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Communal Coping and Posttraumatic Growth in a Context of Natural Disasters in Spain, Chile, and Colombia

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2016

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Cross-Cultural Research
2016, Vol. 50(4) 325–355
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DOI: 10.1177/1069397116663857
ccr.sagepub.com


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Abstract

The aim of this study was to identify communal coping strategies that enhance posttraumatic growth of individuals, communities, and societies in the context of natural disasters. Participants were 540 people affected by floods in Colombia and by earthquakes in Spain and Chile. Posttraumatic growth was assessed at individual, community, and society levels. Direct and indirect relationships between trauma intensity and posttraumatic growth were analyzed to identify and evaluate the mediating role played by communal coping strategies. Growth and communal coping were reported in all nations, but means for posttraumatic growth at all three levels and

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communal coping were higher in the relatively more collectivistic countries, Colombia and Chile, than in the relatively more individualistic Spain. Spiritual coping was more frequent in the two Latin American nations, but it also predicted growth even in more secularized Spain. Social support was similar in Spain and Chile, and higher in Colombia, and played a more important mediating role in Spain. Globally, our results confirmed that communal coping strategies and participation in collective gatherings are antecedent of posttraumatic growth not only at individual but also at communal level and in different cultural contexts.

Keywords

communal coping, posttraumatic growth, natural disasters, community psychology, social support, spiritual coping

Introduction

Effects of natural disasters are strongly shaped by the socio-economic conditions and culture of the affected country (McFarlane & Williams, 2012; Neria, Nandi, & Galea, 2008). In psychosocial terms, disasters require governmental and community responses to mitigate its potential negative effect, especially on vulnerable people (Bonanno, Brewin, Kaniasty, & La Greca, 2010). This is why it is important to examine community dynamics and culturally rooted practices that promote positive responses during and after disasters as criteria for both analysis and intervention.

Natural disasters affect a community or group, and previous human actions or omissions exacerbate or mitigate their effects (e.g., building houses close to rivers or other high-risk zones; prevention programs). In addition, disasters usually have immediate consequences (e.g., loss of human life, destruction on a massive scale), short- and medium-term threats (e.g., seismic aftershocks, tsunami) and long-term psychological consequences, all of which prompt specific behaviors. Some short- and long-term reactions will focus on negative aspects, such as the feeling of being a victim of events or situations of violence related to threats and crime (e.g., the possibility of robberies, looting, and street violence); whereas others will more likely be associated with actions of solidarity and help (Drury & Olson, 1998). Moreover, given that the needs engendered by disasters are urgent, natural disasters usually provoke a response from the government and authorities. A slow or late response from the government may predict posttraumatic stress in certain populations (Rhodes & Tran, 2012).

Trauma usually is accompanied by some social coping. High levels of direct exposure to trauma have been associated with seeking social support from friends, family, and/or the government, and implementing this strategy was found to result in a more positive adaptation to the disaster situation (Tang, 2006). Collective responses as communal coping and participation in collective ritualized activities are also common among people exposed to climatic and environmental disasters (Steg & Sievers, 2000) and were found to reduce the impact of trauma (Villagrán, Reyes, Włodarczyk, & Páez, 2014; Włodarczyk et al., 2016). Therefore, because of the importance of mobilizing social relations when coping with natural disasters, we will focus not only on coping strategies related to the extensive use of social support but also on more group-oriented behaviors, which can be considered communal coping.

Communal Coping Definition

Coping is defined as the efforts or strategies invoked to manage or master stress to reduce the stressor's negative impact on well-being (Pearlin & Schooler, 1978). Originally, coping was studied almost exclusively from an individualistic perspective (Lazarus & Folkman, 1984). However, contrary to much of the existing research, individuals do not process stress alone. In recent years, research into both the impact of stressors on couples and families, and the explication of the social context of stress and coping has included the concept of coping as a social phenomenon (Hobfoll & Spielberger, 1992). From a social support perspective, the use of social resources may foster stress resistance and produce favorable coping outcomes (Hobfoll & Lerman, 1989). However, the social dynamics of coping extend beyond the simple notion of social support where one person provides help to others. *Communal coping is defined as a process in which a stressor perceived as "our" issue is substantively appraised and acted upon within a group or community* (Lyons, Mickelson, Sullivan, & Coyne, 1998).

Communal coping is composed of strategies employed by a group to solve a problem in which said group is involved, and thus reduce stress. First of all, the group or community must perceive itself as an entity, and when something problematic occurs, regardless of whether or not the stressor produces similar consequences for all, communal coping involves thinking and acting as if the stressor were shared. One or more individuals must perceive the stressor as "our" problem (social appraisal) versus "my" or "your" problem (individualistic appraisal) and activate a process of shared or collaborative coping, including some form of communication about the details of the circumstance and the meaning of the situation. Through shared experience and communication that creates a common appraisal, the belief is developed that

joining together to deal with a particular problem would be beneficial, necessary, and expected.

The implementation of communal coping strategies that aim to reduce the negative impact of traumatic experience can lead to posttraumatic growth and may subsequently increase well-being. Several studies have confirmed that communal coping is significantly associated with lower levels of psychological distress (Koehly et al., 2008; Hobfoll, Schröder, Wells & Malek, 2002) and better recovery and increased well-being (Hobfoll et al., 2008) in the context of natural disasters and traumatic events that affect families and communities. These findings are consistent with the assumption that in situations of anxiety and threat, people experience a strong urge to affiliate with others to compare their condition in a social and emotional way and find some kind of meaning in the experience (Schachter, 1959). A number of studies have also shown the benefits of strong community ties that foster resilience in individuals, families, and communities, and facilitate recovery from disasters (for a review, see Bonanno et al., 2010). In addition, community-based interventions regularly include components that encourage community cohesion (e.g., Foa et al., 2005).

Posttraumatic Growth, Culture, and Natural Disasters

Several studies confirmed the important role of asking for and receiving social support as factors contributing to posttraumatic growth (Helgeson, Reynolds, & Tomich, 2006; Prati & Pietrantonio, 2009; Tedeschi & Calhoun, 2004). Effective responses to natural disasters typically require institutional, cultural, and collective engagement. In a study about the effects of Hurricane Katrina, greater religious involvement—which typically fosters increased psychosocial resources—was found to be related to posttraumatic growth (Chan & Rhodes, 2012). Similarly, in the context of the earthquake in Chile, religious coping, social support, and subjective severity predicted posttraumatic growth (García, Páez-Rovira, Zurtia, Martel, & Reyes, 2014). Rhodes and Tran (2012) pointed out that a positive assessment of the government response favored community recovery and were also associated with posttraumatic growth. There is thus interest in identifying what specific aspects of community dynamics can be defined as learned resources which promote posttraumatic growth in the long run. Moreover, we believe it is important to explore other dimensions of growth, such as the perception of benefits at both a communal and a societal level (Poulin, Silver, Gil-Rivas, Holman, & McIntosh, 2009).

