POSTTRAUMATIC GROWTH AMONG THE 1999 DÜZCE EARTHQUAKE SURVIVORS

Abstract: The current study aimed to examine posttraumatic growth (PTG) after earthquake victimization. Variables that may be related to PTG were examined by using Model of Life Crises and Personal Growth (Schaefer & Moos, 1992). In order to examine PTG, the roles of demographic variables, event-related variables, environmental factors, system factors, earthquake specific coping, cognitive appraisal factors, and general ways of coping responses factors were examined. One hundred ninety-nine adults (105 females and 94 males with an age range of 18 to 73) were participants of the study. The participants were from Kaynaşlı, Düzce. The participants were selected on the basis of their age, gender, and the type of their houses. They were contacted through home visits. In the result section, the variables related to PTG were presented. As a result of the regression analysis, it was found that being married, perceived social support, well-being, problem-focused coping, and seeking social support coping were significant predictors of the level of PTG. The results of regression analysis also showed that, general problem focused coping was more efficient than earthquake specific active coping after earthquake victimization for the development of PTG. The article was written from the Ph.D. thesis, titled: "Positive outcomes among the 1999 Düzce earthquake survivors: Earthquake preparedness behaviour and posttraumatic growth"

Keywords: disasters, posttraumatic growth, earthquake preparedness behavior, coping, resources.

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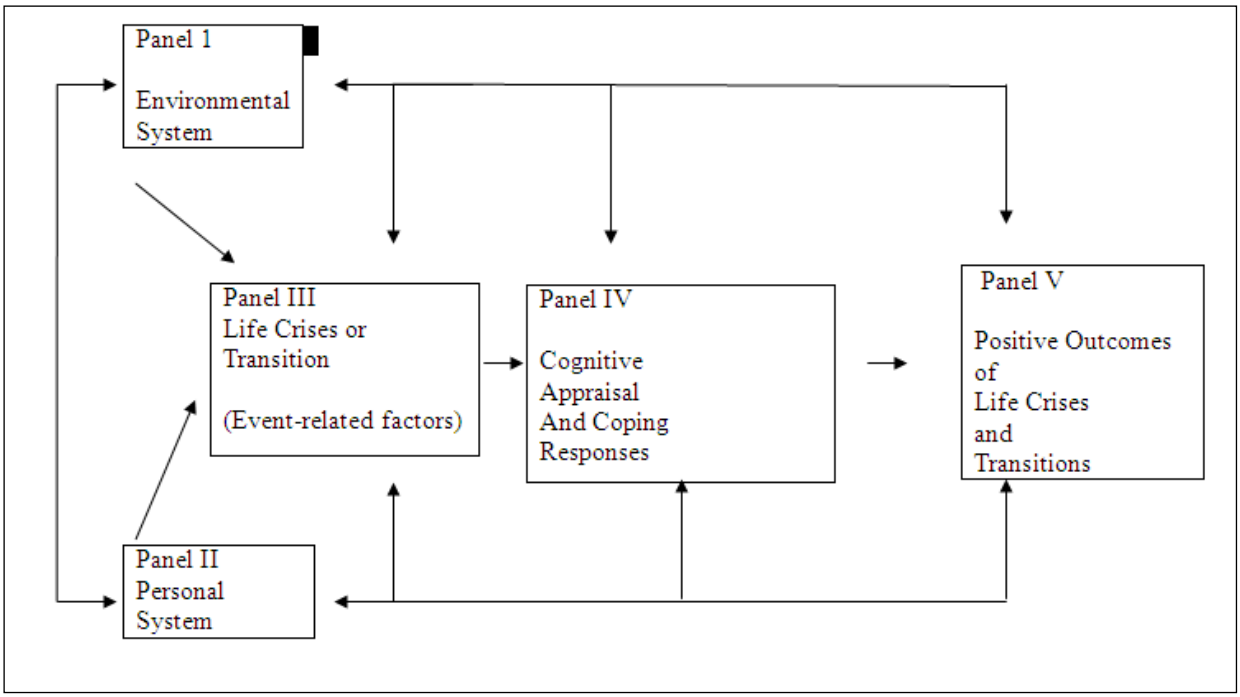
INTRODUCTION

The current study aimed to examine a potential positive outcome of Düzce Earthquake experience, namely posttraumatic growth (PTG). In order to examine PTG, environmental factors, system factors, event related factors, earthquake specific coping and cognitive appraisal factors, and general ways of coping responses factors were examined. Variables that may be related to PTG was examined after earthquake victimization by using a model, which was the Model of Life Crises and Personal Growth (Schaefer & Moos, 1992).

