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Posttraumatic growth in students, crime survivors and trauma workers exposed to adversity

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ABSTRACT

Generalised models of positive change following adversity do not fully account for differences in adjustment among populations who experience posttraumatic growth (PTG). The contributions of event intentionality, frequency of the adversity types, age at serious event, spirituality/religiousness, active coping, PTSD symptoms and social support were explored as predictors of PTG across three samples of university students (N = 101; Study 1), survivors of violent crime recruited from support services (N = 71; Study 2) and those working with survivors of adversity (N = 96; Study 3). The results of Study 1 revealed that age at serious event, active coping, PTSD symptoms and social support positively predicted PTG. Within Study 2, spirituality/religiousness, active coping and social support were the significant positive predictors of PTG. Finally in Study 3, spirituality/religiousness, active coping and social support were the significant positive predictors of PTG. Across all studies, event intentionality and frequency of adversity types did not determine PTG. These results indicate that while participants within each of the populations have the ability to experience PTG, different factors predicted whether PTG was observed. The findings offer greater insight into the multifarious nature of adjustment following adversity.

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1. Introduction

The experience of adverse events often leads to stressful or traumatic reactions and changes in psychological functioning. Nevertheless, some people exposed to adversity report positive changes as a result of their experiences. Such changes are characterised by a greater appreciation for life, the perception of new opportunities, increased feelings of personal strength, improved relationships with people and an enhanced religiosity or spirituality (Joseph, 2012; Tedeschi & Calhoun, 2004). This positive transformation is known as posttraumatic growth (PTG; Tedeschi & Calhoun, 2004), and contrasts with earlier literature that has long-considered only the negative consequences associated with adversarial events.

1.1. Transformational theory of PTG

The processes that underlie the development of PTG are thought to emerge in the same way as do negative effects. These are largely represented in existing models of growth, most notably the transformational model (Tedeschi & Calhoun, 2004). Broadly, the model proposes event-related cognitions and individual differences such as coping responses and social support are thought to play a key role in post-trauma outcomes and PTG. Adversarial events are usually experienced as traumatic if they are seismic enough to shatter world assumptions and pre-existing schemas (Tedeschi & Calhoun, 2004). A period of rumination generally follows, where attempts to reconcile world views with new trauma-related information are made to accommodate it into existing knowledge. This does not imply that PTG occurs in the absence of negative effects, as people exposed to adversity typically report co-occurring negative symptoms including those of posttraumatic stress disorder (PTSD). These negative symptoms appear to be part of the emotional struggle in which growth can occur (Lancaster, Klein, Nadia, Szabo, & Mogerman, 2015). However, as a generalised account of PTG development, the transformational model does not fully account for individual differences in adjustment following adversity.

1.2. Active, religious and spiritual coping styles

Although primarily focused on cognitive factors, the transformational model (Tedeschi & Calhoun, 2004) attends to contextual factors that may predict PTG. Cognitive appraisals can shape coping strategies that are employed to mitigate the most distressing aspects of the adverse event. Separately, two meta-analyses of 84 and 103 PTG studies respectively (Helgeson, Reynolds, & Tomich, 2006; Prati & Pietrantoni, 2009) revealed that active coping strategies and the use of religious or spiritual coping were closely associated with PTG, as people sought to find comfort and attempted to frame their experiences in a positive light. It is thought these processes are driven by an intrinsic need to move

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towards growthful outcomes and make sense of the experience (Joseph, Murphy, & Regel, 2012).

1.3. PTSD symptoms

The period of processing adverse events is generally reflected by increased posttraumatic stress symptoms, marked by intrusive thoughts and flashbacks of the event (Joseph et al., 2012). Findings suggest PTSD cognitions display positive linear and curvilinear relationships with PTG (Kleim & Ehlers, 2009; Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Shakespeare-Finch & Lurie-Beck, 2014). Specifically, lower PTSD symptoms may signify that the person is less affected by the adversarial event and therefore less PTG is experienced. Moderate levels of PTSD symptoms suggest that the person's world has been challenged in some way, yet they are able to engage in cognitive processing necessary for growth to occur. Higher levels of PTSD symptoms are thought to overwhelm a person's coping resources and they are more likely to succumb to negative aftereffects and therefore experience minimal PTG (Joseph et al., 2012).

1.4. Social support

In addition to coping methods, the wider social-environmental context is implicated in the transformational model (Tedeschi & Calhoun, 2004). In particular, social support has emerged as a robust predictor of growth across numerous PTG studies (Linley & Joseph, 2004). The dynamics of interpersonal relationships provide emotional support that can mediate adjustment outcomes (Ullman & Peter-Hagene, 2014) and offer new perspectives that are crucial for PTG development (Tedeschi & Calhoun, 2004). The additional outlooks provided by others aid deliberate rumination and the development of narratives that help people to draw upon the beneficial aspects of the event (Tedeschi, 1999). It is during this process of cognitive engagement that the foundations of PTG are laid, allowing the individual to thrive.