A broader definition of posttraumatic growth, which includes the dimensions outlined above, may help foster the integration of different cultural and collective manifestations that emerge in response to disasters. When cultures

that emphasize collectivist values are exposed to trauma, we expect growth to be associated with increased group cohesion and the promotion of political engagement. In this sense, it has been found that, in aftermath of an earthquake, people do indeed use several communal coping strategies such as, for example, distraction at a community level involving organized activities such as eating and drinking together (Smithe et al., 2014; Villagrán, Reyes, Włodarczyk, & Páez, 2014). Other strategies are linked to the search for understanding through religion (Chan & Rhodes, 2012) and searching for and giving social support (Salloum & Lewis, 2010; Smithe et al., 2014). Thus, some authors have found that the reconstruction of social relations, a sense of belonging and a social identity based on values such as solidarity and community cohesion can help counter the effects of a disaster (Lykes, Martín Beristain, & Cabrera, 2007). Although, it is also important to consider that cultural tightness is associated with relatively greater exposure to collective trauma such as natural disasters (Gelfand et al., 2011). Therefore, currently used concepts of collectivism and individualism may seem to be too abstract and not always accurately depict specificities and nuances that are important and that make a difference to a given community.

The above considerations highlight the need to explore collective and cultural aspects that may foster posttraumatic growth. A comparison of reported posttraumatic growth showed, in general, higher scores in collectivistic and traditional cultures such as Guatemala and Rwanda, than in individualistic cultures such as the United States and Spain, probably due to the stoic ethos and religious background of the former (Vázquez & Páez, 2011). However, it should be noted that previous comparisons were drawn using normative response options and non-representative samples. This study aims to overcome this problem by comparing similar samples of disaster-affected people. We expect to find higher reported levels of posttraumatic growth, specifically collective growth, in collectivistic cultures. Moreover, because Latin American cultures emphasize the expression and social sharing of positive emotions and cognitions (the so-called “simpatico” culture), we expect that this positive bias will be strong in the case of Chile and Colombia. Latin America scores higher for well-being than its social factors predict, whereas the opposite is true for East Asia, reflecting a family-oriented, positive social life in Latin American countries in comparison with Asian collectivism (Helliwell, Huang, & Wang, 2015).

Cultural Differences and Coping Strategies

Coping strategies may be influenced by culturally based worldviews, values, and practices, as well as the ability to modify fundamental assumptions that

are affected by culture and rooted in aspects of collectivism (see Kuo, 2013; Wong & Wong, 2006). The coping behaviors and strategies adopted by individuals from more collectivistic cultures, such as African, Asian, and Latin American countries, tend to place primary importance on group loyalty, duties, norms, and relationships, and tend to see others as a part of the self (i.e., they possess a high group dependent self-construal; see Gelfand et al., 2011). Moreover, more traditional values are associated with religious coping and participation in collective rituals. In this vein, members of collectivistic cultures may place greater importance on collective or communal coping strategies or practices, such as requesting and receiving help and information from friends, family, and/or government; social sharing; and expressing a range of emotions or participation in rituals and spiritual practices (Cross, 1995; Moore & Constantine, 2005; Rhodes & Tran, 2012; Tang, 2006) when they experience problems. However, as found by Taylor, Welch, Kim, and Sherman (2007), Asians and Asian Americans resist seeking social support through concern over shattering relatives' well-being and benefit more from implicit social support, focusing on valued social groups and maintaining in-group harmony. European Americans, on the contrary, are more likely to use explicit social support based on direct interactions and asking for emotional support, even if this upsets others (Taylor et al., 2007). In general, people from more individualistic cultures tend to value uniqueness and voluntary relationships with others (Constantine, Gainor, Ahluwalia, & Berkel, 2003; Kuo, 2011). The direct coping strategies commonly used in Western culture include assertive self-disclosure, expressing one's own thoughts, confronting others, and asking for help (Lucas, 2002). Finally, despite growing empirical evidence of the salience of collective coping strategies among Asians or Asian Americans/Canadians and African Americans/Canadians, little has been done to date to examine coping behaviors among other cultural groups, such as Latin Americans, Pacific Islanders, or Muslims (Kuo, 2013). Furthermore, it is important to remark that differences in the use of social support were found when collectivistic Asians were compared with North Americans (Taylor et al., 2007). Also, as mentioned earlier, Latin American collectivism is characterized by a higher level of interaction and social sharing of positive emotions, which may mitigate this supposedly less frequent seeking of social support (Helliwell et al., 2015; Vázquez & Páez, 2011).

It has been widely shown that highly intense and negative emotional response might result in a positive reappraisal when the traumatic event is strong enough to challenge the basic beliefs of the victim (see García, Cova, & Reyes, 2013; Tedeschi & Calhoun, 1996, 2004; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012; Vázquez et al., 2008). Therefore, we expected perceived intensity of traumatic experience to be associated with communal

coping which in turn increases posttraumatic growth. We hypothesized that the relatively more collectivistic cultures (Chile and Colombia) would report more posttraumatic growth, particularly communal and societal; more communal coping by traditional religious rituals; and less coping by social support than the relatively more individualistic Spanish culture. We also expected to find that spiritual rituals play a more important meditating role and social support a less important role in collectivistic cultures.

The Present Study

In this sense, the purpose of this research was to analyze in more detail the direct and mediational associations between trauma intensity, communal coping strategies, and individual, communal, and societal posttraumatic growth in three different samples exposed to natural disasters (earthquake in Spain and Chile, and floods in Colombia). Specifically, first, in Hypothesis 1, we predicted that positive communal coping strategies would mediate the association between intensity of trauma and posttraumatic growth, with the effect of trauma intensity on posttraumatic growth weakening with increased reliance on positive communal coping strategies. Second, Hypothesis 2, we expected social support to play a more important mediating role in individualistic and spiritual rituals in collectivistic cultures, respectively. Third, Hypothesis 3, we expected a higher frequency of spiritual coping strategies and a lower level of social support communal coping strategies in collectivistic cultures, as well as, Hypothesis 4, lower level of individual, communal, and societal posttraumatic growth in the moderately individualistic Spanish culture, in comparison with the moderately collectivistic Chilean and Colombian cultures. It is important to consider that those later, despite not evidencing strong collectivistic traits, are nevertheless Latin American nations which attach great importance to extended family links, duties, and rights (Hofstede, 2001; Schwartz, 1990).