MODEL OF LIFE CRISES AND PERSONAL GROWTH

Schaefer and Moos (1992) incorporated the possible roles of environmental, individual, and event related factors, cognitive processing, and coping in explaining subsequently on growth reactions. They suggested a conceptual framework, namely "life crises and personal growth model" to explain PTG as an unintentional change model.

Figure 1. A conceptual model for understanding positive outcomes of life crises and transitions (Schafer & Moos, 1992).



According to the model, environmental and personal factors influence life crisis and their aftermath, and influence appraisal and coping responses which in turn influences personal growth. Growth is based on enhanced social resources, personal resources, cognitive appraisals, and coping responses. Environmental and personal system factors interact with event related factors (e.g., severity, duration, and timing of a crisis and its scope), which determine cognitive processes and coping and subsequently their aftermath, which in turn affects resources (see Figure 1).

Therefore, what determines the situation after the traumatic experience (Panel III) is the combination of one's personal (Panel II), and environmental (Panel I) resources and how it is appraised and dealt with (Panel 4). Thus, according to the model for PTG (Panel 5), crucial factors are:

Panel I: Environmental System Factors: The resources of this panel are economical situation, social support network, quality of life determinants, income, a positive family environment. In the current study, quality of life,

social support, and income were examined as the factors of Panel I.

Panel II: Personal System Factors: The resources of this panel are increased personal resources such as self-efficacy, spirituality, and past experiences, being married, being older, and having better education are related to facilitation of PTG. In the current study, age, marital status, sex, education, religiousness and well-being were examined as the factors of Panel II.

Panel III: Life Crisis and Transition (event-related factors): In the current study, severity of earthquake experience and posttraumatic stress were examined as the factors of Panel III.

Panel IV: Cognitive Appraisal and Coping Responses Factors: In the current study, earthquake preparedness behavior was examined as earthquake specific coping, and self-efficacy and outcome-efficacy were examined as earthquake specific cognitive appraisals. Problem-Focused Coping, Seeking Social Support, Helplessness Coping and Fatalistic Coping were examined as general coping responses.

Panel V: Positive Outcomes of Life Crisis and Transitions (PTG): In the current study, PTG was used as positive outcome panel.

Consistent with the theory of stress and coping, Schaefer and Moos (1992) suggested that how much the person becomes distressed is affected by his or her characteristics, appraisal of the event, and coping strategies. These three factor groups determine the transition from trauma to PTG. Appraisals and coping strategies play an important role in this transition. With problem-focused coping, the individual evaluates the event in a rational manner and reappraises the event in a more positive way, and takes actions to solve problems. However, with avoidance coping, the individual evaluates the event as unimportant or beyond their control, and chooses to be passive in the face of the traumatic event. Some studies have empirically tested Schaefer and Moos model. The study of Siegel, Schrimshaw and Pretter (2005) showed that negative affect negatively and positive reappraisal coping, and emotional support were positively and significantly related to PTG among the HIV/AIDS patients.

Similar to Schaefer and Moos' model, Conservation of Resources (COR) Theory (Hobfoll, 1989) emphasized that individuals, families, societies try to maintain, foster and protect their resources when exposed to traumatic events. Their purpose is to provide further resource protection by repairing their damage and mobilizing resources. In this process, they don't show only reactive behaviors to the stressors, they also show proactive behaviors. This result may lead to change in their reliance on themselves and on others (Hobfoll, 2001). This is the proposal of the COR theory. In the current study resources and active coping behavior concepts of COR Theory were used to supplement the Schaefer and Moos' Model, which is the basic model of the current study. For this purpose, earthquake preparedness behavior was taken as an active coping behavior and integrated into the cognitive appraisal and coping responses panel of Schaefer and Moos' Model.

