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**Understanding posttraumatic growth:  
An analysis of longitudinal research and the  
moderating effect of resilience**

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**BSc MSc**

A thesis submitted in partial fulfilment of the requirements for the  
degree of Doctor of Clinical Psychology

Coventry University, School of Health and Life Sciences

&

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May 2011

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## **Acknowledgements**

I would like to begin by thanking Dr Tom Patterson for his valuable support and expert guidance throughout this entire project. My thanks also go to Dr Ian Hume, Dr Katherine Simons and Professor Malcolm Woollard for their assistance at different stages of the thesis. I am grateful to the program leads of the Paramedic Science courses who invited me to their university to collect data. A huge thank you goes to all of the student paramedics who participated in the empirical study. I would also like to acknowledge Vernon Bubb, Helen Devonshire and Claire Russon who proof read different chapters of the thesis. I would like to thank my family for their continual love and support and last, but by no means least, a special thank you goes to Angi for her love, support, proof-reading and the head-clearing walks in the sunshine.



## **Declaration**

This thesis has not been submitted for a degree at any other university. It is my own work and does not contain any work based on collaborative research. Under the supervision of Dr Tom Patterson (Lecturer / Practitioner, Clinical Psychology Doctorate, Coventry University), I carried out all stages of this thesis. Professor Malcolm Woollard (Professor in Pre-hospital and Emergency Care & Director, Pre-hospital, Emergency & Cardiovascular Care Applied Research Group, Coventry University) provided assistance during the design of the empirical study. Dr Ian Hume (Senior Lecturer in Psychology, Coventry University) provided advice and support during the statistical analysis of data in the empirical study. Dr Katherine Simons (Course Director, Postgraduate Diploma in High Intensity Psychological Interventions, Coventry University) was instrumental during the design of the empirical study and proof read drafts of this chapter of the thesis.

## Summary

This thesis consists of three chapters: A literature review, an empirical study and a reflective account of the research process. The overarching theme of the thesis is posttraumatic growth (PTG), which is defined as positive psychological changes that occur during the aftermath of traumatic events.

The literature review examines the findings from 31 longitudinal studies and explores associations between PTG and various demographic, personality, religious, cognitive, emotional, social and behavioural factors. Research examining the relationship between PTG and psychological adjustment is presented and interventional attempts to facilitate PTG are reviewed. The closing section includes a discussion of limitations to the identified studies and reflections on the implications the findings of this review have for research and clinical practice.

The empirical study investigates the relationship between PTG and resilience in a sample of 121 student paramedics. All participants identified PTG however there was large variability within the scores. PTG correlated positively with responses to an item assessing the emotional impact of the most serious incident attended, however no significant effects were found for resilience. Response bias may have had an impact on a number of study variables but this is uncertain given the poor performance of the social desirability scale on a measure of internal consistency. Student paramedics appear able to experience PTG however the relationship the construct shares with resilience remains an issue for further research.

The reflective account focuses on the research journey. Here I provide reflections on different aspects of the project; consider what I have learnt from these experiences and reflect on the overall impact completing the thesis has had on me.

# Chapter

## 1

### **Posttraumatic growth over time: A systematic review of longitudinal research**

Word count: 7,664

*(Excluding table and references)*

Prepared for submission to the Journal of Loss and Trauma

(See Appendix 7.1 for instructions to authors)

## **1.1 Abstract**

Cross-sectional research has led to great advances in our understanding of posttraumatic growth, but this form of study design is limited as it only measures variables at one point in time. This systematic review of 31 longitudinal studies examines associations between posttraumatic growth and various demographic, personality, religious, cognitive, emotional, social and behavioural factors. Research examining the relationship between posttraumatic growth and psychological adjustment is presented and interventional attempts to facilitate posttraumatic growth are reviewed. The closing section includes a discussion of limitations to the identified studies and reflections on the implications these findings have for research and clinical practice.

## **1.2 Introduction**

Researchers have recently begun to examine the significance of positive psychological changes that can occur in individuals following exposure to trauma (Calhoun & Tedeschi, 1999). These changes have been termed stress-related growth (Park, Cohen, & Murch, 1996), adversarial growth (Linley & Joseph, 2004), personal growth (Yalom, 1980), and posttraumatic growth (PTG, Tedeschi & Calhoun, 1996, 2004); the term also adopted in the present review. The vast majority of PTG research is cross-sectional in design. This style of methodological design is effective but it is limited in scope as it only measures variables at one point in time.

The key aim of this systematic review is to determine what can be learnt from the findings of longitudinal PTG research. The review will begin with a description of PTG before discussing the importance of longitudinal research designs in this area of study. Subsequent to this, the findings of relevant research are presented and current debates within the field of PTG are outlined. This leads to the rationale and aims of the review.

### **1.2.1 Posttraumatic growth**

Calhoun and Tedeschi (1999) proposed that the struggle an individual engages in during the aftermath of a traumatic event can produce PTG in three domains. A change in sense of self might be demonstrated in individuals who acknowledge they are stronger than they once thought they were. A change in relational behaviour can be observed in someone who places more importance on their relationships with others. A change in philosophy of life may be characterised in people who report a renewed appreciation for life or a deepening of religious beliefs.

Researchers have suggested that PTG can occur following a range of traumatic events, for example, accidents and disasters (Joseph, Williams, & Yule, 1993; Linley & Joseph, 2006), terrorist attacks (Barbaro Val & Linley, 2006; Dougall, Hayward, & Baum, 2005), war (Tedeschi & McNally, 2011), sexual assault (Cole & Lynn, 2010), and serious physical health problems such as HIV infection (Cieslak *et al.*, 2009), Multiple Sclerosis (MS) (Hart, Vella, & Mohr, 2008) and cancer (Garland, Carlson, Cook, Lansdell, & Specia, 2007; Low, Stanton, Thompson, Kwan, & Ganz, 2006; Manne, Ostroff, Winkel, Goldstein, Fox, & Grana, 2004b; Salsman, Segerstorm, Brechting, Carlson, & Andrykowski, 2009; Scrignaro, Barni, & Magrin, 2010).

### **1.2.2 The relevance of longitudinal PTG research**

It is possible to speculate on why the vast majority of PTG research is cross-sectional in design. Longitudinal research is typically resource intensive, it requires more time than cross-sectional research and researchers risk losing participants through attrition. Regardless of this, such research provides a means to advance our understanding of PTG by exploring patterns of change and examining cause and effect relationships over time (Rajulton, 2001).

Researchers have repeatedly called for more longitudinal PTG research (Barbaro Val & Linley, 2006, Calhoun, Cann, Tedeschi, & McMillan, 2000; Calhoun & Tedeschi, 1998; Feder *et al.*, 2008; Linley & Joseph, 2004; Smith & Cook, 2004). In their review of studies documenting positive change following exposure to trauma and adversity, Linley and Joseph (2004) argued that longitudinal evidence must be given greater weight than cross-sectional evidence in the pursuit for a clearer understanding of PTG over time. Tennan and Affleck (2009) pointed towards a growing need for longitudinal research designs, explaining

that such study would allow researchers to examine PTG over time rather than retrospectively. It has been suggested that retrospective reports of PTG may reflect distorted appraisals of discomfort experienced following a traumatic event rather than actual PTG (Westphall & Bonanno, 2007).

### **1.2.3 Findings from longitudinal PTG research**

Throughout the recent years laudable examples of longitudinal PTG research have been published but many are limited in the extent to which they can provide an adequate understanding of the construct over time. For instance, Affleck, Tennen, Croog, and Levine (1987) interviewed patients who had recently survived a heart attack and asked them if they could identify any possible benefits or gains following their experience. Those who cited benefits were found to be less likely to have suffered a subsequent heart attack when interviewed eight years later. These findings are constructive as they imply the early identification of positive changes following an adverse health event may lead to later benefits in physical health. However, as the researchers only used one question to assess growth this limits the strength of their findings.

In another study, Erbes *et al.* (2005) monitored former prisoners of war over a twelve year period and discovered that variables such as developmental history, personality, social support and posttraumatic distress symptoms could combine to predict PTG. Although these findings are informative, questions about the temporal course of PTG cannot be addressed as the construct was only assessed at one time point.

More recently, Kilmer and Gil Rivas (2010) surveyed seven to ten year old children impacted by Hurricane Katrina and uncovered an association between PTG and cognitive

processes. A link between PTG and cognition is intriguing but these findings should be interpreted with caution due to limited research supporting the valid and reliable measurement of PTG in young people (Clay, Knibbs, & Joseph, 2009).

#### **1.2.4 Debates within the field of PTG research**

A review of more congruent longitudinal PTG research could contribute significantly to current debates within the field. One prominent issue is whether PTG reflects a genuine outcome or a coping process embarked upon by an individual following a traumatic event (Butler, 2007). Research that monitors PTG during the months and years following a traumatic event may help to examine this. The findings of such an exercise would be far-reaching as conceptualising PTG differently has led to conflicting findings within research. For instance, Frazier, Conlon and Glaser (2001) measured PTG as an outcome in their study of positive and negative psychological changes in sexual assault survivors and discovered that individuals who reported higher levels of PTG also reported lower levels of Posttraumatic Distress Disorder (PTSD). Contrary to this, when Hobfoll, Canetti-Nisim, and Johnson (2006) conceptualised PTG as a form of coping they linked high PTG with elevated levels of PTSD.

This leads to a second debate which concerns the association PTG has with psychological adjustment following trauma. In their meta-analysis, Helgeson, Reynolds, and Tomich (2006) identified a link between the identification of benefits and better mental health outcomes. A similar conclusion was reached by Zoellner and Maercker (2006) yet their thoughts were largely based upon longitudinal research that had not used valid and reliable assessments of PTG. Now that such research is in stronger supply verification of these claims can be sought.



## **1.3 Literature review**

### **1.3.1 Rationale**

There are a number of reasons why a systematic review of longitudinal PTG research is warranted. Although a surge in PTG research has been observed over recent years, the vast majority of studies have been cross-sectional. Difficulties associated with a reliance on retrospective reports of PTG have been highlighted (Tennan & Affleck, 2009; Westphall & Bonanno, 2007). A review of longitudinal research that has employed valid and reliable approaches to the measurement of PTG could potentially provide a significant contribution to debates within the field and help researchers gain a clearer understanding of PTG over time. Clinicians are also likely to benefit from the findings of such a review as the discovery of any variables associated with the development and maintenance of PTG could place them in a stronger position to encourage clients to achieve growth.

A range of meta-analyses and reviews investigating PTG have been conducted (Bostock, Sheikh, & Barton, 2009; Butler, 2007; Helgeson *et al.*, 2006; Joseph & Linley, 2006; Linley & Joseph, 2004; Park & Helgeson, 2006; Prati & Pietrantonio, 2009; Sawyer, Ayers, & Field, 2010; Shaw, Joseph, & Linley, 2005; Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010; Zoellner & Maercker, 2006), but none have relied exclusively on the empirical findings of longitudinal research. In combination with the points raised above, this provides a case for the present review to be conducted.

### **1.3.2 Literature review aims**

- To critically evaluate longitudinal research into posttraumatic growth.
- To investigate the temporal course of posttraumatic growth.
- To identify variables linked with posttraumatic growth over time.

### **1.3.3 Inclusion criteria**

To ensure a consistent level of high quality research, only articles published in a peer reviewed journal were selected. Quantitative and qualitative studies were both reviewed and included under the provision that the authors had examined a construct of PTG that corresponded with the theoretical conceptualisation of PTG outlined by Calhoun and Tedeschi (1999). It was also relevant that the participants recruited in each study had undergone an adverse or traumatic experience and PTG was measured at more than one time point.

### **1.3.4 Exclusion criteria**

Articles were excluded if the authors had recruited participants aged eighteen or under or if they had used a measure of PTG that was not empirically supported by two or more studies.

### **1.3.5 The search strategy**

Three strategies were employed to identify the articles included in the review. The search began in October 2010 and ended in January 2011.

First, a number of PTG-based reviews were compiled through an initial literature search (Bostock *et al.*, 2009; Butler, 2007; Helgeson *et al.*, 2006; Joseph & Linley, 2006; Linley & Joseph, 2004; Park & Helgeson, 2006; Prati & Pietrantonio, 2009; Sawyer *et al.*, 2010; Shaw *et al.*, 2005; Vishnevsky *et al.*, 2010; Zoellner & Maercker, 2006) and their reference sections were reviewed for relevant articles.

Second, five major databases were accessed from November 2010 to January 2011 (ASSIA [Applied Social Sciences Index and Abstracts], MEDLINE, PILOTS [Published International Literature on Traumatic Stress], PsycARTICLES, and PsycINFO. Systematic title and abstract searches were performed with the following search terms: *adversarial growth*, *personal growth*, *post traumatic growth*, *posttraumatic growth*, *stress related growth*, *follow [up]*, *longitudinal*, *prospective*, *month*, *time*, and *year*.

Third, the reference sections of all identified sources were reviewed for relevant research.

These strategies identified 31 articles that were taken forward into the literature review (see Table 1.1).

**Table 1.1 A summary of studies included in the literature review**

Study	Event	Assessment phase	N	Measure	Mean (SD)
Park, Edmondson, Fenster, & Blank (2008)	Cancer	Baseline	250 (78m, 172f)	M-BFS <sup>1</sup>	10.2 (7.95)
		1 year	172 (NR)		8.55 (7.05)
Tomich & Helgeson (2006)	Breast cancer	Baseline	70f	M-BFS <sup>2</sup>	NR
		5 years	70f		NR
Yanez, Edmondson, Stanton, Park, Kwan, Ganz, & Blank (2009), Study 2	Cancer	Baseline	165 (55m, 110f)	M-BFS <sup>3</sup>	10.21 (7.87)
		1 year	165 (55m, 110f)		8.62 (7.09)
Dougall, Hayward, & Baum (2005)	Bioterrorism in the United States of America after the September 11th terrorist attacks	Baseline	300 (148m, 162f)	CiOQ	P: 39.63 (NR) N: 22.23 (NR)
		5.5 months	300 (148m, 162f)		P: 37.51 (NR) N: 26.71 (NR)
Linley, Joseph, & Goodfellow (2008)	Various	Baseline	57 (17m, 40f)	CiOQ	P: 39.80 (10.07) N: 19.69 (6.16)
		6 months	40 (NR)		P: 40.95 (10.00) N: 20.56 (6.03)
Butler, Blasey, Garlan, McCaslin, Azarow, Chen, Desjardins, DiMiceli, Seagraves, Hastings, Kraemer, & Spiegel (2005)	September 11th terrorist attacks	Baseline	1505 (345m, 1160f)	CiOQ	P: 43.2 (NR)
				PTGI	56.8 (NR)
		6 months	1505 (NR)	CiOQ	P: 41.3 (NR)
				PTGI	51.1 (NR)

Table 1.1 (*continued*)

Study	Event	Assessment phase	N		Measure	Mean (SD)	
Linley & Joseph (2006)	Disaster response workers	Baseline	56 (35m, 20f, 1 with missing data)		CiOQ	P: 45.55 (10.49) N : 24.68 (8.29)	
					PTGI	39.88 (27.79)	
		6 months	31 (NR)		CiOQ	NR	
					PTGI	NR	
Cann, Calhoun, Tedeschi, Kilmer, Gil-Rivas, Vishnevsky, & Danhauer (2010), Study 3	Leukaemia	Baseline	70 (NR)		PTGI	61.11 (NR)	
		1.5 months	43 (NR)			66.36 (NR)	
Dibb (2009)	Ménière's Disease	Baseline	370 (NR)		PTGI	35.6 (NR)	
		10 months	301 (NR)			37.38 (NR)	
Kunst (2010)	Various	Baseline	473 (229m, 244f)		PTGI	NR	
		6 months	205 (79m, 126f)			NR	
Lieberman, Golant, Giese-Davis, Winzlenberg, Benjamin, Humphreys, Kronenwetter, Russo, & Spiegel (2003)	Breast cancer	Baseline	32f		PTGI	86.9 (NR)	
		4 months	26f			90.8 (NR)	
Low, Stanton, Thompson, Kwan, & Ganz (2006)	Breast cancer	Baseline	417f		PTGI	NR	
		6 months	417f			NR	
		1 year	397f			NR	
Manne, Babb, Pinover, Horwitz, & Ebbert (2004)	Wives of men with prostate cancer		Int	Con	PTGI	Int	Con
		Baseline	29f	31f		49.4 (NR)	41.4 (NR)
		2.5 months	NR	NR		56.4 (NR)	39.9 (NR)

Table 1.1 (*continued*)

Study	Event	Assessment phase	N			Measure	Mean (SD)		
Manne, Ostroff, Winkel, Goldstein, Fox, & Grana (2004)	Breast cancer patients		Pts	Prs		PTGI	Pts	Prs	
		Baseline	162f	162 (159m, 3f)	49 (25.7)		33.8 (22.3)		
		9 months	141f	135 (NR)	52.8 (25.5)		40.9 (26.9)		
		1.5 years	120f	115 (NR)	55.7 (24)		39.7 (25.9)		
Salsman, Segerstorm, Brechting, Carlson, & Andrykowski (2009)	Colorectal cancer	Baseline	55 (NR)			PTGI	43.8 (29.6)		
		3 months	55 (NR)				51.5 (30.1)		
Scrignaro, Barni, & Magrin (2010)	Cancer	Baseline	131 (NR)			PTGI	69.09 (NR)		
		6 months	41 (NR)				68.67 (NR)		
Smyth, Hockemeyer, & Tulloch (2008)	Various		Int	Con		PTGI	Int	Con	
		Baseline	15 (NR)	10 (NR)	NR		NR		
		3 months	14 (NR)	10 (NR)	NR		NR		
Stanton, Ganz, Kwan, Meyerowitz, Bower, Krupnick, Rowland, Leedham, & Belin (2005)	Breast cancer		Int <sup>1</sup>	Int <sup>2</sup>	Con	PTGI	Int <sup>1</sup>	Int <sup>2</sup>	Con
		Baseline	177f	187f	187f		49.9 (25.2)	49.3 (25.2)	50.5 (25.9)
		6 months	143f	139f	136f		53.22 (NR)	51.95 (NR)	51.25 (NR)
		1 year	130f	135f	134f		55.34 (NR)	52.3 (NR)	52.93 (NR)

