Psychological Trauma: Theory, Research, Practice, and Policy

Do Levels of Posttraumatic Growth Vary by Type of Traumatic Event Experienced? An Analysis of the Nurses’ Health Study II
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CITATION
Do Levels of Posttraumatic Growth Vary by Type of Traumatic Event Experienced? An Analysis of the Nurses’ Health Study II

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Objective: Posttraumatic growth (PTG) has been documented in the aftermath of a range of traumatic events, including bereavement, physical assault, and rape. However, only a handful of studies have examined whether levels of total PTG, as well as the 5 domains of PTG (Appreciation of Life, New Possibilities, Relating to Others, Personal Strength, and Spiritual Change), vary by the type of potentially traumatic event. The current study examined variation in total PTG and PTG domains, as well as posttraumatic stress (PTS), by event type using data from a large epidemiological study. Method: Participants were from a substudy of the Nurses’ Health Study 2, an epidemiologic study of female nurses in the United States (N = 1,574). Results: Controlling for demographic covariates, we found that rape was consistently associated with lower PTG, both total PTG and all five PTG domains, relative to other event types. Other findings were limited to specific PTG domains; for example, intimate partner violence (IPV) was associated with higher Personal Strength and New Possibilities. In contrast, rape and IPV were associated with higher PTS, and the serious illness or injury of someone close with lower PTS, relative to other event types. Conclusion: These results add to the growing literature exploring variation in PTG by event type and suggest that different events could yield markedly different patterns of PTG domains and PTS.

Clinical Impact Statement
Posttraumatic growth (PTG), which consists of enhanced appreciation of life, a sense of new possibilities, improved relationships, increased personal strength, and spiritual change, has been documented after a range of traumatic events, including bereavement, physical assault, and rape. This study documented variation in PTG and posttraumatic stress (PTS) by event type in a large epidemiological study of female nurses in the United States. One key finding was that rape was associated with lower PTG and higher PTS relative to other events. Clinicians working with trauma-exposed patients might think these findings useful in contextualizing their initial assessment and monitoring of PTG.

Keywords: posttraumatic growth, posttraumatic stress, trauma exposure, women’s mental health

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The majority of persons will experience one or more potentially traumatic events (PTEs)—events involving actual or threatened death, serious injury, or sexual violence (American Psychiatric Association, 2013)—in their lifetime (e.g., Goldstein et al., 2016; McLaughlin et al., 2013). Epidemiologic studies have provided ample evidence that PTE exposure is associated with a range of adverse psychological outcomes, among them posttraumatic stress disorder (PTSD), major depressive disorder, and generalized anxiety disorder (for a review, see Lowe, Blachman-Forshay, & Koenen, 2015). It has long been recognized, however, that the experience of enduring and coping with a PTE can result in a range of positive psychological changes (Zoellner & Maercker, 2006). In their seminal work, Tedeschi and Calhoun (1996) coined the term posttraumatic growth (PTG) and specified five domains in which positive changes often occur: greater appreciation of life, a sense of new possibilities, stronger relationships with others, a feeling of greater personal strength, and positive spiritual changes. PTG has since been documented following a variety of PTEs, including bereavement (e.g., Armstrong & Shakespeare-Finch, 2011), physical assault (e.g., Kunst, 2011), sexual assault (Kuwert et al., 2014), and serious illness (e.g., Arpawong, Oland, Milam, Rucione, & Meeske, 2013). It has been argued that, along with reducing distress, posttrauma clinical interventions should aim to foster the five domains of PTG among patients who have survived a PTE (e.g., Joseph & Linley, 2006; Tedeschi, Calhoun, & Grollman, 2016). An understanding of what types of PTEs are more or less likely to lead to PTG might help clinicians contextualize their initial assessment and monitoring of this outcome.

### Variation in PTG by Type of PTE

Theory about the development of PTG suggests that different types of PTEs are likely to vary in the extent to which they trigger PTG both in general and with regard to its five domains (Tedeschi, 1999). PTG is thought to arise when the event is experienced as "seismic," shattering the survivor’s assumptions about the world and resulting in cognitive ruminating, processing, and emotion regulation (Linley & Joseph, 2011; Tedeschi & Calhoun, 2004). Several factors are thought to influence the extent to which the mechanisms leading to PTG are triggered, including the severity and duration of the event, event centrality, and survivors’ personality and baseline mental health (Linley & Joseph, 2004; Wamser-Nannen, Howell, Schwartz, & Hasselle, 2018; Zoellner & Mearcker, 2006). It is likely, however, that different types of PTEs vary in this regard. For example, Ulloa, Guzman, Salazar, and Cala (2016) have posited that PTEs that involve sexual violence might be more likely than other events to trigger growth in that such events have more profound effects on survivors’ sense of self in relation to others, as well as their awareness of the societal ailments, such as sexism and misogyny, that contributed to their experience. This new awareness is thought to lead survivors to engage in activism, which is considered a behavioral marker of PTG (Ulloa et al., 2016). Conversely, Meyerson, Grant, Carter, and Kilmer (2011) have argued that survivors of sexual and other forms of violence might be less likely to experience PTG because such events are more clearly the result of human intervention than those that are driven largely by naturally occurring processes (e.g., illnesses and natural disasters). The perceived lack of preventability and controllability of violence is thought to challenge survivors’ sense that they can make meaningful changes in their lives, thereby impeding the developing of PTG.

