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Personality, Coping and Posttraumatic Growth in Emergency Ambulance Personnel

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Inherent in emergency service work is a relatively high level of exposure to potentially traumatic experiences. Traditionally, research has examined the negative or pathological effects that trauma may have on individuals, as well as variables that are proposed to influence post-trauma outcomes, for example, personality, coping, organisational and demographic factors. In recent years, empirical post-trauma research has broadened its scope to investigate positive changes that may also occur following the experience of a traumatic event. This study examines personality and coping variables in relation to levels of posttraumatic growth (PTG) in emergency ambulance personnel (N = 526). Correlations revealed that extraversion, openness, agreeableness, conscientiousness, and coping levels significantly relate to perceptions of PTG. Multiple regression analysis demonstrated that the relationship between personality and PTG is largely mediated by levels of coping. Implications of the research include the tailoring of intervention strategies to differing personalities rather than according to the nature of the event itself.

Key Words: trauma, posttraumatic growth, emergency service work, personality, coping, ambulance, paramedic

Over the past twenty years, trauma research has widened its focus from direct survivors of a traumatic event, to others who come to aid the victim (e.g., Everly, 1995; Hyman, 2004; McFarlane, & Yehuda, 1996; Paton & Violanti, 1996). Many antecedent and mediating variables have been examined where the research interest has been in determining who will suffer from the experience of 'occupational' trauma (traumatic events attended to in the course of employment). The nature of the traumatic event, organisational factors, personality dispositions, and coping variables, have commonly been investigated as predictors or correlates of post-trauma deprivation (see McCammon, 1996). In recent years, a few researchers have systematically investigated notions of positive post-trauma changes in individuals, for example: following loss (Tedeschi & Calhoun, 1996), heart surgery (Affleck & Tennen, 1996), sexual assault and cancer (see McMillan, 1999). However, quantitative investigations focusing on positive changes, rather than negative changes, for individuals in emergency service work (ESW) are sparse (see Shakespeare-Finch, Smith, Gow, Embelton & Baird, 2003). Salient variables relating to ESW's post-trauma deprivation, and also to positive post-trauma changes in direct trauma survivors, are investigated in this study. Specifically, dimensions that form the Five-Factor Model (FFM) of personality and levels of coping are examined with respect to their relationship with positive post-trauma changes. In

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this study we adopt the term posttraumatic growth (PTG) to denote positive post-trauma changes (Tedeschi & Calhoun, 1995, 1996).

The Five-Factor Model (FFM) of Personality

Costa and McCrae's Five Factor Model of personality (FFM) is a comprehensive taxonomy of higher order trait characteristics. The FFM is comprised of Extraversion, Neuroticism, Openness, Agreeableness and Conscientiousness dimensions (Costa & McCrae, 1992). Each of these traits accounts for significant variance in scores when investigating positive or negative outcomes following a traumatic event (e.g., Hyer et al., 1994; Tedeschi & Calhoun, 1996).

Neuroticism contrasts emotional stability with maladjustment or instability. It is the most pervasive dimension of personality in terms of a pathogenic post-trauma outcome correlate and as a predictor of adjustment difficulties in dealing with a traumatic or stressful situation (e.g., Casella & Motta, 1990; Watson & Hubbard, 1996). Extraversion is proposed to be the major FFM correlate of positive affect. For example, a positive relationship has been demonstrated between extraversion and positive post-trauma perceptions (Affleck & Tennen, 1996; Tedeschi & Calhoun, 1996). Openness is related to a propensity to employ cognitive strategies. Open individuals enjoy thinking, and seek out situations that require creativity of thought (Edwards, Weary, & Reich, 1998). A significant positive relationship between individuals, scoring highly in openness and measures of PTG (Tedeschi & Calhoun, 1996) and benefit finding (Affleck & Tennen, 1996), has been demonstrated in trauma survivors. Agreeable individuals (contrasted to Antagonistic) display such characteristics as empathy, courtesy, trustworthiness and helpfulness (Edwards, Weary, & Reich, 1998) and expect others to behave in a similar manner. At this stage, it appears that the agreeable individual is more likely to perceive positive changes as a result of experiencing a traumatic event. The last dimension comprising the FFM is conscientiousness. The conscientious individual is characterised by the tendency to be reliable, organised and persistent in the pursuit of goals, despite the attractiveness or otherwise of the task at hand. Higher levels of conscientiousness have been shown to significantly relate to positive changes in the wake of a traumatic event (Tedeschi & Calhoun, 1996) and in the perception of objectively positive life events (Magnus, Diener, Fujita, & Pavot, 1993).