Table 1.1 (*continued*)

Study	Event	Assessment phase	N		Measure	Mean (SD)	
Steel, Gamblin, & Carr (2008)	Hepatobiliary cancer		Pts	Prs	PTGI	Pts	Prs
		Baseline	120 (89m, 31f)	-		51 (28)	-
		3 months	37 (NR)	40 (NR)		46 (27)	47 (25)
		6 months	20 (NR)	-		47 (26)	-
Tedeschi & Calhoun (1996)	Various	Baseline	604 (199m, 405f)		PTGI	86.9 (NR)	
		2 months	28 (NR)			90.8 (NR)	
Yanez, Edmondson, Stanton, Park, Kwan, Ganz, & Blank (2009), Study 1	Breast cancer	Baseline	418f		PTGI	NR	
		6 months	399f			NR	
		1 year	399f			NR	
Dolbier, Smith Jaggars, & Steinhardt (2010)	Various		Int	Con	M-PTGI <sup>1</sup>	Int	Con
		Baseline	31 (NR)	33 (NR)		17.26 (NR)	16.84 (NR)
		1.25 months	31 (NR)	33 (NR)		28.58 (NR)	19.39 (NR)
Frazier, Tennen, Gavian, Park, Tomich, & Tashiro (2009)	Various	Baseline	122 (NR)		M-PTGI <sup>2</sup>	87.99 (NR)	
		2 months	122 (NR)			86.52 (NR)	

Table 1.1 (*continued*)

Study	Event	Assessment phase	N			Measure	Mean (SD)		
Garland, Carlson, Cook, Lansdell, & Speca (2007)	Cancer		Int <sup>1</sup>	Int <sup>2</sup>		M-PTGI <sup>3</sup>	Int <sup>1</sup>	Int <sup>2</sup>	
		Baseline	44 (3m, 41f)	60 (6m, 54f)	66.24 (21.4)		60.48 (19.51)		
		2 months	44 (3m, 41f)	60 (6m, 54f)	68.09 (22.22)		65.89 (18.9)		
Gunty, Frazier, Tennen, Tomich, Tashiro, & Park (2011)	Various	Baseline	122 (NR)			M-PTGI <sup>2</sup>	87.99 (NR)		
		2 months	122 (NR)				86.52 (NR)		
Milam (2004)	HIV/ AIDS	Baseline	835 (727m, 108f)			M-PTGI <sup>4</sup>	NR		
		1.6 years	434 (NR)				NR		
Salo, Punamäki, Qouta, & Sarraj (2008)	Former political prisoners		Int <sup>1</sup>	Int <sup>2</sup>	Con	M-PTGI <sup>5</sup>	Int <sup>1</sup>	Int <sup>2</sup>	Con
		Baseline	19m	20m	76m		70.14 (NR)	75.6 (NR)	75.39 (NR)
		6 months	NR	NR	NR		75.39 (NR)	74.97 (NR)	76.44 (NR)
		1 year	13m	15m	76m		75.39 (NR)	76.44 (NR)	74.97 (NR)
Park, Cohen, & Murch (1996), Study 3	Various	Baseline	256 (83m, 173f)			SRGS	53.08 (19.31)		
		6 months	147 (38m, 109f)				54.57 (20.95)		



Table 1.1 (*continued*)

Study	Event	Assessment phase	N		Measure	Mean (SD)	
Hart, Vella, & Mohr (2008)	Multiple sclerosis		<i>Int</i> <sup>1</sup>	<i>Int</i> <sup>2</sup>	M-SRGS <sup>1</sup>	<i>Int</i> <sup>1</sup>	<i>Int</i> <sup>2</sup>
		Baseline	62 (NR)	65 (NR)		NR	NR
		2 months	59 (NR)	61 (NR)		NR	NR
		4 months	61 (NR)	64 (NR)		NR	NR
		6 months	61 (NR)	64 (NR)		NR	NR
		1 year	61 (NR)	64 (NR)		NR	NR
King, & Patterson (2000)	Parents of children with Down Syndrome	Baseline	87 (24m, 63f)		M-SRGS <sup>2</sup>	7.8 (NR)	
		2 years	42 (9m, 33f)			58.76 (NR)	
King, Scollon, Ramsey, & Williams (2000)	Parents of children with Down Syndrome	Baseline	87 (24m, 63f)		M-SRGS <sup>2</sup>	59.8 (NR)	
		2 years	42 (9m, 33f)			58.5 (NR)	
Sekse, Raaheim, Blaaka, & Gjengeda (2010)	Gynaecological cancer	Baseline	16f		Interview		
		1 year	16 f				

Note: SD = Standard deviation, m = Male, f = Female, NR = Not reported, *Int*<sup>n</sup> = Intervention group, Con = control group, Pts = Patients, Prs = Partners, M-BFS<sup>1</sup> = Modified BFS (range 15-75), M-BFS<sup>2</sup> = Modified BFS (range 14-56), M-BFS<sup>3</sup> = Modified BFS (range 13-65), CiOQ = Changes in Outlook Questionnaire (P = Positive subscale (range 11-66), N = Negative subscale (range 15-90)), PTGI = Posttraumatic Growth Inventory (range 0-105), M-PTGI<sup>1</sup> = Modified PTGI (range -63-63), M-PTGI<sup>2</sup> = Modified PTGI (range 21-126), M-PTGI<sup>3</sup> = Modified PTGI (range 0-126), M-PTGI<sup>4</sup> = Modified PTGI (range 11-55), M-PTGI<sup>5</sup> = Modified PTGI (range 21-84), SRGS = Stress Related Growth Scale (range 0-100), M-SRGS<sup>1</sup> = Modified SRGS (range 20-140), M-SRGS<sup>2</sup> = Modified SRGS (range 26-78).

### 1.3.6 The measurement of PTG

Three studies used a modified version of the Benefit Finding Scale (BFS, Antoni *et al.*, 2001; Tomich & Helgson, 2004) (Park, Edmondson, Fenster, & Blank, 2008; Tomich & Helgson, 2006; Yanez *et al.*, 2009, Study 2). The BFS begins with the statement '*Having had cancer...*' before instructing participants to respond to twenty items (eg: *has taught me to adjust to things I cannot change*). Responses are scored on a four point Likert scale (*1 = not at all, 4 = very much*). Full and reduced versions of this scale have been found to have sound psychometric properties (Carver & Antoni, 2004; Kinsinger, Penedo, Antoni, Dahn, Lechner, & Schneiderman, 2006; Tomich & Helgson, 2004; Weaver, Llabre, Lechner, Penedo, & Antoni, 2008).

Four studies used the Changes in Outlook Questionnaire (CiOQ, Joseph *et al.*, 1993) (Butler *et al.*, 2005; Dougall *et al.*, 2005; Linley & Joseph, 2006; Linley, Joseph, & Goodfellow, 2008). This measure contains eleven items relating to positive changes (eg: *I feel more experienced*) and fifteen items relating to negative changes (eg: *I no longer feel able to cope with things*). Responses are scored on a six point Likert scale (*1 = strongly disagree, 6 = strongly agree*). The validity and reliability of the CiOQ have been demonstrated in research (Joseph *et al.*, 1993; 2005).

Twenty-two studies used the Posttraumatic Growth Inventory (PTGI, Tedeschi & Calhoun, 1996) (Butler *et al.*, 2005; Cann *et al.*, 2010, Study 3; Dibb, 2009; Dolbier, Smith Jaggars, & Steinhardt, 2010; Frazier, Tennen, Gavian, Park, Tomich, & Tashiro, 2009; Garland *et al.*, 2007; Gunty, Frazier, Tennen, Tomich, Tashiro, & Park, 2011; Kunst, 2010; Lieberman *et al.*, 2003; Linley & Joseph, 2006; Low *et al.*, 2006; Manne, Babb, Pinover, Horwitz, & Ebbert, 2004a; Manne *et al.*, 2004b; Milam, 2004; Salo, Punamäki, Qouta, & Sarraj, 2008; Salsman

*et al.*, 2009; Scrignaro *et al.*, 2010; Smyth, Hockemeyer, & Tulloch, 2008; Stanton *et al.*, 2005; Steel, Gamblin, & Carr, 2008; Tedeschi & Calhoun, 1996; Yanez *et al.*, 2009, Study 1). The PTGI contains twenty-one items measuring positive changes in relational behaviour (eg: *I have more compassion for others*), new possibilities (eg: *I established a new path for my life*), personal strength (eg: *I know I can better handle difficulties*), spiritual change (eg: *I have a better understanding of spiritual matters*) and appreciation for life (eg: *I can better appreciate each day*). Responses are scored on a six point Likert scale (*0 = I did not experience this change at all, 5 = I have experienced this change to a great degree*). Six studies used modified versions of this scale (Dolbier *et al.*, 2010; Frazier *et al.*, 2009; Garland *et al.*, 2007; Gunty *et al.*, 2011; Milam, 2004; Salo *et al.*, 2008). The PTGI is widely acknowledged to have sound psychometric properties (Linley, Andrews, & Joseph, 2007; Shakespeare-Finch, & Enders, 2008; Taku, Cann, Calhoun, & Tedeschi, 2008).

Four studies used the Stress Related Growth Scale (SRGS, Park, Cohen, & Murch, 1996) (Hart *et al.*, 2008; King & Patterson, 2000; King, Scollon, Ramsey, & Williams, 2000; Park *et al.*, 1996). The scale contains fifty items measuring positive changes in social relationships (eg: *I learned to respect feelings of others*), life philosophy (eg: *I rethought how I want to live my life*), and coping skills (eg: *I learned better ways to express my feelings*). Responses are scored on a three point Likert scale (*0 = Not at all, 2 = A great deal*). Three studies used modified versions of this scale (Hart *et al.*, 2008; King & Patterson, 2000; King *et al.*, 2000). Research suggests that the SRGS is a valid and reliable measure (Armeli, Gunthert, & Cohen, 2001; Göral, Kesimci, & Gençöz, 2006; Roesch, Rowley, & Vaughn, 2004).

Only one qualitative study was included in the review (Sekse, Raaheim, Blaaka, & Gjengeda, 2010). The authors used a phenomenological–hermeneutical approach to analyse the data they collected from in-depth interviews.

These findings alone demonstrate the many methods through which PTG is assessed. Potentially there may be problems comparing the findings from studies that utilised different measures. However, as the sound psychometric properties of the measures have been demonstrated through research, tentative conclusions can be drawn and, in line with Linley and Joseph (2004, pp.14), PTG is conceptualised as a unidimensional phenomenon.

### **1.3.7 PTG over time**

Table 1.1 displays the length of time each study was conducted. The vast majority of studies measured PTG over a period of twelve months or less. The largest time span was reported in a study by Tomich and Helgeson (2006) who reassessed participants after five years and the shortest longitudinal investigation occurred in studies by Canne *et al.* (2010, Study 3) and Dolbier *et al.* (2010) who reassessed participants after approximately five weeks. It is important to consider the differences of time within these studies as it can bias the interpretation of results.

The table also presents overall scores on measures of PTG over time. For studies that reported item means these values have been multiplied by the total number of items in the measure so that, where possible, only overall mean scores are reported.

Although it is potentially misleading to compare scores obtained on different measures of PTG in samples of individuals who have experienced different types of trauma there is an interesting pattern of results amongst the studies. PTG appears to be stable over time and although it did not increase in every instance, an observation of the overall mean scores suggests that there were more reports of improvements in PTG over time than reductions.

Also of interest was that there was a greater level of variance in PTG within the studies that reported improvements.

The largest improvement in PTG over time was recorded by King and Patterson (2000) but it seems likely this is a typing error. The largest reduction in PTG was reported in a study conducted by Steel *et al.* (2008) with individuals with hepatobiliary carcinoma. In their discussion, the researchers hypothesised that this may reflect the poor prognosis often associated with this form of cancer.

### **1.3.8 Variables associated with PTG over time**

#### **1.3.8.1 Demographic factors**

Women consistently reported higher levels of PTG than men in two studies (Dougall *et al.*, 2005; Park *et al.*, 2008). In contrast to this, three studies found no relationship between gender and PTG (Dibb, 2009; Salsman *et al.*, 2009; Steel *et al.*, 2008). On this basis it is unclear if gender is associated with PTG over time.

Data from three studies demonstrated that younger participants scored higher levels of PTG at baseline and follow up (Low *et al.*, 2006; Manne *et al.*, 2004b; Salsman *et al.*, 2009). It therefore seems likely that age has a role to play in determining the level of PTG one experiences.

Two studies reported a link between ethnicity and PTG at baseline however these effects were not maintained over time. During the baseline phase of their experiments, Butler *et al.* (2005) found that non-white participants reported the highest levels of PTG and Milam (2004) found this to be the case in African American and Hispanic participants. On the basis

of this evidence there does not appear to be a relationship between ethnicity and PTG over time.

Participants who reported having lower education levels tended to report higher levels of PTG in three studies (Butler *et al.*, 2005; Low *et al.*, 2006; Yanez *et al.*, 2009, Study 1), although there were differences within the studies in how researchers measured this variable. This interesting finding could be examined in greater detail if researchers use more standard approaches to measure education levels.

No research demonstrated an association between marital status and PTG. In a study that examined the perspectives of breast cancer patients and their partners, Manne *et al.* (2004b) measured marital quality, and despite concluding that partners influenced the course of PTG over time, the variable was not responsible for its prediction.

#### **1.3.8.2 Personality**

Optimism and its relationship with PTG over time featured in a number of studies. Park *et al.* (1996) reported that increases in optimism over time predicted increases in PTG. In a study investigating the effectiveness of two different forms of therapy, Hart *et al.* (2008) also found that increases in optimism over time led to increases in PTG. Two studies demonstrated a positive correlation between the variables but this occurred only at the baseline phase and effects did not persist into follow up (Dibb, 2009; Milam, 2008). Three studies failed to find any relationship (King & Patterson, 2000; King *et al.*, 2000; Tomich & Helgeson, 2006). Dolbier *et al.* (2010) found that self esteem predicted PTG at baseline and recorded a positive correlation between the two variables at the second time point. However, five other studies did not evidence any relationship (Dibb, 2009; Gunty *et al.*,

2011; King & Patterson, 2000; King *et al.*, 2000; Tomich & Helgeson, 2006). Only one study investigated the effect of neuroticism on PTG and this showed a weak negative relationship between the two variables (Gunty *et al.*, 2011). Collectively this suggests that while PTG may be associated with optimism, self esteem is unlikely to have any effect and evidence for a role for neuroticism is limited.

#### **1.3.8.3 Religiosity**

Two studies demonstrated a positive association between religion-based coping and high levels of PTG on the PTGI (Butler *et al.*, 2005; Low *et al.*, 2006), but given that the inventory contains a spiritual growth subscale, it is possible that these results reflect conceptual overlap. This issue was foreseen by Milam (2004) and Yanez *et al.* (2009, Study 1) who ran their analyses omitting scores from the spiritual change subscale and still discovered a positive association between religious beliefs and PTG. It seems likely that religiosity shares an important relationship with PTG as a similar link was also reported in two further studies (Frazier *et al.*, 2009; Park *et al.*, 1996).

#### **1.3.8.4 Biological factors**

Many of the identified articles sampled individuals who had endured various forms of illness and as a consequence the relationship between disease and PTG was often referred to. In a study surveying patients with Ménière's disease, Dibb (2009) concluded that patients who believed their disease was more severe experienced higher levels of PTG. Low *et al.* (2006) surveyed breast cancer patients and discovered a positive correlation between illness duration and PTG. In their study, Manne *et al.* (2004b) found that patients who reported less physical impairment tended to report more PTG over time than their

partners, however patient and partner PTG levels remained the same in the group of patients who reported higher levels of impairment. In a study investigating factors associated with PTG over a five year period, Tomich and Helgeson (2006) observed that among cancer patients who reported a high degree of perceived control over their illness, those that had not experienced a recurrence of cancer reported higher levels of PTG than those who had. Bearing these findings in mind, it appears likely that various disease-related factors are associated with PTG over time however it also seems important that the role of cognitive factors is not underestimated.

In contrast, the findings were less consistent when researchers examined the relationship between PTG over time and treatment-related factors. Breast cancer patients who had received chemotherapy or had a mastectomy consistently reported higher levels of PTG in one study (Low *et al.*, 2006). In relation to this, after surveying a sample of patients with HIV/ AIDS Milam (2004) concluded that the initiation of Anti-retroviral therapy positive correlated with PTG initially but these effects were not maintained over time. Other studies failed to detect any influence of treatment-related factors at any time point (Manne *et al.*, 2004b; Salsman *et al.*, 2009).

#### **1.3.8.5 Cognitive processes**

There was weak evidence to suggest that intrusive thoughts related to PTG over time. Manne *et al.* (2004b) demonstrated this relationship in partners of cancer patients but this was not observed in the patients themselves. In a study of disaster workers, Linley and Joseph (2006) were only able to show a positive relationship between intrusions and PTG at baseline and in a study of survivors of colorectal cancer, Salsman *et al.* (2009) found no relationship between the variables.