Different types of PTEs might also be especially likely to present opportunities for PTG in specific domains. For example, Tedeschi (1999) emphasized the key role of self disclosure in deepening interpersonal relationships, and it is possible that privately experienced events like sexual violence might require a greater degree of disclosure than those experienced in public spaces (e.g., car accidents) or that affect a larger community (e.g., natural disasters). Calhoun, Tedeschi, Cann, and Hanks (2010) have also discussed bereavement as a context especially conducive to the five domains of PTG, for example by requiring the survivor to take on new responsibilities (fostering a sense of new possibilities), providing space for new relationships (leading to growth in relationships with others), showing the survivor that he or she can endure despite a major loss (illuminating personal strength), and serving as a reminder of one’s mortality (increasing one’s appreciation of life and promoting spiritual changes). More generally, existential issues and a search for meaning in life, indicators of spiritual change, are thought to arise especially after PTEs involving death (Tedeschi, 1999).

Given theory that different PTEs might differentially foster PTG and its five domains, it is surprising that few studies have investigated this phenomenon empirically. As others have noted (e.g., Armstrong & Shakespeare-Finch, 2011), most studies on PTG have investigated it as a unitary construct, rather than examining the five domains separately. Some researchers have nonetheless descriptively compared average levels of the five domains for survivors of the same PTE type, for example noting the highest levels of PTG in the personal strength domain among spinal cord injury survivors (Pollard & Kennedy, 2007), and the appreciation of life domain among survivors of interpersonal violence (Elderton, Berry, & Chan, 2017). This body of literature supports the notion of variability in the extent to which different PTEs foster the five domains of PTG, but does not directly examine such differences.

To our knowledge, only six studies have investigated differences in PTG by PTE type, most drawing on relatively small convenience samples. The first of these studies did not examine separately the five domains of PTG and included events that did not meet Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM–5) criteria for a PTE. Milam, Ritt-Olson, and Unger (2004) assessed PTG among a predominantly Hispanic sample of 435 adolescents in relation to 10 negative life events and noted variation in PTG among the six most commonly reported, with highest levels for death of a close family member and lowest for moving to a new home; however, the observed differences were not statistically significant.

The second and third studies compared the five domains of PTG, but also included events that did not meet DSM–5 criteria for a PTE. Ickovics and colleagues (2006) drew on a sample of 328 urban adolescent girls and asked them to identify “the hardest thing [they] ever had to deal with” (pp. 843), with some responses notably not meeting DSM–5 criteria for a PTE. The authors found significant differences in total PTG by type of event, such that girls who listed an interpersonal problem (e.g., relationship conflicts or dissolution) as their worst traumatic event had significantly lower PTG than those who listed pregnancy and motherhood, the death of a loved one, or a physical threat (e.g., rape, chronic disease,
Given the lack of research on this topic, our analyses are best conceptualized as exploratory and no specific hypotheses were proposed.

A secondary aim of the current study was to examine variation in PTS by PTE type, and to make descriptive comparisons with the results for PTG. Prior research has shown higher levels of PTS for sexual and other forms of violence relative to other PTEs (e.g., Breslau, Chilcoat, Kessler, & Davis, 1999; McLaughlin et al., 2013), but this pattern has yet to be tested for in NHSII. Further, only two of the aforementioned studies explored variation in both PTG and PTS by PTE type in the same sample—Shakespeare-Finch and Armstrong (2010) found that PTG was highest for bereaved participants and PTS was highest for participants who experienced sexual violence, whereas Kuwert et al. (2014) found that both PTG and PTS were higher among war-related sexual violence survivors than survivors of other war-related trauma. Further research on this topic could provide additional preliminary insight into the types of events the yield different patterns of PTS and PTG.

Method

Participants and Procedure

Data were from the PTSD diagnostic subsample of the NHSII. The larger study, which has been described elsewhere (Bao et al., 2016), includes a total of 116,678 female nurses from the 14 most populous U.S. states, aged 24–42 years at enrollment in 1989 and followed biennially. In 2008, 60,804 women who had responded to both the 2001 Violence Questionnaire as well as the most recent biennial questionnaire were mailed a supplementary questionnaire that assessed trauma exposure and PTS, and 54,282 (89.3%) participants returned the questionnaire. Of these, 43,413 (80.0%) reported exposure to at least one PTE, and 23,104 of the PTE-exposed respondents (53.2%) agreed to be interviewed via telephone. Probable PTSD cases and PTE-exposed controls were identified using Breslau’s lifetime PTSD screen (Breslau, Peterson, Kessler, & Schulz, 1999), which was previously validated against the gold-standard Clinician-Administered PTSD Scale (CAPS; Blake et al., 1995) for the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM–IV; American Psychiatric Association, 1994).

