

Moral Elevation and Compassionate Goals Predict Posttraumatic Growth in the Context of a College Shooting

Jamie L. Tingey^a, Adam P. McGuire^a, Oxana L. Stebbins^a, Thane M. Erickson^a

^a Department of Clinical Psychology, Seattle Pacific University, Seattle, WA, USA

ABSTRACT

After a mass shooting, community members may experience not only distress, but also feeling uplifted or morally elevated by others' prosocial responses to the trauma. Those experiencing elevation may be more likely to strive to support others (compassionate goals) and to endorse posttraumatic growth (PTG). However, the role of elevation in PTG, and the relative contribution of compassionate goals (both from and toward others), remains unknown. Students, faculty, and staff ($N = 385$) completed measures four months after a campus shooting, and a subset repeated measures at eight months ($n = 82$). As expected, compassionate goals toward others incrementally predicted higher PTG beyond perceptions of compassionate goals from others. Also, elevation concurrently and prospectively predicted higher PTG. Lastly, elevation mediated effects of others' compassionate goals on PTG, as hypothesized (95% CI = 2.59 to 5.43). These findings have implications for understanding the social and emotional processes that facilitate PTG.

KEYWORDS

moral elevation; compassionate goals; posttraumatic growth; college shooting

Corresponding Author: Thane M. Erickson, PhD; Email: erickt@spu.edu

CITATION

Tingey, J. L., McGuire, A. P., Stebbins, O. L., & Erickson, T. M. (2017). Moral elevation and compassionate goals predict posttraumatic growth in the context of a college shooting. *The Journal of Positive Psychology, 14*(3), 261-270.
<https://doi.org/10.1080/17439760.2017.1402077>

Negative Psychological Effects of Trauma

Most people will experience one or more traumatic events during their lifetime (Briere & Scott, 2015). Trauma can occur not only at the individual level (e.g., assault), but also in the context of large-scale events (e.g., mass violence, natural disasters), and can be experienced directly or vicariously. Large-scale traumas, such as active-shooter incidents in which multiple people are injured or killed, have become increasingly frequent in the United States since 2000 (Blair & Schweit, 2014). Thus, understanding factors that predict responses to trauma and successful adaptation is increasingly important.

Exposure to traumatic events often predicts adverse outcomes, including posttraumatic stress disorder (PTSD; Kessler et al., 2005). PTSD is characterized by clusters of intrusion symptoms, avoidance, hyperarousal/hyperreactivity, and negative alterations in cognition and mood, with duration of at least one month (American Psychiatric Association, 2013). PTSD is associated with marked distress and impairment, lower quality of life and relationships (Monson, Caron, McCloskey, & Brunet, 2017; Volgin & Bates, 2016), and higher comorbid disorders (Galatzer-Levy, Nickerson, Litz, & Marmar, 2013).

Not All Outcomes of Trauma are Negative: Posttraumatic Growth

Nonetheless, positive outcomes of trauma sometimes occur. Anecdotally, in the wake of traumatic public events, a community may, surprisingly, experience renewed connection or shared purpose. Such responses resonate with the theorized process of posttraumatic growth (PTG): positive personal changes following a traumatic experience (Calhoun & Tedeschi, 2006). Calhoun and Tedeschi (1999) theorized that the distress of a trauma is a catalyst for making meaning of the event, and those who conceptualize the trauma as an opportunity for self-awareness and living one's values may experience greater PTG (Calhoun & Tedeschi, 2006). Core facets of PTG include shifts in self-perception (e.g., viewing oneself as stronger than expected), relationships (closeness and valuing relationships), and one's broader perspective (appreciation of life, heightened spirituality, and a sense of new possibilities; Tedeschi & Calhoun, 1996; Tedeschi, Calhoun, & Wong, 2012). PTG predicts positive outcomes such as happiness, life satisfaction, and well-being (Cann, Calhoun, Tedeschi, & Solomon, 2010; Kim, Kim, & Park, 2016).

A number of studies have investigated variables that predict PTG. For instance, female gender and younger age (Wang et al., 2016), time since the event (Cordova, Cunningham, Carlson, & Andrykowski, 2001), and active-adaptive coping strategies (e.g., positive reframing; Danhauer et al., 2013) predicted PTG. Closer physical proximity to a traumatic event predicted not only higher PTSD, but also higher PTG (Birkeland, Hafstad, Blix, & Heir, 2015). Perceived social support is among the most robust predictors of responses to trauma (e.g., Warner, Gutiérrez-Doña, Angulo, & Schwarzer, 2015). Lack of social support consistently predicted development of PTSD in a meta-analysis of 85 samples (Brewin, Andrews, & Valentine, 2000), whereas higher support has predicted greater PTG (Armstrong, Shakespeare-Finch, & Shochet, 2015; Dekel, Mandl, & Solomon, 2011).

Compassionate Goals as Social Support Processes

Social support thus remains important for buffering stress and promoting positive mental health outcomes (James, Van Kampen, Miller, & Engdahl, 2013; Lakey & Orehek, 2011; Prati & Pietrantonio, 2009), but the psychosocial processes underlying support warrant more fine-grained analysis. Extant studies of support as a predictor of PTG (e.g., Dekel et al., 2011) have emphasized individuals' perceptions that others are available and motivated to provide support (i.e., receiving support). In contrast, few studies have tested whether giving support to others after trauma might predict PTG. Only one cross-sectional study tested this process: In emergency medical dispatchers, providing support did not predict PTG (Shakespeare-Finch, Rees, & Armstrong, 2015). Given the dearth of research examining such processes in less chronic trauma contexts, additional research is warranted.