In an Internet-based study conducted shortly after the September 11<sup>th</sup> terrorist attacks, Butler *et al.* (2005) reported positive associations between denial and PTG at baseline and at six month follow up, however these effects have not been replicated in other research (Low *et al.*, 2006; Scignaro *et al.*, 2010). Overall this suggests that it is unlikely intrusive thoughts or denial are linked with PTG over time.

In contrast there was strong evidence to suggest that positive reinterpretation is positively associated with PTG (Butler *et al.*, 2005; Low *et al.*, 2006; Manne *et al.*, 2004b; Park *et al.*, 1996; 2008; Scignaro *et al.*, 2010). Contemplation also appeared to be related to PTG over time (King & Patterson, 2000; Manne *et al.*, 2004b; Salsman *et al.*, 2009). In a study investigating the experiences of parents of children with Down syndrome (DS), King and Patterson (2000) found that parents were more likely to grow from their experiences if they had spent time thinking about the goals they were no longer able to achieve with their children. Further support for the role of contemplation can be gained from Manne *et al.* (2004b), who found that cancer patients who reported they had thought about why they had developed cancer and what it meant to them also reported more PTG over time.

In an investigation of the psychometric properties of their Core Beliefs Inventory, Canne *et al.* (2010) provided empirical evidence that a disruption in core beliefs can lead to PTG. Although this inventory remains in its infancy, these are promising results that add substance to thoughts PTG researchers such as Tedeschi and Calhoun (1999) have had for some time. In a study using the same sample as King and Patterson (2000), King *et al.* (2000) used a narrative based approach to investigate the stories of parents of children with DS and found that individuals who displayed evidence they had rethought their fundamental beliefs tended to score higher on the SRGS. Viewed collectively this research suggests that re-examining one's core beliefs may be linked with PTG over time.

#### **1.3.8.6 Emotional processes**

Attempts to examine the relationship between emotional processes and PTG are scant and mixed results have been found within research. One study conducted by Manne *et al.* (2004b) found that partners of cancer patients who reported they had tried to make sense of their feelings experienced higher PTG. Furthermore, in the same research Manne *et al.* (2004b) also discovered that cancer patients reported more PTG when their partner openly discussed their feelings. In contrast, two other studies reported no correlation between emotional expression and PTG (Park *et al.*, 1996; Scrignaro *et al.*, 2010). Future study within this area would be helpful as currently, given the limited research, it is difficult to draw any firm conclusions.

Two studies demonstrated evidence of peritraumatic distress predicting later PTG (Kunst, 2010; Park *et al.*, 1996). Although this may be a promising line for future enquiry, measuring the level of distress an individual experienced at the time of an event raises methodological challenges as it can be biased by memory recall difficulties if a long time has elapsed since the traumatic event.

#### **1.3.8.7 Social processes**

A number of studies demonstrated the impact various social influences can have on PTG. The patients with Ménière's disease surveyed by Dibb (2009) tended to report more PTG if they had also admitted they compared themselves with others. These effects were particularly prominent at baseline but they had weakened at follow up. In a study investigating the psychological effects of exposure to a traumatic event through the media, Dougall *et al.* (2005) interviewed participants who lived distant from the anthrax bioterrorism attacks and the September 11<sup>th</sup> terrorist attacks. The researchers discovered

that although PTG was apparent at baseline, these effects reduced over a six month period and were eventually replaced with more negative views about life. The results from two further studies also suggested that social processes only had an initial influence on PTG but any effects diminished over time (Butler *et al.*, 2005; Low *et al.*, 2006).

In comparison, Park *et al.* (1996) presented a positive correlation between social support satisfaction and higher levels of PTG at six month follow up. The results from further analysis also revealed that increases in satisfaction with social support and social support resources between the data collection points led to increases in PTG at follow up. One study investigated the type of social support linked the strongest with PTG over time. In this research, Scignaro *et al.* (2010) found that cancer patients with caregivers who support them to have freedom to determine their own behaviour were more likely to report higher levels of PTG. In contrast to these findings, only one study failed to register any relationship between PTG and social support (Linley & Joseph, 2006). This suggests that despite limited evidence to the contrary, it is conceivable that social support is positively associated with PTG.

#### **1.3.8.8 Behavioural factors**

Active coping was positively correlated with PTG over both time points in a recent study conducted by Scignaro *et al.* (2010) and but Park *et al.* (1996) found no relationship whatsoever between the two variables. Two studies demonstrated positive links between self distraction and PTG at baseline but neither was able to detect the same relationship at follow up (Butler *et al.*, 2005; Scignaro *et al.*, 2010). Collectively these findings suggest that while there may be some evidence that behavioural based coping approaches aid in the

initial development of PTG, this form of coping is unlikely to be involved in its maintenance over time.

Milam (2004) examined the effects of health behaviours and found that those who had not used illicit drugs over the past three months reported more PTG. Higher levels of PTG were also correlated with reductions in smoking and alcohol intake, improved healthy eating and more daily exercise. However, when these variables were regressed to predict PTG lowered alcohol intake and improvements in healthy eating were significant predictors at baseline but not at the follow up phase.

### **1.3.9 PTG and psychological adjustment**

Two studies examined the influence experiencing positive changes had on the course of psychological disorders. In research investigating the potential benefit of identifying positive post-trauma changes, Linley *et al.* (2008) found that initial PTG predicted lower levels of PTSD symptoms, anxiety and depression over a six month period. Hart *et al.* (2008) also indicated that benefit finding was implicated in the reduction of depressive symptoms monitored over a year. So, although it seems likely patients who achieve PTG experience less negative effects following exposure to trauma, more research is needed to confirm this.

Other studies have focused on the influence positive and negative affect has on the course of PTG. Positive affectivity was linked with the prediction of PTG over time in a study conducted by Park *et al.* (1996). The results from further analysis also revealed that increases in PTG at the second time point were significantly related to increases in mood although this is yet to be corroborated in further longitudinal PTG research and of interest

Salsman *et al.* (2009) found no link between the two variables. Also of interest were the findings from three studies that indicated participants with depression were less likely to report PTG (Dolbier *et al.*, 2010; Hart *et al.*, 2008; Milam, 2004). Based upon this research there seems to be some evidence to suggest that positive and negative mood states may have opposing effects on PTG over time.

Research into anxiety and PTG has led to an inconclusive pattern of results. One study demonstrated a positive association between anxiety and PTG that persisted over time (Linley *et al.*, 2008) however the two variables did not correlate with one another at any time point in another study conducted by Salsman *et al.* (2009). With regard to PTSD, Butler *et al.* (2005) discovered those with higher trauma symptoms at baseline were also likely to report higher PTG but by the time of follow up this relationship had inverted so that those reporting higher PTG reported less trauma symptoms. In contrast, Kunst (2010) and Salsman *et al.* (2009) were unable to find any relationship between PTSD and PTG.

### **1.3.10 Clinical interventions**

#### **1.3.10.1 Individual-based approaches**

In a study conducted over one year, Salo *et al.* (2008) monitored the progress of former political prisoners as they underwent individual or group therapy. The researchers found that individual therapy, influenced by psychodynamic, cognitive and behavioural factors, was significantly more effective in facilitating PTG in comparison to group therapy or the scores obtained by those in the control group. However, given that the researchers did not randomise their participants into the different groups their findings may be open to bias. Nevertheless, further support for the effects of individual therapy on PTG can also be gained from research by Hart *et al.* (2008). In this study, patients with MS were randomised

into one of two telephoned administered psychotherapies (Cognitive Behavioural Therapy and Supportive Emotion-Focused Therapy). Their results suggested that both therapies were equally as effective in facilitating PTG but there is a need for caution when interpreting these results as the researchers failed to utilise a control group.

In a study that adopted an experimental design, Smyth *et al.* (2008) assessed the effectiveness of expressive writing in decreasing PTSD symptoms, improving mood and facilitating PTG. Trauma victims were individually instructed to complete three written tasks related to the event they experienced or assigned to a non-treatment control group. Three months later participants in the experimental group did not report a reduction in PTSD symptoms but improvements in mood and PTG subscales were recorded. These findings appear promising but it is relevant to note that this research used the smallest sample out of all of the articles in the review. Only one study failed to acknowledge any effect for individual based approaches on PTG. In a large scale trial, Stanton *et al.* (2005) recruited former breast cancer patients who had recently been discharged following treatment. Participants were sent a general information leaflet, or a peer-modelling video tape or a letter inviting them to two psychoeducational counselling sessions. Although those who had received counselling reported the largest improvements in PTG over time, these findings were non-significant so this led the researchers to conclude that none of the interventions were successful.

On this basis, despite methodological issues in some research, it is possible to conclude that individual based approaches may be a useful context within which to facilitate PTG.

#### **1.3.10.2 Group-based approaches**

The effectiveness of a six-week psychoeducational group for the wives of men with prostate cancer was investigated in a study by Manne *et al.* (2004a). Although measures of outcome did not reveal a decrease in overall distress at the follow up assessment, participants of the group reported significantly more PTG than controls. A further three studies also supported the use of group therapy. The usefulness of electronic support groups for women with cancer was assessed in a study by Lieberman *et al.* (2003). A range of topics that included difficulties managing their illness, relationship problems and feelings of discrimination and isolation were discussed throughout the duration of the group and at the reassessment stage significant improvements were observed on two of the five subscales on the PTGI. Regrettably the researchers failed to include a control group in their study design and this, combined with the use of a small sample, limits the strength and generalisability of their findings.

Garland *et al.* (2007) examined the impact Mindfulness Based Stress Reduction (MBSR) and Healing Arts (HA) programs had on facilitating PTG in cancer patients. The researchers concluded that although both interventions had a positive impact on PTG, MBSR outperformed the HA program. Unfortunately this study also failed to utilise a control group and added to this patients were not randomised into the groups. A theorized link between resilience and PTG led Dolbier *et al.* (2010) to assess the effectiveness of a resilience program administered to a sample of students. The researchers discovered significant increases in PTG over time. But in stark contrast to these findings, Salo *et al.* (2008) cautioned the use of group therapy when attempting to facilitate PTG suggesting individual therapy should be offered to victims of trauma instead as it gives therapists the opportunity to provide patients a treatment package tailored to their own specific needs.

Viewed collectively, these findings suggest that group therapy may also be an appropriate context to facilitate PTG although a limitation of this treatment approach is that it lacks the individualised focus individual therapy is able to offer.

### **1.3.11 Findings from qualitative research**

Only one of the identified articles used a qualitative approach to assess PTG over time. Sekse *et al.* (2010) interviewed sixteen former gynaecological cancer patients five years after treatment and then again one year later. Participants consistently reported developing a greater appreciation for life and a stronger sense of closeness in their relationships with other people. PTG was often described within the context of a fear that the cancer may recur or difficulties in coming to terms with a new body image. Some participants also commented that upon completing their course of treatment they felt abandoned by hospital staff. One suggested that had they had the opportunity to talk with someone this may have helped them readjust.

## **1.4 Discussion**

Despite the utility of the research in this systematic review, it is important that each article is understood within the context of various methodological limitations. Although some methodological issues have been discussed throughout the review, further considerations are raised in the following section. Following this, clinical implications linked to the findings are then considered. The conclusion of this review will also include ideas for future PTG research.



## **1.4.1 Methodological limitations**

### **1.4.1.1 Study comparability**

There may be conceptual difficulties in comparing, for example, the experience of cancer patients against those of individuals who have fallen victim to terrorist attacks. Connected to this, five studies used undergraduate students in their research (Dolbier *et al.*, 2010; Frazier *et al.*, 2009; Gunty *et al.*, 2011; Park *et al.*, 1996; Tedeschi & Calhoun, 1996), and a large number described the most traumatic event they had ever experienced as having relationship problems or an injury producing accident. A proportion of students in a study conducted by Dolbier *et al.* (2010) reported an uncertainty over how events will unfold in the future. This may bear a closer resemblance to anxiety rather than a traumatic event. So collectively the differences in the types of trauma people have reported experiencing is a key methodological limitation.

### **1.4.1.2 Measurement issues**

Although each of the twelve studies that used a modified measure of PTG produced reliable results, any adjustments the researchers made to the measure may have affected their validity. For example, Milam (2004) only used eleven items from the PTGI and Salo *et al.* (2008) reduced the Likert scale from six to four. These amendments may have limited the capability of their inventories. Conversely, some researchers may have improved original measures of PTG. Both Hart *et al.* (2008) and Dolbier *et al.* (2010) reconfigured the Likert scales of their measures to assess positive and negative change, generating similar output to that of the CiOQ. Research suggests that this amendment can greatly improve the psychometric properties of PTG measures (Armeli *et al.*, 2001).

#### **1.4.1.3 Attrition**

Attrition is a problem commonly associated with longitudinal research (Boys, Marsden, Stillwell, Hatchings, Griffiths, & Farrell, 2003; Twisk & de Vente, 2002). Although ten studies assessed the same number of participants throughout their investigation (Butler *et al.*, 2005; Dibb, 2009; Dolbier *et al.*, 2010; Dougall *et al.*, 2005; Frazier *et al.*, 2009; Garland *et al.*, 2007; Gunty *et al.*, 2011; Manne *et al.*, 2004a; Sekse *et al.*, 2010; Tomich & Helgeson, 2006), other researchers were not that fortunate or successful. Kunst (2010) was only able to retain thirty percent of his original sample of participants at follow up. By the time of the final time point, Steel *et al.* (2008) assessed only sixteen percent of the sample they interviewed at baseline. Perhaps the most startling discovery was that Tedeschi and Calhoun (1996) reported the PTGI had good test retest reliability even though less than five percent of the original sample was assessed at the second time point. Such attrition can lead to type I and type II errors.

#### **1.4.1.4 Sampling problems**

Many researchers used small samples and this can reduce statistical power and lead to inaccurate interpretations of data. Typically these articles involved research assessing the effectiveness of interventions (Dolbier *et al.*, 2010; Lieberman *et al.*, 2003; Salo *et al.*, 2008; Smyth *et al.*, 2008) which is understandable to an extent given that such research often involves randomising participants into different groups. However, it is particularly relevant to note that the control group in the study conducted by Salo *et al.* (2008) was over three times the size of either experimental group. The researchers also analysed their data using multivariate analysis of variance which is not recommended for use with small samples (Howell, 2007).

A number of articles re-used data from the same samples. Although this is not a criticism in itself, it is still relevant to acknowledge that overall the review included twenty-eight samples of participants not thirty-two. Frazier *et al.* (2009) and Gunty *et al.* (2011) both used the same sample of undergraduates. Stanton *et al.* (2005), Low *et al.* (2006), and Yanez *et al.* (2009, Study 1) all used a sample of breast cancer patients who were part of a large trial investigating the effectiveness of different psychoeducational interventions. And finally King and Patterson (2000) and King *et al.* (2000) used the same parents of children with DS in their research. These two articles are particularly interesting in that despite using the same data, different scores have been reported on the measures assessing PTG and optimism. These errors can be both confusing and misleading to readers of their research.

#### **1.4.2 Clinical implications**

Despite the points raised above, the findings from this review can provide useful knowledge to clinicians specialising in trauma. A number of variables also appear to be associated with PTG over time. For instance, there may be a relationship between PTG and religiosity. On this basis, it may be helpful for clinicians to explore with clients who possess religious beliefs how they can make sense of what has happened to them within the context of their faith. Park *et al.* (1996) suggested that religiosity can provide some individuals with a framework of meaning that can be conducive for PTG. It may be that religious beliefs help individuals to create coherent narratives that lead to the development of PTG. It could also be useful for clinicians to bear in mind the different cognitive processes associated with PTG. Although supporting clients to positively reframe appraisals linked to a traumatic event or reinforcing optimism may in turn encourage PTG, it also seems crucial that clinicians do not act in haste and instead encourage clients to

contemplate over what has happened to them. Perhaps at a later stage in treatment clinicians may also wish to support clients to consider how the event they have been through relates to the fundamental beliefs they have in their life given the findings from research. The role of social factors should also not be underestimated as support systems may also have a useful role to play in supporting PTG. It may therefore be helpful for clinicians to explore with clients their social support system and how it may be conducive or restrictive towards PTG.

Evidence for PTG over time was apparent in clients who received various forms of individual and group therapy, although there were some methodological issues associated with the studies that investigated this suggesting more research in this area would be useful. Linked to this, although some research suggests that PTG may be linked with better mental health outcomes over time there is also a need for more investigation in this area to confirm this. For instance, it may be that positive affect opens pathways to PTG whereas depression acts as an inhibitor but again further study is needed to clarify this. In the meantime clinicians should be careful not to take for granted that if a client achieves PTG they will be less likely to develop psychological disorders.

### **1.4.3 Conclusion**

Given the measures researchers used to assess PTG and the associations it shared, or did not share, with other measures of outcome, it appears many researchers have adopted the view that PTG is an outcome in its own right rather than a process that occurs in individuals following trauma.

A number of factors appear to be associated with the development and maintenance of PTG. While younger individuals and those with a lower education than others may be more likely to achieve PTG over time, gender effects within the research were small and there was limited evidence to suggest a role for race and marital status. It also seems unlikely self esteem and neuroticism are associated with PTG, yet optimism may have a role to play, as too may religiosity. Although disease related factors such as the severity and the duration of illness seem to have had an impact on PTG over time, it seems unlikely that treatment related factors have any role to play. In terms of the influence of psychological factors, research has tended to focus on the implications various cognitive processes can have on PTG although social support, particularly within the short term, also had an impact on PTG. Emotional processes and behavioural based approaches following traumatic events appeared to exert less powerful influences on growth but more research in these areas would be beneficial.