Coping is distinct from the automatic habitual responses that are perhaps measured more appropriately by the FFM dimensions. Coping is a process by which an individual manages the demands and emotions generated by that which is appraised to be stressful (Lazarus, 1999; McCammon, et al., 1988). Strategies include appraisals of a stressful event and bestowing the situation with meaning, as opposed to the global meaning assessed when measuring levels of PTG (Folkman & Tedlie Moskowitz, 2000). The process involves appraisals as to whether a situation is a threat, a challenge, or a loss, and perceptions of what can be done to alter the situation or minimise the threat. Following the initial appraisal of the situation, coping strategies are implemented (Lazarus & Folkman, 1984). As a mediating variable, coping can be considered a transactional process between individuals, the context, and post-trauma outcome.

The Current Study

The variables reviewed provide evidence that personality dimensions have a relationship with individual post-trauma outcomes. The idea that coping resources reflect

stable personality characteristics has also received considerable support (e.g., Lazarus & Folkman, 1984; Park & Folkman, 1997). Therefore, although direct effects appear to exist between personality variables and PTG, it is likely that personality relates to PTG indirectly, and is mediated through various coping processes (Tedeschi, et al., 1998).

It is hypothesised that personality and coping variables will be significantly related to posttraumatic growth; that is, higher levels of extraversion, openness, agreeableness, conscientiousness, and coping, will be significantly, positively correlated with higher levels of PTG. Further, the proposal that personality factors relate indirectly to PTG through coping resources has been raised (e.g., Tedeschi et al., 1998); however, a model depicting this relationship has not been tested in either a direct trauma survivor population or in a population where the focus is on work-related traumatic experiences. Hence, it is hypothesised that personality dimensions (predictor variables) will significantly relate to posttraumatic growth (outcome variable) indirectly, through the frequency of use of adaptive coping resources (mediating variable).

Method

Participants

Participants were 526 operational ambulance officers from Australia. Four hundred and twenty-three were male and 103 were female with ages ranging from 21 to 63 years (M = 39.84, SD = 9.41). The participants had been in the ambulance service for between 1 and 43 years (M = 11.58, SD = 8.17). Most officers who responded to the survey were married or living in de facto relationships (418), 47 participants were divorced, 56 were single and 2 were widowed. As missing data appeared to occur randomly and in very few cases (i.e., less than 1%), those with data missing on a particular scale were simply excluded from the analyses using that measure hence, there are slight variations in reported degrees of freedom. More detail regarding the composition of this service is available elsewhere (Shakespeare-Finch & Scully, 2005).

Procedure

All personnel were mailed an invitation to participate in the project, a consent form, questionnaire and a return envelope. The 526 ambulance officers returning surveys represented 31% of the potential sample.

Instruments

Neuroticism Extraversion Openness-Five Factor Inventory (NEO-FFI). The NEO-FFI is a short form version of the revised NEO Personality Inventory (Costa & McCrae, 1992). The 60-item inventory measures neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Items are scored on a 5 point likert-type response format ranging from 0 (*strongly disagree*) to 4 (s*trongly agree*). Alpha coefficients are reliable, ranging from 0.77 to 0.94 (Costa & McCrae, 1992) and so it was chosen over the full version for reasons of brevity.

Coping Responses in Rescue Workers Inventory (CRRWI). Coping resources were measured with the Coping Responses in Rescue Workers Inventory (CRRWI) (McCammon et al., 1988). The inventory comprises 32 items aimed at assessing four factors: (1) seeking

meaning, (2) regaining mastery through individual action, (3) regaining mastery through interpersonal action, and (4) philosophical self-contemplation. As the factor structure has revealed inconsistent results to date (e.g., Beaton, Murphy, Johnson, Pike, & Corneil, 1999; Shakespeare-Finch, 2003) and factor analysis is beyond the scope of the current paper, the total adaptive coping score will be used in this instance.

Posttraumatic Growth Inventory (PTGI). The PTGI was designed to measure positive changes that an individual may perceive as having occurred following the experience of a traumatic event, the PTGI (Tedeschi & Calhoun, 1996, p. 466) has 21 items that form 5 factors. The factors measure changes in (1) relating to others, (2) new possibilities, (3) personal strength, (4) spiritual changes, and (5) appreciation of life. Results to date have shown the PTGI to be a reliable and valid measure of positive post-trauma changes (Shakespeare-Finch et al., 2003; Smith & Cook, 2004; Tedeschi & Calhoun).

