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### The role of temperament in posttraumatic growth following death of a loved one

**Abstract:** The study investigates the role of temperament in posttraumatic growth among people who experienced a death of someone close. A group of 74 participants – mostly women (63.5%), aged 21 to 74 years ( $M=38.4$ ;  $SD=15.5$ ), who lost a parent, a child, a spouse or a partner, a sibling or a very close friend completed questionnaires measuring levels of posttraumatic growth (the Posttraumatic Growth Inventory) and temperamental traits (the Formal Characteristics of Behaviour – Temperament Inventory). Results revealed that increased appreciation of life and improved relations to others are the most prevalent areas of posttraumatic growth. Findings suggest that such temperamental traits, as emotional reactivity, and to a lesser extent briskness and endurance play significant role in posttraumatic growth.

**Key words:** Posttraumatic growth, temperament, loss of a loved one

#### Introduction

##### The phenomenon of posttraumatic growth

The most well-known and popular concept of posttraumatic growth was developed by Tedeschi and Calhoun (1996). According to the authors posttraumatic growth applies to positive changes in self-perception, relations with others and appreciation of life, that can emerge as the result of dealing with traumatic experiences. As a result of coping with critical events some people present an increased sense of personal strength and self-efficacy, greater trust in themselves and their own abilities, and also with respect to the future events. Those people notice their increased coping abilities and survival skills in extremely difficult conditions, are able to see new life opportunities, and to set new goals. Many individuals who experienced trauma tend to establish closer relationships with others, discover themselves as being more sensitive and compassionate for others and present a greater tendency to be more open to others. Some of them pay more attention to minor everyday events, and tend to reduce the meaning of important life events. A family, friends and small pleasures of everyday life can be perceived as more important than those, which used to be treated as pivotal (e.g. career). An experience of trauma may also lead to changes in individual's existential (religious) beliefs. People

who experienced a traumatic situation reveal a greater appreciation of their lives. Tedeschi and Calhoun (2007) point out that philosophy of life of people who dealt with a crisis becomes more mature, meaningful and rewarding. They find the strength that allows them to look at their lives from a different perspective and change them for the better.

Tedeschi and Calhoun (1996, 2004) refer posttraumatic growth to the existential approach and assume that posttraumatic growth results from engagement of cognitive processes such as changes in the view of the self and the world involving their deeper understanding and making sense out of what happened. As a result, an experience of loss, through the suffering, is being transformed into an important value. What is more, this deepened understanding of the self and the surrounding reality allows individuals to deal with adversities more effectively in the future. The mechanism underlying PTG is connected with cognitive processes of restructuring information, reconstruction of cognitive schemes, seeking meaning of the event and its importance for one's future functioning (Tedeschi, Calhoun, 1996, 2004, 2007). Tedeschi and Calhoun (2007) assume that posttraumatic growth is not the actual effect of an experienced trauma, but rather the effect of undertaking coping strategies.

It is worth noting that posttraumatic growth is something more than a recovery from a traumatic event.

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However, it does not mean that experiencing traumatic event is something good, desirable or necessary for individual's development or for the occurrence of positive changes.

### **The death of someone close and posttraumatic growth – the role of individual differences**

The death of someone close is a devastating experience leading to various negative outcomes, including intense grief, anxiety, longing, feelings of guilt or depression symptoms (Burton, Haley and Small, 2006, Schulz, Hebert and Boerner, 2008). Moreover, grief related to death of a spouse may increase mortality rates, especially in men, and the rate of myocardial infarction, mainly in parents after the death of a child (Buchi, Morgeli, Schnyder, Jenewein, Hepp, et al., 2007). However, many people also report some positive transitions resulting from bereavement, it is posttraumatic growth (Tedeschi and Calhoun, 2008). This process is related to making sense of loss and plays important role in adjustment following bereavement.

A study reported by Hogan, Greenfield and Schmidt (2001) showed that bereaved individuals experienced an increased sense of posttraumatic growth. Higher levels of positive emotions and spiritual development, and increased levels of personal strength were also found in a study of Kim, Kjervik, Belyea and Choi (2011). Research conducted by Shuchter and Zisook (1993) showed that 42% of the bereaved participants indicated positive changes 2 months after the loss of someone close. Felcyn-Koczevska and Ogińska-Bulik (2012) reported in their study that 33.7% of respondents indicated high level of posttraumatic growth.