1.5. Age at time of serious event

As well as the aforementioned psychosocial characteristics, early life adversity is also thought to be a significant determinant of outcomes in adulthood. For many people, their first experience of adversity occurs in childhood and can often shape conceptions of self-identity (Sutherland & Bryant, 2005). Developmental adversity places the individual at greater vulnerability to more negative effects such as PTSD in later life (Hagenaars, Fisch, & van Minnen, 2011). However, people exposed to adversity in childhood could also change as a result of their experiences in a positive way. At present, there are mixed findings with regard to age at event experience and the degree of growth reported. Studies have reported negative, positive or no relationships between age and PTG (Meyerson, Grant, Carter, & Kilmer, 2011). While the transformational model (Tedeschi & Calhoun, 2004) does not explain the role of temporal factors, such discrepancies may be due to differences in PTG measurement, or the wide demographic range of populations sampled (Linley & Joseph, 2004; Powell et al., 2003; Shakespeare-Finch & Lurie-Beck, 2014). For example, perceived event severity may vary between younger people who experience a novel adverse event compared to older populations with more life experience (Sutherland & Bryant, 2005). Taken together, age at event experience and its influence on PTG development is not fully understood.

1.6. Event intentionality and frequency of exposure to adversity

In addition to investigating the factors relating to growth, the type of event people have been exposed to may influence the amount of PTG reported. Research has observed PTG in approximately 30 to 100% of survivors of breast cancer, transport accidents, natural disasters and those traumatised through bereavement (Linley & Joseph, 2004). The majority of event types explored to date are largely representative of experiences that are not intentionally perpetrated against people. The trauma literature distinguishes between such acts of nature and intentional events where harm is deliberately inflicted upon another person (Santiago et al., 2013). Intentional events have been associated with more adverse outcomes and magnified PTSD symptoms compared to non-intentional acts of nature (Santiago et al., 2013). While it has been suggested that intentional events may have profound effects on PTG development in populations who experience them such as sexual abuse survivors (Tedeschi, 1999), the direction of the effect is unclear as this has not received sufficient empirical support to date.

Alongside the type of adversity, the frequency of exposure is thought to determine subsequent psychological adjustment. Specifically, the experience of multiple adversity is thought to intensify PTSD reactions compared to isolated events (Green et al., 2000). However, no studies have explored the influence of frequency of exposure to adversity on PTG development. As objective characteristics of the event, both the type and frequency of adversarial exposure are not represented in the transformational model which places greater emphasis on subjective interpretations of the event (Tedeschi & Calhoun, 2004). At present, there are no empirical investigations of this assumption and so the way in which intentional and multiple events are related to PTG, if at all, is not clear. Therefore, research that explores PTG in samples of people exposed to a diverse range of multiple intentional and non-intentional adverse experiences is warranted.

1.7. PTG in samples exposed to adversity

1.7.1. Students

The literature has considered growth from adversity in a wide range of samples. This has included survivors of cancer, transport accidents and military combat (Barakat, Alderfer, & Kazak, 2006; Linley & Joseph, 2004). Such research tends to use homogenous samples of people exposed to a specific type of adversity. As a consequence, this confines the study of PTG to narrow samples of survivors and excludes the potential range of intentional and non-intentional adversity that people may experience in their lifetime. One sample where a range of adversarial events could be considered is university students. Students form samples in many existing PTG studies (e.g. DeRoma et al., 2003; O'Connor, Cobb, & O'Connor, 2003; Prati & Pietrantoni, 2009) and there are benefits of doing so. They are a generally accessible population who have been potentially exposed to a range of adverse events rather than one specific stressor. This enables the exploration of both intentional and non-intentional adversity types. Furthermore, it could be argued that university students represent high functioning individuals who, despite previous adversity, are able to lead lives relatively free of the impairments that adversity can generate (Taku et al., 2007). For example, they are able to study academically at a high level. These may reflect a proportion of the trauma population who exhibit resiliency traits prior to the event, or even growth after the event that buffers against pathology such as PTSD (Bensimon, 2012). As such, university students are a high functioning population who provide a representative sample of people potentially exposed to a range of intentional and non-intentional adverse events in order to explore predictors of PTG.

1.7.2. Survivors of violent crime

In contrast to student samples, survivors of violent crime may represent a population who experience more frequent adversity of a deliberate nature. Some survivors of serious criminal acts are subject to a disproportionate number of intentional events in comparison to the non-traumatised population (Kunst, Winkel, & Bogaerts, 2010; Tedeschi, 1999). In particular, survivors of intimate partner violence and sexual assault are likely to experience sequential acts of victimisation in the context of interpersonal relationships (Felson, Ackerman, & Gallagher, 2005). Collectively, exposure to intentional and repeat events place people at great vulnerability to substance

dependency, depression and elevated PTSD symptoms (Ruback, Clark, & Warner, 2014; Scarpa, Haden, & Hurley, 2006), over and above the influence of natural occurrences (Santiago et al., 2013). These additional difficulties impair every day occupational and social functioning to a great degree in violent crime survivors, where chronic adversity can negatively influence perceptions of available support and thus magnify distress (Hanson, Sawyer, Begle, & Hubel, 2010). While literature has increasingly explored the impact of multiple and intentional types of adversity on the maintenance of PTSD symptoms (e.g. Graham-Kevan et al., 2015), less is known about their role in promoting growth. Furthermore, there are no PTG frameworks accounting for multiple exposures. Research has explored PTG among samples with physical assault as the index adverse event (e.g. Kleim & Ehlers, 2009); however, such studies have not taken into account the diverse range of intentional and non-intentional adversarial experiences that survivors of crime often face. This could lead to differences in the processing of adverse events and the factors that contribute towards crime survivor's experiences of PTG.