Study I: Earthquake—Lorca (Spain)

Method

Participants. Participants were 92 people directly affected by the consequences of an earthquake in Lorca (Spain). The sample comprised 62% women and 38% men, aged between 19 and 70 ($M = 41.88$, $SD = 13.54$).

Procedure. The 2011 Lorca earthquake of moderate magnitude—with a moment magnitude scale of 5.1—caused significant localized damage in the Region of Murcia, Spain, and affected around 10,000 people. Participants

were volunteers contacted directly in the affected area during the last few months of 2012 (around 1½ years after the disaster) by psychologists from Lorca's emergency center and asked whether they would be willing to participate in the study. Accessibility sampling considering balancing by sex and socio-economic status was used; confidentiality of participant data was guaranteed by an informed consent.

Measurements

Trauma intensity. The emotional impact of the traumatic episode was assessed by a single item (see García et al., 2013; García & Włodarczyk, 2016): "Overall, how stressful or traumatic was the earthquake-tsunami situation for you?" The response scale was from 1 (*nothing*) to 7 (*a lot*).

Communal coping (CC) and participation in collective gatherings. To measure the frequency of use of different coping strategies, we used previously validated Communal Coping Scale (Villagrán et al., 2014; Włodarczyk et al., 2016) that identifies five communal coping dimensions: distraction or redeployment of attention; regulated emotional expression; positive reappraisal; emotional or informational, and altruistic social support; and self-control or inhibition and group isolation. In addition, we included two more macrosocial strategies as participation in collective gatherings to measure social mobilizations (participation in demonstrations and collective secular rituals) and spiritual rituals. We chose these items on the basis of the results of a previous empirical study which confirmed structural and construct validity of the scale (Włodarczyk et al., 2016). Preliminary confirmatory factor analyses (CFAs) performed with the data used in the present study supported the expected seven-factor solution; all the estimated parameters of the factor structure were statistically significant. Importantly, all estimated factor loadings were more than .50 (ranged from .51 to .84). Therefore, we concluded that communal and macrosocial coping strategies are different, although correlated, concepts. In the next step, we computed composite indexes for each strategy used as a mediating variable in the present study by dividing the sum of the items for each subscale by the number of items. Respondents indicated the extent to which they used communal coping strategies to cope with the effects of the traumatic experience on a standard 4-point Likert-type scale ranging from 0 (*does not apply or not used*) to 3 (*used a great deal*). The psychometric properties of the seven-dimensional scale show that the internal consistency of the dimensions was acceptable. Cronbach's alpha ranged from .59 to .80 in the Spanish sample; from .47 to .76 in the Chilean sample and .41 to .86 in the Colombian sample (see Table 4). Although the alpha value of the Self-Control or Inhibition and Group Isolation subscale, and the alpha value of Spiritual

Rituals and Social Mobilization subscales in case of Colombian sample were rather low, it can be considered acceptable, given the number of items representing those subscales and the scarce amount of research carried out with it.

Individual and collective posttraumatic growth scale. This 20-item scale was used to measure the posttraumatic growth prompted by a traumatic event at an individual, communal, and societal level. Ten items corresponding to the Posttraumatic Growth Inventory–Short Form (Cann et al., 2010) were used to assess individual growth. To evaluate the collective aspects of posttraumatic growth, we added five items to assess communal growth and another five items to measure positive changes in cultural values in response to a collective catastrophe. These items were previously used by Rimé, Páez, Basabe, and Martínez (2010), showing satisfactory reliability. The items used to assess societal growth were inspired by two of the main aspects of a culture of peace as proposed by United Nations Educational, Scientific and Cultural Organization (UNESCO; 2000). Participants were asked to indicate the extent to which they perceived positive changes as the result of the traumatic experience. Response options ranged from 0 (*no change at all*) to 5 (*important change*). The scale was found to have a satisfactory reliability level, with a Cronbach's alpha of .86 for individual posttraumatic growth, .80 for communal posttraumatic growth, and .87 for societal posttraumatic growth. Correlations between these variables are captured in Table 1.

Statistical Analysis

The present study used descriptive statistics, variance analysis, and correlation analysis. All tests were two-tailed and significance was set at .05 and all data were analyzed controlling for age and gender. All statistical procedures were completed using SPSS 20.0. Multiple mediation analyses were the principal data analysis technique used to contrast direct associations between trauma intensity and individual, communal, and societal posttraumatic growth, and the mediating role of communal coping strategies. We used the SPSS macro PROCESS (Hayes & Preacher, 2013) for bootstrapping indirect effects. This macro provides indirect effect estimates for multiple mediators, standard errors (*SEs*), and the confidence intervals (*CI*s) derived from the bootstrap distribution (Hayes & Preacher, 2013).

Results

First, a bivariate correlation analysis was conducted to analyze the relationship between all the study variables (see Table 1). The correlations revealed

Table 1. Correlations Between Trauma Intensity, Communal Coping Strategies, and PTG in Spain ($n = 92$).

	Communal coping strategies							Posttraumatic growth			
	Trauma intensity	Social mobilization	Spiritual rites	Distraction	Emotional expression	Positive reappraisal	Social support	Self-control or inhibition	Individual	Communal	Societal
Trauma intensity	1										
Social mobilization	.127	1									
Spiritual rites	.336**	.378**	1								
Distraction	.038	.595**	.408**	1							
Emotional expression	.183*	.470**	.399**	.664**	1						
Positive reappraisal	.170	.463**	.328**	.560**	.507**	1					
Social support	.232*	.475**	.380**	.511**	.586**	.381**	1				
Self-control or inhibition	.119	.429**	.365**	.438**	.190*	.184*	.206*	1			
Individual	.255**	.347**	.507**	.488**	.329**	.515**	.415**	.221*	1		
Communal	.287**	.271**	.411**	.343**	.281**	.282**	.446**	.199*	.653**	1	
Societal	.043	.378**	.254**	.512**	.282**	.291**	.316**	.402**	.575**	.569**	1

Note. PTG = posttraumatic growth.

**Correlation is significant at .01 (one-tailed).

that trauma intensity was positively related to individual and communal posttraumatic growth, whereas in the case of societal posttraumatic growth, the correlation coefficient did not reach significance. Furthermore, correlations between all communal coping strategies were positive and ranged from moderate to high. The results indicated a similar pattern of association between all communal coping strategies and the three domains of posttraumatic growth.