Posttraumatic growth was observed in parents who experienced death of their premature baby, especially among the mothers: 78% of mothers and 44% of fathers stated having new priorities about what is important in life (Buchi et al., 2007). Among parents who had lost a child, posttraumatic growth was related to more positive beliefs regarding worthiness of the self and seeing themselves as more characteristically lucky (Engelkemeyer and Marwit, 2008). Increased spirituality, religious beliefs, and benefit-finding i.e. desire to help and compassion for others' suffering was noticed in a study of Lichtenthal, Currier, Neimeyer and Keese (2010).

Some researches indicate for the co-occurrence grief and other negative outcomes following death of a loved one (e.g. posttraumatic stress disorder symptoms) and posttraumatic growth (Cadell and Sullivan, 2006, Schoulte, Sussman, Tallman, Deb, Cornick, et al., 2012), what support the notion of multidimensional response to trauma following death of someone close.

In studies on posttraumatic growth special attention has been paid to individual differences, personality traits, in particular. These differences are responsible for the vulnerability to the exposure to traumatic events and consequences of these events, both positive and negative. Temperament or personality traits may reduce occurrence and the intensity of posttraumatic stress disorder (PTSD) symptoms (Strelau and Zawadzki, 2005). On the other hand they may promote positive changes. Linley and

Joseph (2004) found consistent support for the positive relationship between posttraumatic growth and dimensions of extraversion, openness to experience, agreeableness, conscientiousness.

According to Strelau (1998) – the author of regulative theory of temperament (RTT), temperamental traits are more or less unspecific, rather formal characteristics of a human behaviour, which penetrate all kinds of behaviour, regardless of the content or direction of this behaviour. Their contribution to behaviour is especially evident when individuals are confronted with stressful demands, including participation in traumatic events. In a study conducted by Strelau and Zawadzki (2005) temperamental traits such as emotional reactivity and perseveration were positively related to PTSD, whereas briskness and endurance – negatively. Briskness and endurance act as buffers lowering the effect of trauma-inducing events. In turn, emotional reactivity and perseveration act as augmenters increasing the effect of a trauma. Furthermore, emotional reactivity appeared to be best predictor of the intensity of PTSD. Strelau and Zawadzki (2005) stress, that briskness and endurance, which are related to rather chronically decreased levels of activation, share some common variance with extraversion; whereas emotional reactivity reveals a positive relationship to neuroticism, which in turn is negatively related to posttraumatic growth. To date, there are no studies indicating a role of temperament in development of posttraumatic growth. The aim of this explorative study was to investigate a role of temperament in a development of positive changes following the death of a loved one. The study addresses following research questions:

- What positive changes, if any occur in people who lost someone close?
- Is the relationship between temperament and posttraumatic growth?
- Which dimensions of temperament are predictors of occurrence of positive changes aftermath trauma?

Based on research on temperament and PTSD, one may expect that temperamental traits are also related to posttraumatic growth. It is hypothesised that briskness, endurance and activity are positively related, while emotional reactivity and perseveration, negatively related to posttraumatic growth. However, emotional reactivity is expected to be the strongest predictor.

### **Materials and Method**

84 persons who experienced the death of someone close were recruited by mail solicitation and through an announcement at the University of Lodz (Poland). Majority of the respondents were invited to complete a series of questionnaires at the university, the rest of the respondents completed questionnaires at home and returned them to the university. They were informed of confidentiality and expressed the agreement for participating in research. The eligibility criteria were as follow: The lost person was a closed and loved one (a parent, a spouse, a child, a sibling or

a very close friend). Additionally, in cases of a lost parent, the age of person taking part in the study was not higher than 50 years. The death was sudden, unexpected, and occurred no sooner than 3 months and no longer than 3 years prior to the start of the examination. Taking into account the above, 8 participants did not meet the criteria, and 2 persons did not complete the questionnaires. Therefore, their data were excluded and the analysis was conducted on a sample of 74 participants. The age of respondents ranged from 21 to 74 years ( $M=38.4$ ;  $SD=15.5$ ), and 63.5% of them were women. The majority of the participants had lost a parent – 37.8%. Among remaining participants: 21.6% had lost a child, 18.9% a spouse or a partner, 10.8% a sibling and 10.8% a very close friend.

