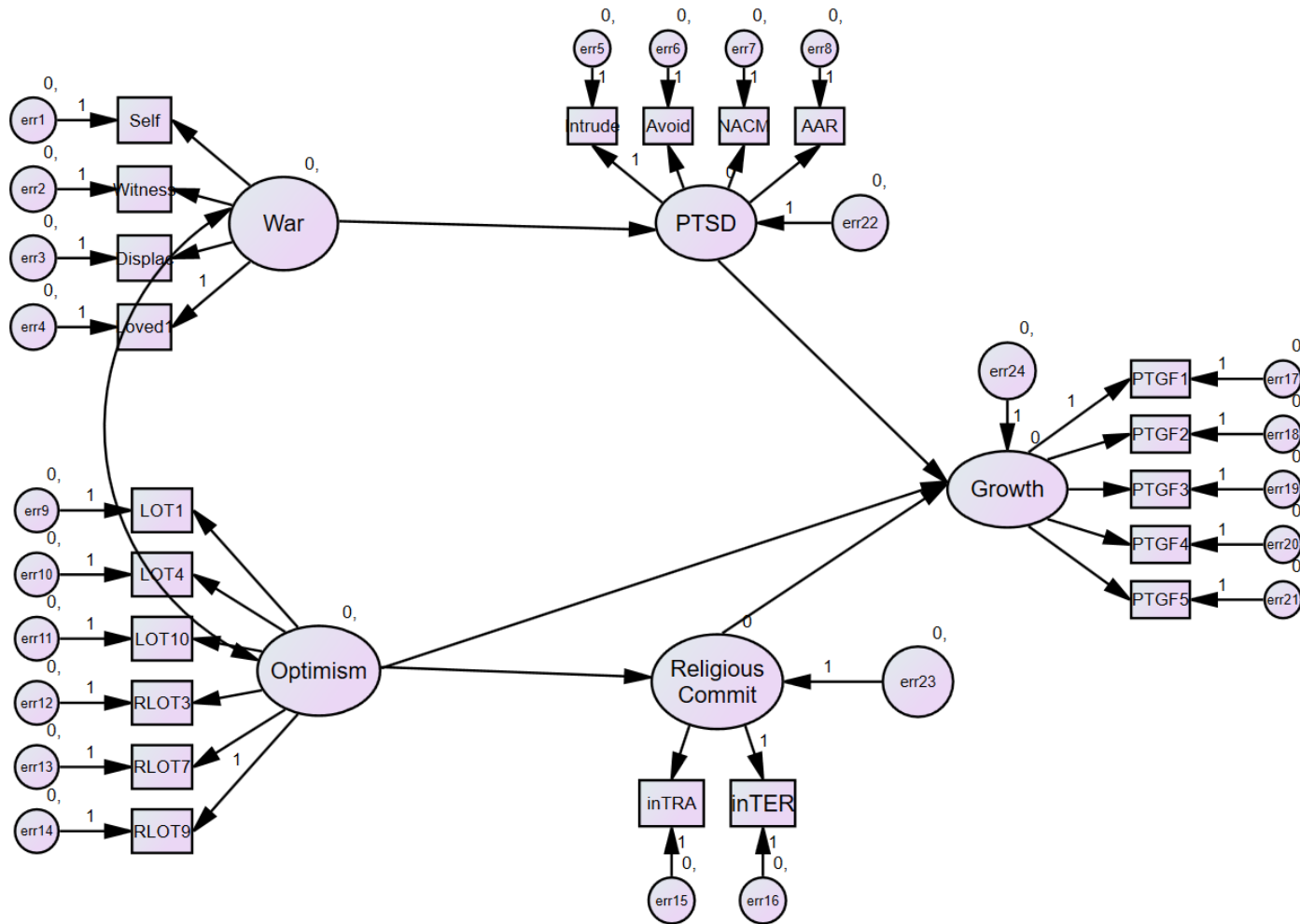

Figure 1. The Hypothesized Model

With SEM, there are two basic variables—unobserved and observed (Schreiber, 2008). Unobserved variables are called latent factors and are graphically depicted with circles or ovals. Observed variables are called manifest variables and are represented graphically with squares or rectangles. Large circles in the graphic represent latent constructs, and small circles represent measurement errors (in observed variables) or disturbances (in equation measurement). Straight, single-headed arrows are indicative of unidirectional paths. The arrow starts from the independent variable and points to the dependent variable. A curved arrow connecting two variables indicates two variables expected to co-vary; however, no hypothesis is made about their causality (O'Rourke & Hatcher, 2013).