1.7.3. Trauma workers

The study of PTG also has particular relevance to those who work with or support people who are exposed to adversity in their occupation (hereafter termed 'trauma workers'). Trauma workers represent another proportion of the population who routinely are exposed to an elevated degree of adverse events (Cohen & Collens, 2013). However, unlike survivors of violent crime, potential traumatisation and PTG can occur indirectly through interactions with people who are also exposed to serious adversity (Cohen & Collens, 2013). While there are currently no explanatory models of vicarious or secondary PTG, recent studies have increasingly drawn attention to PTG emerging in this manner (Brockhouse, Msetfi, Cohen, & Joseph, 2011; Samios, Rodzik, & Abel, 2012). However, there is a paucity of research in relation to trauma worker's own direct experiences of adversity. This is surprising, as altruistic tendencies observed in trauma workers and similar professions are thought to stem from the experience of adversity in their own personal lives (Staub & Vollhardt, 2008). According to the transformational model of PTG (Tedeschi & Calhoun, 2004), the emotional salience and proximity to personal adverse events can trigger cognitive processing necessary for PTG, more so than adversity experienced in occupational contexts. Both personal and work-related adversity has been found to predict PTG in firefighters (Armstrong, Shakespeare-Finch, & Shochet, 2014). Despite repeat exposure to a range of adverse events at work and their own personal history of adversity, trauma workers are relatively high functioning by sustaining employment within emotionally demanding professions (Cohen & Collens, 2013). This may reflect trait resiliency or the buffering nature of PTG which allows trauma workers to reinterpret multiple adversity in a less threatening way (Bensimon, 2012; Samios et al., 2012). Therefore, the current research will focus on personal adversity and predictors of PTG in a high functioning sample of trauma workers with repeat exposure to indirect adversity.

1.8. The current research

Based on the existing literature, this research explored the contributions of event intentionality, frequency of adversity types, age at which the most serious event occurred, spirituality/religiousness, active coping, PTSD symptomology and social support as potential predictors of PTG. These predictors would be explored in three samples who represent survivors exposed to different types or frequencies of adversity. Study 1 explored the role of event intentionality, frequency of adversity types, age at serious event, spirituality/religiousness, active coping, PTSD symptomology and social support variables in a student sample. The student sample represents individuals with experience of a broad range of adversity types yet are able to study academically at a high level. Study 2 applied the same predictors to a sample of survivors of violent criminal victimisation who experience frequent intentional adversity that may negatively impact upon psychological functioning. Finally, Study 3 extended the findings of studies 1 and 2 by exploring the predictors of PTG in a sample of trauma workers who experience not only their own personal adversity, but are frequently exposed to adverse events indirectly yet remain able to continue in demanding roles. Taken together, this approach would allow the identification of individual differences and similarities in the development of PTG across a diverse range of samples that would not otherwise be revealed in single study designs.

2. Study 1

In Study 1, it was expected that spirituality/religiousness, active coping, PTSD symptomology and social support would positively predict growth based on existing PTG literature. Given relationships between objective characteristics and posttraumatic stress symptoms, it was also expected that event intentionality, frequency of adversity types and the age at which the serious event occurred would be related to PTG.

2.1. Method

2.1.1. Participants and procedure

One hundred and one students with prior exposure to adversity took part in the study. Table 1 presents demographic information for the sample. Participants were recruited via university posters and online postings on message boards and student forums. Questionnaires were accessed through a link provided on the websites where the potential participants could access information about the study and their rights as participants. Upon providing informed consent, participants completed the questionnaires, were debriefed and provided details of support services. They had the option to enter a prize draw for a £50 shopping voucher as compensation for their time. The study was approved by the university ethics committee and adhered to British Psychological Society ethical guidelines.

2.1.2. Measures

Demographic information including age, gender, sexuality, ethnicity and religion was collected.

Traumatic Experiences Questionnaire (*TEQ*; Foa, Cashman, Jaycox, & Perry, 1997). The TEQ is a self-report measure of adverse experiences and includes 12 types of event such as exposure to accidents, natural disasters, sexual assaults and serious illness. In this study, the scale was adapted from Foa et al.'s (1997) original version to include two further items of parental neglect and occupational secondary traumas which account for other potentially traumatic events (Cohen & Collens, 2013; Hagenaars et al., 2011). The participant records the frequency of each event to the best of their memory. Intentional events were considered to involve directly perpetrated physical or sexual violence. Two additional questions invite the participant to record the item of the event they perceived to be most severe and the age this first occurred. The measure has been validated in samples of individuals exposed to adversarial events and demonstrates reasonable internal consistency (Foa et al., 1997), which was replicated in this study ($\alpha = .68$).

Beliefs and Values Scale (*BVS*; King et al., 2006). The BVS is a measure of religious and spiritual beliefs, where respondents are asked to indicate their agreement to 20 statements using a scale from 0 (strongly disagree) to 4 (strongly agree). It has been validated as a reliable measure in large and diverse samples (King et al., 2006). Example items include, 'Although I cannot always understand, I believe everything happens for a reason' and 'I believe in a personal God'. An overall score is produced, with higher scores indicative of greater religiosity and spirituality. In the current study, Cronbach's $\alpha = .96$.