In the current study, this active coping behaviour was earthquake preparedness behaviour and so in addition to Schaefer and Moos Model, cognitive appraisal and coping responses panel was divided into two parts. First part include earthquake specific coping, namely earthquake preparedness behaviour and earthquake specific cognitive appraisal namely self-efficacy and outcome-efficacy, it comes from Hobfoll's argument and we added it to the Schaefer and Moos' Model. On the other hand, second part includes general ways of coping namely problem-focused, seeking social support, helplessness and fatalistic coping responses. Similar with Schaefer and Moos' Model, religiousness, coping abilities, coping self-efficacy, and social support are very important personal resources for COR Theory.

The most important addition of Hobfoll (2007) to the model of Schaefer and Moos is "the need for behavioural changes for PTG" argument. In order to experience PTG, survivors should actually engage in something behavioural. According to Hobfoll, if changes in thoughts are not transformed into behavioural changes, PTG can be an illusion. Therefore, behavioural strategies and active coping are important for "real PTG".

Different models emphasize different parts of the growth concept. In the present study, PTG after

victimization was evaluated within the COR model and Schaefer and Moos' Life Crises and Personal Growth Model, hypothesizing that key personal resources which are socio-demoghraphic factors, coping abilities, religiousness and perceived social support influence the PTG after earthquake victimization.

- Empirical Research on Factors Related to Posttraumatic Growth
- Environmental System Factors That Predict Posttraumatic Growth

Some of the environmental system factors, such as quality of life, social support and income were investigated as environmental system factors panel of Schaefer and Moos Life Crisis and Personal Growth Model in the current study. According to study of Tang (2006) after the Southeast Asian Earthquake-Tsunami, frequent support seeking was one of the best predictors of PTG. In order to extend their model on PTG, Calhoun and Tedeschi (2004) studied children who experienced Hurricane Floyd and the subsequent flooding. According to the results of their study, supportive social environment was significantly related to PTG. Furthermore, the amount and type of social support can be important and they can be determined by the severity of the event, prior stressors, and prior personal and social resources (Tedeschi, Park, & Calhoun, 1998). With regards to income, Linley and Joseph (2004) and Hobfoll's (2001) studies examined the relationship between socio-demographic variables and PTG. The results of these studies showed that income is a significant predictor of PTG. Higher income was found to be significantly related with more PTG (Linley & Joseph, 2004). Thus, individuals with higher income as a resource, as proposed by Hobfoll (2001), show more PTG.

Personal system factors that predict posttraumatic growth

With regard to sex and age, women and younger survivors were found to be more likely to report PTG than men and older survivors, respectively (Linely & Joseph, 2004). Milam (2004) found significant contribution of religiosity on PTG among HIV/AIDS patients. Religiousness may have a stress-buffering role by influencing the choice of specific coping strategies (Park, Cohen, & Herb, 1990). Religious activities were one of the many available resources for extending social networks. For example, going to mosque after disaster victimization might be a critical way of interacting with other disaster victims. Social support might be an important mediator in the relationship between religiosity and PTG.

Life crisis or transition (event-related) factors that predict posttraumatic growth

People's responses to crisis are based on some event related factors, such as severity, amount of exposure, proximity and duration (Schaefer & Moos, 1992). Some studies found that more severe exposure is associated with more psychological symptoms and distress (Carr, Lewin, Webster, Hazell, Kenardy, & Carter, 1995; Lonigan, Shannon, Taylor, Finch, & Sallee, 1994). People in Kaynaşlı, study site, experienced two severe earthquakes during a span of 3 months. According to PTG Model of Tedeschi and Calhoun (1998), greater distress is expected to lead to greater posttraumatic growth. According to Tedeschi and Calhoun (1998), the traumatic event can lead to significant damage in the existing schemas. Traumatic stressful events are seismic challenges for the previous schemas by shattering pre-trauma goals, beliefs and coping.