Finally, SEM comprises two components: a measurement model, also called CFA, and a theoretical or structural model (Schreiber, 2008). While the measurement model specifies the relationship of the latent to the observed variables, the structural model identifies specific relationships among the latent variables. The objectives of the SEM are to determine whether a theoretical model is supported by the data collected, and to test the hypothesized direct relationships between independent, or exogenous, variables and dependent, or endogenous, variables. The hypotheses testing in SEM consists of several

analyses of variances and regressions occurring simultaneously. Through this, researchers also can test mediated relationships between variables and examine the reliability of items to latent variables in a single test.

Several fit indices are reported in SEM as a global examination of how well the collected data fit the hypothesized model (Hu & Bentler, 1998; Schreiber, 2008; Sivo, Fan, Witta, & Willse, 2006). Because of well-known problems of fit estimation using chi square ($\chi2$) in large data sets, the Bentler's Comparative Fit Index (CFI) was used with values at .95 or higher, indicating a good-fitting model (Hu & Bentler, 1998; O'Rourke & Hatcher, 2013; Sivo et al., 2006). An absolute index, the Standardized Root Mean Square Residual (SRMR), and a parsimony index, the Root Mean Square Error of Approximation (RMSEA), were used as indices assessing the difference between the proposed model and actual variances and covariances in the data. RMSEA values less than or equal to .06 and SRMR values less than or equal to .08 are preferred (Fabrigar, Porter, & Norris, 2010; O'Rourke & Hatcher, 2013; Sivo et al., 2006).

Results

Demography of Participants
Participants' ages ranged between 28 and 65 years. Many fell within the 31–40 year range (45.7%). More participants were male (70.9%) than female, and many were unemployed (63.7%). Of those who were employed, 34.0% earned less than US$720 a year. Family demographics were varied: 42.3% of participants were single, 30.0% were married, and 23.6% lived with their partners. Many participants (49.3%) had one or two children.

The majority of participants (89.2%) indicated they were displaced during the Liberian civil war. There was no follow-up question to identify how some participants could have stayed in their homes despite the reported rampage that affected the whole country (Verdier et al., 2008), so I can only speculate that they either did not read that question well or had a way to stay safe during the war. Of those who were displaced, 60.4% became internally displaced, while the rest became refugees in and out of Africa. Almost half (48.4%) of the former refugees and IDPs had returned to Liberia since the cessation of the war. Additionally, to assess participants' reaction to the Ebola epidemic and its possible ability to trigger traumatic experiences (Doucleff, 2015), participants were asked to compare the effect of the epidemic to the effect of the civil war on their mental health. The majority (65.8%) indicated that they linked the epidemic to the war several times a day, a process that could re-traumatize those who may have undisclosed PTSD symptoms.

Results From Hypotheses
The first hypothesis proposed that between 10–50% of participants in the study will meet the diagnostic criteria for PTSD (as measured by PCL-5), as well as co-occurring symptoms of distress and growth based on gender. Results of the descriptive statistics indicated that the majority (351; 79.1%) met the criteria for PTSD. Additionally, results from the one-way multivariate analysis of variance indicated that there was a statistically significant difference in post-trauma pathways based on gender (F[2, 376] = 6.016, p = .005; Wilk's λ = .972, partial $\eta2$ = .028). Gender had a statistically significant effect on PTG (F[1, 377] = 6.354, p = .012, partial $\eta2$ = .017), but not on PTSD (F[1, 377] = 3.039, p = .082, partial $\eta2$ = .008). The PTG mean score for females ($\bar{X}$= 84.49, sd = 16.030, n = 109) was higher than for males ($\bar{X}$= 79.56, sd = 17.663, n = 270). Both males and females demonstrated co-occurring PTG and PTSD. Even though there was a statistically significant difference in PTG scores based on gender, there was no such difference in PTSD scores.