However, studies outside of the context of trauma have documented effects of helping on diverse outcomes including immune functioning, perceived health, and remission from substance

abuse (Konrath & Brown, 2013; Krause, 2016; Pagano, Phillips, Stout, Menard, & Piliavin, 2007). In particular, compassionate goals (striving to help and support others in social interactions) may contribute to relational processes that facilitate well-being. In student samples, compassionate goals prospectively predicted increases in perceived and actual social support over time (Crocker & Canevello, 2008) and decreases in distress (Crocker, Canevello, Breines, & Flynn, 2010). Adopting compassionate goals during a laboratory social stressor caused higher observer-rated affiliative behavior and lower endocrine stress responses compared to other coping strategies (Abelson et al., 2014). Additionally, compassionate goals in daily life predicted increases in positive perceptions of oneself (Crocker, Canevello, & Lewis, 2017) and in the belief that difficulties can lead to growth in relationships (Canevello & Crocker, 2011), reminiscent of facets of the PTG construct.

Because compassionate goals have predicted positive changes in self-perception, relational closeness, and social beliefs (factors that parallel core changes defining PTG), one might expect that individuals pursuing compassionate goals in the wake of a trauma may report higher PTG, although this has not been examined directly. Also, perceiving others as high in compassionate goals is likely to predict higher PTG, given that the distinct, but related variable of perceived social support predicted PTG in past studies. However, it remains unknown whether compassionate goals toward others would independently predict PTG and may even mediate the effects of perceptions of others' compassionate goals on PTG.

Elevation Cultivates Compassionate Goals Toward Others

Additionally, emotional reactions to community members' social responses to a trauma may influence striving for compassionate goals in that context as well as PTG. Some communities respond to large-scale traumas with an outpouring of love, courage, and generosity (Turunen, Haravuori, Pihlajamäki, Marttunen, & Punamäki, 2014). Witnessing such support may elicit moral elevation, the socio-moral emotion that occurs when witnessing 'moral beauty' or uncommon acts of goodness (Haidt, 2000, 2003). Elevation is theorized to be characterized by subjective feelings of being uplifted or inspired, physical sensations (e.g., chest warmth or a lump in one's throat), and an action tendency toward helping and supporting others or becoming a better person (Aquino, McFerran, & Laven, 2011; Algoe & Haidt, 2009; Haidt, 2000; Schnall, Roper, & Fessler, 2010).

Empirical studies suggest that elevation may elicit prosocial responses. Self-reported trait elevation predicted self-reported altruism beyond Five-Factor Model traits (Landis et al., 2009) and volunteer engagement (Cox, 2010). Laboratory inductions caused increases in helping motives or behavior (Algoe & Haidt, 2009; Freeman, Aquino, & McFerran, 2009; Lai, Haidt, & Nosek, 2014; Schnall & Roper, 2012; Schnall et al., 2010; Silvers & Haidt, 2008). The only elevation study assessing compassionate goals showed that daily elevation predicted higher same-day, next-day, and subsequent (6 weeks later) compassionate goals in anxious/depressed patients (Erickson & Abelson, 2012). However, no studies have investigated elevation in trauma contexts. Elevation predicted a desire to become a better person (Algoe & Haidt, 2009; Schnall et al., 2010), prosocial responses (e.g. Schnall et al., 2010), and shifts in beliefs (e.g., belief in cooperation; Erickson & Abelson, 2012; increases in spirituality; Van Cappellen, Saroglou, Iweins, Piovesana, & Fredrickson, 2013), all factors characterizing PTG. Thus, elevation might facilitate PTG directly, or indirectly via compassionate goals.

Present Study

The present study tested elevation and compassionate goals in predicting PTG after a traumatic shooting at a private Christian university in the Pacific Northwest. First, we tested the contributions of perceived compassionate goals of others (CG-others) and of the self toward others (CG-self) in predicting PTG four months (Time 1) and eight months (Time 2) post-shooting, hypothesizing that CG-self would predict higher PTG beyond positive effects of CG-others (Hypothesis 1). These expectations are consistent with support predicting PTG (Shakespeare-Finch et al., 2015) and unique effects of compassionate goals on distress, beyond effects of receiving support (Crocker et al., 2010).

Second, we aimed to test a serial mediation model in which even after controlling for proximity to the trauma event, perceptions of others as having compassionate goals (CG-others) would predict higher PTG, directly and indirectly, via higher elevation and compassionate goals (Hypothesis 2). We expected that feeling elevated by the response of others to the trauma would predict higher PTG directly (Hypothesis 3), given the documented effects of elevation on constructs related to PTG (self-perceptions, prosociality, and beliefs). We also hypothesized indirect positive effects of elevation on PTG via compassionate goals toward others (Hypothesis 4), given that elevation has predicted compassionate goals (Erickson & Abelson, 2012). We expected all effects when PTG was assessed concurrently with predictors (Time 1) and when assessed eight months later (Time 2) for a subset of participants who completed a follow-up.

Method

Context and Participants

On June 5, 2014, a young man with no connections to the university walked onto campus with a shotgun and fired shots at several students before being tackled and restrained by a student who was widely hailed as a hero. However, this traumatic event left one student dead and several others with injuries. Data was collected at two time points: four months after the shooting (Time 1) and a follow-up eight months post-shooting (Time 2). Participants included 385 participants (75% female; $M_{age} = 27.93$, $SD = 13.19$, range 18–89) at Time 1 and 82 participants at Time 2 (74% female; $M_{age} = 29.32$, $SD = 14.05$, range 18–64). They represented graduate (Time 1: 4%; Time 2: 7%) and undergraduate students (70%; 62%), faculty (10%; 4%), and staff (16%; 27%). Participants identified as Caucasian (84%; 87%), Asian American (10%; 9%), African American (3%; 2%), and those remaining (3%; 2%) were Native American, Pacific Islander, and multiracial (5%/7% also reported Hispanic/ Latinx ethnicity).