#### **1.4.3.1 Future research**

In addition to ideas previously mentioned, there are a number of directions which further PTG research could travel. One of the key limitations of this review is the issue surrounding study comparability. As more longitudinal PTG research is likely to be conducted, it may be useful for this review to be conducted with analogous research. For example, a future review could focus on longitudinal PTG research in individuals of the same demographic (eg; ethnicity), or individuals who have all experienced a similar adverse event (eg; cancer). It may also be possible to focus on studies that have employed the same measure of PTG (eg; the PTGI) or measured the construct over the same time frame (eg; one year).

It was unfortunate that only one qualitative study was included in the review and this suggests more research using this methodology may be useful. PTG seems to be a common

outcome among those exposed to traumatic events but it is also a subjective experience. More qualitative research could offer a valuable insight into this subjectivity and tell us more about the course of PTG over time.

Finally, it may also be useful for some of the authors of measures of PTG to consider revising their measurement scales. Armeli *et al.* (2001) strongly suggested adjusting the Likert scales of measures of PTG so that positive and negative psychological changes are both given equal weight. An equal emphasis on the different consequences that can occur following a traumatic event reflects many of the aims of positive psychology.

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# **Chapter**

## **2**

### **Posttraumatic growth and resilience in student paramedics**

**Word count: 7,914**

*(Excluding tables, figures and references)*

Prepared for submission to Traumatology

(See Appendix 7.2 for instructions to authors)

## **2.1 Abstract**

Research suggests that ambulance personnel experience posttraumatic growth (PTG) following exposure to critical incidents but it is unclear whether resilience facilitates or impedes this process. To investigate this further, 121 student paramedics completed measures assessing the frequency and emotional impact of critical incidents attended over the past year, PTG, resilience and social desirability. All participants identified PTG however there was large variability within the scores. PTG correlated positively with responses to an item assessing the emotional impact of the most serious incident attended, however no significant effects were found for resilience. Response bias may have had an impact on a number of study variables but this is uncertain given the poor performance of the social desirability scale on a measure of internal consistency. Student paramedics appear able to experience PTG however the relationship the construct shares with resilience remains an issue for further research.

### **Keywords**

Student paramedics; posttraumatic growth; resilience; social desirability

## 2.2 Introduction

Although much research has focused on the negative sequelae of trauma, far less is known about why some individuals are able to gain or grow from their experiences. These positive psychological changes are often referred to collectively as posttraumatic growth (PTG, Calhoun & Tedeschi, 2006), the term also used in the present empirical study. Calhoun and Tedeschi (1999, pp.11) proposed that PTG is typified by improvements in three main areas: change in relationships with others; change in sense of self; and change in philosophy of life.

PTG has been observed in victims of a range of traumas including assault (Kunst, 2011), life threatening illnesses (Hefferon, Greal, Mutrie, & 2009), natural disasters (Cryder, Kilmer, Tedeschi, & Calhoun, 2006) and road traffic accidents (Rabe, Zöllner, Maercker, & Karl, 2006). In contrast, far fewer attempts have been made to examine the experiences of individuals who provide immediate support to victims of these events.

The present study sets out to investigate the prevalence of PTG in a sample of student paramedics and examine if the PTG they experience is associated with resilience. This investigation may be of interest to researchers who have appealed for clarification regarding the relationship between PTG and resilience (Tedeschi & McNally, 2011; Westphal & Bonanno, 2007). The findings may also benefit paramedic training organisations and student paramedics themselves.

The present study will begin with a short description of ambulance work and after this the negative, then positive effects of this type of work are reviewed. There will be a discussion on attempts training organisations can make to promote PTG in student paramedics,

before research examining the relationship between PTG and resilience is summarised. A theoretical framework that links the variables together is presented and following this the potential confounding effects of social desirability in this population are considered.

### **2.2.1 Critical incident exposure**

Paramedics are often first to arrive at the scene of an accident or medical crisis. The emergency calls they attend are commonly referred to as 'critical incidents' (Alexander & Klein, 2001; Clohessy & Ehlers, 1999; Gallagher & McGilloway, 2009) and can be defined as *'...any sudden unexpected event that has an emotional impact sufficient to overwhelm the usual effective coping skills of an individual...'* (Caine & Ter-Bagdasarian, 2003). The frequency of critical incidents is high. According to a recent report published by the West Midlands Ambulance Service (WMAS, 2010), an estimated 2,500 calls are received each day.

### **2.2.2 The negative effects of ambulance work**

Typically, the study of paramedics has tended to focus on the negative psychological effects of ambulance work. In a systematic review, Sterud, Ekeberg and Hem (2006) linked repeated exposure to critical incidents with a wide range of health problems such as mental illness, injuries, accidents and diseases. In a study of ambulance personnel in Ireland, Gallagher and McGilloway (2009) found that many workers experienced a range of psychological problems including mood swings, restlessness, intrusive memories, flashbacks and isolation, leading the researchers to conclude that ambulance personnel have psychological needs that are not being adequately met by the support systems that currently exist.

Findings from other research have suggested paramedics are at a heightened risk of developing Posttraumatic Stress Disorder (PTSD) (Bennett, Williams, Page, Hood, Woollard, & Vetter, 2005; Bennett, Williams, Page, Hood, & Woollard, 2004; Clohessey & Ehlers, 1999; Grevin, 1996; Johnson, Segesten, & Mattson, 2003). A common finding within this vein of research is that the frequency of critical incident exposure is a key predictor of PTSD (Bennett *et al.*, 2005; Johnson *et al.*, 2003).

Due to their lack of experience, student paramedics may be particularly vulnerable to experiencing trauma during the course of their training. In a recent study, Lowery and Stokes (2005) found that trauma-related symptomatology was predicted by the number of highly stressful critical incidents student paramedics had attended. These serious incidents included events when time was a critical factor or the life of an individual was under threat (for example, road traffic accidents, shootings, drug overdoses, and cardiac arrests). The findings from this research imply that the onset of psychological sequelae may not necessarily be linked to the overall frequency of critical incidents attended, but instead it may be more closely related to incidents that evoke high levels of stress in this population.

### **2.2.3 The positive effects of ambulance work**

There is a lack of research focusing on the positive effects of ambulance work. An interesting study by Shakespeare-Finch, Gow, Embleton and Baird (2003) found that 98.6% of a sample comprised of seasoned paramedics and student paramedics reported experiencing at least one positive change as a result of their work. Moreover, those who had been in the profession for longer reported higher levels of PTG. In a related study, Linley and Joseph (2006) found that disaster response workers also reported PTG. Taken

together the findings from both studies provide evidence of the presence of PTG experiences among emergency services personnel.

Other research has generally reported PTG in an anecdotal manner, set often within the context of an investigation focused largely on pathological outcomes. For instance, although the spouses of paramedics interviewed in Regehr's (2005) study mainly described negative effects of their partners' work, some suggested that their partners had developed better coping skills, shown an increase in self-confidence and become more adept at managing stress since becoming a paramedic. Similarly, in a recent qualitative study, Halpern *et al.* (2009) found that many paramedics described negative effects of critical incident exposure but a small number claimed to have experienced PTG in the course of their work.

#### **2.2.4 PTG and paramedic training programmes**

Conclusions drawn from the research presented so far are relevant to courses responsible for the training and development of student paramedics. Collectively they suggest that although there is a risk critical incident exposure may have negative psychological consequences, there is also a possibility student paramedics might experience PTG through the course of their training. This underlines a need for support mechanisms but it also implies that attempts may be made to promote PTG. If more is understood about how this population can achieve positive psychological changes, with this knowledge paramedic training programmes would become better placed to instil a mindset that could potentially benefit their students throughout the rest of their career.



In a review of PTG in emergency services personnel, Paton (2005) suggested organisations can foster positive change through their organisational culture and the training they provide. This point was expanded upon by Shakepeare-Finch (2007) who added that if training organisations were to build resilience in their personnel this would increase the likelihood of PTG occurring.

### **2.2.5 PTG and resilience**

To date, no study has investigated the relationship between PTG and resilience in ambulance personnel. The relationship between the two constructs is often debated within the literature, while related research presents a somewhat confusing picture. For example, in a study of Scottish paramedics, Alexander and Klein (2001) found that those who scored high on measures of hardiness were less likely to report high levels of psychopathology, burnout and posttraumatic symptoms. In their conclusion, these researchers suggested that resilient paramedics may be more inclined to make adaptive appraisals of events. These findings are supported by results from a more recent study of healthcare personnel conducted by Glasberg, Eriksson, and Norberg (2006). However, Paton, Smith and Violanti (2000) presented a different viewpoint. They hypothesised that resilient paramedics may be more inclined to hold high expectations of their capabilities thus they may be at an increased risk of developing trauma-related symptomatology if their self-expectations go unmet. Although this is an interesting argument, Paton *et al.* (2006) did not test this prediction in research.

In order to gain a deeper understanding of the relationship between PTG and resilience one may be tempted to explore research with other populations however this also presents a pattern of mixed opinions and findings. For example, in a study of war veterans Waysman,

Schwarzwald, and Solomon (2001) discovered that resilience was associated positively with PTG. In line with this, Zoellner and Maercker (2006) hypothesised that resilience may aid in the facilitation of PTG. However in their review, Westphal and Bonanno (2007) argued that individuals with high levels of resilience would be less inclined to interpret an event as traumatic and therefore less likely to experience PTG. To add further confusion to this debate, Levine, Laufer, Stein, Hamama-Raz and Solomon (2009) examined PTG and resilience in victims of wartime trauma and found that although the concepts were both salutogenic they were in fact inversely related.

To summarise, it is difficult to draw any firm conclusions from the research literature on the relationship between resilience and PTG in student paramedics. Although a positive association between PTG and resilience seems likely, evidence also suggests that the two concepts are unrelated or they may even oppose one another. The question of whether resilience facilitates or impedes PTG in this population remains unanswered.

### **2.2.6 The broaden-and-build theory of positive emotions**

A theoretical framework that may be able to bring some clarity to this issue is Fredrickson's (2001; 2004) broaden-and-build theory. The model suggests that although negative emotions serve some useful functions, they restrict cognition and behaviour whereas positive emotions broaden mindsets and actions and build personal resources. For instance, joy prompts creativity, interest stimulates the urge to learn more and pride triggers the visualisation of greater accomplishments in the future. Fredrickson (2001) conceptualised resilience as the ability to recover rapidly and efficiently following adversity and proposed that the same mechanisms used to build resilience may also encourage growth.

Although research has not yet applied the broaden-and-build theory to the study of resilience and PTG in student paramedics, empirical support for the model can be found elsewhere. For example, Fredrickson, Tugade, Waugh, and Larkin (2003) surveyed students before and after the September 11<sup>th</sup> terrorist attacks and discovered that students with high levels of resilience were more likely to experience beneficial psychological changes.

### **2.2.7 The present study**

The present study seeks to explore the prevalence of PTG in student paramedics and examine the relationship between PTG and resilience. Firstly, the study will assess if the relationship between the frequency of critical incidents and their associated emotional impact is related to the level of PTG experienced in participants. Secondly, the study will seek to identify if this effect is stronger in individuals who score higher on a measure of resilience.

A final area of investigation for this research concerns the relationship social desirability may have with these variables. It has often been suggested that paramedics, and other emergency services personnel, can sometimes misreport cognitions and emotions surrounding the demands of their work out of desire to appear steadfast and robust (Lowery & Stokes, 2005; Miller, 1995; North *et al.*, 2002; Regehr, Goldberg, & Hughes, 2002; Stephens, Long, & Miller, 1997). It may be that student paramedics believe they should not suffer any emotional consequences as a result of their experiences, or they should be resilient or be able to identify PTG. Linked to this, although a small number of studies have suggested that measures of PTG and resilience are unaffected by response bias (Bowen, Morasca, & Meischke, 2006; Salsman, Segerstorm, Brechting, Carlson, & Andrykowski, 2009; Tedeschi & Calhoun, 1996) such research is scarce so therefore a

measure of social desirability will be administered alongside other measurements included in the present study.

### **2.2.8 Hypotheses**

1. Student paramedics will report posttraumatic growth
2. There will be a positive relationship between self-reported posttraumatic growth and critical incident exposure.
3. The positive association between posttraumatic growth and critical incident exposure will be stronger in student paramedics who demonstrate higher levels of resilience.
4. None of the variables under investigation will be associated with social desirability.

## **2.3 Method**

### **2.3.1 Ethics**

Ethical approval for this study was granted by the Coventry University Peer Review Ethics Process (see appendix 1.1 and 1.2 pp.106-111) and throughout the study professional practice guidelines were adhered to (British Psychological Society, 2004; 2010).

### **2.3.2 Participants**

Out of the one hundred and twenty-four individuals who were invited to take part in the study, one hundred and twenty-one student paramedics participated ( $n = 121$ ; 46 = male, 75 = female). The average age of participants was 26.39 ( $SD = 7.17$ ) and the ethnic composition of the sample was 91.7% White British, 3.3% White Other, 1.7% White Irish, 0.8% Asian Indian, 0.8% Asian Other, 0.8% Black Caribbean, and 0.8% Black Other.

Program leads of Paramedic Science courses across England were written to with information about the study. At a later date they were re-contacted to determine whether they were willing to support in recruitment. Subject to their agreement, a scheduled visit to the university was arranged. Participants were recruited from the following universities: Birmingham City University, Coventry University, Oxford Brookes University, the University of Hertfordshire, the University of West of England, and the University of Worcester. Only student paramedics in their second year of a two year Paramedic Science Foundation degree course of accredited by the Health Professions Council were included in the study. Student paramedics in their first year were excluded from the study on the basis that they would have not attended as many critical incidents as students in their second year. Participants were also excluded if they had not experienced a critical incident over the past year.

### 2.3.3 Design

The study used a correlational analytic survey design. This design was selected to ensure that the highest number of participants were able to take part in the study.

PTG acted as the criterion variable for the study. The first independent variable, critical incident exposure, was measured using three items. Participants were asked to: (A) report the emotional impact of the most serious incident they had attended over the past year; (B) estimate the total number of serious incidents they had attended over the same time period; and (C) report the overall emotional impact of attending these incidents. It was anticipated that participants would report PTG and that self-reported exposure to critical incidents would be positively associated with self-reported PTG. The second independent variable, resilience, was also expected to positively relate to PTG. Social desirability was included as a confounding variable and was not expected to associate with any of the other variables.

All of the participants answered the three items assessing critical incident exposure first, but the presentation of measures of PTG, resilience and social desirability were counterbalanced in an attempt to eliminate order effects.

The differences between PTG and resilience have sparked debate within the extant research literature (Levine *et al.*, 2009; Tedeschi & McNally, 2011; Westphal & Bonanno, 2009). Within the context of this study resilience has been defined as the ability to cope with stress and adversity (Connor & Davidson, 2003) and PTG has been defined as positive psychological changes that occur following trauma (Tedeschi & Calhoun, 1996).

### **2.3.4 Materials**

The reader is referred to appendix 5.1 pp. 118-122 for copies of the measures described below.

#### **2.3.4.1 Demographic data**

Each participant was asked their gender, age and ethnicity.

#### **2.3.4.2 Critical incident exposure**

Data on exposure to critical incidents was collected via a questionnaire designed specifically for the present study. The questionnaire begins by asking participants to consider the most serious incident they have experienced over the past twelve months. A series of open ended questions are asked to capture the details of the event. (*When was it? Where were you? Who were you with? What were you doing?*). The emotional impact of this incident is measured using a seven point Likert scale (*1 = not at all, 7 = extremely*). Subsequent to this participants are asked to estimate the total number of serious incidents they have attended at work over the past twelve months and then rate, using a 7 point Likert scale (*1 = not at all, 7 = extremely*), their overall emotional impact. Despite having good face validity, as this measure has never been used in research its psychometric properties are yet to be examined.

#### **2.3.4.3 Posttraumatic growth**

The Posttraumatic Growth Inventory (PTGI, Tedeschi & Calhoun, 1996) is a 21-item self-report measure. The measure consists of five factors measuring positive changes in the way one relates to others (eg: *I am more willing to express my emotions*), new possibilities (eg: *I*

*developed new interests*), personal strength (eg: *I discovered I'm stronger than I thought I was*), spiritual change (eg: *I have stronger religious faith*) and appreciation for life (eg: *I have changed my priorities about what is important in life*). Participants are requested to read each statement and respond using a six point Likert scale (0 = *I did not experience this change at all*, 5 = *I have experienced this change to a great degree*). There is no threshold score for the PTGI. Lower scores indicate low levels of PTG and higher scores indicate high levels of PTG on the scale.

The PTGI was standardised by Tedeschi and Calhoun (1996) using a sample of students ( $n = 798$ ). Findings from a range of studies have supported the five factor model outlined above (Brunet, McDonough, Hadd, Crocker, & Sabiston, 2010; Linley, Andrews, & Joseph, 2007; Morris, Shakespeare-Finch, Rieck, & Newbery, 2005; Taku, Cann, Calhoun, & Tedeschi, 2008). The convergent and divergent validity of the scale has also been supported in research (Shakespeare-Finch & Enders, 2008; Weinrib, Rothrock, Johnsen, & Lutgendorf, 2006). Further research has indicated that the PTGI performs well on measures of internal consistency (Jaarsma, Pool, Sanderman, & Ranchor, 2006; Linley *et al.*, 2007; Taku *et al.*, 2008) and has appropriate test-retest reliability (Butler *et al.*, 2005; Linley & Joseph, 2006; Salsman *et al.*, 2009).

#### **2.3.4.4 Resilience**

The Connor-Davidson Resilience Scale (CD-RISC, Conner & Davidson, 2003) is a 25-item self-report measure that assesses five factors of resilience that include personal competence (eg: *I am not easily discouraged by failure*), tolerance of negative affect (eg: *I can handle unpleasant feelings*), positive acceptance of change and secure relationships (eg: *I am able to adapt to change*), control (eg: *I am in control of my life*) and spiritual influence (eg:



*Sometimes fate or God can help*). Participants are instructed to read each statement and respond using a five point Likert Scale (*0 = Not true at all; 4 = True all the time*). There is no threshold score for the CD-RISC. Lower scores indicate low levels of resilience and higher scores indicate high levels of resilience on the scale.