Hypotheses two through four were analyzed with SAS and AMOS to test the confirmatory model and the theoretical model, and to provide graphical representation. Missing data analysis was computed through the relationship between missing values on each variable of the 444 responses. Data were missing completely at random, and no statistically significant relationships were observed among variables. Listwise deletion within the correlation matrix reduced the sample size to 350.

The present analyses followed Anderson and Gerbing's (1988) two-step procedure. The first step used CFA to develop a measurement model meant to establish an acceptable fit to the data collected. The second step was a theoretical model that was a modification of the measurement model. This modified model is a structural equation model representing the theoretical model of interest. The theoretical model was then tested and revised until a theoretically meaningful and statistically acceptable model was achieved.

The measurement model. A measurement model describes the nature of the relationship between several latent variables and the manifest indicator variables that measure those latent variables. The measurement model investigated in this study consisted of five latent variables corresponding to the five constructs of the post-trauma pathways model: War, PTSD, Optimism, Religious Commitment, and PTG ($N = 350$). Each of the five latent variables was measured by at least two manifest variables (Figure 2).
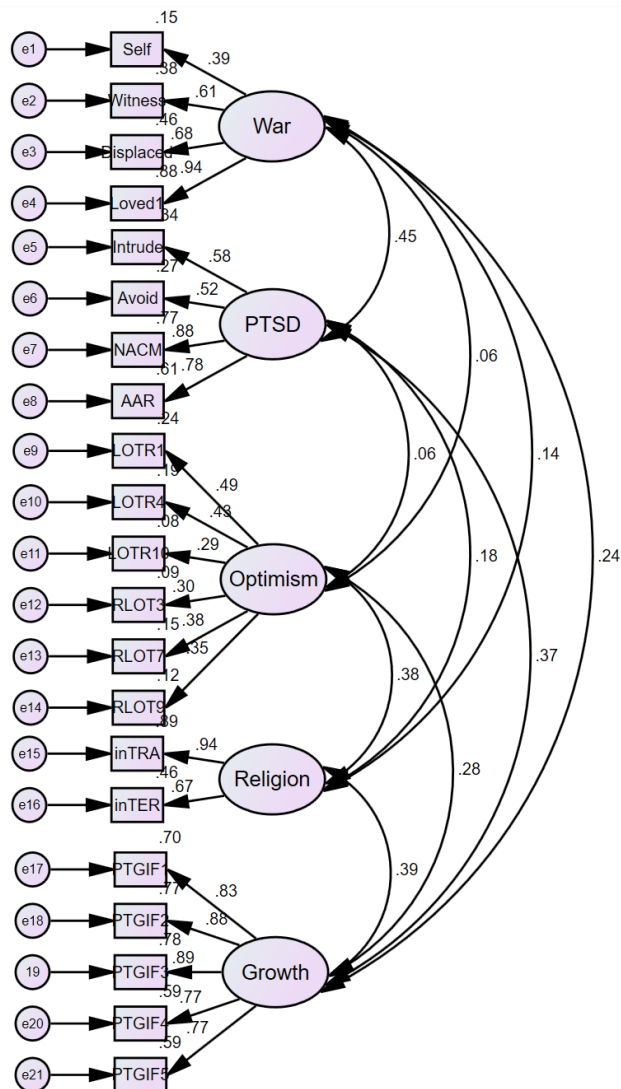

Figure 2. The Confirmatory Factor Analysis (CFA) Model

The maximum likelihood estimation successfully converged in 40 iterations. The correlations table was consulted for multicollinearity; only one relationship was above .90. The relationship between war-related threat to self and intrapersonal religious commitment was .93. The fit indices indicated an acceptable fit of the data to the hypothesized structure. The CFI was .94, SRMR was 0.056, and RMSEA was .050, with a 90% confidence interval of .042–.058. All items loaded statistically significantly ($p < .05$) on the theorized latent variables and no modifications were warranted based on the values calculated (see Table 1). The squared multiple correlations, an indicator of reliability of items, seemed acceptable, except for some items loading onto the optimism factor. These results were unsurprising considering the low Cronbach's alpha of the instrument in this sample.