Subsequently, 2,112 probable PTSD cases and 2,001 probable controls were randomly selected for diagnostic interviews. Among those selected, 3,013 participants (73.3%) completed structured telephone interviews, including 1,510 participants with and 1,503 without probable PTSD (71.5% and 75.1% completion rates, respectively). The structured interview included assessments of participants’ self-identified worst lifetime trauma, PTG, and PTS. The current study drew on data from 1,610 participants reporting on PTG and PTS in reference to the six most commonly identified worst traumatic events, each reported by 5% or more of the full sample to ensure adequate statistical power. Of the 1,610 participants, 36 (2.2%) were dropped because of missing data on one or more of the variables in the analysis. The final sample therefore consisted of 1,574 participants. The Partners Human Research Committee approved this study, and the protocol for the PTSD diagnostic subsample has been published (Koenen et al., 2009).
Measures

Worst lifetime traumatic event. Participants were asked to identify traumatic events they had experienced from a list of 25 events drawn from diagnostic interviews used in previous epidemiologic studies (e.g., Kessler & Ustün, 2004; Robins, Helzer, Coster, & Golding, 1988), and to indicate whether they had experienced any other “very stressful situation or event” that was not on the inventory. Participants reporting multiple lifetime traumatic events were then asked to identify which event they perceived as the “worst.” Of the 25 events, six were identified as worst events by 5% or more of the participants who completed the inventory: (a) “had someone close to you experience a life-threatening physical illness or injury” (illness/injury of someone close); (b) “experienced the sudden unexpected death of someone close to you” (bereavement); (c) “been physically hurt; for example, shoved, hit, kicked, or beaten up by a spouse or significant other” (intimate partner violence [IPV]); (d) “been physically injured, for example hit, kicked, or beaten up, by a person other than your parents or spouse/significant other” (physical assault); (e) “rape—someone either having sexual intercourse with you or penetrating your body with a finger or object when you did not want them to. The person could have used pressure, force, threats or manipulation or you could have been too young to have known what was going on” (rape); and (f) “had a serious illness or operation” (illness/operation).

Posttraumatic growth. PTG was assessed using the 10-item Posttraumatic Growth Inventory-Short Form (PTGI-SF), which has previously documented evidence of reliability and internal consistency (Cann et al., 2010). The short form was selected in the current study to reduce burden on participants and boost retention. Participants indicated whether they experienced various changes in their life as a result of their worst traumatic event from 0 (a very small degree) to 5 (a great deal). Two items assessed each PTG domain; responses were summed for a 0–50 point total PTG scale. Cronbach’s alpha (α) of internal consistency of the PTG full and subscales ranged from .76 to .91.

Posttraumatic stress. DSM-IV PTSD symptoms were assessed in reference to each participant’s worst lifetime traumatic event via a 17-item diagnostic telephone interview, previously validated against the CAPS (Blake et al., 1995) in another cohort (Uddin et al., 2010). Participants indicated the extent to which they had ever been bothered by each symptom from 1 (not at all) to 4 (extremely). Responses were summed to generate PTS severity scores, ranging from 17–85 (α = .89).

Demographic covariates. The following demographic covariates were included in the analysis based on previous research documenting their associations with PTS and PTG (e.g., Breslau, Chilcoat, et al., 1999; Elderton et al., 2017; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995): age (continuous) and marital status (reference: married) at the time of the worst traumatic event, race (reference: white), and annual household income in 2001 (reference: $49,999 or below). These data were obtained from the interviews as well as prior biennial NHISII questionnaires.

Data Analysis

Data analyses were computed in SAS (Cary, NC). First, a series of preliminary analyses was conducted. Descriptive statistics for all variables in the analyses were computed. Mean total PTG, PTG domain, and PTS scores for each event type were computed and visually inspected. Independent-samples t tests and Fisher’s exact tests assessed for differences between the 1,574 participants included in analytic sample and the 36 participants who were dropped because of missing data. Second, multivariate generalized linear regression analyses predicting total PTG, PTG domains, and PTS were conducted to fulfill the study aims. Predictors in these analyses included demographic covariates and a categorical indicator for worst lifetime trauma type. Models predicting total PTG and PTG domains also included PTS as a covariate, whereas the model predicting PTS included total PTG as a covariate. When the omnibus effect of worst trauma type was statistically significant, all pairwise comparisons between worst trauma types were conducted, with a Bonferroni correction for multiple testing.