Brief COPE (Carver, 1997). The Brief COPE is a 28-item questionnaire assessing 14 coping styles on a four point scale from 0 (I haven't been doing this at all) to 3 (I've been doing this a lot). Participants rate

Table 1
Sample characteristics for Study 1, Study 2 and Study 3.

Characteristics	Study 1 ($N = 101$)			Study 2 ($N = 71$)			Study 3 ($N = 96$)		
	M	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Age (years)	26.96	9.96	17–58	40.85	11.95	19–67	35.86	11.16	21–69
Time since serious event (years)	8.29	8.15	0–34	22.48	14.00	0–55	12.06	12.17	0–58
		N	%		*N*	%		*N*	%
Female sex		84	83.2		50	70.4		84	87.5
Marital status									
Single		46	45.5		20	28.2		20	28.2
Dating/cohabiting		41	40.6		16	22.5		36	37.9
Married		8	7.9		20	28.2		31	32.6
Divorced/separated		6	5.9		15	21.1		8	8.5
Heterosexual orientation		82	81.2		57	80.3		89	92.7
Ethnicity									
White		77	77.8		61	85.9		84	87.5
Black		2	2.0		1	1.4		1	1.0
Asian		14	10.1		4	5.6		4	4.2
Mixed		4	4.0		3	4.2		4	4.2
Other		6	6.1		2	2.8		3	3.1
Religious		51	50.5		50	70.4		60	62.5
Event type									
Accident		46	45.5		33	46.5		51	53.1
Natural disaster		6	5.9		8	11.3		12	12.5
Serious attack/threat[a]		41	40.6		54	76.1		44	45.8
Sexual trauma[a,b]		31	30.7		52	73.2		35	36.5
Military conflict[a]		5	5.0		6	8.5		4	4.2
Serious illness		30	29.7		15	21.1		27	28.1
Bereavement		54	53.5		33	46.5		53	55.2
Neglect[a]		27	26.7		33	46.5		26	27.1
Other event		19	18.8		14	19.7		17	17.7

[a] Classed as intentional event.
[b] Sexual traumas classed as child sexual abuse, rape and sexual assault.

which coping styles they employ; example items include, 'I've been taking action to make the situation better' (active coping), with higher scores representing greater use of the specific coping style. The Brief COPE has demonstrated good internal reliability and can be used as a short measure for coping in specific situations of interest (Carver, 1997). As with previous studies (e.g. Thornton & Perez, 2006), the active coping scale was of particular interest due to links between such coping styles and new perspectives in PTG development (Tedeschi & Calhoun, 2004). These two subscales were used in subsequent analysis. Reliability scores for the active coping scale was .78.

PTSD-8 (Hansen et al., 2010). The PTSD-8 is a measure of posttraumatic stress symptoms, where respondents rate their agreement with eight statements on a four point scale from 'not at all' to 'most of the time'. Participants were asked to identify their most serious event and indicate the symptoms they have experienced in the past 2 weeks. There are three subscales of avoidance, intrusion and hyperarousal which are represented with items such as 'Recurrent thoughts or memories of the event' and 'Avoiding activities that remind you of the event'. Participants with a score of three or above on each subscale may display PTSD traits. It has been validated in samples of rape survivors, whiplash patients and survivors of disasters (Hansen et al., 2010). In the study, the overall scale was used with Cronbach's $\alpha = .88$.

Two-Way Social Support Scale (*2-Way SSS*; Shakespeare-Finch & Obst, 2011). The 2-Way SSS is a 21-item measure of giving and receiving emotional and instrumental social support on a scale from 0 (not at all) to 5 (always). There are four subscales of receiving emotional support, giving emotional support, receiving instrumental support and giving instrumental support. Example items include, 'There is someone in my life I can get emotional support from' and 'There is someone who will help me fulfil my responsibilities when I am unable'. Higher scores endorse greater support. The scale has been validated in two community samples (Shakespeare-Finch & Obst, 2011) and the overall score for the measure was used in this study, demonstrating excellent reliability ($\alpha = .93$).

Posttraumatic Growth Inventory — Short Form (*PTGI-SF*; Cann et al., 2010). The PTGI-SF is a measure of growth, on a six point scale from 0 (no change as a result of crises) to 5 (very great change). Participants are asked to rate what extent they have changed since their stressful life event with 10 items such as, 'I changed my priorities about what is important in life' and 'I discovered that I'm stronger than I thought I was'. It has been validated for use in samples including survivors of domestic abuse, bereaved persons and those with complex health needs, demonstrating similar reliability to that of the original 21-item version of the PTGI, whilst having the advantage of brevity (Cann et al., 2010). A total score is obtained, with higher scores reflecting greater perceived change. The PTGI-SF demonstrated high internal consistency in the current study ($\alpha = .89$).

2.2. Results

The prevalence of exposure to adverse events for participants is presented in Table 1. Of the sample, 83.2% experienced more than one adverse event type, with 68.3% experiencing two to five event types and 15% experiencing six to ten separate event types. In addition, 30.7% reported bereavement as the most serious event experienced among the range of adversity types.

Means and standard deviations for the psychosocial measures are presented in Table 2. Pearson correlations revealed that age at serious event ($r = .37$, $p < .001$), spirituality/religiousness ($r = .40$, $p < .001$), active coping ($r = .46$, $p < .001$), PTSD symptomology ($r = .28$, $p = .005$) and social support ($r = .35$, $p < .001$) were all positively associated with reported PTG. Event intentionality and frequency of event types were not related to PTG.