The CD-RISC was standardised using a random sample of the general population ( $n = 577$ ), primary care outpatients ( $n = 139$ ), psychiatric outpatients in private practice ( $n = 43$ ), participants in a study of generalized anxiety disorder ( $n = 25$ ) and participants in two clinical trials of PTSD ( $n = 22, n = 22$ ). There has been debate within research over the factor structure of the CD-RISC. Although Connor and Davidson (2003) originally demonstrated that a five factor solution offered the best fit of their data, some studies have suggested three (Kararmak, 2010; Xu & Zhang, 2007) or four (Khoshouei, 2009) factor solutions are also viable. The convergent validity of the scale has been supported in research (Campbell-Sills, Cohan, Stein, 2006; Kararmak, 2010; Xu & Zhang, 2007) and the scale has also been found to correlate positively with other previously validated measures of resilience (Connor & Davidson, 2003; Xu & Zhang, 2007). Research has indicated the CD-RISC performs well on assessment of internal consistency (Conner & Davidson, 2003; Gillespie, Chaboyer, & Wallis, 2009; Kararmak, 2010; Khoshouei, 2009) and has appropriate test-retest reliability (Conner & Davidson, 2003; Khoshouei, 2009).

#### **2.3.4.5 Social desirability**

The Marlow-Crowne Social Desirability scale (MCSD, Crowne & Marlowe, 1960) is a 33-item self-report measure that provides a measure of social desirability response bias. Participants are requested to read each item on the scale (eg: *I'm always willing to admit when I've made a mistake*) and then indicate if the statement is true or false of them. High

scores on the scale are deemed as improbable therefore reflective of an apparent social desirability response bias (see appendix 5.2 pp. 123 for the scoring algorithm). The MCSD scale correlates well with the Edwards Social Desirability Scale (Edwards, 1957) suggesting it possesses concurrent validity (Crowne & Marlow, 1960; Reynolds, 1982). A collection of studies investigating the factor structure of the MCSD scale have consistently reported that a two factor solution is the most appropriate conceptualisation (Loo & Loeawen, 2004; Ramanaiah & Martin, 1980). Within research the internal consistency of the MCSD scale ranges from .69 to .87 (Ballard, 1992; Loo & Loeawen, 2004; Marlowe & Crowne, 1960; Reynolds, 1982).

Since its original publication researchers have sought to develop shorter forms of the MCSD scale in order to increase the utility of the measure. Ballard (1992) proposed a scale consisting of 11 items and demonstrated its validity and reliability using principal component analysis and reliability estimates. In a study investigating the psychometric properties of the MCSD scale and 13 shorter versions, Loo and Loeawen (2004) strongly recommended the use of Ballard's (1992) shortened scale. On this basis, the 11 item MCSD scale was used.

### **2.3.5 Procedure**

Potential participants from each university were met as a cohort and each individual was provided with a participant information leaflet (see appendix 2.1 pp.112). This document contained information about the study and described the advantages and disadvantages of taking part. After the student paramedics had read the leaflet and were satisfied their questions were answered, they were invited to participate in the study. Those who agreed were given a consent form (see appendix 3.1 pp.115) and booklet containing the study

questionnaires. Upon completing the booklet participants were thanked for their involvement, given a debrief leaflet (see appendix 4.1 pp.116) and once again invited to ask any questions.

## **2.4 Results**

### **2.4.1 Power analysis**

The number of required participants was calculated using G Power version 3 (Faul, Erdfelder, Buchner, & Lang, 2009), a power analysis software program. Aitken and West (1991) suggested that the most common effect size for power calculations of this type is Cohen's (1988)  $f^2$ . Setting  $f^2$  at 0.15: the medium range (Cohen, 1988; Faul *et al.*, 2009), the significance level ( $\alpha$ ) at .01 and the power level ( $1-\beta$ ) at .80 calculated that 82 participants would be needed. In order to anticipate any sampling problems, it was estimated that 110 participants should be recruited.

### **2.4.2 Data input**

The data were inputted using PSAW Statistics Version 17.0. One discrete value was created to account for any missing values. Prior to analysis a subsample of participants were subtracted from data set ( $n = 7$ , 5.79%) because they had previously worked within the ambulance service or military for a number of years and were experienced practitioners, not student paramedics at an early stage in the career as the remaining sample were. As a result one hundred and fourteen cases ( $n = 114$ ) were carried forward in statistical analysis.

### **2.4.3 Preliminary data screening**

The data were screened to determine whether they satisfied the assumptions of multiple regression analysis. Cook's D and Mahalanobis values indicated that there were no outliers and inspection of histograms suggested that there was normality of residuals. A scattergram was generated to check for independence of residuals, absence of

heteroscedasticity, and linearity of relationship between the predictors and predicted variables; all three of these assumptions were met. Tolerance values indicated that multicollinearity was not excessive.

#### **2.4.4 Overview of the results in relation to the hypotheses**

**Hypothesis 1:** *Student paramedics will report posttraumatic growth*

Although there was a large degree of variance within the scores participants obtained on the PTGI, all participants reported experiencing positive psychological changes as a result of attending critical incidents (see Table 2.1).

**Hypothesis 2:** *There will be a positive relationship between self-reported posttraumatic growth and critical incident exposure.*

There was a significant positive correlation between the emotional impact of the most serious incident attended and PTG but PTG was not correlated with the frequency of serious incidents attended or the overall emotional impact of serious incidents (see Table 2.2).

**Hypothesis 3:** *The positive association between posttraumatic growth and critical incident exposure will be stronger in student paramedics who demonstrate higher levels of resilience.*

Regression analysis indicated that resilience did not have a significant effect on posttraumatic growth (see Table 2.3).

**Hypothesis 4:** *None of the variables under investigation will be associated with social desirability.*

Social desirability was not associated with posttraumatic growth (see Table 2.3) however social desirability was negatively correlated with the emotional impact of the most serious incident and positively correlated with resilience (see Table 2.2).

## 2.4.5 Descriptive data

**Table 2.1 Descriptive statistics**

Variable	Minimum	Maximum	<i>M</i>	<i>SD</i>
Emotional impact of the most serious incident	1	7	4.14	1.66
Frequency of serious incidents	1	50	9.75	8.74
Overall emotional impact of serious incidents	1	6	3.28	1.15
Posttraumatic growth	4	93	42.11	20.68
Resilience	46	93	72.94	9.49
Social Desirability	2	11	7.18	2.16

### 2.4.6.1 Serious incident characteristics

Thematic analysis was used to analyse the characteristics of the most serious incident attended by student paramedics (Braun & Clarke, 2006). The following themes were identified: (a) Medical emergencies (eg; cardiac arrest, child victim, dressing burns) (45%); (b) Road traffic accidents (eg; cars, motorcycles, bicycles) (17%); (c) Suicide/ parasuicide (eg; hanging, overdose) (15%); (d) Violent incidents (eg; gunshot injury) (4%); (e) Having to provide emotional support (eg; acting calmly and reassuringly) (2%); (f) Industrial accident (eg; foot injury from a hedge trimmer) (1%); (g) Vague responses (eg; assisting mentor, at work, on placement) (19%). (See appendix 6.1 pp.124 for further detail)

#### **2.4.6.2 The emotional impact of attending serious incidents**

The emotional impact of the most serious incident was significantly higher than the overall emotional impact of attending serious incidents ( $t_{(113)} = 6.199, p < .001$ ). On average, the frequency of serious incidents was approximately once every five weeks.

#### **2.4.6.3 Posttraumatic growth**

The mean total score on the PTGI was 42.11 ( $SD = 20.68$ ). The internal consistency of the measure was good ( $\alpha = .83$ ). Item means for each subscale of the PTGI were calculated, as each subscale contains a different number of items. The results were as follows: Personal strength ( $M = 2.74, SD = 1.17$ ), appreciation of life ( $M = 2.52, SD = 1.33$ ), relating to others ( $M = 1.99, SD = 1.12$ ), new possibilities ( $M = 1.58, SD = 1.20$ ) and spiritual change ( $M = .72, SD = 1.14$ ).

#### **2.4.6.4 Resilience**

The mean total score on the CD-RISC was 72.94 ( $SD = 9.49$ ). The internal consistency of the measure was good ( $\alpha = .83$ ). Item means for the CD-RISC were calculated, as each subscale contains a different number of items. The results were as follows: Adaptability/ability to bounce back ( $M = 3.19, SD = .49$ ), personal competence, high standards, and tenacity ( $M = 3.08, SD = .53$ ), control ( $M = 3.06, SD = .63$ ), emotional and cognitive control under pressure ( $M = 2.79, SD = .42$ ), and spiritual influences ( $M = 1.81, SD = .97$ ).

#### **2.4.6.5 Social desirability**

The mean total score on the MCSD scale was 7.18 ( $SD = 2.16$ ). The internal consistency of the scale was moderate to satisfactory ( $\alpha = .56$ ).

## 2.4.6 Correlational analysis

Table 2.2 displays correlations between the variables. The emotional impact of the most serious incident correlated positively with the overall emotional impact of serious incidents ( $r = +.49, p < .001$ ) and PTG ( $r = +.26, p = .007$ ), but negatively with social desirability ( $r = -.20, p = .032$ ). Resilience correlated positively with social desirability ( $r = +.29, p = .002$ ) but it did not correlate with any of the variables measuring critical incident exposure or PTG.

**Table 2.2 Correlations between the variables**

	1	2	3	4	5	6
1. Emotional impact of the most serious incident		+.05	+.49**	+.26**	-.16	-.20*
2. Frequency of serious incidents			+.08	-.12	-.05	-.03
3. Overall emotional impact of serious incidents				+.17	-.14	-.09
4. Posttraumatic growth					+.02	-.04
5. Resilience						+.29**
6. Social desirability						

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

## 2.4.7 Regression analysis

Stepwise regression was used to examine the effect of social desirability, resilience and the three critical incident exposure variables on posttraumatic growth. When social desirability was entered at step 1, R square was .002. This indicated that social desirability accounted for 0.2% of the variability of scores on the PTGI. The standard error of the estimate was 20.767. The model fit was non-significant ( $F_{(1, 102)} = .176, p = .675$ ). At step 2, when resilience was added, R square was .003. This indicated that social desirability and resilience accounted for 0.3% of the variability of scores on the PTGI. The standard error of



the estimate was 20.854. The model fit was non-significant ( $F_{(2, 101)} = .163, p = .850$ ). At step 3, when the three critical incident exposure variables were added R square was .091. This indicated that a model comprised of social desirability, resilience, the emotional impact of the most serious incident, frequency of serious incidents and the overall emotional impact of serious incidents accounted for 9.1% of the variability of scores on the PTGI. The standard error of the estimate was 20.220. The model fit was non-significant ( $F_{(5, 98)} = 1.956, p = .092$ ). Standardised beta coefficients are displayed in Table 2.3.

**Table 2.3 Regression statistics for the predictors of Posttraumatic growth**

	Predictor	$\beta$	$t$	$p$
Step 1				
	Social Desirability	-.042	-.420	.675
Step 2				
	Social Desirability	-.053	-.514	.609
	Resilience	+.040	.389	.698
Step 3				
	Social Desirability	-.012	-.113	.910
	Resilience	+.070	.689	.492
	Emotional impact of the most serious incident	+.241	2.136	.035*
	Frequency of serious incidents	-.129	-1.339	.184
	Overall emotional impact of serious incidents	+.068	.609	.544

\*  $p < .05$

As demonstrated in Table 2.3, social desirability had no significant effect on posttraumatic growth throughout testing. The inclusion of resilience into the model also had no significant effect. Although the emotional impact of the most serious incident attended by student paramedics was positively associated with posttraumatic growth, neither the frequency of serious incidents nor the overall emotional impact of serious incidents were significantly related to the criterion variable.

## **2.5 Discussion**

### **2.5.1 Overview**

The present study sought to investigate the prevalence of PTG in a sample of student paramedics and explore the relationship between PTG and resilience. A positive relationship between self-reported critical incident exposure and PTG was hypothesised; furthermore, resilience was also expected to be positively related to PTG. A final hypothesis was that none of the variables under investigation would be associated with social desirability.

All of the student paramedics reported experiencing positive psychological changes as a result of attending serious incidents however there was a large amount of variability within scores on the PTGI.

Only one of the three variables assessing critical incident exposure was linked with PTG. Although there was a positive association between the emotional impact of the most serious incident attended and PTG, neither the frequency of serious incidents nor the overall emotional impact of these experiences were related to PTG.

At no point during analysis was resilience associated with PTG. The two variables did not correlate with one another and resilience did not have a significant effect when it was added to the model during regression analysis.

Social desirability did not correlate with PTG and it did not predict the same variable during multiple regression analysis but it was negatively correlated with responses on the item that measured the emotional impact of the most serious incident attended and positively

correlated with resilience. These findings appear to indicate that these two variables were confounded by social desirability but it is also relevant to note that the MCSD scale performed poorly on a measure of internal consistency suggesting the reliability of the scale was questionable.

These findings are now expanded upon in greater detail. Following this, methodological limitations are discussed, clinical implications of the findings are considered, and directions for future research are suggested.

### **2.5.2 The prevalence of PTG**

The average score obtained by participants in the present study (42.11) resembles the level of PTG reported in other research with emergency services personnel (Linley & Joseph, 2006; Shakespeare-Finch *et al.*, 2003). There were also similarities in the type of PTG participants experienced in the current and in another study of paramedics conducted by Shakespeare-Finch *et al.* (2003). In this research and in the present study participants demonstrated higher scores on PTGI subscales assessing personal strength, appreciation for life and relating to others and lower scores on the new possibilities and spiritual change subscales. It may be that the training student paramedics receive and the opportunities they have to relate this to practice enhances their personal strength. Perhaps too the critical incidents they experience lead them to appreciate their own lives more.

Interestingly the level of PTG reported by student paramedics in the present study appears markedly lower than findings from wider PTG research. In their standardisation study, Tedeschi and Calhoun (1996) found that a sample of undergraduate participants reported an average of 71.48 on the measure. Butler *et al.* (2005) administered the PTGI on a sample

of victims of the 9/11 terrorist attacks and found that on average participants scored 53.95. More recently, Brunet *et al.* (2010) reported an average of 94.71 in a sample of breast cancer survivors. It may be that because emergency services personnel provide support to the victims of traumatic events and are not the victims of the event themselves they may experience less PTG.

### **2.5.3 Critical incident exposure and its relationship with PTG**

As the variables assessing critical incident exposure were designed specifically for the present study, they cannot be compared to findings from previous research. It is perhaps understandable that the average score of the emotional impact of the most serious incident attended was higher than the overall emotional impact of attending serious incidents. Interestingly, none of the sample marked seven (the highest value) for this particular item. Perhaps for some student paramedics it is the intensity linked with such experiences that drew them onto the profession. Even so, given the frequency of serious incidents identified in the present study this underlines the importance of support systems in place for student paramedics to access if necessary.

Given that Lowery and Stokes (2005) discovered that the frequency of stressful experiences student paramedics attended was positively related to the development of trauma symptomatology, it was predicted that the number of serious incidents participants attended would also be positively related to PTG however this was not the case. With regards to the current study, it was the emotional impact of serious incidents rather than their frequency that was the more powerful predictor. There are, however, some problems with this viewpoint. A correlation does not imply causality. Added to this it is also possible that student paramedics may have misreported the number of serious incidents they

attended due to uncertainty over the difference between 'critical' and 'serious' incidents. This highlights a potential problem with this variable, which is elaborated upon later in the report.

#### **2.5.4 Resilience and its relationship with PTG**

The average scores participants obtained on the CD-RISC (72.94) compares favourably with findings from research using the scale. In their standardisation study, Connor and Davidson (2003) found that a sample of participants drawn from the general population scored an average of 80.4 on the scale. A study of nurses reported the mean score of the CD-RISC to be 75.9. More recently, Karairmak (2010) administered the scale on a sample of earthquake survivors and found that on average participants scored 70.06.

Given that resilience did not correlate with PTG or predict the variable during analysis it appears that in the case of the present study the two constructs were independent of one another and a hypothesis that links the variables together cannot be accepted. This discovery is inconsistent with findings from previous research that has suggested the constructs are related either positively (Waysman *et al.*, 2001; Zoellner & Maercker, 2006) or inversely (Levine *et al.*, 2009). The finding also fails to provide support for the broaden-and-build theory of positive emotions (Fredrickson, 2001; 2004). Although it is possible that scores on the measure were confounded by social desirability, a point expanded upon in the next section, there may be strength in this finding. There is a tendency for published research to contain significant results and this could bias the view within research and by implying an association between resilience and PTG exists when in fact no such relationship exists. Given that this debate still exists within studies it would be useful to explore this issue further in future research.

### **2.5.5 The role of social desirability**

It is interesting to note that the average score participants obtained on the shortened version of the MCSD scale (7.18) was substantially higher than other findings from research. In her study investigating different versions of the scale, Ballard (1992) found that participants scored an average of 4.53. Other research with student samples has revealed average scores of 4.55 (Loo & Loewen, 2004) and 4.92 (Loo & Thorpe, 2000). At first sight this suggests that the student paramedics in the current study seemed to believe that it was very important they present themselves in a positive light. However, it is also important to note that the internal consistency of the measure was low so it possible that the reliability of the scale was compromised.

At no time during analysis did the scores participants obtained on the PTGI share any association with social desirability. This is an important finding in the sense that firstly, it provides further support for the validity of the PTGI and secondly, it reinforces findings from previous research (Salsman *et al.*, 2009; Tedeschi & Calhoun, 1996).