In the next step, mediation analyses were conducted taking the different domains of posttraumatic growth as dependent variables. In the first analysis, individual posttraumatic growth was the predicted variable. Trauma intensity, spiritual rituals, distraction, and reappraisal were positively associated with individual posttraumatic growth and emotional expression presented a negative association as indicated by the significant unstandardized regression coefficients shown in Figure 1a. Furthermore, the results of the analysis indicate that participation in spiritual rituals partially mediated the effect of trauma intensity on the development of individual posttraumatic growth ($B = .10$, $SE = .04$, $CI [.03, .20]$).

As shown in Figure 1b, trauma intensity, spiritual rituals, and social support were found to be significant predictors of communal posttraumatic growth. In this case, participation in spiritual rituals and social support totally mediated the relationship between trauma intensity and communal posttraumatic growth. Significant indirect effects of trauma intensity on communal posttraumatic growth were generated through spiritual rituals ($B = .07$, $SE = .04$, $CI [.01, .17]$) and social support ($B = .07$, $SE = .04$, $CI [.01, .19]$). Finally, no mediating effects were found for societal posttraumatic growth. As shown in Figure 1c, when the rest of the variables included in the equation were controlled, distraction was positively associated with societal posttraumatic growth.

Study 2: Earthquake—Concepción (Chile)

Method

Participants. Participants were 332 students from the University of Concepción and the University of San Sebastian. All were directly exposed to the devastating impact of the earthquake which occurred in Chile on February 27, 2010, as they were residents of the Bío Bío region which was the area most severely affected by the catastrophe. The sample comprised 225 women and 103 men, aged between 18 and 30 ($M = 19.82$, $SD = 1.95$).

Procedure. Accessibility sampling was used. Having previously talked to random lecturers and obtained their consent, questionnaires were distributed

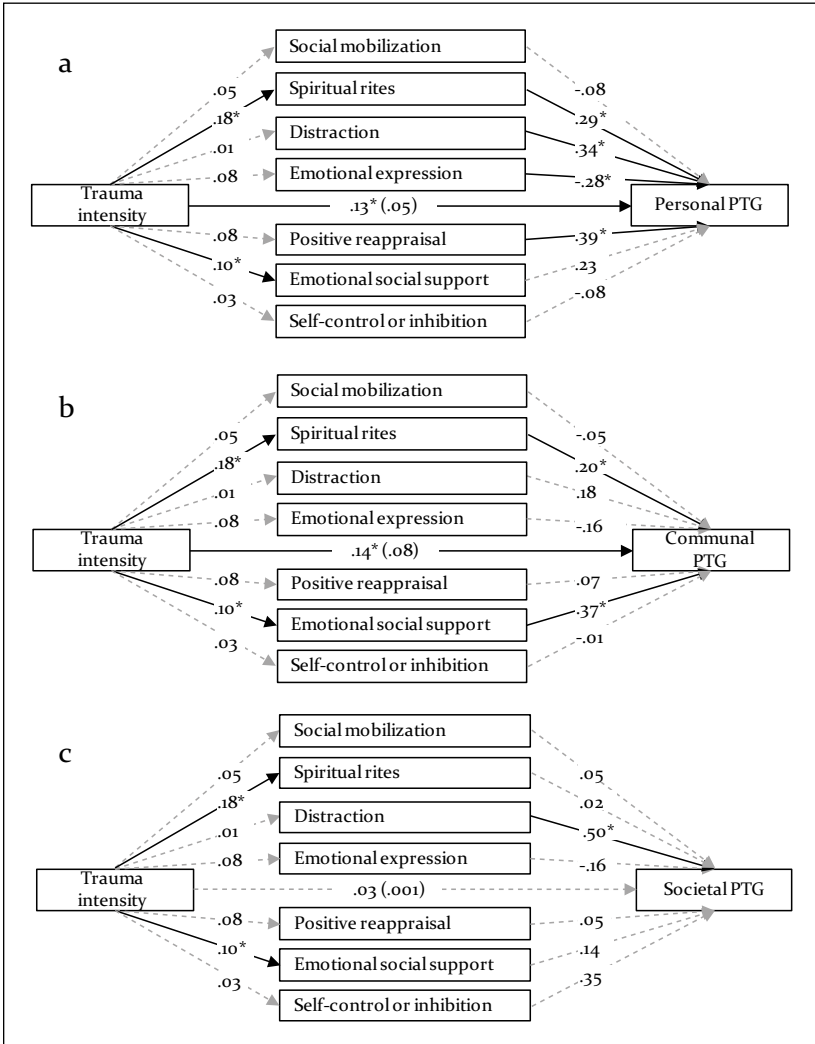


Figure 1. Relations between trauma intensity, communal coping strategies, and individual, communal, and societal PTG in Spain.

Note. PTG = posttraumatic growth.

*significant at .05.

among volunteer students from the Psychology, Nursing, Philosophy, and Pedagogy Faculties at the University of Concepción, and the Law Faculty at

the University of San Sebastian, in September 2012, approximately 2 years after the disaster. Participants were asked to complete the questionnaire in relation to their experience of the situation during the earthquake.

Measurements. The same measures were used as in Study 1. Table 4 shows the descriptive statistics and reliability levels for the study variables.

Results

A bivariate correlation analysis was conducted to analyze the relationship between the study variables presented in Table 2. A moderate correlation was found between trauma intensity and all the three domains of posttraumatic growth. Moreover, communal coping strategies were found to correlate positively with each other, with the exception of self-control or inhibition and group isolation, which correlated only with participation in social mobilization. Correlations between different domains of posttraumatic growth and communal coping strategies were moderate. The results were consistent with the hypothesis that the use of different coping strategies enhances all domains of posttraumatic growth.

To test whether the relationship between trauma intensity and different domains of posttraumatic growth were mediated by communal coping strategies, three separate mediation analyses were conducted. Figure 2a shows the results of the mediation analysis in which individual posttraumatic growth was the dependent variable. The results indicate that trauma intensity, participation in spiritual rituals, and positive reappraisal are direct positive predictors of individual posttraumatic growth. Participation in spiritual rituals and positive reappraisal partially mediated the effect of trauma intensity on individual posttraumatic growth. Significant indirect effects of trauma intensity for individual posttraumatic growth were found through reappraisal ($B = .02$, $SE = .01$, $CI [.02, .06]$) and spiritual rituals ($B = .04$, $SE = .01$, $CI [.01, .07]$).

Figure 2b shows a similar pattern when communal posttraumatic growth was the predicted variable. In this instance, however, there was full mediation. Trauma intensity, distraction, and positive reappraisal were found to have a significant positive direct effect on communal posttraumatic growth. However, when positive reappraisal was inserted into the equation, the effects of trauma intensity were no longer significant. Accordingly, a significant indirect effect of trauma intensity on communal posttraumatic growth was found through reappraisal ($B = .02$, $SE = .01$, $CI [.01, .06]$). Societal posttraumatic growth was predicted exclusively by trauma intensity and distraction. In this case, however, as with the Spanish sample, no mediating effects were found (see Figure 2c).