Sampling Procedures

Participants were recruited by emails at Time 1 and 2 that contained a link for an online survey tool (Qualtrics) preceded by a consent form. Participation was voluntary and took approximately 15 minutes. As an incentive, participants who completed the survey were entered into a drawing to receive one of ten \$50 Visa gift cards. An Institutional Review Board (IRB) approved the study procedures.

Measures and Covariates

Elevation

The Elevation Scale is a self-report measure that includes 13 items related to somatic (e.g., ‘I felt a warm or glowing feeling in my chest’) and cognitive-affective aspects of elevation (‘It made me feel that I was somehow “lifted up” or “nobler” myself’). Items were originally

developed by J. Haidt and in a later study, Landis and colleagues (2009) found evidence of psychometric properties to support the validity of the scale. We retained the original items but modified the instructions to pertain to the trauma context. Instructions stated that while the June 5 events were clearly tragic, some people reported positive feelings about how students, faculty, staff, and community members responded to the situation (e.g., the heroic student who stopped the shooter, generous community support, and social media expressions of grace rather than hatred for the shooter). Respondents were asked to write briefly about specific events witnessed or stories heard in the two weeks after the shooting, in order to prompt recall. Next, they rated on a 0 (not at all) to 4 (extremely) scale the extent to which, during those two weeks when they encountered these positive events/stories, they experienced each item. All items were summed except for three (items 3, 6, and 10) used to determine if participants endorsed phenomena that were not characteristic of elevation, consistent with previous studies. Landis and colleagues (2009) found evidence of a two-factor model (psychological and physiological factors), convergence with expected correlates (e.g., prosocial behavior, spiritual transcendence), and internal consistency. In the present study, $\alpha = 0.89$.

Compassionate Goals

The mean of seven items from Crocker and Canevello (2008) retrospectively measured compassionate goals of the self toward others (CG-self), and we adapted the same items to assess compassionate goals from others toward self (CG-others). Respondents rated their perception of goals occurring during the 2 weeks post-shooting on a 0 (not at all) to 4 (extremely) scale. CG-self items inquired, ‘In your relationships with other people at that time, how much did you want to or try to ...,’ and assessed degrees of compassionate goals such as ‘be supportive of others’ and ‘avoid being selfish or self-centered.’ CG-others items began with the same prompt but assessed ‘how much did other people want or try to ...’ and assessed the same compassionate goals (e.g., ‘be supportive of you’). Responses to the original items demonstrated construct validity, factorial validity, and internal consistency (Crocker & Canevello, 2008). Responses were internally consistent in our study for CG-self ($\alpha = 0.90$) and CG-others ($\alpha = 0.95$).

Posttraumatic Growth

The PTG Inventory (PTGI; Tedeschi & Calhoun, 1996) measured perceived positive life changes across multiple domains following the traumatic event. Respondents rated 21 items on a 0 (I did not experience this change as a result of the shooting) to 5 (I experienced this change to a very great degree as a result of the shooting) scale. A sample item includes, ‘I changed my priorities about what is important in life.’ Higher total summed scores indicate higher PTG. Responses in past studies suggested construct validity, test-retest reliability over two months, and internal consistency (Tedeschi & Calhoun, 1996). In our study, responses for Time 1 ($\alpha = 0.95$) and Time 2 ($\alpha = 0.97$) were internally consistent.

Proximity to Trauma

A single item (adapted from Hughes et al., 2011) assessed physical proximity to the traumatic event as a proxy for trauma-related stress exposure: ‘Where were you at the time of the shooting on June 5, 2014?’ (0 = off campus and not in Seattle, 1 = off campus and in Seattle, 2 = on campus but not in [the building where the shooting occurred], and 3 = in [the building]). Higher scores indicated higher proximity, which we treated as a covariate to control for varying levels of exposure to the trauma across university community members.

Results

Preliminary Analyses

Data screening suggested no substantial skewness or kurtosis. Descriptive statistics and a correlation matrix for study variables are provided in Table 1. The data were 98.7% complete for Time 1 and 99.2% complete for Time 2. We used multiple imputation to handle missing data, but because the pattern of results was the same with and without imputation, we report the results based on raw data. Similar results were evident with and without controlling for sex, so presented results do not include sex as a covariate.

Table 1. Correlations and descriptive statistics for study variables.

Variable	CG-oth- ers	CG-self	Eleva- tion	PTG	PTG (Time 2)	Prox- imity
CG- others	–					
CG-self	0.56**	–				
Elevation	0.36**	0.43**	–			
PTG	0.20**	0.23**	0.43**	–		
PTG (Time 2)	0.20	0.17	0.41**	0.81**	–	
Proximity	0.11**	0.05	0.01	0.17**	0.06	–
<i>M</i>	2.79	3.09	24.95	32.09	32.02	1.61
<i>SD</i>	0.87	0.70	10.75	22.05	24.10	0.74

Notes: CG-others = Compassionate Goals from others; CG-self = Compassionate Goals of self toward others; PTG = Posttraumatic Growth; all measures at Time 1 (4 months after shooting) unless otherwise noted as Time 2 (8 months);

* $p < .05$; ** $p < .01$.