However, scores on the MCSD scale were associated with other study variables. There was a negative correlation between the responses participants gave when they were asked to rate the emotional impact of the most serious incident attended and social desirability. It may have been that participants believed it was more desirable to under-report emotional impact of attending serious incidents. Possibly linked to this the positive correlation between social desirability and resilience could be interpreted to suggest that the student paramedics thought that it was more socially desirable to report higher levels of resilience. So on one hand the associations social desirability shared with the variables mentioned above could add substance to thoughts some researchers have held for some time; that many emergency services personnel may misguidedly believe they must be strong enough

to cope with the demands of their work (Miller, 1995; North *et al.*, 2002; Regehr *et al.*, 2002; Stephens *et al.*, 1997). However on the other hand given poor psychometric properties of the measure this limits the strength of this conclusion.

### **2.5.6 Methodological limitations**

It is important to view the findings from the present study within the context of a number of methodological limitations. The first relates to the measurement of critical incident exposure. On reflection, a pilot study that sought to assess the psychometric properties of the measure would have been useful given the measure had never been used in research. During data collection a small number of participants expressed that they were unsure if the measure wanted an indication of the emotion they experienced at the time of the incident or the emotional impact the incident has left on them generally. Added to this, some participants may have defined a serious incident differently to others. This may have led to differences in responding and if the study were to be repeated by the present author, the items on this measure would be more clearly worded.

The psychometric properties of the measure of social desirability could also be called into question. The scale scored particularly low on a test of internal reliability suggesting it was possible it did not produce a stable pattern of results. A further criticism of the present study is that in terms of sample characteristics, participants were primarily white, female and aged between 20 and 22. This could potentially limit the generalisability of the findings. Future investigations could seek to study more representative samples.

A final criticism of the study is the scoring system of the PTGI. Given that no threshold for the scale exists theoretically it is possible to conclude that all of the student paramedics

experienced PTG. However, there was huge variability within responses on the measure. Some participants scored high indicating high levels of PTG whereas others scored lower reflecting lower PTG. A threshold score for PTG would be useful because it would allow for PTG to be measured more precisely. This could be of benefit to researchers and clinicians as the dimensionality of PTG could then be more clearly understood.

### **2.5.7 Clinical implications**

The findings from the present research suggest that student paramedics can experience PTG. In line with recommendations made in previous research (Paton, 2005; Shakespeare-Finch, 2007), it remains important for paramedic training programmes to consider how they can increase the likelihood of PTG occurring in students. One way of achieving this could be to include clinical psychologists in the training of student paramedics. The interactive exchange that would occur when student paramedics shared their experiences of critical incident exposure and clinical psychologists shared their knowledge of PTG would be a good example of interdisciplinary practice that could bring benefit to paramedic science and clinical psychology.

Another possible issue for training organisations is how student paramedics deal with the demands of their work. In the present study, given the performance of participants on the measure of social desirability, student paramedics may have under-reported the degree to which they may have been emotionally affected by exposure to critical incidents and over-reported their level of resilience. This implies trainers should be aware of the preconceptions student paramedics may have concerning the profession they are due to enter. Disseminating the findings from this investigation to student paramedics and their trainers could be beneficial as it could help to stimulate open and honest conversation.



According to the broaden-and-build theory generating positive emotions such as honesty, openness and curiousness could help to cultivate a more authentic form of resilience student paramedics could then take forth into their placements.

#### **2.5.8 Future research**

Arguably, one of the key recommendations suggested by findings from the present study is that valid and reliable measures of social desirability should be included in future research investigating the experiences of those who work within the emergency services. Such research would build on the findings of the present study and provide researchers with more information upon which to base their conclusions.

Given that a key finding in the present study is that student paramedics appear able to experience PTG, it would be useful for future research to pursue this line of investigation. Future research might track PTG of student paramedics at the beginning and end of training to further investigate any changes over the training period. The effectiveness of interventional efforts such as the inclusion of clinical psychologists during paramedic training could also be assessed. Findings from these further investigations could help researchers understand more about the course of PTG over time and what can be done to aid its facilitation. Increasing our understanding of these questions has the potential to benefit the area of PTG research and student paramedics before they embark on their qualified career.

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# **Chapter**

## **3**

### **Reflective paper**

#### **Posttraumatic growth: A personal and professional journey**

Word count: 3,394

### **3.1 Abstract**

Throughout the course of the thesis I kept a reflective journal that helped in the preparation of this final chapter which includes a reflective account of my research journey. In the present reflective paper, I begin by discussing how I came to investigate posttraumatic growth. Following this, I reflect on the research process and the learning experiences; firstly, with the literature review and then the empirical study. In the closing sections of this chapter I make some overall reflections before closing with some final thoughts.

### **3.2 Introduction**

Perhaps one of the most difficult tasks of the thesis was the selection of a subject area. I felt strongly that I wanted to examine an understudied area of psychological interest. I recall thinking I did not know what the subject for my thesis would be, but I knew it would feel intuitively right when I found it. Thesis thoughts weighed heavily on my mind until one day, during a lecture on the psychological effects of trauma; I was introduced to positive psychology and the concept of posttraumatic growth (PTG, see Tedeschi & Calhoun, 2004).

Clinically, I had been interested for some time in how people can use their strengths to help them cope with difficulties they experience. This may have been largely due to the two years prior to clinical training that I spent working in neurological rehabilitation services. Friends and family often describe me as encouraging and optimistic and I try to use these interpersonal skills to my advantage during my clinical work. The idea that for some individuals PTG can take place even following the most dreadful of events resonated with my own outlook. Although I was aware of the negative psychological effects of trauma, I believed that positive psychological effects were a truly worthwhile area of study.

Having identified a general area in which I wanted to carry out my thesis, my time was then spent deciding upon topics for my literature review and empirical study. These projects are now discussed in greater detail below.

### **3.3 Literature review**

#### **3.3.1 The area of study**

In line with one of my reasons for selecting PTG as an area of study, I wanted to conduct a literature review that was relevant and would provide a genuine contribution to scientific knowledge. If I knew I was embarking on a worthwhile project this would motivate me and maintain my interest throughout the project. Six months were spent reading and analysing PTG research, while paying particular attention to the recommendations researchers made for future study. At times, it felt like I was swimming through a sea of research. It was very easy to drift off on different tangents and lose focus. On reflection, I think that this was because I was so new to this area of research. Nevertheless, I began to notice a theme that wove in and out of many of the studies I read. Different researchers consistently stated PTG was an area in need of longitudinal study. I recall feeling startled when I discovered this. PTG, I assumed, as with any other form of growth, was a process that unfolded over time, yet to my surprise the vast majority of research that had assessed the construct had done so cross-sectionally.

Initially, to add continuity to the thesis, I wanted my literature review to focus on longitudinal PTG research in emergency services personnel. However, through the course of further research and negotiations during supervision this idea was re-evaluated due to

concerns there would not be enough available research. The search criteria were broadened and I sought to examine all longitudinal PTG research.

### **3.3.2 Reflections on the research process**

I soon rediscovered how easy it was to lose myself in a sea of research. Even though I had narrowed my investigation to longitudinal PTG studies, there still appeared to be a large collection of research which led me to question why so many researchers had stated it was needed. At times literature searching was a frustrating exercise but this was balanced out by feelings of satisfaction when I found what I was looking for. I noticed that the more I familiarised myself with the research, the easier the process became. Clear inclusion and exclusion criteria and supervision anchored me and enabled me to identify a sizeable collection of studies to take forward into the literature review.

Following this, my next aim was to immerse myself in reading each article with more careful attention to detail than I had ever done before. Downloading PDF versions of each article on my phone and constructing a large poster to take prime position in my study were to name but a few of the behaviours I noticed myself engaging in. It was easier to read some articles than others. I felt overjoyed when I had found my search had uncovered a well conducted, informative research study. I felt puzzled and annoyed when I came across studies which were not so well conducted. Categorising the findings from the review and writing the project up were exercises that I had never engaged in before. I had attempted to read all of the related reviews, past theses and the notes from training we had received but I still found myself struggling to apply what I had learnt to my own literature review.



### **3.3.3 The learning experience**

Prior to this project, I had completed various clinical practice reports, audits and small scale research but I had never reviewed such a large collection of research before. On reflection, having completed the literature review I now feel more confident about navigating my way through a sea of research. I understand the importance of crystallising inclusion and exclusion criteria and receiving supervision throughout this process. I also now know how to collectively describe and evaluate a large body of research and report my findings in an organised and informative manner, which has been an important learning experience for me.

As a researcher, it has been helpful to have developed a deeper understanding of longitudinal research. This is a valuable experience as I believe, given the limited time and resources of researchers, there is a tendency to rely more on cross-sectional research as a method of examination. Although studies that follow this type of design are useful, they do not provide an understanding of progress and change that can be gained from longitudinal studies (Rajulton, 2003).

As a clinician, it has been helpful to learn more about PTG over time. Such information will be useful to me in a professional context as I embark upon my career as a qualified clinical psychologist. I now understand when working with trauma victims it is necessary to give individuals time to process their thoughts and feelings connected to the event. It seems, from the findings of my review, that it is also helpful to gradually support trauma victims to explore how the way they are coping with an event fits within the context of their own fundamental beliefs, which has been an additional point of personal learning for me.

## **3.4 Empirical paper**

### **3.4.1 The area of study**

The idea for the empirical study developed during meetings I had with my supervision team. Part of my research had led me to consider the relationship between resilience and PTG and my main supervisor also shared this interest. The essence of the research question had a substance which we both believed could be unpacked within the context of an empirical study. Does resilience help or hinder growth?

The idea of investigating this question within a large sample of student paramedics appealed too, as I believed there were parallels between their training experiences and my own as a trainee clinical psychologist. We were all healthcare professionals at an early stage in our career undertaking a training course comprised of placements, lectures and assignments. While student paramedics provide emergency care and support to victims of trauma, trainee clinical psychologists can meet the same people at a much later stage in the treatment process. Although my research identified that student paramedics received support during their training, I had doubts as to whether they would receive the same level of psychological support available to trainee clinical psychologists, such as weekly clinical supervision and personal development groups.

Added to this, I also believed it was important that as a clinical psychologist at an early stage in my career, I should gain experience of applying my understanding of psychology to other healthcare staff. My training has led me to believe that as clinical psychologists we have a responsibility to share our knowledge not only with the individuals we treat but also with the different staff we work alongside.

### **3.4.2 Reflections on the process**

#### **3.4.2.1 My choice of methodological design**

As I developed my research design around the central research question I soon began to think that a quantitative approach offered the most comprehensive style of investigation. I knew that conducting this type of study would involve the recruitment of a large number of student paramedics, which could, and in fact did, present challenges. However, I believed that it would generate a large data set upon which generalisable conclusions could be drawn. Through the use of statistical techniques I was able to perform a series of validity and reliability checks which helped me to check the accuracy of my data. Added to this, a final benefit of the approach I took to the empirical study was that it would more replicable than a qualitative study.

However, a qualitative approach applied to the research question would have potentially revealed some fascinating results. On reflection, a criticism of the method I used could be that through focusing my attention on quantitative data I overlooked an opportunity to investigate the real meaning behind the experiences of the participants (Kruger, 2003). A qualitative approach would have enabled a deeper insight into any PTG student paramedics experienced through the course of their training and how this related to their resilience. Perhaps an example of the type of data my study neglected to analyse due to the methodology I adopted can be observed in some of the statements student paramedics made when they were asked to report the most serious incident they had attended over the past year:

*'Called to miscarriage, foetus had been delivered, mother stated 11 weeks pregnant. We removed foetus to waste bag and dealt with bleeding mother. When at A and E showed foetus to nurse it was still alive.'*

*'Third manning. At scene helped to shield casualty (who had died) from other motorists seeing her. Supporting other drivers who had witnessed the crash.'*

*'An elderly lady had purposefully starved herself so she would die, a family member phoned when she found the relative who she hadn't seen in a long time.'*

These comments exemplify some of the qualitative detail of the type of critical incidents student paramedics attended, and provide a very brief glimpse of the types of narrative that may exist around their experiences of attending critical incidents. At times I felt shocked and saddened by what I read. Student paramedics were truly exposed to trauma through the course of their training. The words they used to describe critical incidents created images in my mind that could never be captured by any of the quantitative data I analysed. However despite this, I remained confident that in balance the methodology I had adopted was the appropriate one to answer the questions my study was asking.

#### **3.4.2.2 Ethical issues**

It was a prudent exercise to begin considering ethical issues associated with the empirical study as early as possible. To examine the effects of exposure to critical incidents I needed to ask student paramedics to recall the most serious incidents they had attended. I believed it was important that participants felt protected and were made aware in advance

that any information they provided would be treated sensitively and respectfully in line with BPS guidelines (BPS, 2004; 2010).

There were a number of ethical considerations that were made prior to the execution of the study. Firstly, encouraging student paramedics to recall the number of critical incidents they had attended and their emotional impact could potentially be distressing for them. Secondly, there was a possibility that student paramedics may become upset if they realised they were not able to identify any PTG or resilience in themselves. All of these risks and potential benefits were explained to student paramedics before they made any decision to participate. They were also advised participation was voluntary, they could withdraw at any time and all of their responses would be handled sensitively.

Despite a small number of students exercising their decision not to participate in my research no ethical issues emerged during data collection. On reflection, I think this was largely due to the prior ethical considerations I made and the amendments my supervisor and I made to the study and the helpful feedback from the ethical review process.

### **3.4.3 Learning experience**

Throughout the empirical study I learned how to conduct research over a set timescale, how to network with different people and how to take account of relevant ethical issues relating to the research. My previous experiences of completing a BSc dissertation and MSc research project were helpful preparation but I had never completed a project of this magnitude before. This was emphasised to me at different points throughout the research journey. I had never had such a large supervisory team, had contact with so many different people or put so much thought into the planning and execution of a research study.

Meeting the student paramedics was a fascinating exercise. During the data collection phase I travelled to Coventry, Birmingham, Worcester, Oxford, Hertfordshire and Bristol. I learnt how to liaise with course leads, introduce a study as the lead researcher and collect a large amount of data. Often the end of data collection sparked discussions within student paramedics over how they manage the psychological aspects of their work. Inadvertently, I occasionally became a group facilitator. This was not a role I had experience in but it was something I enjoyed. I felt privileged that the students felt able to describe to me the type of incidents they had attended. I recall one man explaining to me that during placements he had his 'armour' on. On reflection, this, alongside the qualitative comments made by student paramedics on the nature of critical incidents they attended, has to some degree facilitated an easier understanding for me of why there was bias in some responses of participants. Perhaps given the demands of placements, lectures and assignments, student paramedics need to project an image of being strong and able to cope with critical incidents? The social desirability bias findings in my empirical study have certainly caused me to reflect on this, and also on how men and women (at least among the participants I studied) may possibly use different mechanisms or strategies to maintain their sense of being able to cope in an emotionally challenging role.

Given the impact of the bias in responding, I was unable to confirm or refute the relationship between PTG and resilience. Instead I was urged to consider how response bias can influence the pattern of results. Initially I felt frustrated at being unable to draw firm conclusions on part of what I set out to investigate but this aside there is a useful lesson to be learnt. It is important during research to assess variables that can potentially confound data.

## **3.5 Overall reflections on the project**

### **3.5.1 Feelings**

Without doubt the completion, of this project has stirred waves of different emotions in me. Moments of joy followed key events during the process. Discovering a subject area, crystallising the aims for the literature review and empirical paper and completing data collection were all high points. In contrast to this, there were times when the thesis seemed a frustrating and disappointing exercise. These low points were often associated with data collection. Although I feel proud to have collected as much data as I did, each cohort of student paramedics I met were fewer in number than I had anticipated. This annoyed me, particularly when I had travelled long distances. I also became frustrated when tasks such as obtaining my ethical approval were not being completed as fast as I had expected they would be. On reflection, I may have been over ambitious with my expectations of how the thesis would progress and it would be useful for me to set more realistic goals when I conduct research again. It has also helped me to be more aware of how I respond when a project I am involved in is not going so well, something that I hope to apply constructively to other areas of my professional and personal life.

### **3.5.2 Spinning plates**

A key challenge during the completion of the thesis was achieving a balance between my academic and clinical work. This was especially difficult during parts of the second year when I was selecting specialist placements, preparing to present seminars and working clinically with an unfamiliar client group. On reflection, this was a challenge I enjoyed meeting and through which I learnt how to prioritise. Nevertheless I felt like a plate spinner, anxious that a plate would tumble to the ground or everything would go wrong.

Although I draw strength from knowing that this never happened, I benefited greatly from the supervision and support I received from staff associated with my training.

### **3.5.3 My placement in oncology and palliative care**

It was a fascinating experience working with cancer patients and their families from September 2010 until March 2011. As I studied PTG I noticed I became able to observe it in the patients I worked with. As a result, PTG began to mean more to me. I felt rewarded and satisfied when, at the end of therapy, I believed I had helped someone fight cancer. I felt sad and at a loss when patients I had begun to work with died.

### **3.5.4 My own growth**

Although clinical training and the completion of a thesis bear minimal resemblance to a traumatic event, I feel through the course of my clinical and thesis experiences I have grown. Reading accounts of critical incidents, learning about PTG and meeting cancer patients had led me to reconsider the way I live my own life. My relationship with my girlfriend is more important to me than ever and following completion of my training we plan to live together. With her, I have begun attending church every week. Although I remain uncertain over my own religious beliefs, I respect religion and have a newfound interest in it following conclusions I made during the literature review and after working alongside chaplains during my most recent placement. A final revelation, which I never anticipated I would make, is that I have developed an interest in plants and gardening. I have wondered how I have come to be engaged in this hobby, and I think it relates to a satisfaction obtained from watching growth occur.