Table 2. Correlations Between Trauma Intensity, Communal Coping Strategies, and PTG in Chile (n = 332).

	Communal coping strategies							Posttraumatic growth			
	Trauma intensity	Social mobilization	Spiritual rites	Distraction	Emotional expression	Positive reappraisal	Social support	Self-control or inhibition	Individual	Communal	Societal
Trauma intensity	1										
Social mobilization	.040	1									
Spiritual rites	.163**	.152**	1								
Distraction	.094*	.184**	.296**	1							
Emotional expression	.154**	.120*	.317**	.705**	1						
Positive reappraisal	.139**	.113*	.359**	.527**	.545**	1					
Social support	.078	.242**	.249**	.451**	.481**	.528**	1				
Self-control or inhibition	.050	.164**	.024	.000	-.089	-.047	.023	1			
Individual	.223**	.110*	.345**	.307**	.343**	.378**	.345**	.037	1		
Communal	.170**	.095*	.262**	.416**	.399**	.417**	.362**	.007	.694**	1	
Societal	.150**	.146**	.166**	.196**	.110*	.137**	.160**	.155**	.416**	.428**	1

Note. PTG = posttraumatic growth.

**Correlation is significant at .01 (one-tailed).

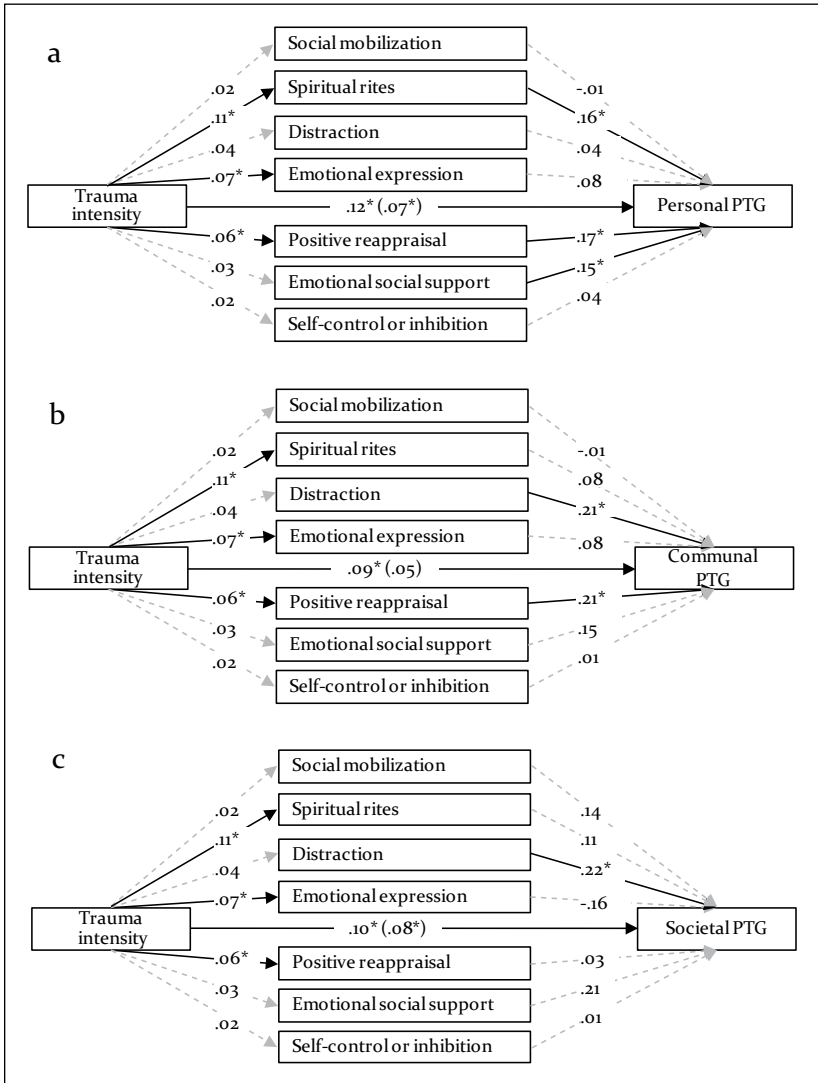


Figure 2. Relations between trauma intensity, communal coping strategies, and individual, communal, and societal PTG in Chile.

Note. PTG = posttraumatic growth.

*significant at .05.

Study 3: Floods—Northern Colombia

Method

Participants. Participants were 120 people affected by floods in Colombia. All were residents of two villages to the south of Barranquilla. The sample comprised 63.3% women and 36.7% men, aged between 17 and 81 ($M = 38.82$, $SD = 14.08$).

Procedure. In November 2010, a coupled ocean-atmosphere phenomenon “*La Niña*” resulted in the flooding of 400 km² at Canal Del Dique (south of Barranquilla) with an estimated maximum volume of 1.2 billion m³ of flooding which forced around 174,739 people to leave their flooded homes, effectively rendering them homeless (UnNorte, 2011). Two years later, those who had still not been able to return to their dwellings were contacted directly at shelters in Campo de la Cruz and Sabanalarga (south of Barranquilla) which in 2011 were gathering around 1,600 adults (UnNorte, 2011). The questionnaire was administered to those who agreed to participate in the study after they had signed an informed consent form.

Measurements. The same measures were used as in Studies 1 and 2. Table 3 shows the descriptive statistics and reliability levels for all the study variables.

Results

As in Studies 1 and 2, we first examined correlations between trauma intensity and the three domains of posttraumatic growth. As shown in Table 3, trauma intensity was positively related only to communal posttraumatic growth. Correlations between communal coping strategies ranged from negative although non-significant, to highly positive (see Table 3). Interestingly, social mobilization was strongly related to distraction and emotional expression, moderately associated with self-control or inhibition and group isolation, and unrelated to social support and participation in spiritual rituals. For its part, participation in spiritual rituals was related exclusively to social support. Surprisingly, participation in spiritual rituals was unrelated to any of the three domains of posttraumatic growth. The relationship between communal coping strategies and communal posttraumatic growth was generally stronger than with individual and societal posttraumatic growth.

To determine whether trauma intensity had an indirect effect on individual, communal, and societal posttraumatic growth in Colombia, we conducted the same mediation analyses as in Studies 1 and 2. As shown in Figure 3a and in

Table 3. Correlations Between Trauma Intensity, Communal Coping Strategies, and PTG in Colombia (*n* = 120).