Differential Prediction of PTG by Self and Others' Compassionate Goals

At Time 1, to directly test the question of whether giving and receiving social support both uniquely predicted PTG in the context of the shooting (Hypothesis 1), we conducted a multiple linear regression with compassionate goals toward others (CG-self) and perceived compassionate goals of others (CG-others) simultaneously predicting concurrent PTG. In line with hypotheses, even with perceived CG-others marginally predicting higher PTG ($b = 2.85$, $SE = 1.52$, $pr = 0.10$, $p = .062$), CG-self uniquely predicted higher PTG ($b = 4.89$, $SE = 1.90$, $pr = 0.13$, $p = .010$). These analyses demonstrated that striving to support others explained unique variability in PTG beyond perceiving others as striving to provide support.

Serial Multiple Mediation Analysis

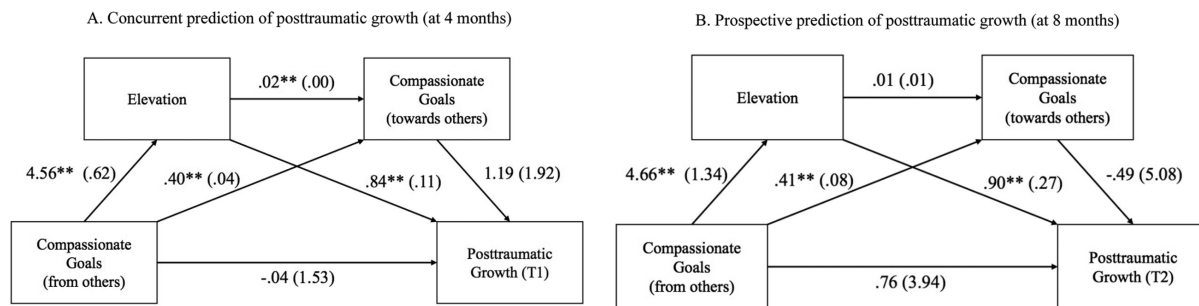
We conducted serial multiple mediation model analysis of Time 1 data to test whether elevation and compassionate goals toward others mediated the effect of perceptions of compassionate goals from others on PTG (Hypothesis 2). Hayes (2013) recommended this strategy over separate mediation models because it accounts for covariance between hypothesized mediators when calculating indirect paths. Our model also controlled for physical proximity to the trauma to equalize participants on this variable. Using PROCESS (Hayes, 2013), coefficients for direct and indirect effects were computed. Bias-corrected bootstrap (95%) confidence intervals were calculated to test significance of indirect effects (intervals not containing zero indicate significance at $p < .05$).

Table 2. Direct and indirect effects of compassionate goals from others on posttraumatic growth through elevation and compassionate goals towards others.

Effect					<i>b</i>	SE	<i>p</i>	95% CI	
CG-others	→	Elevation	→	PTG (T1)	=	3.84*	0.72	[2.59, 5.43]	
				PTG (T2)	=	4.21*	1.72	[1.47, 8.47]	
CG-others	→	Elevation	→	CG-self → PTG (T1) PTG (T2)	=	0.09	0.14	[−0.17, 0.40]	
					=	−0.03	0.31	[−0.84, 0.50]	
CG-others	→	CG-self	→	PTG (T1) PTG (T2) Direct effect of CG-others on PTG (T1) (T2)	=	0.48	0.76	[−0.99, 1.99]	
					=	−0.20	1.97	[−4.32, 3.67]	
					=	−0.04	1.53	.98	[−3.06, 2.97]
					=	0.76	3.94	.85	[−7.09, 8.61]

Notes: CG-others = Compassionate goals from others; CG-self = Compassionate goals of self toward others; PTG = Posttraumatic growth; T1 = PTG measured at 4 months after the shooting; T2 = PTG measured at 8 months; Path effects are presented as unstandardized beta weights (*b*); The significance of indirect effects was calculated with bias-corrected bootstrap confidence intervals (95%), with intervals not containing zero indicating significance at $p < .05$.

Results (presented in Table 2) suggest that the variables in the model explained 20% of the variance in concurrent PTG. With regard to specific paths in the model, most hypotheses were supported (See Figure 1A). As expected, CG-others predicted higher elevation and higher CG-self (Hypothesis 2), and elevation predicted higher CG-self and higher PTG (Hypothesis 4). Contrary to expectations and the aforementioned multiple regression analysis, CG-others and CG-self did not predict PTG when controlling other variables. We also note that the control variable of proximity to the trauma did not predict elevation ($b = -0.72$, $SE = 0.72$, $p = .32$) or compassionate goals toward others ($b = -0.03$, $SE = 0.04$, $p = .51$) but did predict higher PTG ($b = 4.39$, $SE = 1.45$, $p = .003$).



Figures 1. (A and B). Serial mediation model with perceived compassionate goals from others (toward self) predicting posttraumatic growth at 4 and 8 months after a campus shooting, mediated by elevation and compassionate goals toward others experienced immediately after the event.

One indirect effect was significant: the effect of perceiving compassionate goals from others, through experiencing moral elevation, to PTG. Thus, even after accounting for proximity to the ‘ground zero’ of the shooting, individuals who perceived higher compassionate goals from others were more likely to experience moral elevation and, in turn, report greater PTG. In contrast, the other two indirect effect paths in the model were not significant. Namely, the unique indirect effects of CG-others on PTG via CG-self, or via both elevation and CG-self, were not significant.

Supplementary Analyses Predicting PTG at Eight Month Follow-Up

A smaller subset of participants ($n = 82$) provided follow-up data. We repeated the foregoing analyses with follow-up PTG scores as the outcome variable. In the multiple

regression analysis, contrary to expectations, neither perceptions of others' compassionate goals ($b = 4.41$, $SE = 3.70$, $pr = 0.13$, $p = .237$) nor goals toward others ($b = 2.80$, $SE = 5.12$, $pr = 0.06$, $p = .585$) predicted PTG at the follow-up.