Multiple regression analysis was conducted to assess the contributions of the seven predictors towards PTG in the student sample. Using the simultaneous method, a significant model emerged, F (7, 93) = 10.27, $p < .001$; adjusted $R^2 = .39$ in which age at serious event, spirituality/religiousness, active coping, PTSD symptoms and

Table 2
Means and standard deviations for key Study 1, Study 2 and Study 3 variables.

	Study 1 ($N = 101$)			Study 2 ($N = 71$)			Study 3 ($N = 96$)		
	M	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Frequency of event types	3.36	2.13	1–10	5.19	2.79	1–14	3.86	2.32	1–12
Age at serious event (years)	18.65	9.42	2–52	18.36	14.01	1–56	23.42	12.32	0–56
Spirituality/religiousness	32.98	21.22	0–76	43.83	21.27	0–78	38.68	20.25	3–79
Active coping	3.67	1.73	0–6	4.28	1.49	0–6	3.52	1.72	0–6
PTSD symptomology	12.42	5.89	0–23	15.82	6.09	0–24	9.54	6.08	0–24
Social support	75.18	18.70	30–105	70.82	22.37	16–105	83.28	16.11	45–105
Posttraumatic growth	25.24	12.45	0–50	27.69	13.23	0–50	23.41	13.48	0–50

social support emerged as significant predictors of PTG. Event intentionality and frequency of event types did not predict PTG. The results are presented in Table 3. Collinearity diagnostics revealed that no two variables were highly correlated (Tolerance for all variables > .66; VIF for all variables < 1.52).

2.3. Discussion

Study 1 showed expected relationships between PTG and a number of psychosocial variables among students. Specifically, spirituality/religiousness, active coping, PTSD symptomology and social support were positively related to PTG development. In partial support of the hypothesis, Study 1 indicated that these variables as well as age at the time of the serious event were also positive predictors of PTG. In particular, active coping methods, spirituality/religiousness and social support demonstrated stronger relationships with growth compared to the other variables. Contrary to the hypothesis, both event intentionality and frequency of event types were neither associated nor predictive of growth. Taken together, the results suggest that psychosocial factors are more closely related to adjustment of adversity compared to objective characteristics of the serious event (Tedeschi & Calhoun, 2004).

Study 1 explored predictors of PTG in a high functioning sample exposed to a broad range of adversity. However, this does not fully account for the experiences of people exposed to particularly frequent and intentional adverse events above the normative population. One example of a population with more extreme and intentional adversity is survivors of violent crime, whose experiences can lead to poor social and occupational functioning (Hanson et al., 2010; Ruback et al., 2014). Therefore, Study 2 assessed the efficacy of the predictor variables used in Study 1 in relation to a sample comprised of survivors of violent crime. The purpose was to ascertain the extent to which the degree and type of adversity experienced in this sample mediated the influence of the psychosocial predictors of PTG.

3. Study 2

In Study 2, it was hypothesised that the age the most serious event occurred, spirituality/religiousness, active coping, PTSD symptomology and social support would contribute towards PTG, based on the findings from Study 1. Given that survivors of violent crime may experience significant adversity that may serve as a catalyst for growth, it was expected that event intentionality and frequency of event types would be associated with PTG.

3.1.1. Participants and procedure

Seventy-one survivors of crime volunteered to take part in this study. Table 1 presents demographic information for the sample. Participants were recruited using messages advertised on websites provided by three victim services, which support female and male survivors of domestic violence, child sexual abuse and sexual assault respectively. Two participants were also sampled from a concurrent study using survivors of violent crime (Graham-Kevan et al., 2015). Procedures used to collect data were the same as outlined in Study 1.

3.1.2. Measures

Participants self-reported demographic information including age, gender, sexuality and ethnicity and religious beliefs. All measures in this study were the same as those described in Study 1.

Trauma history was explored using the TEQ (Foa et al., 1997). Internal reliability for this scale in this sample as measured by Cronbach's alpha was $\alpha = .73$. The degree of spirituality/religiousness was assessed using the BVS measure (King et al., 2006) and in this study, Cronbach's $\alpha = .96$. The Brief COPE (Carver, 1997) assessed active coping styles with a Cronbach's alpha of .61. PTSD symptomology was assessed using the PTSD-8 (Hansen et al., 2010) and the reliability of the overall scale in this study was excellent ($\alpha = .91$). The 2-Way SSS measure (Shakespeare-Finch & Obst, 2011) was employed to establish perceptions of social support. As with Study 1, the overall score for the measure was used in this study and the internal consistency of the items was high ($\alpha = .95$). Finally, the brief version of the PTGI measure (Cann et al., 2010) was employed to explore reported PTG. The PTGI-SF demonstrated excellent reliability in this study ($\alpha = .91$).

Table 3
Multiple regression results for Study 1, Study 2 and Study 3, with posttraumatic growth as the criterion.