Earthquake specific coping, Cognitive appraisal and general coping responses factors that predict posttraumatic growth

There is no research that directly examine the relationship between earthquake preparedness behaviour, self-efficacy, outcome-efficacy, and PTG. One of the important contributions of the current study is to analyze the relationship between earthquake preparedness behavior and PTG. The development of new coping resources and using problem-focused coping is one of the most important variable related to PTG. The study of Oaksford, Frude, and Cuddihy (2004), after the Lower Limp Amputation, and the study of Tang

(2004) after the Southeast Asian Earthquake-Tsunami showed the predictive power of active coping on posttraumatic psychological growth. As a result, for the post-trauma factors, people using more problem-focused coping handle the trauma more easily and have more improvement (Sheikh, 2004). By using problem focused coping, people evaluate the traumatic event in a more rational way, reappraise the event in a more positive manner, and take some logical actions to solve the trauma related problems.

1999 Marmara and Düzce Earthquakes

The 17 August 1999 Marmara Earthquake was the second worst natural disaster in terms of extent of human loss, after the 1939 Erzincan Earthquake, ever to take place in Turkey. It resulted from the rupture of the North Anatolian fault system with a magnitude of 7.4 at the Richter scale. The earthquake caused 17,127 deaths and 43,953 injuries. After the earthquake, 10,000 houses were totally destroyed and approximately 240,000 houses and work buildings were severely damaged (Government Crisis Center, 1999a). Three months after the 17 August 1999 Marmara Earthquake, another earthquake of 7.2 magnitude occurred near Duzce on November 12, 1999 (Government Crisis Center, 1999b). The earthquake caused 244 deaths and 544 injuries only in Kaynaşlı.

Hypothesis

1. In terms of environmental system factors, higher quality of life, social support, and income will be related to higher PTG.

2. In terms of personal system factors, being older, being married, being female and higher education, religiousness, and well-being will be related to higher PTG.

3. In terms of event-related factors, higher severity of traumatic event, and posttraumatic stress will be related to higher PTG.

4. In terms of earthquake specific coping and cognitive appraisal factors, higher earthquake preparedness behavior, self-efficacy and outcome-efficacy will be related to higher PTG.

5. In terms of general coping responses factors, more problem-focused coping, seeking social support, lower helplessness coping, and fatalistic coping will be related to higher PTG.

Method

Sample

One hundred ninety-nine adults (105 females and 94 males with an age range of 18 to 73) from Kaynaşlı were participants of the study. The participants were selected on the basis of their age, gender, and the type of their houses. They were contacted through home visits. The mean age of the participants was 34.81 (Range: 18-73). The majority of the participants were married (74.9%). Fifty six percent of the sample was employed and 73.9% of the participants reported having a child in their homes. Considering education level, 4% of them (n=8) were illiterate, 38.7% of them (n=77) were primary school graduates, 22.1% of them (n=44) were secondary school graduates, 32.2 % of them (n=64) were high school graduates, and 3% of them (n=6) were university graduates. Most of the sample lived the majority of their lives in Kaynaşlı.

Instruments

The Ways of Coping Questionnaire (WCQ)

Ways of Coping Questionnaire (WCQ) was designed by Lazarus and Folkman in 1985 to examine a broad array of cognitive and behavioral strategies that people engage in when they are in diverse stressful contexts. In the current study, to examine the type and frequency of the coping styles, that 1999 Duzce Earthquake survivors used after victimization, the 42-item WCQ which was obtained from the study of Karanci, Alkan, Akşit, Sucuoğlu, and Balta (1999) was used. Karanci et al., (1999) reported the Cronbach's alpha reliabilities of the five scales as problem solving (r=.75), fatalistic approach (r=.78), helplessness approach (r=.69), seeking social

support (*r*=.59), and escape (*r*=.39). According to data of the present study 4 factors were determined. The first factor was labeled as "problem solving/optimistic coping" (*r*=.81), the second factor was "fatalistic approach" (*r*=.76), the third factor was labeled as "helplessness/self-blaming approach" (*r*=.59) and the fourth factor was labeled as "seeking social support"(*r*=.58). The internal consistency of the whole scale was found to be .84.