The serial multiple mediation analysis yielded the same pattern of results as for Time 1, when predicting PTG at follow-up (17% of variance explained). In this model (See Figure 1B) CG-others predicted higher elevation and higher CG-self, but did not predict PTG at follow-up. Elevation predicted higher CG-self (marginally, $p = .052$) and higher PTG. CG-self did not uniquely predict PTG at follow-up. Proximity to the trauma marginally predicted lower elevation ($b = -2.65$, $SE = 1.48$, $p = .077$), but did not predict CG-self ($b = 0.10$, $SE = 0.08$, $p = .198$) or PTG at follow-up ($b = -0.22$, $SE = 3.54$, $p = .950$).

Discussion

Perceptions of receiving support positively predicted PTG in past studies (Armstrong et al., 2015; Dekel et al., 2011; Guay, Billette, & Marchand, 2006; Prati & Pietrantonio, 2009), but the unique effects of striving to offer support (i.e., compassionate goals; CGs) in the context of a traumatic event and the emotional inspiration which might facilitate this striving, have not been investigated. The present study investigated CGs and elevation as predictors of PTG following the mass trauma of a campus shooting.

Compassionate Goals Predicting PTG

When CGs toward others and from others were entered as simultaneous predictors of PTG, the former predicted higher PTG at Time 1 even after controlling for marginally significant effects of the latter on PTG, as hypothesized. This is a novel finding, given that past research has almost exclusively examined perceived support from others as a predictor of PTG. Reports of striving to help others during the two weeks after the shooting was more strongly predictive of perceived growth than perceiving such motivations in others, consistent with past research on the unique effects of compassionate goals toward others beyond receiving support, in the context of college students' relationships (Crocker & Canevello, 2008; Crocker et al., 2010). The only similar study found that self-reported provision of support to others did not predict PTG (Shakespeare-Finch et al., 2015). That study measured support based on generalized reports about oneself (e.g., I am there to listen to others' problems), whereas we assessed compassionate goals anchored to social interactions with university community members during a particular time frame. One's context-specific prosocial responses may be more important predictors of PTG, relative to trait-like prosocial motivations. We note that goals did not predict PTG at Time 2, which may be due to a much smaller sample than at Time 1.

Finding unique effects of compassionate goals toward others suggests that striving to help others may contribute to meaning-making in the wake of a trauma. Traumas violate individuals' beliefs about the benevolence and safety of the world, whereas conceptualizing and making meaning of such events (Park, 2010) is theorized to facilitate PTG (Calhoun & Tedeschi, 2006; Wang et al., 2016). Offering support to others after a trauma may perhaps create meaning by increasing one's sense of agency and by fostering the belief that good will still exists in the world, alongside suffering. Individuals who do not already perceive available support might benefit from learning to cultivate and pursue compassionate goals toward others as a way to cope in the aftermath of trauma. The probability of experiencing PTG may be enhanced by giving to others (e.g., making a difference in others' lives during social interactions, volunteering, mentoring children, etc.), instead of passively relying on support from others. Our correlational

findings are suggestive, but future research must test these possibilities experimentally and in longer longitudinal designs.

The Role of Elevation in Social Goals and PTG

We also examined moral elevation reported in response to others' social reactions to the shooting, finding that in a serial mediation model, elevation was linked to CGs and PTG in ways that partially supported hypotheses. Due to consistent results across Time 1 and 2 in our serial mediation models, the following discussion will pertain to both times points. First, as expected, perceptions of others' CGs predicted higher elevation, consistent with the theory that witnessing others' generous or otherwise virtuous actions triggers feeling uplifted (Haidt, 2003). Past research has largely focused on elevation as a result of witnessing virtuous acts displayed toward third parties (e.g. Algoe & Haidt, 2009), but our findings suggest that being a direct recipient of others' support may also contribute to elevation. Alternatively, receiving support may make individuals more able to feel elevated by others' acts toward a third party.

In addition, perceptions of others' CGs predicted not only elevation, but higher CGs toward others, as hypothesized. This has not been tested in past research. CGs have prospectively predicted higher perceptions of receiving support from others (Crocker & Canevello, 2008), and we expected that this relationship may be reciprocal. Our finding was also consistent with elevation studies in which witnessing others' prosocial acts experimentally led to higher prosocial motives or behaviors (Aquino et al., 2011; Van de Vyver & Abrams, 2015).

Elevation predicted CGs towards others, in line with hypotheses and previous links to self-reported altruism (Landis et al., 2009), helping behavior (Schnall et al., 2010), and compassionate goals (Erickson & Abelson, 2012). Only one study examined elevation in the context of clinical distress (Erickson & Abelson, 2012), but our study extends the finding that elevation predicts prosocial motivations into the novel context of a traumatic event. Additionally, trauma exposure itself may predict engaging in daily helping behavior (Frazier et al., 2013), but our findings suggest the role of elevation in predicting prosocial responses, beyond proximity to trauma and others' compassionate goals. Experiencing elevation may provide the emotional energy to help individuals respond in a supportive manner during a time of distress.