	Communal coping strategies							Posttraumatic growth			
	Trauma intensity	Social mobilization	Spiritual rites	Distraction	Emotional expression	Positive reappraisal	Social support	Self-control or inhibition	Individual	Communal	Societal
Trauma intensity	1										
Social mobilization	.129	1									
Spiritual rites	.249**	.130	1								
Distraction	.098	.561**	.021	1							
Emotional expression	.206*	.444**	-.002	.685**	1						
Positive reappraisal	.159	.251**	-.084	.376**	.380**	1					
Social support	.113	.145	.185*	.092	.259**	.393**	1				
Self-control or inhibition	.100	.353**	-.095	.494**	.406**	.239**	.043	1			
Individual	-.012	.191*	.107	.504**	.317**	.326**	.221**	.297**	1		
Communal	.180*	.359**	-.055	.410**	.498**	.494**	.424**	.415**	.331**	1	
Societal	.129	.297**	-.076	.367**	.270**	.112	.051	.218**	.222**	.389**	1

Note. PTG = posttraumatic growth.

**Correlation is significant at .01 (one-tailed).

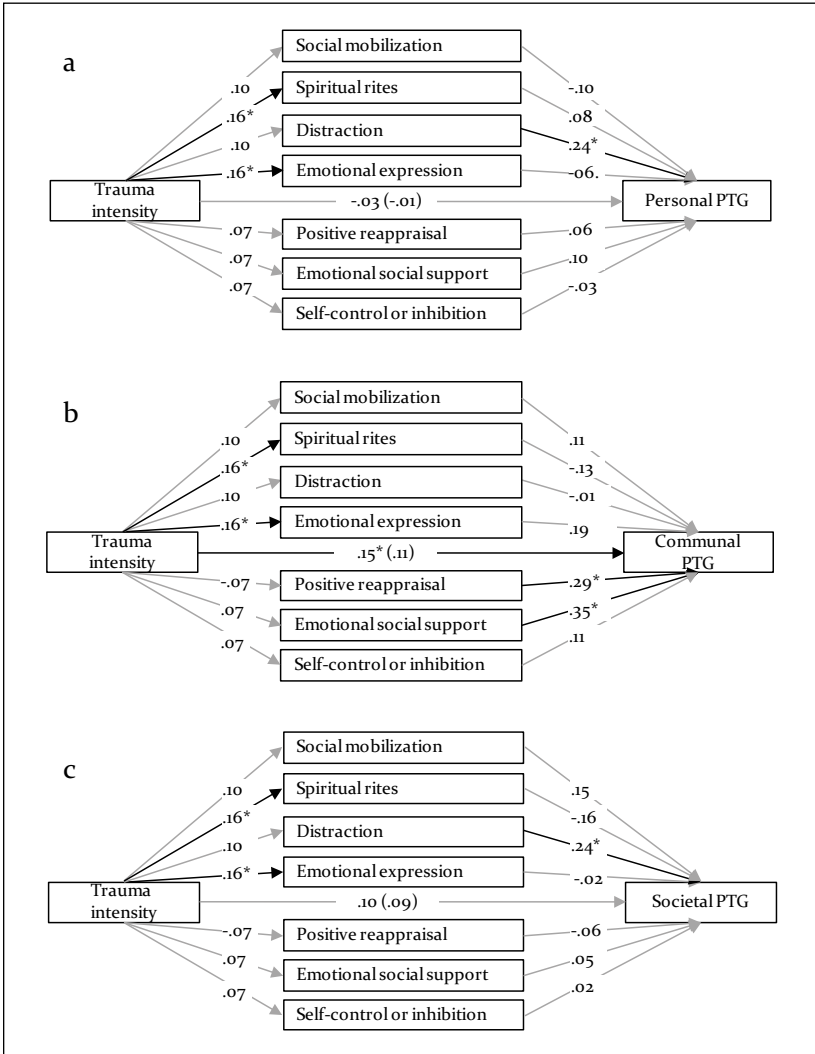


Figure 3. Relations between trauma intensity, communal coping strategies, and individual, communal, and societal PTG in Colombia.
 Note. PTG = posttraumatic growth.
 *significant at .05.

line with the results of the correlation analysis, only distraction was found to have a significant positive direct effect on individual posttraumatic growth.

Furthermore, as shown in Figure 3b, communal posttraumatic growth was directly and positively related to trauma intensity, positive reappraisal, and social support. Moreover, a significant indirect effect of trauma intensity on communal posttraumatic growth was found through social support ($B = .03$, $SE = .02$, $CI [.01, .07]$), indicating full mediation. As in both Studies 1 and 2, no mediating effects were found and again only distraction was found to be positively associated with societal posttraumatic growth (see Figure 3c).

Overall Results: Comparison in Coping and Posttraumatic Growth Between the Three Sample Groups

Table 4 shows the mean scores, standard deviations, and alpha coefficients for all the scales included in the three studies.

Subsequently, to examine whether the mean scores for trauma intensity, communal coping strategies, and individual, communal, and societal posttraumatic growth differed between the three samples, we conducted a series of one-way ANCOVAs controlling for sex and gender. Tukey's HSD tests showed that participants from Colombia reported statistically significantly higher trauma intensity than did participants from Spain, and participants from Chile reported less trauma intensity than did both Colombia and Spain. Regarding communal coping strategies, social mobilization was more frequently used in Spain than in Chile. Moreover, coping through participation in religious rituals, distraction, emotional expression, and positive reappraisal was more frequent in more collectivistic Colombia and Chile than in Spain. Furthermore, social support was reported more frequently in Colombia than in Chile, as was self-control or inhibition and group isolation, which was used as a coping strategy more frequently among participants from Colombia than among those from either Chile or Spain.

As expected, all three domains of posttraumatic growth were higher in more collectivistic Chile and Colombia than in the more individualistic Spain. In particular, Colombians scored higher for individual posttraumatic growth than Chileans, and both Colombians and Chileans scored higher than Spaniards. Regarding communal posttraumatic growth scores, no statistically significant differences were observed between Chile and Colombia, although the scores reported in both countries were higher than in Spain. Finally, spiritual coping was higher in the more collectivistic and less secularized Latin American nations. However, no differences were found between Spain and the two Latin American countries studied as regards seeking social support.

Table 4. Communal Coping Strategies and PTG in Colombia, Spain, and Chile.