Results

Analyses were performed using the Statistical Package for the Social Sciences. A scrutiny of frequencies, detrended and normal probability plots, scatterplots, Shapiro Wilk's, Levene's, Cochran's, and Box M statistics, revealed no extreme kurtosis or skewness, and assured no breaches of univariate or multivariate linearity, normality, multicollinearity, and homogeneity of variance assumptions. Mahalanobis distance values revealed no significant multivariate outliers.

To ensure demographics did not significantly affect levels of PTG a series of *t*-tests and ANOVA were conducted. One significant difference was found, that is, female officers (M = 54.64; SD = 21.28, range = 0-100) scored more highly on the PTGI than male officers (M = 47.74; SD = 21.45; range = 0-100; t (502) = -2.86, $p < .01$).

Bivariate correlations were used to assess the relationship between personality variables, total coping and PTG, revealing positive significant correlations between extraversion, openness to experience, agreeableness, conscientiousness, and total CRRWI scores, with participants' total scores on the PTGI. The neuroticism dimension did not correlate in either direction with total PTGI scores or total coping levels, but did elicit a very weak significant and negative relationship with Factor 3 (changes in personal strength). Extraversion, openness and conscientiousness were significantly related to all of the PTGI factors and agreeableness correlated with factors 1 and 4 (relating to others and spiritual changes). The coping scores were the most strongly related to all of the PTGI factors. Table 1 presents the correlation coefficients between the FFM dimensions, coping levels, total PTGI scores and all factors of the PTGI.

Coping as a Mediator: Regression Analysis

To validate coping as a mediating variable between personality and PTG, Baron and Kenny's (1986) four-step approach was used. The first regression confirmed a significant relationship between FFM dimensions and PTG, F (5, 500) = 10.58, $p < .001$. The second regression assessed the relationship between personality dispositions and coping, and also elicited a significant result, F (5, 517) = 25.16, $p < .001$. The third and fourth steps of the process were tested with a multiple regression. In this case, the predicted outcome was for coping to significantly relate to PTG, and for personality to be a non-significant addition to the regression equation, thus confirming coping as a full mediator between personality and

Table 1

Correlations Between Personality, Total CRRWI, Total PTGI Scores and PTGI Factors

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness	Coping (CRRWI)
Extraversion	-0.45***					
Openness	-0.15***	0.26***				
Agreeableness	-0.30***	0.29***	0.18***			
Conscientiousness	-0.38***	0.33***	0.01	0.16***		
Total CRRWI Score	0.01	0.30***	0.27***	0.21***	0.16***	
Total PTGI Score	-0.04	0.22***	0.22***	0.14**	0.14**	0.44***
PTGI Factor 1	-0.06	0.22***	0.19***	0.22***	0.10*	0.43***
PTGI Factor 2	-0.03	0.19***	0.26***	0.03	0.11*	0.36***
PTGI Factor 3	-0.11*	0.18***	0.17***	0.08	0.18***	0.27***
PTGI Factor 4	0.05	0.10*	0.11**	0.14**	0.11*	0.37***
PTGI Factor 5	0.03	0.14**	0.12**	0.05	0.10*	0.31***

Notes. *** = $p<.001$, ** = $p<.01$, * = $p<.05$
Factor 1=relating to others, Factor 2=new possibilities, Factor 3=personal strength, Factor 4=spiritual changes, Factor 5=appreciation of life.

PTG. Results revealed that coping significantly predicted PTG, F (1, 503) = 119.34, $p < .001$ and that personality did elicit a significant change to the equation F (1,502) = 5.37, $p < .05$. Further investigation revealed that extraversion was the significant variable accounting for this result (β=.10, p<.05). Therefore, coping was supported in its position as a mediator between FFM personality characteristics and PTG, with the exception of extraversion. That is, extraversion added unique variance to PTGI scores beyond that which was accounted for by levels of adaptive coping.

Discussion

Results largely supported the hypotheses posed. The FFM of personality dimensions and the frequency of using coping resources were found to significantly relate to PTG. These results replicate and extend findings from previous research. For example, extraversion, openness to experience, agreeableness, and conscientiousness dimensions were found to relate to PTG in Tedeschi and Calhoun's participants who were recruited from a more general population (1996). In keeping with previous results, extraversion was the personality dimension that correlated most strongly with total posttraumatic growth scores in the ambulance sample but, openness to experience was also related to PTG at the same level. Further, neuroticism was not significantly correlated with PTG in either direction. Hence, previous trends have been replicated in this sample in that personality variables were found to be related to PTG following the experience of traumatic experience in an emergency service population.

When examining which facets of PTG were related to particular personality domains, extraversion, openness and conscientiousness were related to all elements of the PTGI. Openness to experience and changes in the perception of new possibilities demonstrated the strongest relationship, with extraversion and agreeableness forming the most significant relationships with changes in relating to others.