Although our finding that perceptions of others' CGs predicted PTG is consistent with past effects of social support on PTG (Dekel et al., 2011; Guay et al., 2006; Prati & Pietrantonio, 2009; Shakespeare-Finch et al., 2015), our results contribute a new finding that elevation may mediate such effects. Elevation uniquely predicted higher PTG both concurrently and prospectively, as hypothesized, beyond effects of CGs from or to others. CG-others no longer predicted PTG when elevation was in the model, suggesting full mediation. This mediation fits with the fact that theorized effects of elevation (shifts in beliefs, prosocial behavior, and desire to become a better person; Algoe & Haidt, 2009; Schnall et al., 2010; Van Cappellen et al., 2013) correspond to theorized factors facilitating PTG (Tedeschi & Calhoun, 1996).

No other indirect relationships were significant (i.e., CG-others→elevation→CG-self; CG-others→elevation→CGself→PTG; elevation→CG-self→PTG), and CG-self did not predict PTG when all variables were included in the model. It is possible that CG-others did not predict PTG when elevation was included because elevation and support share a common core of social interconnectedness. This shared variance may be so strong that, once controlled for, there is little unique variance of CGs. Alternatively, negative emotions (Pessoa, 2009) and trauma (Blair et al., 2013) may influence executive functioning, and trauma-related difficulties in attending to others may have diminished the growth-predicting capacity of CGs in our participants.

Nonetheless, our findings were consistent with the idea of elevation as a mechanism through which a supportive environment predicts PTG. Moreover, these findings were present while accounting for proximity to the shooting, which also predicted higher PTG (consistent with the theory of PTG and previous research; Birkeland et al., 2015). Our findings imply the possibility of incorporating a focus on elevation into standard post-trauma strategies (e.g., self-care, cognitive behavioral interventions; Gutermann et al., 2016). One might educate survivors about the emotion of elevation and adapt behavioral activation to encourage proactively searching for uplifting behavior in the community of survivors (e.g., cued recall and mindful attention to supportive acts, viewing elevating videos, or reading uplifting stories). Future studies should experimentally test such possibilities.

Limitations

The present study relied on retrospective self-report measures which may be vulnerable to memory biases; however, participants provided responses anonymously, which may reduce self-presentation biases. The cross-sectional nature of the study restricts causal inferences; the fact that elevation predicted both concurrent and subsequent PTG suggests the robustness of that finding, but the sample size was smaller for the prospective analyses. Future studies should assess the development of PTG over a longer time frame to identify key windows of change, ideally with experimental manipulation of elevation and compassionate goals to determine causal effects. Additionally, we tested our hypotheses at a private, religiously affiliated university, so future studies should examine the contributions of elevation and compassionate goals to PTG in other contexts and with more culturally diverse samples.

Conclusion

To our knowledge, no studies have examined elevation and compassionate goals in trauma contexts. This study adds to the PTG literature, showing that experiences of elevation can account for the previously documented effects of receiving support on PTG. Given the unfortunate prevalence of mass shootings, our findings are particularly relevant. Our results resonate with how the university president summarized the period following the shooting investigated in our report: It was both the worst and best time in the history of the university – given both the tragic events and the uplifting way that students, staff, and faculty responded with an outpouring of support and compassion. We hope that future studies will further elucidate the processes by which traumas may become opportunities for finding moral beauty and growth.

ACKNOWLEDGEMENTS

We wish to pay our deepest respect and condolences to the victims of the shooting on July 5, 2014, as well as the friends, family members, and community who continue to carry the loss and grief from this tragic event. We would also like to honor the staff and faculty who provided support, and especially the student who risked his own life to disarm the shooter, displaying a powerful example of self-sacrifice, courage, and moral beauty amidst tragedy. Lastly, we thank the administration of Seattle Pacific University for supporting this research.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

FUNDING

This work was supported by Seattle Pacific University.

References

- Abelson, J. L., Erickson, T. M., Mayer, S. E., Crocker, J., Briggs, H., Lopez-Duran, N. L., & Liberzon, I. (2014). Brief cognitive intervention can modulate neuroendocrine stress responses to the trier social stress test: Buffering effects of a compassionate goal orientation. *Psychoneuroendocrinology*, 44, 60–70. doi:10.1016/j.psyneuen.2014.02.016
- Algoe, S. B., & Haidt, J. (2009). Witnessing excellence in action: The ‘other-praising’ emotions of elevation, gratitude, and admiration. *Journal of Positive Psychology*, 4, 105–127. doi:10.1080/17439760802650519
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.
- Aquino, K., McFerran, B., & Laven, M. (2011). Moral identity and the experience of moral elevation in response to acts of uncommon goodness. *Journal of Personality and Social Psychology*, 100, 703–718. doi:10.1037/a0022540
- Armstrong, D., Shakespeare-Finch, J., & Shochet, I. (2015). Organizational belongingness mediates the relationship between sources of stress and posttrauma outcomes in firefighters. *Psychological Trauma: Theory, Research, Practice, and Policy*, 8, 343–347. doi:10.1037/tra0000083
- Birkeland, M. S., Hafstad, G. S., Blix, I., & Heir, T. (2015). Latent classes of posttraumatic stress and growth. *Anxiety, Stress & Coping: An International Journal*, 28, 272–286. doi:10.1080/10615806.2014.956097
- Blair, J. P., & Schweit, K. W. (2014). *A study of active shooter incidents, 2000–2013*. Washington, DC: Texas State University and Federal Bureau of Investigation, US Department of Justice.
- Blair, K. S., Vythilingam, M., Crowe, S. L., McCaffrey, D. E., Ng, P., Wu, C. C., ... Blair, R. R. (2013). Cognitive control of attention is differentially affected in trauma-exposed individuals with and without post-traumatic stress disorder. *Psychological Medicine*, 43, 85–95. doi:10.1017/S0033291712000840
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for post-traumatic stress disorder in traumaexposed adults. *Journal of Consulting and Clinical Psychology*, 68, 748–766. doi:10.1037/0022-006X.68.5.748
- Briere, J. N., & Scott, C. (2015). *Principles of trauma therapy: A guide to symptoms, evaluation, and treatment*, 2nd ed., DSM-5 update. Thousand Oaks, CA: Sage.
- Calhoun, L., & Tedeschi, R. G. (1999). *Facilitating posttraumatic growth : A clinician’s guide* (LEA series in personality and clinical psychology). Mahwah, NJ: Lawrence Erlbaum Associates.
- Calhoun, L. G., & Tedeschi, R. G. (2006). *Handbook of posttraumatic growth: Research and practice*. Mahwah, NJ: Erlbaum.
- Canevello, A., & Crocker, J. (2011). Changing relationship growth belief: Intrapersonal and interpersonal consequences of compassionate goals. *Personal Relationships*, 18, 370–391. doi:10.1111/j.1475-6811.2010.01296.x
- Cann, A., Calhoun, L. G., Tedeschi, R. G., & Solomon, D. T. (2010). Posttraumatic growth and depreciation as independent experiences and predictors of well-being. *Journal of Loss and Trauma*, 15, 151–166. doi:10.1080/15325020903375826
- Cordova, M. J., Cunningham, L. C., Carlson, C. R., & Andrykowski, M. A. (2001). Posttraumatic growth following breast cancer: A controlled comparison study. *Health Psychology*, 20, 176–185. doi:10.1037/0278-6133.20.3.176