	Study 1 ($N = 101$)			Study 2 ($N = 71$)			Study 3 ($N = 96$)		
	B	SE (B)	β	B	SE (B)	β	B	SE (B)	β
Event intentionality[a]	−3.21	2.42	−.13	7.64	5.61	.13	−4.67	2.60	−.17
Frequency of event types	.62	.54	.11	−.60	.51	−.13	.76	.59	.13
Age at serious event	.26	.11	.19*	.07	.10	.07	.15	.10	.14
Spirituality/religiousness	.13	.05	.23**	.25	.06	.40***	.16	.06	.23*
Active coping	2.08	.65	.29**	2.12	.87	.24*	2.11	.71	.27**
PTSD symptomology	.47	.18	.22*	.10	.25	.05	.41	.21	.19
Social support	.12	.06	.17*	.15	.07	.25*	.22	.08	.26**

[a] Intentionality was dummy coded: 0 = no history of intentional event; 1 = history of intentional event.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

3.2. Results

The prevalence of exposure to adverse events for participants is presented in Table 1. Of the participants, 94.4% experienced more than one adverse event type, with 56.4% experiencing two to five event types and 32.4% experiencing six to ten event types. Notably, around three-quarters of participants experienced sexual abuse (73.2%) and serious physical attacks or threats (76.1%). Nearly a quarter (23.9%) of the sample indicated that sexual abuse was the most serious adverse event they had experienced.

Means and standard deviations for the psychological measures are presented in Table 2. Pearson correlations revealed that age at serious event ($r = .25$, $p = .033$), spirituality/religiousness ($r = .50$, $p < .001$), active coping ($r = .37$, $p = .002$) and social support ($r = .40$, $p = .001$) were all positively associated with reported PTG. PTSD symptomology, event intentionality and frequency of event types were not related to PTG.

Multiple regression analysis assessed the seven variables as potential predictors towards PTG in the sample. Using the simultaneous method, a significant model emerged, $F(7, 63) = 7.12$, $p < .001$; adjusted $R^2 = .38$. Table 3 presents the results of the regression in which spirituality/religiousness, active coping and social support emerged as significant predictors. There was no evidence of colinearity among the variables (Tolerance for all variables > .68; VIF for all variables < 1.46).

3.3. Discussion

In line with Study 1, the results suggest that spirituality/religiousness, active coping and social support were all positive predictors of growth among survivors of violent crime. As in Study 1, objective characteristics of event intentionality and frequency of event types were unrelated to PTG development in the sample. Contrary to the findings of Study 1 and the Study 2 hypothesis, the age at which the serious event occurred and PTSD symptoms did not predict PTG. This highlights that although the students and crime survivors share some similar predictors of PTG and are able to report positive changes despite previous adversity, the populations are not identical.

While Study 2 considered predictors of PTG among people exposed to frequent and often intentional adversity, little is known about cumulative adversity in samples that appear to function at a higher level. Trauma workers are not only exposed to adverse events through engagement with clients in occupational settings (Brockhouse et al., 2011; Cohen & Collens, 2013), but themselves experience adversity in their personal lives. There are few studies of predictors of PTG in trauma workers in relation to their own personal adversity (Armstrong et al., 2014). It is possible that exposure to repeat indirect adversity may buffer against negative symptoms from their own adversity (Samios et al., 2012). Therefore, the purpose of Study 3 is to investigate predictors of PTG in a sample of trauma workers in the aftermath of personal adverse events.

4. Study 3

As with the student sample in Study 1, it was predicted that the age at which the serious event occurred, spirituality/religiousness, active coping and social support would positively predict PTG in trauma workers. However, as their job role may encourage the development of coping techniques such as buffering from negative symptoms, it may be that event intentionality, frequency of event types and PTSD symptoms would be unrelated to PTG.

4.1.1. Participants and procedure

Ninety-six trauma workers volunteered to take part in this study. Participants were recruited using professional forums and snowball methods. The final sample consisted of 21 counsellors, 11 mental health nurses, 29 psychotherapists, 17 psychologists, three psychiatrists and 15 social workers or support workers. Table 1 presents demographic information for the sample. Procedures used to collect data were the same as outlined in Study 1.

4.1.2. Measures

As with the previous two studies, participants completed demographic information including age, gender, sexuality and ethnicity and religious beliefs. All measures in this study were the same as those described in Study 1.

The TEQ (Foa et al., 1997) exploring trauma history demonstrated a Cronbach's alpha of .69. The BVS (King et al., 2006) measured perceptions of spirituality/religiousness and was found to have excellent internal consistency ($\alpha = .96$). As in the previous studies, the Brief COPE (Carver, 1997) was employed to assess active coping ($\alpha = .77$) which demonstrated acceptable reliability. The PTSD-8 (Hansen et al., 2010) captured PTSD symptomology and the reliability of the overall scale was excellent ($\alpha = .90$). Social support was measured using the 2-Way SSS (Shakespeare-Finch & Obst, 2011) and the internal consistency of the items was excellent ($\alpha = .94$). PTG was again explored using the PTGI-SF (Cann et al., 2010) and reliability for the scale in this study was high ($\alpha = .92$).

4.2. Results

The prevalence of exposure to adverse events is presented in Table 1. 86.5% of the sample experienced more than one adverse event type, with 64.7% experiencing two to five event types and 20.8% experiencing six to ten event types. Like Study 1, most of the participants (26.0%) rated bereavement of a family member or close friend as their most serious adverse experience.