Adaptive coping was also demonstrated to have a moderate relationship with positive post-trauma changes. In terms of coping and PTGI dimensions, changes in relating to others and in perceptions of new possibilities related most strongly, followed by spiritual changes, a renewed appreciation for life and last, but not least, a developed sense of personal strength. However, the specifics of coping have not been examined in this paper and require future attention in order to inform the discussion of potential intervention and counselling strategies that aim to assist post-trauma adaptation.

Further to adaptive coping being a correlate of PTG, it was shown to mediate the relationship between four of the FFM domains and PTG. The exception to this was extraversion. That is, results demonstrated an indirect pathway to growth through coping for the FFM dimensions, but extraversion accounted for unique variance in PTGI scores demonstrating a direct and indirect pathway to growth.

Applications, Implications and Future Research.

Although results need to be treated with caution, due to factors such as the cross-sectional nature of the research, findings suggest a number of potential applications. For example, Trobst et al. (2000) suggest that intervention procedures may be more effective if tailored for individuals, or classes of individuals, based on personality dispositions. For example, individuals scoring highly in neuroticism may benefit from relaxation training,

while the outgoing Extravert may respond best to offers of social support. Due to their curious and creative nature, individuals scoring highly in openness may benefit from training in imagery or artistic expression. In other words, intervention strategies may be more effective, if they are organised according to individuals' underlying personality dispositions, rather than according to the nature of an event itself (Moos, 2002; Trobst et al., 2000). Literature that claims a personality unique to emergency service personnel does exist (e.g., Mitchell, 1983). However, more recent literature (e.g., Gist & Woodall, 1998; Moran, 1998) suggests that this assumption may be flawed. That is, there may be just as much variability in personality dimensions in emergency services when compared to the general population in services that do not recruit personnel, based in part, on trait measures of personality.

The FFM also assesses the covariation between factors. For example, a high score on the neuroticism factor, combined with a low score on the extraversion component, would be expected to correlate with passive and ineffective forms of coping, whereas individuals who score low on neuroticism, high on extraversion, and high on openness to experience rely on deriving strength from adversity as a style of coping with threat. It may be that the characteristics associated with extraversion may negate the ineffective forms of coping that are usually associated with individuals who score highly on the neuroticism dimension (Watson & Hubbard, 1996). Whether the combination of low levels of neuroticism and higher levels of extraversion and openness is the most favourable profile for the prediction of PTG levels in emergency service workers who have endured a traumatic work-related event, is yet to be determined. This level of analysis is also an area for future research.

As support has been found for a relationship between personality and PTG, coping and PTG, and personality with coping, a further examination of the dimensions of PTG and coping in this population is warranted. Developing a clearer understanding of which personality factors relate to particular coping strategies, and how coping dimensions relate to PTG, may help in the construction of pre-event education and intervention processes such as those described by Trobst (2000).

Concluding Comments

Investigations of PTG, its prevalence, correlates, predictors and dimensions are uncommon, but are gaining rapid momentum. This research adds to the current body of knowledge regarding potential post-trauma outcomes in an emergency service population and provides evidence that personality and coping variables have a role in people's perceptions of their own positive post-traumatic outcomes. The enhancement of individual officer's well-being is beneficial for emergency services in general and the promotion of positivity through pre-event training and specifically designed interventions is an exciting area for future study.

References

Affleck, G., & Tennen, H. (1996). Construing benefits from adversity: Adaptational significance and dispositional underpinnings. *Journal of Personality, 64,* 899-922.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173-1182.

Beaton, R., Murphy, S., Johnson, C., Pike, K., & Corneil, W. (1999). Coping responses and posttraumatic stress symptomatology in urban fire service personnel. *Journal of Traumatic Stress, 12,* 2, 293-308.

Casella, L. & Motta, R. (1990). Comparison of characteristics of Vietnam veterans with and without posttraumatic stress disorder. *Psychological Reports, 67,* 595-605.

Costa, Jr. P. T. & McCrae R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI*). Professional Manual. Florida: Psychological Assessment Resources, Inc.

Edwards, J. A., Weary, G., & Reich, D. A. (1998). Causal uncertainty: factor structure and relation to the Big Five personality factors. *Personality and Social Psychology Bulletin, 24,* 5, 451-472.

Everly, G. S., Jr. (1995). *Innovations in disaster and trauma psychology, volume one: Applications in emergency services and disaster response.* Ellicott City: Chevron.

Folkman, S., & Tedlie Moskowitz, J. (2000). Positive affect and the other side of coping. *American Psychologist, 55,* 6, 647-654.