Results

Preliminary Analyses

Table 1 lists descriptive statistics for the 1,574 participants in the analytic sample. Nearly half (44.5%) reported bereavement as their worst trauma, whereas 24.6% reported illness/injury of someone close, 11.9% reported rape, 10.5% reported illness/operation, 7.2% reported IPV, and 1.4% reported physical assault. As shown in Table 2, PTG total and domain scores were generally highest for those who reported IPV or illness/operation as their worst trauma and lowest for those who reported physical assault or rape as their worst trauma. PTS was highest among those who reported rape as their worst trauma and lowest among those who reported illness/injury of someone close.

Significant differences between the 1,574 participants in the analytic sample and the 36 excluded for missing data were detected in worst trauma type and marital status ( Fisher’s exact test ps = .030 and .005, respectively). Inspection of standardized residuals indicated that there were fewer participants in the analytic sample and more excluded participants who reported rape as their worst event than expected and whose event was prior to the baseline assessment (and thus their marital status at the time of the event was unknown). Additionally, there were more participants in the analytic sample and fewer excluded participants who were married than expected.

Multivariable Generalized Linear Regression Models

Table 3 shows the results of multivariable generalized linear regression models predicting total PTG, PTG domains, and PTS. The omnibus effect of worst event type was significant across all models. As such, all pairwise comparisons were conducted, with a Bonferroni correction for multiple testing. We note here that mean differences (Mdiff) reported do not correspond to the differences between values reported in Table 2, but rather the least squares means as calculated in the multivariable models. These values and their 95% confidence intervals are reported in Supplemental Table 1 in the online supplemental materials.

Total PTG. In the model predicting total PTG, participants reporting bereavement as their worst lifetime trauma had significantly higher scores than those who reported physical assault (Mdiff = 7.51, 95% CI [2.60, 12.42], p = .003) and rape (Mdiff =
9.91, p < .001), and illness/operation (physical assault: \(M_{diff} = 13.34, 95\% CI [6.18, 16.51], p < .001\); rape: \(M_{diff} = 9.99, 95\% CI [7.18, 12.82], p < .001\)). Additionally, those who reported illness/operation had significantly higher scores than those who reported bereavement (\(M_{diff} = 3.83, 95\% CI [1.84, 5.82], p < .001\)).

PTG–Appreciation of Life. Participants reporting the illness/injury of someone close as their worst lifetime trauma had significantly higher PTG–Appreciation of Life scores than those who reported rape (\(M_{diff} = 1.82, 95\% CI [1.26, 2.38], p < .001\)) and physical assault (\(M_{diff} = 1.78, 95\% CI [0.65, 2.91], p = .002\)). Those reporting bereavement also had significantly higher PTG–Appreciation of Life scores than those reporting rape (\(M_{diff} = 1.54, 95\% CI [1.04, 2.04], p < .001\), as did those reporting IPV (\(M_{diff} = 1.75, 95\% CI [1.11, 2.39], p < .001\), and illness/operation (\(M_{diff} = 2.43, 95\% CI [1.79, 3.07], p < .001\)). Additionally, participants reporting illness/operation had significantly higher PTG–Appreciation of Life scores than those reporting bereavement (\(M_{diff} = 0.89, 95\% CI [0.44, 1.34], p < .001\)), and physical assault (\(M_{diff} = 2.39, 95\% CI [1.22, 3.57], p < .001\)).

PTG–New Possibilities. In the analysis predicting PTG–New Possibilities, participants reporting IPV as their worst lifetime trauma had significantly higher scores than those reporting illness/injury of someone close (\(M_{diff} = 1.82, 95\% CI [1.19, 2.45], p < .001\), bereavement (\(M_{diff} = 1.88, 95\% CI [1.30, 2.47], p < .001\)), physical assault (\(M_{diff} = 3.10, 95\% CI [1.77, 4.42], p < .001\)), and rape (\(M_{diff} = 2.54, 95\% CI [1.83, 3.25], p < .001\)). Additionally, those reporting illness/operation had significantly higher scores than those reporting illness/injury of someone close (\(M_{diff} = 0.95, 95\% CI [0.42, 1.48], p < .001\)), bereavement (\(M_{diff} = 1.01, 95\% CI [0.51, 1.51], p < .001\)), and rape (\(M_{diff} = 1.67, 95\% CI [0.96, 2.37], p < .001\)).

PTG–Relating to Others. In the model predicting PTG–Relating to Others, participants reporting illness/injury of someone close as their worst lifetime trauma had significantly higher scores than those reporting physical assault (\(M_{diff} = 3.03, 95\% CI [1.87, 4.18], p < .001\)) and rape (\(M_{diff} = 2.21, 95\% CI [1.64, 2.78], p < .001\)), as did those reporting bereavement (physical assault: \(M_{diff} = 2.76, 95\% CI [1.62, 3.90], p < .001\); rape: \(M_{diff} = 1.94, 95\% CI [1.44, 2.45], p < .001\)). IPV (physical assault: \(M_{diff} = 2.21, 95\% CI [0.98, 3.43], p < .001\)), and illness/operation (physical assault: \(M_{diff} = 3.26, 95\% CI [2.06, 4.45], p < .001\); rape: \(M_{diff} = 2.44, 95\% CI [1.79, 3.09], p < .001\)).