POST-TRAUMATIC GROWTH INVENTORY

Post-traumatic Growth Inventory (PTGI) was developed by Tedeschi and Calhoun (1996). In 1996, Tedeschi and Calhoun conducted a study for the reliability of the PTGI in a university sample. The results of this study showed an acceptable construct validity, internal consistency coefficient (.90) and test-retest reliability over a two months' time interval (.71). In 2005, Kılıç made the Turkish translation of PTGI. Although, the original PTGI used 6-point scales, in his translation, Kılıç used 5-point scale with a different wording as compared to the original and he also used a 4-factor solution. Cronbach alpha reliability of the scale was moderate (.73) in the current study.

WORLD HEALTH ORGANIZATION QUALITY OF LIFE SCALE (WHOQQL-BREF)

The WHOQOL-BREF was developed by the World Health Organization (1993) to collect information related to the quality of life of patients. The WHOQOL-BREF instrument has 26 items measuring the following broad domains: physical health, psychological health, social relationships, and environment. Fidaner, Elbi, Fidaner, Yalçın, Eser, Eser, and Göker (1999) adapted the WHOQOL-BREF into Turkish. The study showed that WHOQOL-BREF can be used instead of WHOQOL-100 as a reliable and valid scale. Correlation coefficients ranged between .49 and .78. In the current study WHOQOL-BREF version was used and it's Cronbach's alpha reliability was .88.

REVISED AND TRANSLATED MULILIS-LIPPA EARTHQUAKE PREPAREDNESS SCALE (MLEPS)

The original form of MLEPS has been translated and adapted into Turkish by Şakiroğlu (2005). In the study of Şakiroğlu, preparedness was examined in 5 categories, namely supply, utilities, stabilization, planning, and knowledge. In the original scale subjects were asked to rate the difficulty of preparing for each item to measure the variable of self-efficacy on a 5-point scale, from 1: not at all difficult to 5: extremely difficult. In the Turkish version, subjects were also asked to rate the perceived effectiveness of preparing for each item in order to measure the variable of outcome efficacy. Participants rated both difficulty and effectiveness of preparing on 3 point scales (1=not at all, 2=a little, 3=very much) instead of a 5-point scale (Şakiroğlu, 2005). The internal reliabilities of the preparedness part was (α=.78), difficulty (self-efficacy) part (α=.86) and effectiveness (outcome efficacy) part was (α=. 80) were satisfactory.

RELIGIOUSNESS SCALE (RS)

RS of Yaparel (1996) was used to assess religious resources of the participants. It consists of 31 items rated on 5-point scale. According to Yaparel, RS has 4 subscales, which are religious knowledge, religious feelings, religious behaviours and religious beliefs. Cronbach's alpha reliability of the 10-item RS was .91.

MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT (MSPSS)

MSPSS was developed by Zimet, Dahlen, Zimet, and Forley (1988). It consists of 12 items rated on 7-point scales, to assess perceived adequacy of social support from friends, family and significant others. Eker and Arkar (1995) has adapted MSPSS into Turkish with high Cronbach alphas from different studies ranging between .85 to .91. In the present study, whole scale point was used and it's Cronbach alpha reliabilities was .89.

PSYCHOLOGICAL WELL-BEING SCALE

In order to represent and assess Psychological Well-being, the scale was developed by Ryff (1989). In the present study, the 18-item shortened Psychological Well-being Scale was used. The correlation coefficients between the shortened subscales with the main scales ranged from .70 to .89. The factor analysis confirmed the 6-factor model with a single-second order factor called psychological well-being.

TRAUMATIC STRESS SYMPTOM CHECKLIST (TSSC)

Traumatic Stress Symptom Checklist (TSSC), includes 17 PTSD symptoms and 6 depression symptoms assessed in relation to 'last week'. All measures of TSSC on an 4-point intensity scale (0=not at all bothered; 1=slightly; 2=fairly, 3=very much bothered). The TSSC was validated by Basoglu et. al. (2001). Cronbach's alpha reliability of the TSSC was .83. In the current study Cronbach alpha reliability of the scale was high (.89).