	Spain (<i>n</i> = 87)	α	Chile (<i>n</i> = 301)	α	Colombia (<i>n</i> = 119)	α	Quadratic <i>F</i> (2, 504)	<i>p</i> ≤	η_p^2
Trauma intensity									
<i>M</i>	5.01 ^{a,b,c}	—	3.93 ^{a,b,c}	—	6.49 ^{a,b,c}	—	120.43	.001	.308
<i>SD</i>	1.55		1.73		0.98				
Social mobilization									
<i>M</i>	0.75 ^a	.636	0.46 ^a	.502	0.60	.405	8.13	.001	.031
<i>SD</i>	0.71		0.63		0.75				
Spiritual rites									
<i>M</i>	0.84 ^{a,b,c}	.854	1.26 ^{a,b,c}	.759	2.51 ^{a,b,c}	.433	104.58	.001	.293
<i>SD</i>	0.92		1.03		0.66				
Distraction									
<i>M</i>	0.97 ^{a,b,c}	.760	1.56 ^{a,b,c}	.673	1.24 ^{a,b,c}	.827	19.26	.001	.071
<i>SD</i>	0.75		0.83		0.99				
Emotional expression									
<i>M</i>	1.40 ^{a,b}	.677	1.76 ^{a,b}	.685	1.75 ^{a,b}	.548	16.42	.001	.061
<i>SD</i>	0.71		0.78		0.75				
Positive reappraisal									
<i>M</i>	1.78 ^{a,b}	.679	2.06 ^{a,b}	.731	2.05 ^{a,b}	.675	5.18	.006	.020
<i>SD</i>	0.67		0.76		0.72				
Emotional social support									
<i>M</i>	1.77	.650	1.59 ^c	.757	1.90 ^c	.540	0.55	.576	.002
<i>SD</i>	0.66		0.76		0.62				
Self-control or inhibition and group									
<i>M</i>	0.67 ^{b,c}	.594	0.66 ^{b,c}	.472	0.85 ^{b,c}	.446	5.88	.003	.023
<i>SD</i>	0.54		0.55		0.69				
Individual posttraumatic growth									
<i>M</i>	3.34 ^{a,b,c}	.880	3.73 ^{a,b,c}	.875	4.22 ^{a,b,c}	.557	35.45	.001	.123
<i>SD</i>	0.81		0.83		0.41				
Communal posttraumatic growth									
<i>M</i>	3.27 ^{a,b}	.747	3.68 ^{a,b}	.835	3.71 ^{a,b}	.718	8.49	.001	.033
<i>SD</i>	0.78		0.92		0.83				
Societal posttraumatic growth									
<i>M</i>	2.57 ^{a,b,c}	.907	3.09 ^{a,b,c}	.878	3.47 ^{a,b,c}	.781	20.42	.001	.075
<i>SD</i>	0.91		1.09		0.80				

Note. PTG = posttraumatic growth.

Tukey post hoc:

^aSpain versus Chile, *p* < .05.

^bSpain versus Colombia, *p* < .05.

^cChile versus Colombia, *p* < .05.

Therefore, the overall results were consistent with the hypothesis that the effect of trauma intensity on posttraumatic growth is weakened with increased reliance on positive communal coping strategies that mediate the association between intensity of trauma and posttraumatic growth (Hypothesis 1). Moreover, cultural differences we expected regarding the frequency of communal coping strategies (Hypothesis 2), participation in religious rituals (Hypothesis 3), and levels of individual, communal, and societal posttraumatic growth (Hypothesis 4) were not as pronounced as we expected. More specifically, regarding cultural differences in experiencing growth in the aftermath of a natural disaster, the findings of all three studies presented (only partially in line with Hypothesis 4) suggest that communal and societal growth was more strongly perceived in collectivistic countries, with individual growth also being more common in these countries, especially among Colombian participants.

Discussion

This study sought to examine the relationship between trauma intensity and three domains of posttraumatic growth, and to identify communal coping strategies that enhance posttraumatic growth in the context of natural disasters in three different cultures with different collectivistic or individualistic orientations.

More specifically, we examined the direct and indirect relationships between trauma intensity and posttraumatic growth, and identified and evaluated the role played by communal coping strategies. Regarding the relationship between trauma intensity and communal coping strategies, our findings revealed that trauma intensity was associated with communal coping strategies such as participation in spiritual rituals, emotional expression, and reappraisal (Hypothesis 1), and unrelated to social mobilization, and inhibition and group isolation.

Furthermore, although we expected lower level of individual posttraumatic growth (Hypothesis 4) and lower frequency of spiritual coping strategies (Hypothesis 3) in Spanish culture, our multivariate analyses revealed that trauma intensity, spiritual rituals, and reappraisal are directly and positively associated with individual posttraumatic growth in both Chile and Spain, although surprisingly not in Colombia. These findings are broadly in line with the previous limited comparisons (Vázquez & Páez, 2011) and demonstrate that collectivistic cultures which emphasize a stoic ethos might be more prone to experience individual and collective posttraumatic growth. One explanation for this result could be related to the living conditions of the survivors of the flood in Colombia, who were previously residents of

high-risk areas who then experienced important economic and lifestyle losses. Moreover, during the period in which the data were collected, participants were still living in a transitional shelter, receiving aid from the government and various non-governmental organizations (NGOs) and waiting for future relocation by local authorities. Consequently, this group was affected by increased uncertainty (Alderman, Turner, & Tong, 2012) and might have experienced a secondary trauma; all these conditions may have undermined participants' capacity for positive reappraisal. This is consistent with the results reported by Afifi, Felix, and Afifi (2012), who concluded that heightened levels of uncertainty are associated with exposure to stressors and are negatively associated with mental health.

Importantly, the results revealed that although collective religious forms of coping were reported more frequently by Chilean and Colombian participants than Spanish ones (with the greatest differences in effect size of all coping strategies), it appears to have a direct positive effect on the development of individual posttraumatic growth in both Chile and Spain, playing a mediating role in communal coping in this latter country. These results only partially confirm Hypothesis 2 and 3, and more importantly suggest that religious coping is beneficial and enhances posttraumatic growth even in secularized contexts (Gerber, Boals, & Schuettler, 2011; Pargament, Smith, Koenig, & Perez, 1998). This could be due to the fact that religious rituals induce transcendent emotions (peacefulness/calm; Emmons, 2005) which are related to connections to larger groups and the universe and thereby provide meaning and purpose to life (Peterson & Seligman, 2004); in this way, religious rituals may enhance posttraumatic growth. Social support was not, as we expected (Hypothesis 3), higher in the relatively individualistic Spanish culture, and it was higher in Colombia than in Chile. Furthermore, trauma influence on communal growth appears to be fully mediated by social support in Spain and Colombia. This supports the idea that asking for and receiving social support is an antecedent of posttraumatic growth not only at an individual level but also at a communal level (Helgeson et al., 2006; Prati & Pietrantonio, 2009). The results not only partially support the role of social support in individualistic countries but also show that Latin American collectivism does not display the "social inhibition" style of Asian cultures (Helliwell et al., 2015).