- Cox, K. S. (2010). Elevation predicts domain-specific volunteerism 3 months later. *Journal of Positive Psychology*, 5, 333–341. doi:10.1080/17439760.2010.507468
- Crocker, J., & Canevello, A. (2008). Creating and undermining social support in communal relationships: The role of compassionate and self-image goals. *Journal of Personality and Social Psychology*, 95, 555–575. doi:10.1037/0022-3514.95.3.555
- Crocker, J., Canevello, A., Breines, J. G., & Flynn, H. (2010). Interpersonal goals and change in anxiety and dysphoria in first-semester college students. *Journal of Personality and Social Psychology*, 98, 1009–1024. doi:10.1037/a0019400
- Crocker, J., Canevello, A., & Lewis, K. A. (2017). Romantic relationships in the ecosystem: Compassionate goals, nonzero-sum beliefs, and change in relationship quality. *Journal of Personality and Social Psychology*, 112, 58–75. doi:10.1037/pspi0000076
- Danhauer, S. C., Case, L. D., Tedeschi, R., Russell, G., Vishnevsky, T., Triplett, K., ... Avis, N. E. (2013). Predictors of posttraumatic growth in women with breast cancer. *Psycho-Oncology*, 22, 2676–2683. doi:10.1002/pon.3298
- Dekel, S., Mandl, C., & Solomon, Z. (2011). Shared and unique predictors of posttraumatic growth and distress. *Journal of Clinical Psychology*, 67, 241–252. doi:10.1002/jclp.20747
- Erickson, T. M., & Abelson, J. L. (2012). Even the downhearted may be uplifted: Moral elevation in the daily life of clinically depressed and anxious adults. *Journal of Social and Clinical Psychology*, 31, 707–728. doi:10.1521/jscp.2012.31.7.707
- Frazier, P., Greer, C., Gabrielsen, S., Tennen, H., Park, C., & Tomich, P. (2013). The relation between trauma exposure and prosocial behavior. *Psychological Trauma: Theory, Research, Practice, and Policy*, 5, 286–294. doi:10.1037/a0027255
- Freeman, D., Aquino, K., & McFerran, B. (2009). Overcoming beneficiary race as an impediment to charitable donations: Social dominance orientation, the experience of moral elevation, and donation behavior. *Personality and Social Psychology Bulletin*, 35, 72–84. doi:10.1177/0146167208325415
- Galatzer-Levy, I. R., Nickerson, A., Litz, B. T., & Marmar, C. R. (2013). Patterns of lifetime PTSD comorbidity: A latent class analysis. *Depression and Anxiety*, 30, 489–496. doi:10.1002/da.22048
- Guay, S., Billette, V., & Marchand, A. (2006). Exploring the links between posttraumatic stress disorder and social support: Processes and potential research avenues. *Journal of Traumatic Stress*, 19, 327–338. doi:10.1002/jts.20124
- Gutermann, J., Schreiber, F., Matulis, S., Schwartzkopff, L., Deppe, J., & Steil, R. (2016). Psychological treatments for symptoms of posttraumatic stress disorder in children, adolescents, and young adults: A meta-analysis. *Clinical Child and Family Psychology Review*, 19, 77–93. doi:10.1007/s10567-016-0202-5
- Haidt, J. (2000). The positive emotion of elevation. *Prevention & Treatment*, 3. doi:10.1037/1522-3736.3.1.33c
- Haidt, J. (2003). The moral emotions. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 852–870). Oxford: Oxford University Press.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford.
- Hughes, M., Brymer, M., Chiu, W. T., Fairbank, J. A., Jones, R. T., Pynoos, R. S., ... Kessler, R. C. (2011). Posttraumatic stress among students after the shootings at Virginia Tech. *Psychological Trauma: Theory, Research, Practice, and Policy*, 3, 403–411. doi:10.1037/a0024565