FINDINGS

PREDICTORS OF LEVEL OF POSTTRAUMATIC GROWTH

Hierarchical regression analysis was conducted to examine how well environmental factors, system factors, event related factors, earthquake specific coping and cognitive appraisal factors, and finally coping responses factors of Life Crisis and Personal Growth Model of Schaefer and Moos (1992) predicted PTG. In the analysis, the first block consisted of environmental factors, which were quality of life, social support, and income; and personal system factors namely, age, gender, marital status, education, religiosity, and well-being. Predictors in the second block were event related factors, namely severity of past earthquake experience and posttraumatic stress. The third block consisted of earthquake specific coping, namely earthquake preparedness behaviour and earthquake specific cognitive appraisal factors, namely poor self-efficacy and outcome-efficacy. Predictors in the fourth block were general ways of coping responses factors, which were problem-focused coping, seeking social support coping, helplessness coping and fatalistic coping. Blocks were added to analysis with enter method. The criterion variable (DV) in this analysis was the level of PTG. Table 1 presents the variables that were used in the prediction of PTG, their means, standard deviations, ranges, and in which step they were introduced in the regression analyses. Table 2 presents the standardized regression coefficients *(β)*, R^2, *t* values, *df* and significant *F* change after each block of the regression analyses. Variables resulted in a significant increment in explained variance (R^2) at the end of each block.

The inclusion of all environmental and system factors of Life Crisis and Personal Growth Model of Schaefer and Moos (1992) in the first step resulted in a significant increment in R^2, and explained 28.8% of the variance, $R^2 = .288$, $F(9, 181) = 8.129$, $p < .001$. Social support of environmental system factors; marital status and well-being of personal system factors were significant predictors in the first step. Then, in the second step, event related variables resulted in a significant increment in R^2 and explained 2.7% of the variance, $R^2 = .315$, $F(2, 179) = 3.523$, $p < .05$. In addition to social support, marital status and well-being; severity of earthquake experience of event related variables was significant predictor of PTG in the second step. In the third step, earthquake preparedness behaviour and earthquake specific cognitive appraisal factors resulted in a significant increment in R^2 and explained 3.5% of the variance $R^2 = .350$, $F(3, 176) = 3.210$, $p < .05$. In addition to social support, marital status, well-being and severity of earthquake experience; earthquake preparedness behaviour was a significant predictor of PTG in the third block. Finally in the last step, coping responses variables resulted in a significant increment in R^2 and explained 15.9% of the variance $R^2 = .509$, $F(4, 172) = 13.945$, $p < .001$. In addition to social support, marital status and well-being; problem focused coping and seeking social support coping were significant variables in the last step. While earthquake preparedness behaviour and severity of earthquake experience were significant in the third step, after the inclusion of coping responses in fourth step, they were no longer significant. With all these factors in the model, 50.9% of the variance in the level of PTG was explained. When each single variable

was considered in the third step, being unmarried (t = -4.406, p<.001), social support (t = .4.291, p <.001), well-being (t = 2.917, p <.01), severity of earthquake experience (t = 2.238, p <.05) and earthquake preparedness behaviour (t = 2.343, p <.05) were found to be positively and significantly related to posttraumatic growth. In the last step when coping responses were added to the analysis, being unmarried (t = -3.247, p <.001), social support (t = 3.180, p <.01), well-being (t = 2.238, p <.05), problem-focused coping (t = 5.341, p <.001) and seeking social support coping (t = 3.173, p <.01) were found to be positively and significantly related, but earthquake preparedness behaviour and severity of earthquake experience was not significant after the addition of coping responses.