The following techniques were used in the study: a Polish adaptation of the Posttraumatic Growth Inventory (PTGI), the Formal Characteristics of Behaviour – Temperament Inventory (FCB-TI). The Posttraumatic Growth Inventory (PTGI) developed by Tedeschi and Calhoun (1996) is most frequently used and best-validated questionnaire to assess positive changes aftermath trauma. It consists of 21 items (i.e. “*I changed my priorities about what is important in life*”) rated on a Likert-type scale from 0 (“*I did not experience this change as a result of my crisis*”) to 5 (“*I experienced this change to a very great degree as a result of my crisis*”). Higher scores indicate higher levels of posttraumatic growth. The Polish adaptation of PTGI (Oginska-Bulik and Juczynski, 2010) comprises of the following 4 factors: Factor 1. Changes in self-perception – as a result of an experienced trauma a person notices new opportunities and perceives growth in personal strength; Factor 2. Changes in relating to others – greater sense of relation to others, increased empathy and altruism; Factor 3. Greater appreciation of life – changes in philosophy of life, change of priorities, greater appreciation of everyday life; Factor 4. Spiritual changes – better understanding of spiritual problems and an increase in religiosity. Internal consistency measured by Cronbach’s alpha for the full scale, and test-retest reliability after 2 months are high (0.93; 0.74, respectively).

Temperament was assessed by the Formal Characteristics of Behaviour – Temperament Inventory (FCB-TI) developed by Zawadzki and Strelau (1997). It includes 120 items (i.e. “*If I slept shorter than normally I feel distorted and tired the following day*”) to which a respondent answers YES (1) or NO (0). Higher scores indicate higher levels of a particular temperamental trait. FCB-TI has been proved to be a reliable technique (Cronbach’s alpha from 0.75 to 0.85) and composes of six scales:

- Briskness – tendency to react quickly, to keep in high tempo in performing activities, and to shift easily in response to changes in the surroundings from one behaviour to another;
- Perseveration – tendency to contribute and to repeat behaviour or experience emotions after cessation of a stimuli evoking this behaviour or emotion;

- Sensory Sensitivity – ability to react to sensory stimuli of a low stimulate value;
- Emotional Reactivity – tendency to react intensively to an emotion-generating stimuli, expressed in high emotional sensitivity and in low emotional endurance;
- Endurance – ability to react adequately in situations demanding long-lasting or highly stimulating activity and under intense external stimulation;
- Activity – tendency to undertake behaviours of a highly stimulating value or to supply by means of behaviour strong stimulation from the surroundings.

## Results

### Prevalence of posttraumatic growth and the level of temperamental traits

Before starting calculations the normality of distributions of variables included in the study was checked (for posttraumatic growth:  $d=0,10$ ;  $curtosis=-0,41$ ;  $skewness=0,15$ ), and then in subsequent steps of results analysis of posttraumatic growth level was established, including gender, age and type of loss. Then the relationship between temperamental traits and posttraumatic growth was checked, using correlation coefficients. In the next step regression analysis was conducted to establish which temperamental traits allow to predict posttraumatic growth. Distributions of the results are normal, which authorizes the use of parametric tests. The means and standard deviations for analysed variables are presented in Table 1.

**Table 1. Means and standard deviations of analysed variables**

Variable	<i>M</i>	<i>SD</i>	Min	Max
Posttraumatic growth total	58.86	20.21	1	92
1. Changes in self-perception	21.89	9.96	1	74
2. Changes in relations to others	21.97	7.42	1	41
3. Appreciation of life	9.94	3.39	2	15
4. Spiritual changes	5.05	2.95	0	9
Briskness	13.39	4.61	3	20
Perseveration	12.45	3.57	1	19
Sensory sensitivity	14.75	3.32	4	19
Emotional reactivity	11.58	4.11	4	20
Endurance	8.64	4.58	0	19
Activity	7.62	4.46	0	17

Note. *M*- Mean, *SD* – standard deviations, Min – minimum, Max- maximum

Normative data developed for the Polish version of PTGI (Oginska-Bulik and Juczynski, 2010) indicates that the examined group presented an average level of posttraumatic growth (Sten score = 5). 39.2% of the participants revealed low, 35.1% average and 25.7% high levels of posttraumatic growth. The levels of positive changes in the analysed group ( $M=58.86$ ) were similar to levels obtained by individuals

who experienced other adverse life events, such as a spinal cord injury – ( $M=59.86$ ), mastectomy ( $M=60.44$ ), cardiological surgery ( $M=60.7$ ), or a serious illness of a child ( $M=60.01$ ) (Ogińska-Bulik and Juczynski, 2010).