The theoretical model. The 5-factor solution hypothesizing the directional relationship successfully converged in 29 iterations. Using the maximum likelihood estimation, evidence from the model suggested that the data did not fit the model as expected (CFI = .932, SRMR = 0.062, RMSEA = 0.052). Although all parameters within the model indicated statistically significant t-values, one of the paths linking two latent constructs was non-significant. The standardized path coefficient from religious commitment (F3) to growth (F5) was not significant ($t = 1.87$, $se = 0.25$, $p = 0.06$). Further, inspection of the squared multiple correlations table indicated that R-square values relating to the negatively worded optimism items (3, 7, and 9) were weak (< .25).

Revised model. To look for the best fitting model, the Wald test and the Lagrange multiplier tables were consulted. The Wald test provides information on parameters that can be dropped to improve the model. The Lagrange multipliers provide information on parameters to be added. Experts caution researchers to ensure that data-driven model modifications do not capitalize on chance characteristics of the sample data, as they have the tendency to produce a final model that is not generalizable to the population or to other samples (O'Rourke & Hatcher, 2013; Schreiber, 2008). Researchers are therefore encouraged to identify parameters that could be dropped from the model without significantly affecting the model's fit, as it is generally safer to drop parameters than to add new parameters when modifying models (O'Rourke & Hatcher, 2013). The Wald test suggested the intrapersonal variable within the religious commitment factor be dropped. Even though that suggestion was deemed statistically feasible, it was not theoretically feasible. Furthermore, because of the problems associated with the negatively worded items in the optimism scale, the errors associated with those items were allowed to covary.

When the three errors were covaried, the model was reanalyzed. The maximum likelihood successfully converged in 19 iterations. The revised model fit the data well (CFI = .953; SRMR = 0.049; RMSEA = 0.044). All path coefficients were nontrivial and statistically significant (i.e., $t > |1.96|$). Figure 3 depicts standardized path coefficients for the revised model.

Table 1

Regression Weights and Squared Multiple Correlations (SMC) of the Measurement Model

	Standardized						t-value (standard error)					
	War	**PTSD**	**LOT**	**RC**	**Growth**		**War**	**PTSD**	**LOT**	**RC**	**Growth**	**SMC**
Self	**0.37**						**7.51 (0.05)**					0.14
Witness	**0.64**						**17.22 (0.37)**					0.41
Displac	**0.68**						**19.48 (0.04)**					0.47
Loved1	**0.94**						**34.37 (0.03)**					0.88
Avoid		**0.49**						**11.00 (0.04)**				0.24
Intrude		**0.53**						**12.50 (0.04)**				0.29
NACM		**0.91**						**35.25 (0.03)**				0.80
AAR		**0.79**						**26.47 (0.03)**				0.61
LOT1			**0.49**						**7.41 (0.07)**			0.24
LOT4			**0.41**						**5.95 (0.07)**			0.16
LOT10			**0.24**						**3.41 (0.07)**			0.06
RLOT3			**0.29**						**4.29 (0.07)**			0.09
RLOT7			**0.40**						**6.07 (0.07)**			0.16
RLOT9			**0.44**						6.59 (0.07)			0.20
inTRA				**0.94**						**15.11 (0.06)**		0.89
inTER				**0.67**						**12.55 (0.05)**		0.44
PTGf1					**0.82**						**40.58 (0.02)**	0.68
PTGf2					**0.86**						**48.87 (0.02)**	0.74
PTGf3					**0.88**						**56.47 (0.02)**	0.78
PTGf4					**0.76**						**30.31 (0.03)**	0.58
PTGf5					**0.76**						**29.69 (0.03)**	0.57