Table 1. Means and Standard Deviations of Criterion and Predictor Variables Entered in the Three Steps of the Regression Analysis of PTG

	Mean	Std. Deviation	Range
PTG (DV)	3.22	.99	
Block 1 Income(1:<500; 2:500-1000; 3:1000-2000; 4:2000<)	2.20	.70	
Quality of Life	3.51	.49	
Well-Being	3.45	.38	
Age	34.8	12.6	18-73
Gender(1: Male; 2: Female)	1.54	.49	
Marital Status (1: Married,2: Single)	1.27	.48	
Education	12.92	3.58	3-18
Religiousness	4.37	.70	
Social Support	5.27	1.35	
Block 2 Severity of Earthquake Experience (1:No, 2: Yes)	1.60	.49	
PTS	1.27	.44	
Block 3 Earthquake Preparedness Behavior	2.01	.36	
Outcome-Efficacy (1:None, 2:Little, 3: Very)	2.79	.28	
Poor Self-Efficacy (1:None, 2:Little, 3: Very)	1.31	.29	
Block 4 Problem-Focused Coping (1:never, 2:sometimes, 3:always)	2.49	.29	
Seeking Social Support Coping (1:never, 2:sometimes, 3:always)	2.15	.48	
Helplessness Coping (1:never, 2:sometimes, 3:always)	1.93	.37	
Fatalistic Coping (1:never, 2:sometimes, 3:always)	2.15	.37	

Table 2. Predictors of Levels of Posttraumatic Growth

Variables	Block	R^2	*df*	*F* Change	*B*	*t*
	1	.288	9, 181	8.129***		
	2	.315	2, 179	3.523*		
	3	.350	3, 176	3.210*		

	4	.509	4, 172	13.945***		
BLOCK 1 Income					.052	.794
Quality of Life					.035	.487
Well-Being					.209**	2.917
Age					-.119	-1.591
Gender					.049	.776
Marital Status					-.295***	-4.406
Education					-.110	-1.575
Religiousness					.064	.953
Social Support					.288***	4.291
BLOCK 2 PTS					-.076	-1.108
Severity of Earthquake Experience					.148*	2.238
BLOCK 3 Earthquake Preparedness Behavior					.153*	2.343
Outcome-Efficacy					.086	1.278
Poor Self-Efficacy					-.027	-.400
BLOCK 4 Problem-Focused Coping					B .379***	t 5.341
Seeking Social Support Coping					.204**	3.173
Helplessness Coping					.076	1.264
Fatalistic Coping					-.013	-.181
Significant Predictors on Final Block Well-Being					.145*	2.238
Marital Status					-.199***	-3.247
Social Support					.196**	3.180
Problem-Focused Coping					.379***	5.341
Seeking Social Support Coping					.204**	3.173

* $p<.05$; ** $p<.01$; *** $p<.001$

Hierarchical regression analysis results revealed that being married, perceived social support, well-being, problem-focused coping, and seeking social support coping were significant predictors of the level of PTG. The results of regression analysis also showed that, general problem focused coping was more efficient than earthquake specific active coping after earthquake victimization for the development of PTG.

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

This study is a comprehensive study to examine the factors that may be related to PTG after severe disaster victimization. A major strength of the study was that it examined positive outcomes within comprehensive models and thus yielded an understanding of the concepts of earthquake preparedness behaviour, and PTG. Based on the results about the importance of social support and problem-focused coping on positive outcomes after victimization, these variables may be important in guiding education programs for disasters and disaster management. A survivor's ability to return to social life and to their social support networks appeared as important factors. Therefore, they may need to be considered when implementing interventions to maximize PTG after disaster victimization. Furthermore, using problem-focused coping as a resource was important for positive outcomes. In order to help disaster survivors to be more prepared, and to experience more positive outcomes after disaster victimization, it may prove useful to foster problem-focused coping in disaster training programs is recommended.