The levels of changes in particular dimensions of posttraumatic growth were also examined. In this case, the mean of each dimension was divided by a number of items loading each factor. Higher levels of changes were observed in an appreciation of life ( $M=3.31$ ) and in relationships with others ( $M=3.14$ ), than in self-perception ( $M=2.43$ ) ( $t=7.29$   $p<.001$ ;  $t=6.54$   $p<.001$ ) and the spiritual sphere ( $M=2.52$ ;  $t=4.73$   $p<.01$ ).

Levels of temperamental traits were similar to normative data obtained by Zawadzki and Strelau (1997) ( $M=14.30$ ;  $12.63$ ;  $14.79$ ;  $11.72$ ;  $8.63$ ;  $8.87$ , respectively).

Gender was related to the levels of posttraumatic growth. Higher levels of positive changes were observed in women than men ( $M=62.31$ ;  $SD=18.46$  and  $M=52.85$ ;  $SD=21.53$ ;  $t=1.99$   $p<.05$ ). The differences mainly denote changes in relations with others ( $M=23.81$ ;  $SD=7.10$  and  $M=18.77$ ;  $SD=6.99$ ;  $t=2.94$   $p<.01$ ) and an appreciation of life ( $M=10.57$ ;  $SD=3.06$  and  $M=8.85$ ;  $SD=3.70$ ;  $t=2.15$   $p<.05$ ), both significantly higher in women.

The age of participants did not differentiate the levels of posttraumatic growth ( $M=60.34$ ;  $SD=22.49$  for younger and  $M=56.50$ ;  $SD=15.22$  for older participants). A relationship between types of loss and the levels of positive changes was checked using ANOVA variance analysis. Results indicate a relationship between types of loss and the level of posttraumatic growth. Persons who experienced a parent's or sibling's death revealed higher level of positive changes ( $M=64.5$ ,  $SD=19.4$ ,  $M=78.8$ ,  $SD=9.50$ , respectively) compared to individuals who had lost a child ( $M=43.5$ ,  $SD=15.7$ ,  $p<.01$ ). Moreover, a brother's or sister's death ( $M=78.8$ ,  $SD=9.5$ ) seems to lead to the higher level of posttraumatic growth than the death of a close friend ( $M=47.3$ ,  $SD=21.2$ ,  $p<.01$ ). The loss of a child or a very close friend was related to the lowest levels of posttraumatic growth.

## Correlational Analysis

In the next step, Pearson's correlation coefficients were calculated to check the relationship between analysed variables. Data is presented in Table 2.

As shown in Table 2, temperament was poorly associated with posttraumatic growth. Emotional reactivity was negatively correlated with changes in self-perception, whereas briskness and endurance were positively correlated with an appreciation of life. There was no significant relationship between posttraumatic growth and FCB-TI scales.

## Predictors of Posttraumatic Growth

In order to investigate predictors of posttraumatic growth among persons who have lost someone close a series of multiple regression analyses (step-wise) was performed for the total scale of PTGI and for each individual factor of growth. None of temperamental traits appeared the predictor of posttraumatic growth – total. Only for positive changes in self-perception temperament seems to play significant role.

Only emotional reactivity was found a significant predictor of factor 1 of posttraumatic growth, it is changes in self-perceptions – negatively related. However this dimension explains only 8% of the total variance in the dependent variable. The higher level of this trait the lower posttraumatic growth. Temperamental traits do not allow to predict the remained dimensions of posttraumatic growth.

## Discussion

The examined group of persons who experienced a negative life event such as death of someone close is prone to revealing positive changes, although to varying degree. 39.2% of the participants revealed low (score range: 0-53), 35.1% - average (54-72) and 25.7% high level (73-105) of posttraumatic growth. Higher levels of changes occurred in appreciation of life and relations to others, in comparison to changes in self-perception and spiritual sphere. Moreover, none of the participants showed a lack of positive changes aftermath trauma. The results obtained in this study are

**Table 2. Pearson's correlation coefficients between temperament and posttraumatic growth**

Temperamental traits:	PTG total	F.1	F.2.	F.3.	F.4.
Briskness	0.07	0.14	-0.14	0.26*	0.06
Perseveration	-0.09	-0.21	0.05	-0.05	0.07
Sensory sensitivity	0.07	0.09	0.13	-0.12	-0.01
Emotional reactivity	-0.12	-0.27*	0.16	-0.18	-0.10
Endurance	0.16	0.18	0.07	0.25*	0.19
Activity	0.08	0.14	-0.04	0.19	-0.07