Gist, R., & Woddall, S. J. (1998). Social science *versus* social movements: The origins and natural history of debriefing. *Australasian Journal of Disaster and Trauma Studies*. http://www.massey.ac.nz/~trauma/issues/1998-1/gist1.htm

Hyer, L., Braswell, L., Albrecht, B., Boyd, S., Boudewyns, P., & Talbert, S. (1994). Relationships of the NEO-PI to personality styles and severity of trauma in chronic PTSD victims. *Journal of Clinical Psychology, 50,* 5, 699-707.

Hyman, O. (2004). Perceived social support and secondary traumatic stress symptoms in emergency responders. *Journal of Traumatic Stress Studies, 17,* 2, 149-156.

Lazarus, R. S. (1999). *Stress and emotion: A new synthesis.* New York: Springer.

Lazarus, R.S., & Folkman, S. (1984). *Stress, appraisal, and coping.* New York: Springer.

Magnus, K., Diener, E., Fujita, F., & Pavot, W. (1993). Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology, 65,* 5, 1046-1053.

McCammon, S. L. (1996). Emergency medical service workers: Occupational stress and traumatic stress. In D. Paton & J. M. Violanti (Eds.). *Traumatic stress in critical occupations: Recognition, consequences and treatment.* (pp. 58-86). Springfield, IL: Charles C. Thomas.

McCammon, S., Durham, T., Jackson Allison, E., & Williamson, J. (1988). Emergency Workers' cognitive appraisal and coping with traumatic events. *Journal of Traumatic Stress, 1,* 3, 353-372.

McFarlane, A.C., & Yehuda, R. (1996). Resilience, vulnerability, and the course of posttraumatic reactions. In B. van der Kolk, A. McFarlane, & L. Weisaeth, (Eds.). *Traumatic stress: The effects of overwhelming experience on mind, body, and society.* (pp. 155-181). New York: Guilford Press.

McMillan, J. C. (1999). Better for it: How people benefit from adversity. *Social work, 44* 5, 455-468.

Mitchell, J. T. (1983). When disaster strikes: The critical incident debriefing process. *Journal of Emergency Medical Service, 8*, 36-39.

Moos, R. H. (2002). The mystery of human context and coping: An unravelling of clues. *American Journal of Community Psychology, 30,* 1, 67 – 82.

Moran, C. (1998). Individual Differences and Debriefing Effectiveness. *Australasian Journal of Disaster and Trauma Studies*. http://www.massey.ac.nz/~trauma/issues/1998-1/moran1.htm

Park, C. L., Cohen, L. H., & Murch, R. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71-105.

Park, C. L., & Folkman, S. (1997). Stability and change in psychosocial resources during caregiving and bereavement in partners of men with AIDS. *Journal of Personality, 65,* 2, 421-447.

Paton, D., &.Violanti, J. (1996). *Traumatic stress in critical occupations; Recognition, consequences and treatment.* Spring Field, IL: Charles C. Thomas.

Shakespeare-Finch, J.E. (2003). Posttraumatic growth in emergency ambulance personnel: The roles of personality and coping. Unpublished PHD thesis, Queensland University of Technology, Brisbane, Australia.

Shakespeare-Finch, J., & Scully, P. (2005). A Multi-method Evaluation of an Emergency Service Employee Assistance Program. *Employee Assistance Quarterly, 19,* 4, 71-91.

Shakespeare-Finch, J., Smith, S., Gow, K., Embelton, G., & Baird, L. (2003). The prevalence of posttraumatic growth in emergency ambulance personnel, *Traumatology, 9,* 1, 58-71.

Smith, S. G. & Cook, S. L. (2004). Are reports of posttraumatic growth positively biased? *Journal of Traumatic Stress, 17,* 4, 353-358.

Tedeschi, R. G., & Calhoun, L. (1995) *Trauma and Transformation: Growing in the aftermath of suffering*. Thousand Oaks, CA: Sage Publications.

Tedeschi, R. G., Park, C. L., & Calhoun, L. (Eds.). (1998). *Posttraumatic Growth: Positive changes in the aftermath of crisis*. Mahwah, NJ: Lawrence Erlbaum Associates.

Tedeschi, R.G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9* (3), 455-471.

Trobst, K. K., Wiggens, J. S., Costa Jr. P. T., Herbst, J. H., McCrae, R. R., & Masters III H. L. (2000). Personality psychology and problem behaviours: HIV risk and the five-factor model. *Journal of Personality, 68*, 6, 1233-1252

Watson, D., & Hubbard, B. (1996). Adaptational style and dispositional structure: Coping in the context of the five-factor model. *Journal of Personality, 64*, 4, 737-774.