### **3.6 Final thoughts**

I have been surprised during the write up of this report just how much of an impact the completion of this thesis has had on me and what I have learnt. I have experienced challenges but, with the aid of invaluable supervision, I have been able to complete a large scale project from start to finish and from this I draw great satisfaction.

I plan to continue to conduct research and aim to have the chapters of my thesis published. Having now completed a literature review, it would be interesting to learn how to conduct a meta-analysis. I am also interested in conducting a longitudinal study to gain firsthand experience of how they are completed. Building upon earlier observations, I would also be interested in conducting a qualitative study in the future. Finally, as I embark upon a career as a clinical psychologist, I am keen to maintain and further develop my interest in PTG. Although I now know significantly more about the concept than I did at the start of the thesis, this has also led me to realise there is still much more I need to learn.

### 3.7 References

British Psychological Society (2004). *Guidelines for minimum standards of ethical approval in psychological research*. Leicester: Author.

British Psychological Society (2010). *Code of human research ethics*. Leicester: Author.

Kruger, D. J. (2003). Integrating quantitative and qualitative methods in community research. *The Community Psychologist*, 36, 18-19.

Rajulton, F. (2001). The fundamentals of longitudinal research: An overview. *Canadian Studies in Population*, 28, 169-185.

Tedeschi, R. G., & Calhoun, L. G. (2004). A clinical approach to post-traumatic growth. In P.A. Linley, & S. Joseph (Eds.) *Positive psychology in practice*. (pp. 405–419). New Jersey: Wiley.

## The Appendices

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## Appendix 1.1 Approval to commence with my research

FW: Applying for ethical approval

Page 1 of 4

### **FW: Applying for ethical approval**

Stevie Johnson [aa6528@coventry.ac.uk] on behalf of ethics.hls [ethics.hls@coventry.ac.uk]

**Sent:** 07 June 2010 12:40

**To:** Simon Russon [russons@coventry.ac.uk]

**Attachments:** Ethics Reviewer feedback ~1.docx (17 KB)

Dear Simon,

Please see reviewers feedback attached, you have approval to commence with your research.

Kind Regards

Stevie Johnson  
Faculty Administrative Assistant  
Faculty of Health and Life Sciences  
Coventry University  
Tel:0247 679 5985  
Email:aa6528@coventry.ac.uk

---

**From:** Lorraine McFarland  
**Sent:** 07 June 2010 12:21  
**To:** ethics.hls  
**Subject:** RE: Applying for ethical approval

Dear Stevie,

Ethics approval attached for:

The impact of resilience on posttraumatic growth

Best regards  
Lorraine

*Dr Lorraine McFarland  
Faculty of Health & Life Sciences,  
Health Design & Technology Institute  
Coventry University Technology Park  
Puma Way  
Coventry.  
CV1 2TT*

*Tel 024 7615 8090*



[www.hdti.org.uk](http://www.hdti.org.uk)

---

**From:** Stevie Johnson **On Behalf Of** ethics.hls  
**Sent:** 26 May 2010 12:59  
**To:** Lorraine McFarland  
**Subject:** FW: Applying for ethical approval

<https://pod51002.outlook.com/owa/?ac=Item&t=IPM.Note&id=RgAAAABzc8SQ%2fA...> 14/04/2011

Dear Lorraine,

Would you be willing to review the attached ethics proposal (a review form is attached).

Ideally, I would need a response by Friday 4<sup>th</sup> June 2010.

Can you let me know if you're agreeable, and if this time frame suits.

Many Thanks

Stevie Johnson  
Faculty Administrative Assistant  
Faculty of Health and Life Sciences  
Coventry University  
Tel:0247 679 5985  
Email:[aa6528@coventry.ac.uk](mailto:aa6528@coventry.ac.uk)

---

**From:** Simon Russon  
**Sent:** 24 May 2010 17:46  
**To:** [ethics.hls](mailto:ethics.hls)  
**Subject:** FW: Applying for ethical approval

Hello,

I was wondering if I could check the status of my application, please?

I submitted the enclosed application on 29th March and received the email below the following day.

Are you able to tell me how things are progressing?

Many thanks,

Simon Russon.

---

**From:** Judy White on behalf of [ethics.uni](mailto:ethics.uni)  
**Sent:** Tue 30/03/2010 12:27  
**To:** Simon Russon  
**Subject:** RE: Applying for ethical approval

Dear Simon

Your application has been forwarded to [ethics.hls@coventry.ac.uk](mailto:ethics.hls@coventry.ac.uk) where it will be allocated for review. Your application will be processed within the Faculty using the process attached.

If you have any queries regarding your application, please do so using the email address in the above paragraph.

With kind regards

Judy

<https://pod51002.outlook.com/owa/?ac=Item&t=IPM.Note&id=RgAAAABzc8SQ%2fA...> 14/04/2011

**Judy White**  
**Assistant Registrar, Registry Research Unit**  
Coventry University  
Jaguar Building (JA106)  
Coventry  
CV1 5FB

Tel: 024 7688 7029 Mobile: 07974 98 4522  
Email: [judy.white@coventry.ac.uk](mailto:judy.white@coventry.ac.uk)

---

**From:** Simon Russon  
**Sent:** 29 March 2010 19:15  
**To:** ethics.uni  
**Subject:** Applying for ethical approval  
**Importance:** High

Hello,

My name is Simon Russon and I'm a second year student on the DClinPsy course ran by Coventry University and the University of Warwick. I would like to submit my thesis for ethics approval, please. I have completed the checklist and included an appendix that contains documents relevant to the study. With section 16 of the application in mind, please see below for emails from my clinical supervisor and director of studies.

I hope all of this is satisfactory. Please do not hesitate to get in touch if there is anything I've missed or you would like any further clarification.

Many thanks,

Simon Russon

---

**To whom it may concern,**

I have read this checklist and confirm that it covers all the ethical issues raised by this project fully and frankly. I also confirm that these issues have been discussed with the student (Simon Russon) and will continue to be reviewed in the course of supervision. I am prepared to make the declaration as indicated in the researcher certification checklist in Section 16 (page 16) of the medium to high risk ethics application form.

Yours sincerely

**Tom Patterson**

Dr Tom Patterson  
Lecturer / Practitioner  
Clinical Psychology Doctorate  
Coventry University

<https://pod51002.outlook.com/owa/?ac=Item&t=IPM.Note&id=RgAAAABzc8SQ%2fa...> 14/04/2011

Tel: 024 7688 8328

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Any views or opinions expressed within this e-mail are those of the author and do not necessarily represent those of Coventry University.

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**From:** Eve Knight**Sent:** Wed 10/02/2010 13:22**To:** 'anna\_goodwin@hotmail.com'; 'becky\_clay\_84@yahoo.co.uk'; 'Gail Bellamy (gailbellamy82@yahoo.co.uk)'; 'Hannah Seabrook'; hayley.ford@virgin.net; 'helen peckett'; 'Marianne Durran'; mellywalwyn@googlemail.com; 'mperdikouri@hotmail.com'; robjobeuk@yahoo.co.uk; sandhesi@gmail.com; Simon Russon; 'Sophie Chappell (chappell\_lion@hotmail.com)'; 'Tina Oza (tina\_oza@hotmail.com)'; 'William Morgan (billmorgan66@yahoo.co.uk)'  
**Cc:** Adrian Neal; Camilla Watters; 'Camilla Watters (cwatters@nhs.net)'; David Sanders; Eve Knight; Helen Liebling-Kalifani; Jacky Knibbs; 'Jacky Knibbs'; Sarah Kent; Tom Patterson; Tracey Hayburn  
**Subject:** Coventry Uni ethics forms

Dear all,

If you are submitting to Coventry University ethics and require a signature or email from your "director of studies" then please can you ask your supervisor to do this. If your supervisor is not a member of the course team or Coventry University staff then you will have somebody acting as a co-ordinator of research from the course team, in which case they can sign it.

Regards

Eve

---

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<https://pod51002.outlook.com/owa/?ac=Item&t=IPM.Note&id=RgAAAABzc8SQ%2fA...> 14/04/2011

## Appendix 1.2 Ethics review feedback form

Name of applicant: Simon Russon Faculty/School/Department: .....

Research project title: The impact of resilience on posttraumatic growth

Comments by the reviewer

### 1. Evaluation of the ethics of the proposal:

The proposal outlined in the application – appears satisfactory. Any ethical problems that may arise have been identified and accounted for. Telephone number of the Samaritans is provided to the participant.

### 2. Evaluation of the participant information sheet and consent form:

The PIS comprehensively explains the study. (It may be worth considering whether there is too much information being provided prior to participants completing the questionnaires that may influence their responses. For example: The section -**The possible disadvantages and risks associated with this project?** -Relates to the possible experience of thoughts, feeling and emotions relating to the life experiences they are being asked to consider and could be summarised to refer to these feelings without giving away too much information regarding the expected outcomes of the study, initiating a response bias or causing participants to consider an option that may not otherwise have occurred to them.

**What are the benefits to taking part in this study?** - Could include the benefits of the information to posttraumatic growth research and future paramedic training.)

The consent form is appropriate.

### 3. Recommendation:

(Please indicate as appropriate and advise on any conditions. If there any conditions, the applicant will be required to resubmit his/her application and this will be sent to the same reviewer).

☐ Approved - no conditions attached

☒ Approved with minor conditions (no need to resubmit) See 2 above.  
Suggestions for consideration only.

☐ Conditional upon the following – please use additional sheets if necessary (please re-submit application)

☐ Rejected for the following reason(s) – please use other side if necessary





Further advice/notes - please use other side if necessary

**Name of reviewer: Lorraine McFarland .....**

**Signature: .....**

**Date: 6 June 2010 .....**

## **Appendix 2.1    Participant information leaflet**

experience as a student paramedic. Following this you will be asked to complete questionnaires that measure resilience, posttraumatic growth and social desirability. This should take approximately ten minutes.

### **Do I have to take part?**

No. You are under no obligation to participate in this study. If you begin to take part and then change your mind you can withdraw at any time. If you decide after you have taken part that you no longer wish to be a participant you can withdraw by contacting the principal investigator with your participant number any time until May 2011 (the submission date for this study) and your data will be removed and destroyed. There are no negative consequences to deciding that you do not want to participate in this study.

### **What are the possible disadvantages and risks associated with this project?**

One of the questionnaires used in this study will ask you to recall the most serious incidents you have attended. It is possible that recalling these memories could trigger uncomfortable thoughts or feelings. You are reminded you can withdraw from this study at any time. The principal investigator will be available should you wish to talk to him, ask him any questions or withdraw from the study.

### **What are the benefits to taking part in this study?**

There are two benefits to taking part in this study. The first is that taking part could help you to recognise any positive changes in yourself as a result of attending critical incidents. Participating in this study may lead you to change the way in which you think about the effects of attending critical incidents for the better. The second benefit of this study is that you may find it useful to discover how resilient you are.

Further information about this study will be made available through the debriefing sheet which will be distributed following participation. If you would like to any further information concerning the results of this study please make the principal investigator aware of this and you will be emailed a summary of the results.

### **What if something goes wrong?**

If you decide to participate in this study and something goes wrong you can withdraw at any time. If you decide to withdraw after you have participated please contact the principal investigator with your participant number and your data will be removed and destroyed.

If you would like to make a complaint about how you have been treated by the principal investigator you can talk to him directly or use the Coventry University Complaints Procedure, completing an online form available at: <http://www.coventry.ac.uk/cu/registry/a/2117>

### **Confidentiality & data protection**

All of the data collected in this study will be treated confidentially and in accordance with the principles of the Data Protection Act (1998). All consent forms will be stored separately from the questionnaires in a locked filing cabinet. In order to protect your confidentiality you will only be identifiable through a participant number on the front page of the questionnaire booklet. All of the questionnaires will be stored in a

second locked filing cabinet where they will be kept secure from any unauthorised access, accidental loss or destruction. Data from the questionnaires will be inputted onto a statistical software program and saved in a password protected file to further ensure security. In accordance with the Data Protection Act (1998), after five years all of the information I have provided will be destroyed.

### **What will happen with the results of the study?**

The results from this study will be written up as part of the principal investigator's doctoral thesis. It is also expected that following this the thesis will be re-written and submitted to a peer reviewed journal. In addition, the results of the study may also be presented at an academic conference.

### **Who has reviewed this study?**

This study has been reviewed through the Coventry University Peer Review Process.

### **Further information/Key contact details**

Dr Tom Patterson                      (Research Supervisor) ([t.patterson@coventry.uni.ac.uk](mailto:t.patterson@coventry.uni.ac.uk))  
Simon Russon                              (Principal Investigator) ([russons@coventry.uni.ac.uk](mailto:russons@coventry.uni.ac.uk))

Doctorate Course in Clinical Psychology,  
Coventry University,  
Priory Street,  
Coventry.  
CV1 5FB.

Telephone:                              02476 888 328

## **Appendix 3.1    Consent form**

## **Appendix 4.1    Debrief leaflet**

## **References**

Calhoun, L.G. & Tedeschi, R. G. (2006). *Handbook of posttraumatic growth*. New Jersey: Laurence Erlbaum Associates.

Chan, I.W.S., Lai, J.C.L., & Wong, K.W.N. (2006). Resilience is associated with better recovery in Chinese people diagnosed with coronary heart disease. *Psychology and Health*, 21 (3), 335–349.

Levine, S.Z., Laufer, A., Stein, E., Hamama-Raz, Y., & Solomon, Z. (2009). Examining the relationship between resilience and posttraumatic growth. *Journal of Traumatic Stress*, 22 (4), 282–286.

Paton, D. (2005). Posttraumatic growth in protective services professionals: Individual, cognitive and organizational influences. *Traumatology*, 11 (4), 335-346.

Paton, D., Smith, L., & Violanti, J. (2000). Disaster response: risk, vulnerability and resilience. *Disaster Prevention and Management*, 9 (3), 173-179.

Shakespeare-Finch, J. E. (2007). Building resilience in emergency service personnel through organisational structures. In Proceedings 42nd Annual Australian Psychological Society conference: Making an impact, pp. 362-365, Brisbane.

Shakespeare-Finch, J.E., Smith, S.G., Gow, K.M., Embelton, G., & Baird, L. (2003). The Prevalence of Post-Traumatic Growth in Emergency Ambulance Personnel. *Traumatology*, 9 (1), 58-71.

If you have been negatively affected by participating in this study, you may wish to speak with the principal investigator or contact him or the academic supervisor of this research using the contact details below. Alternatively you may wish to contact the Samaritans 08457 90 90 90 (24 hours a day, seven days a week)

## **Further information/Key contact details**

Dr Tom Patterson (Research Supervisor) ([t.patterson@coventry.uni.ac.uk](mailto:t.patterson@coventry.uni.ac.uk))  
Simon Russon (Principal Investigator) ([russons@coventry.uni.ac.uk](mailto:russons@coventry.uni.ac.uk))

Doctorate Course in Clinical Psychology,  
Coventry University,  
Priory Street,  
Coventry.  
CV1 5FB.

Telephone: 02476 888 328

## Appendix 5.1 The study questionnaires

Participant ID: .....

### Demographic data

Please report the following personal details which will be treated in the strictest confidence, and used solely for the purpose of this study:

**Age:** \_\_\_\_\_ years

**Gender:** Male ☐

Female ☐

**Please indicate your ethnic origin:**

White British ☐

Asian Other ☐

White Asian ☐

White Irish ☐

Black African ☐

Mixed Other ☐

White Other ☐

Black Caribbean ☐

Chinese ☐

Asian Indian ☐

Black Other ☐

Other Ethnic Group  
(Please specify) ☐

Asian Pakistani ☐

White and Black African  
Caribbean ☐

Asian  
Bangladeshi ☐

White and Black African ☐



## **A questionnaire investigating the effects of attending critical incidents**

1. Please describe the **most serious incident** you have attended at work over the past **twelve months**.

**When was it?**

.....

.....

**Where were you?**

.....

.....

**Who were you with?**

.....

.....

**What were you doing?**

.....

.....

2. Using the scale below, **please place a circle around a number between 1 and 7** that you feel best describes your emotional reaction to the above event (1 = the incident did not distress me at all; 7 = the incident distressed me extremely):

**Not at all**

**Extremely**

1      2      3      4      5      6      7

3. **Please estimate the total number of serious incidents** you have attended at work over the past **twelve months**:

.....