Note: Statistically significant $p < .05$ in bold; War = War events; PTSD = Post-Traumatic Stress Disorder; LOT = Optimism; RC = Religious Commitment; Growth = Post-Traumatic Growth
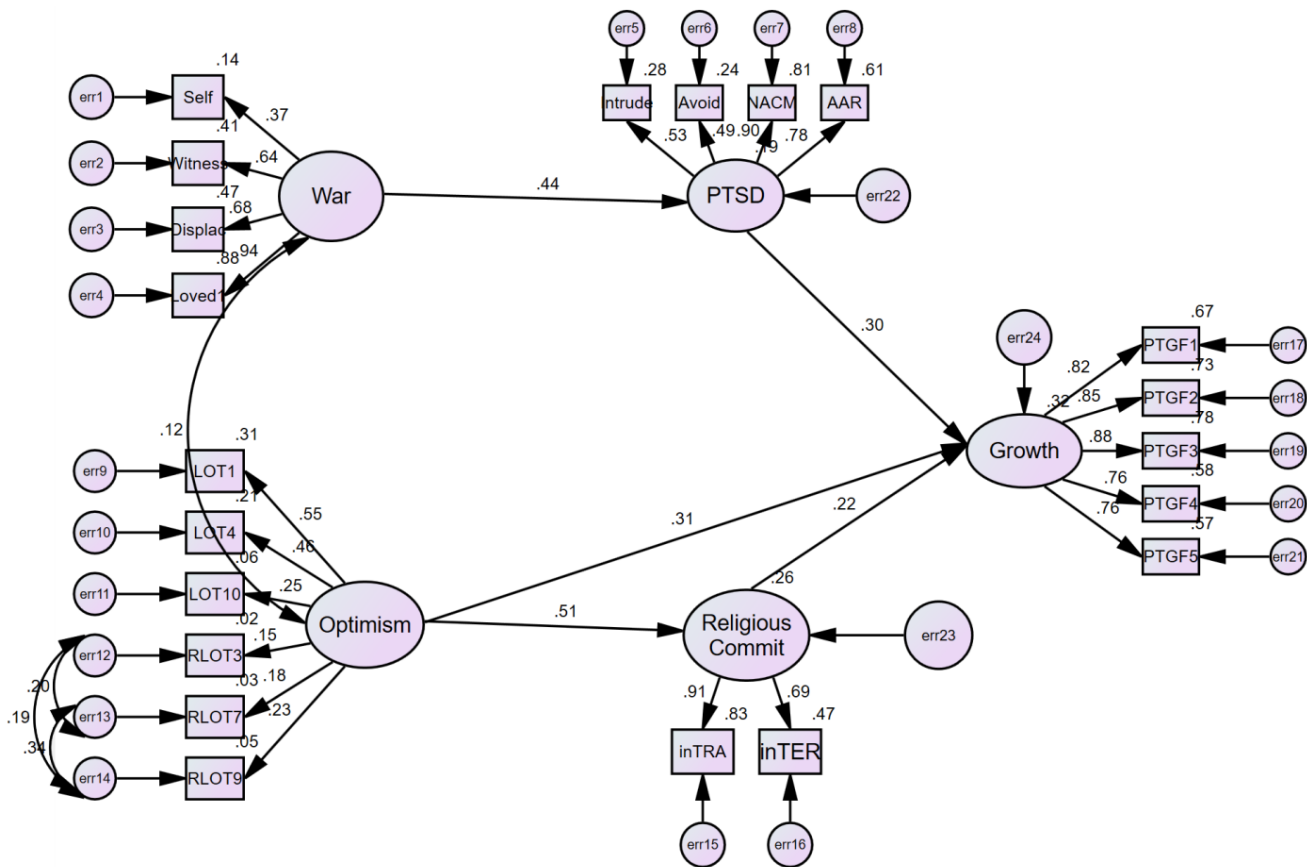
Figure 3. Standardized Estimates of the Final Model

R-square values showed that war accounted for 44% of the variance in PTSD; optimism accounted for 51% of the variance in religious commitment; and PTSD, optimism, and religious commitment accounted for 83% of the variance in PTG. As shown in Table 2, all goodness-of-fit indices for the revised model were in ideal parameters.

Table 2

Fit Indices and Modification of Theoretical Model (N = 350)

Model	χ^2	df	Pr > χ^2	$\Delta\chi^2$	Δdf	CFI	SRMR	RMSEA	RMSEA CL$_{90}$
Baseline	2697.77	210	< .0001	--	--				
Measurement Model (M_m)	338.17	179	< .0001	2359.60	31	.936	0.056	0.050	(0.042-0.059)
Theoretical Model (M_T)	347.65	179	< .0001	--	--	.932	0.062	0.052	(0.044-0.060)
Modified Theoretical Model (M_{Tm})	292.98	176	< .0001	54.67	3	.953	0.049	0.044	(0.035-0.052)

Note: $\chi 2$ = chi square; df = degrees of freedom; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; RMSEA CL90 = RMSEA 90% Confidence Limits

Discussion and Implications

Because participants were survivors of a 10-year war-related traumatic experience, it was unsurprising that the majority of them met the PTSD diagnosis (APA, 2013). Despite the time lapse, these participants exhibited signs of intrusion, avoidance, reckless behaviors, and hypervigilance. Because the majority of the participants had joint households (married, 30%; lived with partners, 23.6%), it is likely that their loved ones could struggle with secondary traumatization (Jenkins & Baird, 2002; Lahav et al., 2016). Any therapeutic intervention for a group like this must be systemic in nature (Gehart, 2017) to address the mental health issues of not just survivors, but also the significant people in their lives.