- James, L. M., Van Kampen, E., Miller, R. D., & Engdahl, B. E. (2013). Risk and protective factors associated with symptoms of post-traumatic stress, depression, and alcohol misuse in OEF/ OIF veterans. *Military Medicine*, 178, 159–165. doi:10.7205/ MILMED-D-12-00282
- Kessler, R. C., Berglund, P., Delmer, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*, 62, 593–602. doi:10.1001/archpsyc.62.6.593
- Kim, J., Kim, M., & Park, S. (2016). Exploring the relationship among posttraumatic growth, life satisfaction, and happiness among Korean individuals with physical disabilities. *Psychological Reports*, 119, 312–327. doi:10.1177/0033294116653954
- Konrath, S., & Brown, S. (2013). The effects of giving on givers. In M. L. Newman, N. A. Roberts, M. L. Newman, N. A. Roberts (Eds.), *Health and social relationships: The good, the bad, and the complicated* (pp. 39–64). Washington, DC: American Psychological Association. doi:10.1037/14036-003
- Krause, N. (2016). Providing emotional support to others, self-esteem, and self-rated health. *Archives of Gerontology and Geriatrics*, 65, 183–191. doi:10.1016/j.archger.2016.03.014
- Lai, C. K., Haidt, J., & Nosek, B. A. (2014). Moral elevation reduces prejudice against gay men. *Cognition and Emotion*, 28, 781–794. doi:10.1080/02699931.2013.861342
- Laakey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological Review*, 118, 482–495. doi:10.1037/a0023477
- Landis, S. K., Sherman, M. F., Piedmont, R. L., Kirkhart, M. W., Rapp, E. M., & Bibe, D. H. (2009). The relation between elevation and self-reported prosocial behavior: Incremental validity over the Five-Factor Model of personality. *Journal of Positive Psychology*, 4, 71–84. doi:10.1080/17439760802399208
- Monson, E., Caron, J., McCloskey, K., & Brunet, A. (2017). Longitudinal analysis of quality of life across the trauma spectrum. *Psychological Trauma: Theory, Research, Practice, and Policy*. Advance online publication. doi:10.1037/ tra0000254
- Pagano, M. E., Phillips, K. A., Stout, R. L., Menard, W., & Piliavin, J. A. (2007). Impact of helping behaviors on the course of substance-use disorders in individuals with body dysmorphic disorder. *Journal of Studies on Alcohol and Drugs*, 68, 291–295. doi:10.15288/jsad.2007.68.291
- Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin*, 136, 257–301. doi:10.1037/a0018301
- Pessoa, L. (2009). How do emotion and motivation direct executive control? *Trends in Cognitive Sciences*, 13, 160–166. doi:10.1016/j.tics.2009.01.006
- Prati, G., & Pietrantonio, L. (2009). Optimism, social support, and coping strategies as factors contributing to posttraumatic growth: A meta-analysis. *Journal of Loss and Trauma*, 14, 364–388. doi:10.1080/15325020902724271
- Schnall, S., & Roper, J. (2012). Elevation puts moral values into action. *Social Psychological and Personality Science*, 3, 373–378. doi:10.1177/1948550611423595
- Schnall, S., Roper, J., & Fessler, D. M. (2010). Elevation leads to altruistic behavior. *Psychological Science*, 21, 315–320. doi:10.1177/0956797609359882

- Shakespeare-Finch, J., Rees, A., & Armstrong, D. (2015). Social support, self-efficacy, trauma and well-being in emergency medical dispatchers. *Social Indicators Research*, 123, 549–565. doi:10.1007/s11205-014-0749-9
- Silvers, J. A., & Haidt, J. (2008). Moral elevation can induce nursing. *Emotion*, 8, 291–295. doi:10.1037/1528-3542.8.2.291
- Tedeschi, R. G., & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9, 455–471. doi:10.1002/jts.2490090305
- Tedeschi, R. G., Calhoun, L. G., & Wong, P. T. P. (2012). Pathways to personal transformation: Theoretical and empirical developments. In P. T. P. Wong (Ed.), *The human quest for meaning: Theories, research, and applications* (2nd ed.). (pp. 559–572). New York, NY: Routledge.
- Turunen, T., Haravuori, H., Pihlajamäki, J. J., Marttunen, M., & Punamäki, R. (2014). Framework of the outreach after a school shooting and the students' perceptions of the provided support. *European Journal of Psychotraumatology*, 5, 1–9. doi:10.3402/ejpt.v5.23079
- Van Cappellen, P., Saroglou, V., Iweins, C., Piovesana, M., & Fredrickson, B. (2013). Self-transcendent positive emotions increase spirituality through basic world assumptions. *Cognition & Emotion*, 27, 1378–1394. doi:10.1080/02699931.2013.787395
- Van de Vyver, J., & Abrams, D. (2015). Testing the prosocial effectiveness of the prototypical moral emotions: Elevation increases benevolent behaviors and outrage increases justice behaviors. *Journal of Experimental Social Psychology*, 58, 23–33.
- Volgin, R., & Bates, G. (2016). Attachment and social support as predictors of posttraumatic stress and posttraumatic growth. *Traumatology*, 22, 184–191. doi:10.1037/trm0000083
- Wang, Y., Gan, Y., Miao, M., Ke, Q., Li, W., Zhang, Z., & Cheng, G. (2016). High-level construal benefits, meaning making, and posttraumatic growth in cancer patients. *Palliative and Supportive Care*, 14, 510–518. doi:10.1017/S1478951515001224
- Warner, L. M., Gutiérrez-Doña, B., Angulo, M. V., & Schwarzer, R. (2015). Resource loss, self-efficacy, and family support predict posttraumatic stress symptoms: A 3-year study of earthquake survivors. *Anxiety, Stress, and Coping: An International Journal*, 28, 239–253. doi:10.1080/10615806.2014.955018