Means and standard deviations for the psychological measures are presented in Table 2. Pearson's correlations showed that spirituality/religiousness ($r = .37$, $p < .001$), active coping ($r = .35$, $p = .001$), PTSD symptomology ($r = .27$, $p = .009$) and social support ($r = .32$, $p = .002$) were positively associated with overall PTG. The age the serious event occurred, event intentionality and frequency of event types were unrelated to PTG.

A multiple regression analysis using the simultaneous method assessed the seven variables as potential predictors towards PTG among participants and produced a significant model, $F(7, 88) = 7.11$, $p < .001$; adjusted $R^2 = .31$. Spirituality/religiousness, active coping and social support emerged as the three significant predictors of PTG and are presented in Table 3. As with Study 1 and Study 2, colinearity was not identified in this sample (Tolerance for all variables > .70; VIF for all variables < 1.44).

4.3. Discussion

This study was the first to identify predictors of PTG among a sample of trauma workers, building on similar work in firefighters (Armstrong et al., 2014). As with studies 1 and 2, the findings provided support for the hypothesis that spirituality/religiousness, active coping and social support were necessary for PTG to occur in trauma workers. Neither event intentionality nor frequency of event types was linked to growth, consistent with the hypothesis and the prior two studies on students and survivors of violent crime. As with the crime survivors in Study 2, age at serious event did not predict PTG, which was contrary to the students in Study 1 and the hypothesis. Collectively, the results support the robustness of spirituality/religiousness, active coping and social support factors as predictors of growth. Meanwhile, objective characteristics and PTSD symptoms appear to vary among different populations of people exposed to adversity and do not influence PTG development.

5. General discussion

In the research presented, the predictive ability of event intentionality, frequency of event types, age at serious event, spirituality/religiosity, active coping, PTSD symptoms and social support on levels of PTG was explored. These factors were assessed in three populations of survivors exposed to different types or frequencies of adversity where factors salient for PTG development may vary. Collectively, the predictive factors explained a significant proportion (between 30 and 45%) of the variance in PTG scores across the three studies. An encouraging finding was that regardless of life trajectory, participants in all three studies reported similar levels of PTG. This is perhaps not surprising given that PTG has been observed across a broad range of adversarial exposures (Linley & Joseph, 2004). Notwithstanding the apparent universality of PTG, this series of studies for the first time revealed some notable differences and similarities among the predictive factors that were salient for growth to occur in three populations studied.

5.1. Active, religious or spiritual coping and PTG

Across all three populations, active coping and spiritual or religious coping strategies were the most robust predictors of PTG. Earlier reviews of the literature report large effect sizes for coping methods on PTG development overall (Prati & Pietrantoni, 2009). This is perhaps not surprising given that active and religious or spiritual coping methods may reflect attempts to understand significant challenges brought about by adverse events (Tedeschi & Calhoun, 2004). Importantly, the findings indicate that regardless of life trajectory, people exposed to different types of adversity who employ active coping strategies perceived more PTG.

The presence and degree of spirituality/religiousness was consistently associated with PTG in the three samples. This suggests that the use of existential beliefs can be found in the three populations investigated. Literature on the benefits of spiritual and religious coping in PTG development is widely available (e.g. Helgeson et al., 2006; O'Connor et al., 2003; Prati & Pietrantoni, 2009). In a paradoxical fashion, adversarial events not only shatter assumptions but can lead to greater engagement with existential, philosophical or moral questions that represent growth (Tedeschi & Calhoun, 2004). It therefore appears that such strategies can enhance the sense of meaning in life or bring about a new engagement with religion and spirituality for many people. However, not all participants recorded a religious affiliation and so it would be advantageous for future studies to distinguish between types of religious and spiritual beliefs and their individual contributions towards PTG.

5.2. PTSD symptoms and PTG

Relationships emerged between PTSD and PTG in Study 1 only. The mixed findings across the three populations may be partly explained by psychosocial resources that survivors may draw upon in order to mitigate negative effects. Students with less life experience of adversity may attribute greater significance to early or novel experiences (Sutherland & Bryant, 2005). This may exacerbate symptoms as processing of the event occurs (Tedeschi & Calhoun, 2004), but not so much as to overwhelm the survivor, allowing growth from the event. The lack of relationship between PTSD and PTG among the survivors of violent crime appears contrary to assertions that growth and distress co-exist (Lancaster et al., 2015). However, this may be explained by adaptive attempts to normalise or dissociate from such experiences to minimise distress (Hagenaars et al., 2011). It is this numbness to emotional experience that may account for the lack of PTSD symptoms among the crime survivors. In addition, PTSD symptoms may be of a severity as to overwhelm the crime survivors, thus inhibiting growth (Shakespeare-Finch & Lurie-Beck, 2014). Furthermore, trauma workers are in a unique position to experience cumulative stressors through their roles (Cohen & Collens, 2013). It is possible that this exposure may buffer against PTSD symptoms and allow growth to occur (Samios et al., 2012), as reflected by lower PTSD scores for this group. Collectively, the present findings suggest that PTSD symptoms are particularly susceptible to the wider environmental and psychological contexts in which the samples function.