Positive reappraisal at a communal level appeared to be an adaptive strategy, as it seems to influence individual posttraumatic growth in Spain and Chile, and communal posttraumatic growth in Chile and Colombia. Furthermore, the relationship between trauma intensity and communal posttraumatic growth appears to be fully mediated by positive reappraisal in Chile. Congruently with the meta-analysis by Prati and Pietrantonio (2009),

positive communal reappraisal was identified as one of the most important antecedents of posttraumatic growth.

Finally, in all the samples, societal posttraumatic growth was specifically associated with distraction. This result suggests that social activities unrelated to collective trauma that enhance group cohesion and collective joy may play an important specific role in the development of societal growth (Páez, Rimé, Basabe, Włodarczyk, & Zumeta, 2015). Taken together, the findings enclosed within the presented studies, although extending earlier research in different cultural contexts, highlight the importance of communal coping and participation in secular and spiritual collective gatherings as common responses to address the stressful implications of life circumstances, such as natural disasters. More importantly, our studies provide substantial empirical evidence that these responses are functional and beneficial. Moreover, when the stressor is perceived to be a collective problem, a cooperative problem-solving process appears to be triggered and people perceive not only personal but also communal and societal changes and benefits. The aforementioned results provide substantial evidence that participation in cooperative coordinated activities extends social networks and creates bonds between people while enhancing solidarity. In turn, a community's capacity for problem-solving and finding benefit in the adversity may be fostered.

In spite of its important contribution, our research has limitations to be taken into account when discussing its research implications and the design of future studies. First, we should note that performing real-world field studies of victims of natural disasters forced us to use simple and short adaptations of measurement instruments because of their ease and practicality. This dilemma could be partially resolved by replicating our findings with additional studies using controlled methods and captive samples. Accordingly, we have to explicitly acknowledge that the measure of trauma intensity that was used was a subjective evaluation of traumatic experience and did not directly measure posttraumatic stress disorder (Bonanno et al., 2010).

Second, the data are cross-sectional and retrospective and thus do not allow for causal claims about either the associations between trauma intensity and posttraumatic growth or the impact of communal coping. An important temporal distance exists between the occurrence of the disaster and the recollection of the data. Furthermore, when assessing coping strategies in the aftermath of a natural disaster, it is difficult to distinguish between temporary strategies and generalized forms of coping (Yamashita, 2012).

The third limitation is related to the difference in sample sizes¹ and the fact that the study design cannot separate the impact of the trauma itself from that of heightened exposure resulting from the specific conditions in each country. Colombian and Spanish participants were probably more directly

affected by the disaster than the Chilean sample. However, as shown by Smithe et al. (2014), people living outside the area affected by a disaster may report similar symptoms to those suffered by individuals who directly experienced the traumatic event.

Other important issues relate to the effects of different types of natural disasters and the timing of those disasters relative to the study period. In this case, the Colombian population experienced flooding that resulted in important economic and even human losses; by comparison, the effects of the earthquakes in Spain and Chile were less severe. Furthermore, it is important to bear in mind that participants from the Colombian sample had been evacuated and were still living in transitional shelters. The process of evacuation and its immediate aftermath is likely to encourage bonds among the evacuated individuals and might alter the impact of communal coping (Afifi et al., 2012). We also still have no clear idea of the time that elapses between a traumatic event and the onset of posttraumatic growth (Bitsch, Elklit, & Christiansen, 2011). Finally, it is important to consider other contextual aspects such as an adequate response from the authorities (Rhodes & Tran, 2012) and the social and organizational resources previously available to a community (Benight, Swift, Sanger, Smith, & Zeppelin, 1999; Hobfoll & Lilly, 1993).

The findings reported here make a significant contribution to the growing body of research attesting to the benefits of communal coping, especially in the context of natural disasters, which promotes, in some cases, the appearance of posttraumatic growth. The results presented here are consistent with those proposed by Norris and Elrod (2006), suggesting that it is necessary to adopt a wider perspective on the combined effects of psychosocial factors that may reduce the negative effects of natural disasters on individuals and communities. The results show the need to strengthen the resources available to communities to facilitate prevention and intervention in the event of natural disasters, while highlighting the importance of considering community and cultural aspects in research on the impact of and responses to such disasters. In sum, this research contributes to the cross-cultural literature on emotional collective gatherings and provides some practical implications by pointing out that intense shared emotional states generated during social encounters are a basis for building a sense of togetherness which can be translated into high community resilience.

Acknowledgments

The authors thank City Hall of Lorca (Spain), and Antonio Varón Molina and Dr. Félix Cova (Universidad de Concepción, Chile) for their role in collecting data and their helpful research assistance on Studies 1 and 2.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Spanish Ministry of Science and Innovation under Grant PSI2011-26315; the University of the Basque Country under Grant IT-666-13 and Grant UFI 11/04; Basque Government's Post-doctoral Research Staff Improvement Training Fellowship granted to Anna Włodarczyk under Grant POS_2015_1_0075; and the Directorate of Research and Projects (DIP) of the Universidad del Norte, Colombia.

Note

1. It is important to consider that we performed preliminary analysis using the country as a categorical moderator, and in addition we tested all our models on three equivalent groups, nevertheless the results revealed the same patterns when using different data analysis techniques. Therefore, given that the interpretation of the alternative analyses was much more complicated, we aimed to present the results in separate studies which analyze the mediational role of each strategy in each sample.

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Dario Páez is professor of social psychology at the University of Basque Country and director of the Group Research Culture, Cognition, and Emotion. His main topics are social processes of cognition and emotion and cross-cultural social psychology, collective memory and transitional justice. He has edited “Collective Memories of Political Events” (1997, with Pennebaker & Rime), a monograph on “Cross-Cultural Social Psychology” in *Revue Internationale de Psychologie Sociale* (2005, with P.B. Smith), a monograph on “Emotional Climate” in the *Journal of Social Issue* (2007), and the book *Overcoming Political Conflict and Building Culture of Peace* (2011, with J.de Rivera). He is currently focused on social regulation of emotions and collective behavior (“Psychosocial Effects of Perceived Emotional Synchrony in Collective Gatherings” in *Journal of Personality and Social Psychology*, 2015, with Rime, Basabe, Włodarczyk, & Zumeta) and on collective memory and social representations of history (Bobowik, Liu, Guisime, & Licata, 2016).

Carlos Reyes graduated in psychology at the Catholic University of Valparaiso, Chile (2000). He participated in various projects of prevention and social intervention in Chile, in areas of education and health with different groups (children, youth, adults, and the disabled). He studied masters in governance and human rights at the Autonomous University of Madrid (2013) and PhD in social and organizational

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