Note. F.1. – changes in self-perception; F.2. – changes in relations to others; F.3. – appreciation of life; F.4. – spiritual changes, \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

**Table 3. Predictors of changes in self-perception**

Predictors	Beta	Stand. Error of Beta	B	Stand. Error of B	t	p
Emotional reactivity	-0.32	0.11	-0.77	0.28	-2,72	.01
Intercept			22,96	5,41	4,24	.001

$R=0.32$ ;  $R^2=0.08$

Beta – standardized regression coefficient; B – non-standardized regression coefficient; t – test t value; p – level of significance; R – correlation coefficient;  $R^2$  – coefficient of determination

congruent with data obtained from a group of persons who experienced loss of someone loved in a study of Felcyn-Koczevska & Ogińska-Bulik (2012).

The study showed that temperament was poorly associated with positive changes after death of someone close. Emotional reactivity was negatively correlated with changes in self-perception, while briskness and endurance were positively correlated with appreciation of life ( $p < .05$ ).

Although the study has a cross-sectional character some conclusions can be drawn regarding the casual relationship between temperament and growth. It follows from the concept of temperament, which indicates that temperament are present prior to traumatic event (since birth). As Strelau and Zawadzki (2005) indicate, temperamental traits constitute antecedent conditions that influences the consequences of experienced trauma. It means that both briskness, expressed in tendency to react quickly, to keep in high tempo in performing activities, and endurance, expressed in ability to react adequately in situations demanding long-lasting or highly stimulating activity may increase appreciation of life aftermath trauma following death of someone close.

Both traits, but especially briskness develop on the basis of rather chronic decreased levels of activation, share common variance with extraversion, which is positively related to posttraumatic growth. It is worth noting that briskness also plays essential role in reducing symptoms of PTSD. It seems to be confirmed by results from Strelau and Zawadzki's study (2005), in which briskness was negatively related to the level of PTSD.

In turn, emotional reactivity is negatively related to posttraumatic growth, expressed in positive changes in self-perception. Additionally this temperamental trait appeared the only predictor of changes in self-perception. It means that tendency to react intensively to an emotion-generating stimuli, expressed in high emotional sensitivity and in low emotional endurance decreases the level of posttraumatic growth. Additionally, emotional reactivity is a trait that shares essential variance with neuroticism, that is negatively related to growth after trauma (Linley and Joseph, 2004). Low level of emotional reactivity also allow to predict PTSD symptoms (Oniszczenko, 2010, Strelau and Zawadzki, 2005). It is worth remembering that the majority of the participants were women. In turn, women generally reveal higher emotional reactivity than men.

The poor role of temperament in a process of posttraumatic growth may suggest that occurrence of positive changes following traumatic experiences is rather determined by acquired skills of coping than genetic factors underlying temperament. This would be consistent with results of studies indicating the importance of resiliency in posttraumatic growth following death of someone close (Oginska-Bulik, in press). Also, other individual's resources, such as social support and self-efficacy beliefs seem to be more significant variables in occurrence of positive posttraumatic changes than temperamental traits.

Limitations of the study should be also considered. Firstly, the sample size was small and the participants experienced various types of loss, what could act as a

confounding variable. Secondly, the cross-sectional design of the study cannot fully reveal causality. Moreover, positive changes were assessed using a self-reported questionnaire, therefore the impact of social approval variable on the effect size should be considered. People may have a tendency to make a false claim that the changes occurred. Their declaration may be the effect of imagination, wishful thinking, illusion, or serve to raise self-esteem. In order to increase the objectivity of the assessment of positive changes following trauma it would be useful to incorporate other measurements, such as additional assessments made by someone close to the respondent or as Linley and Joseph (2004) suggest, physiological measures of hormone secretion in response to a traumatic event.

Despite the limitations it is worthy noting that the conducted study delivered new data in the area of positive changes aftermath trauma and their relationship with individual human characteristics, however further studies are required, including both people who have experienced loss of someone close and also other types of trauma. The results can also be used in practice. Caregivers/clinicians should help individuals who suffer from trauma related to death of a loved one, not only to manage emotional distress, but also facilitate a new understanding about goals and life beliefs and to promote positive changes following bereavement. However, it should be remembered that not all individuals experience growth. Encouraging bereaved persons towards seeking positive changes when growth is not present may increase their suffering.

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