Table 2

<table>
<thead>
<tr>
<th>Worst traumatic event</th>
<th>PTG-Total M (SD)</th>
<th>PTG-AL M (SD)</th>
<th>PTG-NP M (SD)</th>
<th>PTG-RO M (SD)</th>
<th>PTG-PS M (SD)</th>
<th>PTG-SC M (SD)</th>
<th>PTS M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bereavement</td>
<td>32.65 (11.64)</td>
<td>6.99 (2.62)</td>
<td>5.56 (2.93)</td>
<td>6.85 (2.57)</td>
<td>7.19 (2.66)</td>
<td>6.07 (3.33)</td>
<td>31.75 (11.87)</td>
</tr>
<tr>
<td>Illness or injury of someone close</td>
<td>32.75 (11.48)</td>
<td>7.05 (2.47)</td>
<td>5.29 (2.59)</td>
<td>7.05 (2.46)</td>
<td>7.19 (2.67)</td>
<td>6.16 (3.36)</td>
<td>27.98 (10.39)</td>
</tr>
<tr>
<td>Intimate partner violence</td>
<td>36.58 (10.17)</td>
<td>7.44 (2.42)</td>
<td>7.87 (2.47)</td>
<td>6.39 (2.78)</td>
<td>8.61 (2.19)</td>
<td>6.27 (3.59)</td>
<td>36.90 (13.35)</td>
</tr>
<tr>
<td>Physical assault</td>
<td>26.36 (11.21)</td>
<td>5.73 (2.55)</td>
<td>4.59 (3.08)</td>
<td>4.23 (3.02)</td>
<td>6.36 (2.40)</td>
<td>5.45 (3.17)</td>
<td>36.18 (14.88)</td>
</tr>
<tr>
<td>Rape</td>
<td>29.96 (14.44)</td>
<td>5.92 (3.46)</td>
<td>5.86 (3.43)</td>
<td>4.99 (3.34)</td>
<td>7.66 (2.84)</td>
<td>5.52 (3.78)</td>
<td>41.09 (14.72)</td>
</tr>
<tr>
<td>Illness/operation</td>
<td>35.96 (10.83)</td>
<td>7.81 (2.38)</td>
<td>6.39 (2.72)</td>
<td>7.35 (2.61)</td>
<td>7.64 (2.60)</td>
<td>6.78 (2.93)</td>
<td>31.49 (12.87)</td>
</tr>
</tbody>
</table>

Note. AL = Appreciation of Life; NP = New Possibilities; RO = Relating to Others; PS = Personal Strength; SC = Spiritual Change; M = mean; SD = standard deviation. Total PTG scores range from 0–50, and each PTG domain ranges from 0–10, with higher scores indicating greater PTG. PTS ranges from 17–85 with higher scores indicating more severe PTS.
### Table 3