4. Using the scale below, **please place a circle around a number between 1 and 7** that you feel best describes the overall emotional impact that attending these serious incidents has had on you (1 = They have not distressed me at all; 7 = they have distressed me extremely):

**Not at all**

**Extremely**

1      2      3      4      5      6      7

## **The Connor-Davidson Resilience Scale** (CD-RISC, Connor & Davidson, 2003)

For each item, circle the appropriate number below that best indicates how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	<b>Not at all true</b>	<b>Rarely true</b>	<b>Sometimes true</b>	<b>Often true</b>	<b>Nearly always true</b>
1. I am able to adapt when changes occur.	0	1	2	3	4
2. I have at least one close and secure relationship that helps me when I am stressed.	0	1	2	3	4
3. When there are no clear solutions to my problems, sometimes fate or God can help.	0	1	2	3	4
4. I can deal with whatever comes my way.	0	1	2	3	4
5. Past successes give me confidence in dealing with new challenges and difficulties.	0	1	2	3	4
6. I try to see the humorous side of things when I am faced with problems.	0	1	2	3	4
7. Having to cope with stress can make me stronger.	0	1	2	3	4
8. I tend to bounce back after illness, injury, or other hardships.	0	1	2	3	4
9. Good or bad, I believe that most things happen for a reason.	0	1	2	3	4
10. I give my best effort no matter what the outcome may be.	0	1	2	3	4
11. I believe I can achieve my goals, even if there are obstacles.	0	1	2	3	4
12. Even when things look hopeless, I don't give up.	0	1	2	3	4
13. During times of stress/crisis, I know where to turn for help.	0	1	2	3	4
14. Under pressure, I stay focused and think clearly.	0	1	2	3	4
15. I prefer to take the lead in solving problems rather than letting others make all the decisions.	0	1	2	3	4
16. I am not easily discouraged by failure.	0	1	2	3	4
17. I think of myself as a strong person when dealing with life's challenges and difficulties.	0	1	2	3	4
18. I can make unpopular or difficult decisions that affect other people, if it is necessary.	0	1	2	3	4
19. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	0	1	2	3	4
20. In dealing with life's problems, sometimes you have to act on a hunch without knowing why.	0	1	2	3	4
21. I have a strong sense of purpose in life.	0	1	2	3	4
22. I feel in control of my life.	0	1	2	3	4
23. I like challenges.	0	1	2	3	4
24. I work to attain my goals no matter what roadblocks I encounter along the way.	0	1	2	3	4
25. I take pride in my achievements.	0	1	2	3	4

## **The Post Traumatic Growth Inventory** **(Tedeschi & Calhoun, 1996)**

Please indicate for each of the following statements the degree to which the change reflected in the question is true in your life as a result of your exposure to serious incidents you have attended during training, circling the appropriate number and using the following scale:

0 = I did not experience this change as a result of attending serious incidents.

1 = I experienced this change to a very small degree as a result of attending serious incidents.

2 = I experienced this change to a small degree as a result of attending serious incidents.

3 = I experienced this change to a moderate degree as a result of attending serious incidents.

4 = I experienced this change to a great degree as a result of attending serious incidents.

5 = I experienced this change to a very great degree as a result of attending serious incidents.

1. I changed my priorities about what is important in life.	0	1	2	3	4	5
2. I have a greater appreciation for the value of my own life.	0	1	2	3	4	5
3. I developed new interests.	0	1	2	3	4	5
4. I have a greater feeling of self-reliance.	0	1	2	3	4	5
5. I have a better understanding of spiritual matters.	0	1	2	3	4	5
6. I more clearly see that I can count on people in times of trouble.	0	1	2	3	4	5
7. I established a new path for my life.	0	1	2	3	4	5
8. I have a greater sense of closeness with others.	0	1	2	3	4	5
9. I am more willing to express my emotions.	0	1	2	3	4	5
10. I know better that I can handle difficulties.	0	1	2	3	4	5
11. I am able to do better things with my life.	0	1	2	3	4	5
12. I am better able to accept the way things work out.	0	1	2	3	4	5
13. I can better appreciate each day.	0	1	2	3	4	5
14. New opportunities are available which wouldn't have been otherwise.	0	1	2	3	4	5
15. I have more compassion for others.	0	1	2	3	4	5
16. I put more effort into my relationships.	0	1	2	3	4	5
17. I am more likely to try to change things which need changing.	0	1	2	3	4	5
18. I have a stronger religious faith.	0	1	2	3	4	5
19. I discovered that I'm stronger than I thought I was.	0	1	2	3	4	5
20. I learned a great deal about how wonderful people are.	0	1	2	3	4	5
21. I better accept needing others.	0	1	2	3	4	5

## **Marlowe-Crowne Social Desirability Scale – Short Form 1**

**(Crowne & Marlowe, 1960; Ballard, 1992)**

Listed below are a number of statements concerning personal attributes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally by circling the appropriate response.

1. I sometimes feel resentful when I don't get my way.	TRUE	FALSE
2. On a few occasions, I have given up doing something because I thought too little of my ability.	TRUE	FALSE
3. There have been times when I felt like rebelling against people in authority even though I knew they were right.	TRUE	FALSE
4. No matter who I'm talking to, I'm always a good listener.	TRUE	FALSE
5. I can remember "playing sick" to get out of something.	TRUE	FALSE
6. There have been occasions when I took advantage of someone.	TRUE	FALSE
7. I'm always willing to admit it when I make a mistake.	TRUE	FALSE
8. I sometimes try to get even rather than forgive and forget.	TRUE	FALSE
9. When I don't know something I don't at all mind admitting it.	TRUE	FALSE
10. I am sometimes irritated by people who ask favours of me.	TRUE	FALSE
11. I have never deliberately said something that hurt someone's feelings.	TRUE	FALSE

## Appendix 5.2 Scoring algorithm for the MCSDS

For each answer the respondent provides that matched the response given above (eg; true=true or false=false) assign a value of 1. For each discordant response (eg; true=false or false=true) assign a value of 0. Total score can range from 10 (when all responses match) to 0 (when no responses match).

1. I sometimes feel resentful when I don't get my way.		FALSE
2. On a few occasions, I have given up doing something because I thought too little of my ability.		FALSE
3. There have been times when I felt like rebelling against people in authority even though I knew they were right.		FALSE
4. No matter who I'm talking to, I'm always a good listener.	TRUE	
5. I can remember "playing sick" to get out of something.		FALSE
6. There have been occasions when I took advantage of someone.		FALSE
7. I'm always willing to admit it when I make a mistake.	TRUE	
8. I sometimes try to get even rather than forgive and forget.		FALSE
9. When I don't know something I don't at all mind admitting it.	TRUE	
10. I am sometimes irritated by people who ask favours of me.		FALSE
11. I have never deliberately said something that hurt someone's feelings.	TRUE	

## Appendix 6.1 Descriptions of the most serious incident

### 1. Medical emergencies (n=50, 44%)

1. Cardiac arrest.
2. Cardiac arrest. 60 yr female.
3. Responding to breathing difficulties.
4. Help maintain airway.
5. Responding to a cardiac arrest.
6. Carrying out a resuscitation on a patient in cardiac arrest.
7. Attending an 8 month old cardiac arrest.
8. Trying to resuscitate them.
9. 15 month old boy in status epilepticus - trying to stop him fitting.
10. Resuscitating a 24 week premature baby who had just been born.
11. Attending to an anaphylactic female in severe respiratory distress.
12. Assisting a patient to ventilate the lungs as they were in cardiac arrest. Airway - LMA, breathing - parac, circulation – adrenaline.
13. Abdominal aortic aneurism resulting in cardiac arrest.
14. Attending a 3-4 year old boy at school in respiratory distress with a tracheotomy in place, having to do brachyostomy due to low SABS and oxygen levels.
15. CPR on a 26 year old male as he was in cardiac arrest.
16. Cardiac arrest, advanced life support
17. Managing the cardiac arrest of 16 year male, family support, CPR, airway management.
18. Details were given as head injury in high street when we arrived. It was a cardiac arrest and advanced life support was commenced.
19. Cardiac arrest. CPR on a 80ish year old patient.
20. With an old woman, seriously ill, unstable.
21. Suctioning, assisting paramedic in fluid administration, vital signs.
22. Applying burns dressings, getting basic obs from pt, reassuring patient.
23. Attending an emergency call to a child not breathing.
24. A resuscitation of a 7year old boy, whom had anaphylactic reactions.
25. Pt cardiac arrest, on arrival it was confirmation of death.
26. Dressing 3rd degree burns full thickness burns to arms, legs and head.
27. I was doing chest compressions to start then I had to cannulate, give fluids and drugs and I also had to defibrillate the patient.
28. Talking to the patient when he arrested in his van. Had to give CPR on road side.
29. Called to person had fallen unknown injuries when we arrived the patient had fallen down stairs and had multiple injuries to head and chest. I helped to take observations, assessment of patient, dressing injuries.
30. Commenced CPR, suction and maintained an open airway.
31. Had just finished another job before receiving this one. Performed BLS for 20 minutes before receiving back up.
32. Performing BLS, evaluating the patient, setting fluids, liaising with police/ fire.
33. Day shift with SCAs - Paediatric respiratory arrest.
34. On a day shift working for SCAs. Called to a 29 year old cardiac arrest.
35. On cover, call came through to a 51 year old female unconscious.
36. Young female head injury.
37. Performed CPR on a paraplegic child.
38. Attending alongside a paediatric arrest.
39. I delivered two babies, twins, first was deformed and dead, second peri arrest.
40. ALS on a patient COPD. Difficulties during the procedure.

41. Assisting with the delivery of a terminated foetus.
42. Called to miscarriage, foetus had been delivered, mother stated 11 weeks pregnant. We removed foetus to waste bag and dealt with bleeding mother. When at A and E showed foetus to nurse it was still alive.
43. Attending to a 9 month old female experiencing ongoing tonic-clonic seizure which did not cease with rectal diazepam (usually works).
44. My first ever cardiac arrest and I was doing CPR on a frail 92 year old female.
45. Anaphylaxis shock 50 year old female.
46. 10 year old girl with meningitis had been anaesthetised, incubated, very severe rash, transfer to paediatric ICU.
47. Assisting the paramedic with CPR.
48. Ventilating a patient who was trying to push the Dr off their chest during CPR.
49. A cardiac arrest on a 60 year old man - I was doing CPR.
50. I was called to a cardiac arrest where I took part in airway management and inserted LMA and did chest compressions on route to hospital and used the defibrillator to shock the patient.

## 2. Road traffic accidents (n = 19, 17%)

1. Trying to stabilise and immobilise a 15 year old boy who had been hit by a car with a head injury.
2. Attending to an RTC.
3. Attending 999 call to road traffic accident - amputated arm.
4. Called to RTC.
5. Attending RTC - Car hit a pedestrian.
6. Attending RTC involving 2 cars and a motorcycle.
7. Car vs pedestrian collision, pedestrian suffered significant injuries.
8. 70 year old male hit by car. I was maintaining patient's airway and stemming bleeding at hand.
9. I was attending a bus driver ran over a cyclist, crushing her,
10. RTC.
11. Car vs motorbike, motorcyclist knocked over by car helping to stabilise motorcyclist, helping doctor.
12. Treating and extracting 4 patients trapped in a car.
13. On shift attending an RTC on bypass near XXXX.
14. Attending an RTC.
15. RTA - second crew.
16. Driving the ambulance and supporting my crewmate responding to a road traffic accident head on collision between two cars with three people trapped.
17. Third manning. At scene helped to shield casualty (who had died) from other motorists seeing her. Supporting other drivers who had witnessed the crash.
18. RTC - male - multiple injuries.
19. Working, RTA Truck vs cyclist. Cyclist trapped under truck, multiple injuries.

## 3. Suicide/ parasuicide (n = 16, 14%)

1. Attending a young male hanging in a park.

2. Hanging - 17 year old male – attending.
3. A cardiac arrest of a 21 year old female, large overdose.
4. Working my crew partner on a London ambulance attending to a 35 yr old male hanging in a drug den.
5. Job was a fall from height - 100 ft my role was to assist doctors on scene.
6. Attending the incident out of me and the colleague. I was attending the patient who had jumped off a 30 ft bridge - attempted suicide.
7. Incident was a traumatic suicide at a private residence.
8. Called to a red call, escaped psychiatric patient who had stabbed themselves in the throat (x4 lacerations). Police in attendance.
9. Called to an attempted suicide.
10. Called to a patient who jumped off a 60 ft bridge.
11. Attending a hanging, a 40 year old male severe airway trauma, needle cricothyrotomy applied.
12. Attending a recognition of life extinct.
13. Female in 20s jumped off building from 13th floor.
14. On station call came through over radio 20 yr old male, traumatic injuries from hanging - still hanging.
15. No intervention DOA, hanging.
16. An elderly lady had purposefully starved herself so she would die, a family member phoned when she found the relative who she hadn't seen in a long time.

4. Violent injury (n = 5, 4%)

1. Providing medical assistance to the victim of an assault.
2. Attending a patient who had been shot in the chest (dead on arrival).
3. Transferring patients from Selly Oak to the new QE hospital. Transferred a soldier critically hurt in Afghanistan.
4. At work picking up army men from airport.
5. Gunshot injury to the face.

5. Emotional support (n = 2, 2%)

1. Reassuring and keeping family calm.
2. Patient was having a mental breakdown due to family abuse. I was trying to calm the patient down.

6. Industrial accident (n = 1, 1%)

1. Treating a man that had his foot cut off by an industrial hedge trimmer.

7. Not reported (n = 19, 18%)

1. Working as a medic.
2. Working a night shift.
3. Working.
4. Paramedic response on a day shift.

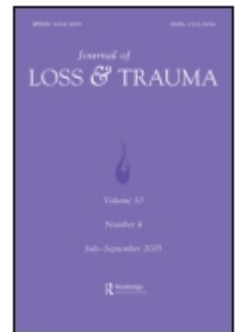


5. Working.
6. Carrying around patient assessment and documented my finding.
7. Responding to a 999 call.
8. On student placement.
9. Assisting a mentor with patient treatment.
10. A flat of an elderly gentleman.
11. Assisting mentor.
12. Assessing the patient, treating appropriately, assisting paramedics.
13. Assisting mentor.
14. Assisting paramedic technician and doctor.
15. Assisting paramedic.
16. Waiting for job.
17. At that time I was driving the ambulance and supporting my crewmate.
18. As the call came in we were on Standby in Oxford.
19. On standby - driving but changed to attend with paramedic.
20. –
21. –

## Appendix 7.1 Instructions to authors: The Journal of Loss and Trauma

### Submission of Manuscripts

Original manuscripts should be submitted to John Harvey, Department of Psychology, University of Iowa, Iowa City, IA 52242-1407; phone (319) 335-2473; fax (319) 335-2799; e-mail: john-harvey@uiowa.edu. Authors are strongly encouraged to submit manuscript files via email attachment. The manuscript should be prepared using MS Word or WordPerfect and should be clearly labeled with the authors' names, file name, and software program. Each manuscript must be accompanied by a statement that it has not been published elsewhere and that it has not been submitted simultaneously for publication else-where. Authors are responsible for obtaining permission to reproduce copyrighted material from other sources and are required to sign an agreement for the transfer of copyright to the publisher. All accepted manuscripts, artwork, and photographs become the property of the publisher.



All parts of the manuscript should be typewritten, double-spaced, with margins of at least one inch on all sides. Number manuscript pages consecutively throughout the paper. All titles should be as brief as possible, 6 to 12 words. Authors should also supply a shortened version of the title suitable for the running head, not exceeding 50 character spaces. Each article should be summarized in an abstract of not more than 100 words. Avoid abbreviations, diagrams, and reference to the text.

Manuscripts, including tables, figures, and references, should be prepared in accordance with the Publication Manual of the American Psychology Association (Fourth Edition, 1994). Copies of the manual can be obtained from the Publication Department, American Psychological Association, 750 First Street NE, Washington, DC 20002-4242; phone (202) 336-5500.

### Illustrations

Illustrations submitted (line drawings, halftones, photos, photomicrographs, etc.) should be clean originals or digital files. Digital files are recommended for highest quality reproduction and should follow these guidelines:

- 300 dpi or higher
- sized to fit on journal page
- EPS, TIFF, or PSD format only
- submitted as separate files, not embedded in text files

### Tables and Figures

Tables and figures should not be embedded in the text, but should be included as separate sheets or files. A short descriptive title should appear above each table with a clear legend and any footnotes suitably identified below. All units must be included. Figures should be completely labeled, taking into account necessary size reduction. Captions should be typed, double-spaced, on a separate sheet. All original figures should be clearly marked in pencil on the reverse side with the number, author's name, and top edge indicated.

**Proofs**

One set of page proofs is sent to the designated author. Proofs should be checked and returned within 48 hours.

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Each corresponding author will receive one copy of the issue in which the article appears. Reprints of individual articles are available for order at the time authors review page proofs. A discount on reprints is available to authors who order before print publication.

## Appendix 7.2 Instructions to authors: Traumatology

### Aims and Scopes

Traumatology welcomes submissions of original articles that focus on innovations in understanding and helping the traumatized. The Journal intends to bring fresh new ideas about the challenges and the opportunities of traumatic events for individuals, groups, families, communities, and cultures. Submissions may be in the form of research reports, reports from the field, innovations in assessment, treatment, or prevention. Reviews of various media are by invitation only.

### General Instructions

All submissions should be sent to <http://mc.manuscriptcentral.com/tmt>. No submissions are accepted by mail or fax. Please prepare manuscripts using the style and standards outlined in the Publication Manual of the American Psychological Association (APA), 5th edition.



### Title Page

The title should be brief and meaningful. The authors' first and last names and affiliations should follow the title. The corresponding author should list his or her institutional affiliation, current address, contact information including telephone number, fax number, and if the manuscript was orally presented at a meeting, the name of the organization, place, and date it was read. Each additional author should supply email or phone number.

### Abstract

An abstract of approximately 125 words should be provided on a separate sheet of paper. This abstract should be factual and should present the reason for the study, the main findings, and the principal conclusions. The abstract should be followed by 6 to 8 key words relating to the article.

### Text

Pages should be numbered consecutively. All abbreviations should be spelled out at first mention. Subheads should be inserted at suitable levels. Style should conform to that adopted by the American Psychological Association.

### Artwork Submissions

Artwork includes charts and graphs, maps, photographs, line art, and tables with 17 or more columns. For electronic art acceptable file formats include the following: TIFF, EPS, JPEG, and PDF. Microsoft application files are acceptable for vector art (line art). For all scanned images line art (black and white) images should be scanned as a bitmap at 900ppi and photos should be scanned as grayscale or CMYK at 300ppi.

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Authors are responsible for correctness and completeness of references. References should be typed double-spaced on a separate sheet of paper. They must be listed sequentially in alphabetical order according to the last name of the first author. References should not include any unpublished observations or personal communications. References should be typed in the style adopted by the American Psychological Association.

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