In order to prevent possible psychological problems before the earthquakes happen, some kind of resource gain before or after the earthquake could be helpful. The result of the current study showed that social factors (perceived social support) and coping (using more problem-focused coping) may increase PTG, so in disaster training programs, ways to increase social (such as community groups), and coping resources might be examined. According to the results of the current study, posttraumatic stress and earthquake preparedness behaviour were found to be negatively and significantly related. Disasters and disaster related distress effected survivors' level of earthquake preparedness behaviour. In Turkey there is a high risk for earthquakes. For this reason understanding the personal, social and psychological factors is very important to reduce the negative effects of disasters. Preparing for a possible earthquake would reduce the number of life and property loss and decreasing the psychological distress caused by the expectations of future earthquake it will also have a protective effect on the mental health of people. As previously mentioned, some studies showed that major earthquakes lead to psychological problems among the Turkish survivors (Başoğlu et al., 2002; Salcioğlu et al., 2002). In order to prevent possible psychological problems before and after the earthquakes happen, some kind of social, personal, environmental resources gain and learning the use of problem-focused coping in stressful situations could be helpful.

The results of the present study offer additional support for The Life Crises and Personal Growth Model of Schafer and Moos (1992) to understand PTG. The effect of various variables on positive outcomes of survivors is examined. These measures can be adjusted to the needs of each group and individuals will need to be treated in sensitive ways. In these treatment models, such as cognitive behavioural therapy, social support might be increased and using problem-focused coping might be emphasized. Professionals may identify coping skills and encourage the use of them for dealing with the difficulties posed by the disaster. They need to be sensitive to positive changes that survivors experience after disaster victimization and may try to facilitate PTG in more favourable perceptions of self by the help of increment in resources, such as problem-focused coping, well-being, and social support.

The effect of traumatic events depends on the individuals and varies from individual to individual so it is a complex situation to understand. Therefore, various factors may contribute to positive, negative, and the mixture of negative and positive experiences (Calhoun & Tedeschi, 2004; Jang, 2006). The current study included a group of variables that may be associated with possible positive outcomes in survivors who experienced a severe disaster. The effect of personal, such as income; and environmental resources, such as social support; earthquake related variables, such as earthquake specific coping; and coping styles such as problem-focused coping on PTG was shown in the present study. All therapists, psychologist and other specialists must carefully examine these variables, and psychological interventions considering these variables may improve the

positive outcomes after a severe disaster experience.

There are some limitations of this study that needs to be addressed. The most important limitation of the present study was its cross-sectional design. Longitudinal research is needed to examine how variables contribute the development of positive outcomes after victimization across time. Another limitation of the current study was small sample size. If the sample size of the present study is increased, larger variances on positive outcomes after victimization may be explained by more variables. As another limitation of the present study, the self-report nature of the questionnaires could be marked, since it creates methodological limitations.

The results, therefore, may be subject to self-report bias. The possible differences between perceived and actual state of PTG might be taken into account in interpreting the results. Furthermore, actual state of PTG need to be assessed by other report, such as the clinicians', another family member's report and socio-economic status indicators. Selection of sample from Kaynaşlı, Turkey, led to problems of the representativeness of this sample for other earthquake exposed areas. The selection of present sample only from Kaynaşlı brings about generality problems of the present findings to earthquake survivors from other socioeconomic groups in regards to gender, income, marital status, education level, and employment status and from the big cities.
In terms of recommendations, although the present study included lots of important factors, future studies can measure some other factors that might influence the positive outcomes, such as self-efficacy (Calhoun & Tedeschi, 1998b; Tedeschi et al., 1998), introversion- extraversion (Sheikh, 2004), optimism (Calhoun & Tedeschi, 1998b), and hopefulness (Tennen & Affleck, 1998).

Finally, apart from experiencing a severe disaster it was possible that many of survivors in the present sample had traumatic events in their lives. As a recommendation for future studies, occurrence of other stressful events might be examined with a traumatic event checklist to determine the relationship between other stressful events for earthquake survivors and positive outcomes. The present study can be replicated with other samples after different types of disaster victmization, such as survivors of flood in order to figure out their psychological distress and PTG levels, and understand relationships between resources, PTG and disaster preparedness. Obtaining findings from different samples exposed to different types of disasters, provide more broad-spectrum support for the Person Relative to Event (PrE) Model (Mulilis & Duval, 1997) and Model of Life Crises and Personal Growth (Schaefer, & Moos, 1992).

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