**Results of Multivariable Models Predicting Total Posttraumatic Growth (PTG), PTG Domains, and Posttraumatic Stress (PTS; N = 1574)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>PTG-Total B (SE)</th>
<th>PTG-AL B (SE)</th>
<th>PTG-NP B (SE)</th>
<th>PTG-RO B (SE)</th>
<th>PTG-PS B (SE)</th>
<th>PTG-SC B (SE)</th>
<th>PTS B (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>27.62 (2.18)**</td>
<td>5.19 (0.49)**</td>
<td>4.20 (0.55)**</td>
<td>5.71 (0.50)**</td>
<td>6.57 (0.49)**</td>
<td>5.94 (0.49)**</td>
<td>28.97 (2.25)**</td>
</tr>
<tr>
<td>Demographic covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at time of “worst” traumatic event</td>
<td>−0.03 (0.04)</td>
<td>0.01 (0.01)</td>
<td>−0.01 (0.01)</td>
<td>0.01 (0.01)</td>
<td>−0.02 (0.01)*</td>
<td>−0.02 (0.01)*</td>
<td>−0.04 (0.04)</td>
</tr>
<tr>
<td>Marital status at time of “worst” traumatic event</td>
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<tr>
<td>Married</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
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<td>Ref</td>
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<tr>
<td>Event prior to baseline</td>
<td>1.29 (1.11)</td>
<td>0.40 (0.25)</td>
<td>0.44 (0.28)</td>
<td>0.19 (0.26)</td>
<td>0.26 (0.25)</td>
<td>−0.01 (0.32)</td>
<td>−1.72 (1.15)</td>
</tr>
<tr>
<td>Never married</td>
<td>−2.18 (1.59)</td>
<td>−0.35 (0.36)</td>
<td>−0.51 (0.40)</td>
<td>−0.40 (0.37)</td>
<td>−0.06 (0.36)</td>
<td>0.08 (0.46)</td>
<td>−0.95 (1.65)</td>
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<tr>
<td>Divorced, separated or widowed</td>
<td>−0.06 (1.40)</td>
<td>0.39 (0.32)</td>
<td>0.16 (0.35)</td>
<td>−0.20 (0.32)</td>
<td>0.05 (0.31)</td>
<td>−0.45 (0.40)</td>
<td>0.62 (1.44)</td>
</tr>
<tr>
<td>Missing marital status</td>
<td>−1.41 (1.86)</td>
<td>−0.33 (0.42)</td>
<td>−0.46 (0.47)</td>
<td>−0.02 (0.43)</td>
<td>−0.26 (0.42)</td>
<td>−0.35 (0.53)</td>
<td>0.58 (1.92)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>White</td>
<td>Ref</td>
<td>Ref</td>
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<td>Ref</td>
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<tr>
<td>Black</td>
<td>−0.45 (4.38)</td>
<td>0.11 (0.99)</td>
<td>−0.82 (1.10)</td>
<td>−0.67 (1.01)</td>
<td>−0.16 (0.99)</td>
<td>1.10 (1.25)</td>
<td>4.35 (4.53)</td>
</tr>
<tr>
<td>Asian</td>
<td>−0.12 (4.10)</td>
<td>1.13 (0.93)</td>
<td>0.47 (1.03)</td>
<td>−0.51 (0.95)</td>
<td>−0.36 (0.92)</td>
<td>−0.84 (1.17)</td>
<td>−1.56 (4.24)</td>
</tr>
<tr>
<td>Other</td>
<td>2.59 (2.01)</td>
<td>0.64 (0.46)</td>
<td>−0.09 (0.50)</td>
<td>0.74 (0.47)</td>
<td>0.46 (0.45)</td>
<td>0.85 (0.58)</td>
<td>0.29 (2.08)</td>
</tr>
<tr>
<td>Household income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$49,999 and below</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
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<td>Ref</td>
</tr>
<tr>
<td>$50,000–$74,999</td>
<td>−0.41 (1.00)</td>
<td>−0.05 (0.23)</td>
<td>&gt;−0.01 (0.25)</td>
<td>0.07 (0.23)</td>
<td>−0.06 (0.23)</td>
<td>−0.37 (0.29)</td>
<td>−1.76 (1.04)</td>
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<tr>
<td>$75,000–$99,999</td>
<td>0.20 (1.05)</td>
<td>0.23 (0.24)</td>
<td>&lt;−0.01 (0.26)</td>
<td>0.19 (0.24)</td>
<td>0.10 (0.24)</td>
<td>−0.33 (0.30)</td>
<td>−2.92 (1.08)**</td>
</tr>
<tr>
<td>$100,000–$149,999</td>
<td>−1.15 (1.04)</td>
<td>−0.03 (0.24)</td>
<td>−0.12 (0.26)</td>
<td>0.02 (0.24)</td>
<td>−0.13 (0.23)</td>
<td>−0.88 (0.30)**</td>
<td>−1.92 (1.08)**</td>
</tr>
<tr>
<td>$150,000 and above</td>
<td>−1.49 (1.20)</td>
<td>−0.01 (0.27)</td>
<td>−0.24 (0.30)</td>
<td>−0.09 (0.28)</td>
<td>−0.25 (0.27)</td>
<td>−0.90 (0.34)**</td>
<td>−3.27 (1.24)**</td>
</tr>
<tr>
<td>Missing income</td>
<td>1.01 (1.28)</td>
<td>0.17 (0.29)</td>
<td>0.20 (0.32)</td>
<td>0.14 (0.30)</td>
<td>&lt;−0.01 (0.29)</td>
<td>−0.50 (0.37)</td>
<td>−3.82 (1.32)**</td>
</tr>
<tr>
<td>PTS</td>
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<td></td>
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<tr>
<td>PTG-Total</td>
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</tr>
<tr>
<td>Worst lifetime traumatic event</td>
<td>13.40***</td>
<td>13.51***</td>
<td>14.68***</td>
<td>17.69***</td>
<td>6.82***</td>
<td>7.74***</td>
<td>25.87***</td>
</tr>
</tbody>
</table>

Note. AL = Appreciation of Life; NP = New Possibilities; RO = Relating to Others; PS = Personal Strength; SC = Spiritual Change. Total PTG scores range from 0–50, and each PTG domain ranges from 0–10, with higher scores indicating greater PTG. PTS ranges from 17–85 with higher scores indicating more severe PTS.