5.3. Social support and PTG

Social support also emerged as one of the most robust predictors of growth in all three studies. This reinforces earlier findings on the benefits of social support as a potential buffer against stressful events (Linley & Joseph, 2004). It has been suggested that a recognition of one's own vulnerability as a result of exposure to adversity can lead to increased sensitivity towards other people and the revision of schemas (Tedeschi & Calhoun, 2004). In addition, enriched social networks can bring out opportunities for disclosure that in turn promote positive outcomes (Ullman & Peter-Hagene, 2014). Importantly, social support appears to permeate across all types of adversity and populations, which highlights the significant role that the accessibility and maintenance of supportive networks play in post-event adjustment.

5.4. Age at serious event and PTG

An additional aspect of these series of studies was the inclusion of age at the time the serious event happened. Findings indicated that this factor was relevant to PTG in Study 1 only. While previous reviews have reported ambiguous relationships between age and PTG development (Helgeson et al., 2006; Meyerson et al., 2011), it has been suggested that the nature of the participants sampled may account for such discrepancies (Shakespeare-Finch & Lurie-Beck, 2014). The student sample was younger compared to the violent crime survivors and trauma workers. Younger samples are more likely to be confronted with novel adverse events in childhood and adolescence, which can represent significant changes in a person's life (Sutherland & Bryant, 2005). The age at which the event occurred may be less salient for older samples that are more able to process both the positive and negative aspects of the experience (Barakat et al., 2006).

5.5. Event intentionality, frequency of event types and PTG

This was the first PTG study to determine that event intentionality and frequency of historical event types were unrelated to PTG development. The findings confirm the view that objective characteristics of the event are unrelated to growth (Joseph et al., 2012; Tedeschi & Calhoun, 2004), which had previously received no empirical support. It had also been speculated that intentional and frequent acts may in some way influence growth compared to isolated events (Tedeschi, 1999), given that chronic adversity is associated with more severe pathology (Green et al., 2000; Hagenaars et al., 2011; Santiago et al., 2013). However, this suggestion is not supported by the current findings. There is some evidence to suggest that frequent exposure to adversity can buffer against perceptions of severity by allowing people to prepare for subsequent events, which may constitute growth in itself (Armstrong et al., 2014; Kunst et al., 2010; Samios et al., 2012). In sum, the findings provide new insight into the role of event type and frequency on PTG development, where growth can occur regardless of prior exposure to adversity. This is an encouraging development for psychological interventions that could target the psychosocial factors most closely associated with growth.

5.6. Implications, limitations and future research

This research has important theoretical implications for understanding PTG among different samples of the general population who are exposed to adversity. The present studies contribute to recent literature that calls for an exploration of individual differences and commonalties

in predictors of PTG (Lancaster et al., 2015), which are not duly accounted for in existing PTG models. The findings suggest that generalised models of PTG do not reflect the nuances of positive adjustment after adversity. Furthermore, the research draws attention to the role of cumulative events, which did not appear to influence PTG development although may buffer against posttraumatic stress symptoms. Currently, the transformational model of PTG (Tedeschi & Calhoun, 2004) only considers growth and processing in the aftermath of single, isolated incidents, which do not represent people who are exposed to multiple adverse events across the lifespan. Future research is encouraged to adopt a more holistic view of adversarial experiences and investigate PTG development in survivors of multiple adversity. Encouragingly, the present findings provide the first evidence that prior adversarial history does not affect the ability of survivors to report positive changes (Joseph et al., 2012; Tedeschi & Calhoun, 2004). This differs from the posttraumatic stress literature where intentional and frequent events are often associated with exacerbated negative symptoms (e.g. Green et al., 2000; Santiago et al., 2013) and suggests that the mechanisms that underpin both PTG and posttraumatic stress operate differently. Indeed the relationship between PTG and posttraumatic stress remains ambiguous (Lancaster et al., 2015; Shakespeare-Finch & Lurie-Beck, 2014) and future research would be directed to explore these relationships further.

In respect of practical implications, efforts could focus on enhancing resiliency factors that predict PTG across a variety of populations. The present findings implicate active coping, spirituality/religiousness and social support factors which may promote growth. In the case of spirituality/religiousness, these findings do not imply that belief systems should be imposed or altered by clinicians; rather, these beliefs appear to be beneficial for PTG development. When targeted in psychological interventions, coping and social support factors could promote a better quality of life as a result of improved social and occupational functioning (Hanson et al., 2010) and allow people to be in a better position to consider the positive as well as negative aspects of their adverse experiences.

There are strengths and limitations to research of this kind which should be noted. The study included a diverse range of adversarial experiences within each sample ranging from common normative life stressors such as bereavement and illness, to more seismic life-changing events. However, the modest sample sizes prevented the exploration of additional factors that differ among the samples. Second, data relied on self-reports which are advantageous in that participants are likely to identify with the questions and are more motivated to consider their own personalities rather than those of others (Paulhus & Vazire, 2007). However, retrospective accounts of adversarial history and associated adjustment may have been influenced by tendencies to over or under-report information.

6. Conclusion

Overall, the results across the three populations broadly support the salience of subjective interpretations in adjustment from adversity, in contrast to objective characteristics of the event, such as type and frequency. The studies provide greater understanding of the dynamic nature of psychosocial factors. In particular, coping and social support variables remain robust predictors of PTG regardless of population or prior experiences of adversity. However, the age at serious event and PTSD symptoms appear to display more nuanced relationships with PTG which are not reflected within existing PTG frameworks. Therefore, coping and social support factors could be the focus of interventions to not only reduce PTSD symptoms, but promote opportunities for PTG development.

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