Moreover, results of the first hypothesis indicated that there was a statistically significant difference in PTG scores based on gender, with females reporting more growth than males. These results confirm research in both Western and non-Western samples using the PTGI as an instrument to assess psychological growth after a traumatic experience (Baker et al., 2008; Powell et al., 2003). The high Cronbach's alpha of the PTGI within the sample suggests that the construct of growth is being measured consistently across samples. Thus, interventions used in Western samples to enhance growth, barring any cultural complications, could work in non-Western samples.

In addition, results of the SEM confirm that people with dispositional optimism have a higher chance of gaining growth after a traumatic event than people who are pessimistic (Broekhof et al., 2015; Peterson & Steen, 2012). Readers are cautioned in making this leap because this Western-based instrument used in the non-Western environment was not consistent in measuring the optimism construct ($\alpha < .70$). It is however possible that had the statements not been negatively worded, participants' responses would have been different. This assertion is confirmed by the improved theoretical model from covarying the errors of the negatively worded items in the optimism factor.

There is also evidence from the data that participants used their search for the sacred to grow from the war-related traumatic experiences. These results have implications for professional counselors and counselor educators. Counselor educators can train professional counselors to appropriately assess spirituality as part of their multicultural assessment. Because of spirituality's ability to enhance growth, incorporating spiritual competencies with a therapeutic relationship could enhance post-trauma healing. However, there were no questions assessing participants' use of religious commitment as a community or whether their use of religious commitment arose from the war-related experiences.

In a related study assessing religious commitment's moderating effect on the relationship between trauma and growth, the researchers discovered a curvilinear moderating effect (Acquaye, Sivo, & Jones, in press). Thus, the higher participants' religious commitment, the lower their PTG; at mid-religious commitment, there was increased PTG. These findings were not too far from Joseph's (2011) supposition that increased religiousness did not automatically lead to increased growth. Therefore, when clients report growth, professional counselors should not assume this growth corresponds to increased religiousness. It may well be that for some clients, decreased religiousness will lead to increased growth (Barrington & Shakespeare-Finch, 2013).

Limitations and Suggestions for Future Research

Because of the group-like nature of data collection, participants communicated among themselves. This kind of communication could skew the results, especially if some participants are providing

responses that are consistent with the majority narrative. If possible, future research could be done with more privacy and not in a group format.

On the other hand, this mode of data supports the recommendation that future work take a qualitative approach and identify participants' perceptions about growth, religious commitment, and optimism. It is possible that even though reliability analyses supported the reliability of these instruments, participants' opinions without the prompts in such surveys could have shed a new light onto what they perceived to be growth and optimism.

It would be enlightening to conduct a comparative study to examine those who are still living outside Liberia (e.g., in the United States) and those living within Liberia to explore whether optimism and religious commitment before or after the war played a part in PTG, depending on where a person currently resides. This comparative study could identify differences in both religious commitment and optimism scores between gender and family status, depending on current residence. Finally, the comparative study may identify current post-trauma (disorder and growth) scores and how these scores reflect outlook on life.

In sum, the hypothesis that between 10–50% of participants will meet the diagnostic criteria for PTSD was supported; 79.1% of participants met the diagnostic criteria for PTSD. Furthermore, the hypothesis that both males and females will exhibit co-occurring PTSD and PTG was partially supported. Even though there were no differences in PTSD scores between gender, females reported higher PTG scores than their male counterparts. The third hypothesis that those who report high optimism will have higher PTG scores was supported. Finally, the model also supported the hypothesis that people who reported higher religious commitment scores will have higher PTG scores, as well as the hypothesis that optimism, PTSD, and religious commitment could all predict PTG. Most of the instruments used were reliable enough to aver that the measurement of the constructs is cross-cultural.

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