*p < .05. **p < .01. ***p < .001.
PTG–Personal Strength. Participants whose worst lifetime trauma was IPV had significantly higher PTG–Personal Strength scores than those whose worst lifetime trauma was bereavement ($M_{\text{diff}} = 1.04, 95\% \text{ CI [0.52, 1.57]}, p < .001$), physical assault ($M_{\text{diff}} = 2.11, 95\% \text{ CI [0.92, 3.30]}, p < .001$), and rape ($M_{\text{diff}} = 1.49, 95\% \text{ CI [0.85, 2.12]}, p < .001$). Additionally, participants whose worst lifetime trauma was illness/operation had significantly higher PTG–Personal Strength scores than those whose worst lifetime trauma was rape ($M_{\text{diff}} = 1.08, 95\% \text{ CI [0.45, 1.72]}, p = .001$).

PTG–Spiritual Change. In the analysis predicting PTG–Spiritual Change, participants whose worst lifetime trauma was bereavement, illness/injury of someone close, IPV, and illness/operation had significantly higher scores than those whose worst lifetime trauma was rape ($M_{\text{diff}} = 1.87, 95\% \text{ CI [0.95, 2.20]}, p < .001$); bereavement ($M_{\text{diff}} = 1.95, 95\% \text{ CI [1.23, 2.65]}, p < .001$); illness/operation ($M_{\text{diff}} = 1.34, 95\% \text{ CI [-2.15, -0.53]}, p = .001$); and $M_{\text{diff}} = 2.37, 95\% \text{ CI [1.57, 3.18]}, p < .001$, respectively.

PTS. The analysis predicting PTS showed that participants whose worst lifetime trauma was rape had significantly higher scores than those whose worst lifetime trauma was illness/injury of someone close ($M_{\text{diff}} = 1.37, 95\% \text{ CI [11.27, 16.26]}, p < .001$), bereavement ($M_{\text{diff}} = 9.93, 95\% \text{ CI [7.69, 12.17]}, p < .001$), and illness/operation ($M_{\text{diff}} = 11.14, 95\% \text{ CI [8.23, 14.05]}, p < .001$). Additionally, participants whose worst lifetime trauma was bereavement had significantly higher scores than those whose worst lifetime trauma was illness/injury of someone close ($M_{\text{diff}} = 3.83, 95\% \text{ CI [2.32, 5.34]}, p < .001$); those whose worst lifetime trauma was IPV had significantly higher scores than those whose worst lifetime trauma was illness/injury of someone close ($M_{\text{diff}} = 8.09, 95\% \text{ CI [5.44, 10.60]}, p < .001$); and illness/operation ($M_{\text{diff}} = 5.39, 95\% \text{ CI [2.46, 8.33]}, p = .003$); and those whose worst lifetime trauma was physical assault had significantly higher scores than those whose worst lifetime trauma was illness/injury of someone close ($M_{\text{diff}} = 9.73, 95\% \text{ CI [4.57, 14.89]}, p = .002$).

Discussion

This epidemiologic study of PTE-exposed women examined differences in total PTG, the five PTG domains, and PTS by type of PTE. Significant omnibus differences in each outcome by PTE type were detected in multivariable models, and the patterns of pairwise comparisons yielded three key findings. First, rape was most consistently associated with significantly lower PTG, both in terms of total PTG and of each of the five PTG domains, relative to other events. Second, differences in PTG for other event types were limited to distinctive PTE subdomains; IPV was associated with significantly higher growth in personal strength and new possibilities, serious illnesses or operations with significantly higher growth in appreciation of life and new possibilities, and physical assault with significantly lower growth in new possibilities and relating to others, relative to other events. Third, the pattern of results for PTS was, descriptively, quite different than that for PTG. Specifically, rape and IPV were associated with significantly higher PTS, and the serious illness or injury of someone close with significantly lower PTS, relative to other events.

As noted, the literature exploring variation in PTG by PTE type is limited, making it difficult to situate the results of the current study in the context of other findings. For example, the largest study on this topic to date (Karanci et al., 2012) compared levels of PTG for three event types (bereavement, motor vehicle accidents, and natural disasters), but two of these were rarely identified as a worst trauma in our sample and thus not included in the analysis. Our finding that rape was associated with lower PTG relative to most other events is consistent with a prior study showing that sexual assault experiences (including rape) were associated with lower PTG than was bereavement (Shakespeare-Finch & Armstrong, 2010). Notably, however, the prior finding was limited to two PTG domains (relating to others, appreciation of life), whereas ours was consistent across the five domains. This divergence could be attributable to several issues, including differences in sample characteristics, or the small sample size ($N = 98$) and more heterogeneous sexual assault category of the prior study. Other studies on this topic have included even more heterogeneous PTE categories, likely owing to concerns of statistical power, but limiting the extent to which findings can be compared. For example, in their study of urban adolescents, Ickovics and colleagues (2006) included rape in an event category alongside pregnancy and motherhood, bereavement, chronic disease, and financial strain. As another example, in their study of Japanese university students, Taku and colleagues (2007) included serious illness in the Self category, alongside accidents, crime victimization, and natural disasters. The necessarily heterogeneous event types used in prior research demonstrates the need for other large-scale investigations on this topic to ensure adequate statistical power when exploring variation in PTG across different event types. In doing so, future studies should employ commonly used inventories of events that meet DSM–5 criteria for a PTE, which would facilitate comparison across samples.

Future research is also needed to better understand how different PTE types lead to PTG. For example, there is likely variation in the extent to which different PTEs impact survivors’ assumptions about themselves, other people, and the world around them—in essence, in how seismic PTEs are (Tedeschi & Calhoun, 2004). One possibility is that events need to be seismic to a certain degree to trigger the mechanisms leading to PTG, such as cognitive rumination, processing, and emotion regulation (Tedeschi & Calhoun, 2004), but that extremely seismic events—likely including rape—hinder such processes. Further studies are thus needed that not only examine PTG by PTE type, but also the shattered assumptions and cognitive and affective processes that sometimes follow exposure.

Additional research is also needed to understand why some events might be especially conducive to specific PTG domains. It could be, for example, that some IPV survivors, through dissolving an abusive relationship, realize a renewed sense of strength and vision for what is possible in their intimate relationships and other aspects of their lives, accounting for the patterns observed in the current study. Serious illnesses, on the other hand, might be more likely than other PTEs to trigger existential concerns, which in turn foster greater appreciation of one’s life and recognition of new possibilities to find meaning. Further work could explore these possibilities, as well as various characteristics of PTEs, including survivors’ sense of how much the event affected their daily lives, and whether the event was experienced private versus publicly, that might explain our results.
Regarding our analysis of type of worst trauma as predictive of PTG, the results were generally consistent with prior studies showing that events involving interpersonal violence tended to be associated with higher PTG symptoms (e.g., Breslau, Chilcoat, et al., 1999). A unique contribution of the study was our comparison of patterns of PTG versus PTG by PTE type. Here we observed that some PTEs were associated with higher levels of both PTG and PTS (e.g., IPV), whereas others were associated with higher PTG but lower PTS (e.g., illness/operation), and others higher PTS but lower PTG (e.g., rape), relative to other PTEs. This pattern of results could perhaps account for some of the inconsistency in the results of prior studies investigating associations between PTG and PTS, with some studies finding positive associations, others negative association, and others nonsignificant associations (Shakespeare-Finch & Lurie-Beck, 2014). That is, the association between PTG and PTS might vary by event type. Further work with this dataset will explore this possibility as well as other potential sources of variation in the PTG–PTS relationship. Future research should also explore factors that account for why some PTEs yield different patterns of PTG and PTS, including characteristics of PTEs (e.g., event centrality; extent to which different PTEs are attributable to human intervention or perceived as controllable; for assaultive PTEs, relationship to the perpetrator), internal mechanisms (e.g., shattered assumptions, cognitive and affective processes, existential concerns), and external events (e.g., new opportunities for relationships). For example, the extremely seismic events that hinder PTG might trigger PTS, whereas processing of existential concerns could foster PTG while protecting against PTS. In other scenarios, PTS and other forms of distress that follow exposure could result in PTG.

Our results should also be interpreted in light of at least four additional limitations. First, although using an inventory of PTEs and having participants respond in reference to an identified worst event was both efficient and consistent with prior epidemiologic studies (e.g., Breslau, Chilcoat, et al., 1999; McLaughlin et al., 2013), this approach did not account for the potential cumulative psychological impact of exposure to multiple PTEs, or allow for within-participant examination of variation in PTG by event type. In a similar vein, characteristics of PTEs (e.g., severity or controllability; for assaultive PTEs, relationship to the perpetrator), internal mechanisms (e.g., shattered assumptions, cognitive and affective processes, existential concerns), and external events (e.g., new opportunities for relationships). For example, the extremely seismic events that hinder PTG might trigger PTS, whereas processing of existential concerns could foster PTG while protecting against PTS. In other scenarios, PTS and other forms of distress that follow exposure could result in PTG.

However, despite these limitations, the current study provides evidence that levels of PTG, both as a single construct and its subdomains, vary by the type of event experienced, and that the events that are most strongly associated with PTG are not entirely overlapping with those that are most strongly associated with PTS. It builds off of prior work through its direct examination of variation in both total PTG and the five PTG domains by PTEs, inclusion of PTEs as defined in the DSM–5, adjustment for sociodemographic characteristics and PTS in multivariable models, and use of a large epidemiologic sample. A further understanding of the mechanisms by which different events might lead to the different components of PTG versus PTS might help clinicians and other service providers promote positive psychological outcomes among PTE-exposed populations.

References


