

## **Intrusive versus deliberate rumination in posttraumatic growth across US and Japanese samples**

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To examine the role of rumination in the aftermath of traumatic/stressful events, posttraumatic growth (PTG) and the four types of rumination (i.e., intrusive rumination soon after the event, intrusive rumination recently, deliberate rumination soon after the event, and deliberate rumination recently) were assessed retrospectively for participants from the USA ( $N=224$ ) and Japan ( $N=431$ ). The results from a hierarchical regression analysis revealed that the hypothesized relationships among the four types of rumination and PTG were largely supported. Intrusive rumination soon after the event was positively related to PTG but recent deliberate rumination most strongly predicted the current levels of PTG for both samples. Some evidence for cultural differences in the role of rumination in PTG was also observed. In the US sample, deliberate rumination recently was more important than the deliberate rumination in the immediate aftermath of the traumatic/stressful event, whereas in the Japanese sample, deliberate rumination both soon after and recently were positively related to PTG. The results illustrate the importance of considering rumination as multidimensional and as varying across time in its impact on PTG. Future directions and clinical implications were discussed.

**Keywords:** posttraumatic growth; intrusive rumination; deliberate rumination

Highly stressful and traumatic events typically produce a variety of cognitive, emotional, behavioral, and social elements that influence the eventual outcome. A common theme in models that focus on the aftermath of these significant life events is the impact of rumination<sup>1</sup> that occurs. Although the ruminative thinking that goes on after a traumatic or stressful event has been often considered to be negative, depressogenic, and intrusive thinking that may dominate the survivors' experience as they focus on the harm they have experienced, a broader and multidimensional view of rumination that can occur under these circumstances has been suggested theoretically (Martin & Tesser, 1996) and found empirically (Treyner, Gonzalez, & Nolen-Hoeksema, 2003).

According to Martin and Tesser (1996), rumination can include recurrent thinking that is not necessarily intrusive but rather involves reminiscence, anticipation, problem solving and "making sense" of events. Similarly, Treyner et al. (2003)

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found two separate factors in the Ruminative Responses Scale (Nolen-Hoeksema, Larson, & Grayson, 1999), representing what they termed “brooding” and “reflective pondering” rumination. Brooding rumination involves a relatively passive, consideration of current conditions, and it was associated with higher levels of depression. Reflective rumination, however, involves a more deliberate effort focused on dealing with the situation, and was associated with lower depression over time (Nolen-Hoeksema & Davis, 2004). Thus, ruminative thoughts can be viewed not just as intrusive, potentially nonconstructive or psychologically harmful, but also as deliberate, reflective, or constructive.

This multidimensional perspective had already been anticipated in at least one model of posttraumatic growth (PTG) (Calhoun & Tedeschi, 1998). PTG refers to positive psychological change experienced as the result of struggling with major life crises or traumatic events. The PTG model includes a variety of elements that are assumed to play a role in determining the degree of growth, including characteristics of the person and of the challenging circumstances, management of emotional distress, self-disclosure, distal and proximate socio-cultural influences, and rumination. Highly stressful or traumatic events that challenge people’s assumptive world (Janoff-Bulman, 1992), their schema for understanding their world, set the stage for potential growth, but growth is only achieved if the cognitive work required to restore a meaningful understanding of the world is accomplished. “Understanding the type of cognitive processing and when it occurs may be crucial to understanding the cognitive routes to posttraumatic growth . . .” (Tedeschi & Calhoun, 2004, p. 11).

The current study examines the possible relationships between type of rumination (intrusive and nonconstructive rumination versus deliberate and constructive rumination), the timing of them (soon after the event versus recently/prolonged), and PTG. Although significant relationships between rumination and PTG have been reported (e.g., Calhoun, Cann, Tedeschi, & McMillan, 2000), it has still been open to debate whether the two distinctive types of rumination have different impacts on PTG. This study attempts to expand on the previous findings by using a part of an existing rumination scale developed by Calhoun et al. (2000) that has been used in PTG research (e.g., Proffitt, Cann, Calhoun, & Tedeschi, 2007) in an effort to see if style of cognitive processing is an important variable. In addition, data will be compared across a US and a Japanese sample, to determine if there are cross-cultural similarities in the relationships between rumination and PTG.

As automatic, intrusive thoughts in the aftermath of a traumatic event can be regarded as an indication that the event had a significant impact, it was predicted that more intrusive rumination soon after the event would be positively related to PTG. Intrusive, “brooding” thoughts (Treyner et al., 2003) may prime the process of more deliberate rumination that ultimately facilitates growth. Deliberate and constructive rumination soon after the traumatic or stressful event would also be positively associated with PTG. The more an individual engages in deliberate and constructive rumination, thinking about the ways to make sense out of the event or recognizing the positive by-products of the experience, the more likely it is that PTG will be experienced.

Intrusive rumination that is still present well after the traumatic event may or may not be significant in PTG. Ideally, as the aftermath of a traumatic event unfolds, intrusive ruminations that do little more than keep the event in mind are replaced by the more deliberate style of rumination, so that the work of rebuilding a meaningful

assumptive world can progress. Prolonged intrusive rumination could result in higher levels of depression. However, it also must be noted that moderately positive relationships between negative symptoms and PTG have been reported (e.g., Taku, Calhoun, Cann, & Tedeschi, 2008), implying that it may be possible that individuals who still engage in intrusive rumination or who continue to experience negative emotions associated with their experience, also can experience PTG. Even when prolonged intrusive thoughts are associated with PTG, it would be expected that the relationships would be weaker than those between other types of rumination and PTG. Continued deliberate rumination well after the event might indicate an ongoing process of rebuilding an assumptive world and incorporating the changes that are realized. Deliberate rumination at this stage might focus on benefit reminding, keeping salient the positive changes that one has come to recognize (Helgeson, Reynolds, & Tomich, 2006). It was predicted that deliberate rumination levels well after the traumatic or stressful event would be positively related to PTG.

## Method

### Participants

Characteristics of the samples are shown in Table 1. In the US sample, 197 were Caucasian, 17 African-American, four Asian, and six other. The types of highly stressful events reported were: mixed events not specified (37.5%), death of a family member or close friend (38.4%), September 11th events (12.9%), serious medical condition (3.6%), and others with low frequencies (7.6%). The present data set was created as part of an ongoing research project evaluating patterns in PTG. Each previous study had addressed additional research questions that were distinct from the current questions about the properties of a rumination measure and its relationship to PTG. The Japanese sample consisted of 431 undergraduate students.<sup>2</sup> The types of events reported as most traumatic or stressful in life were: relationship problems (33.2%), death of a family member or close friend (16.5%), significant academic problems (16.2%), and others with low frequencies (34.1%).

Table 1. Distribution of demographic variables in the US and the Japanese samples.

	US sample ( <i>N</i> = 224)	Japanese sample ( <i>N</i> = 431)
Mean age (years)	36.9 ( <i>SD</i> = 14.2)	19.9 ( <i>SD</i> = 1.2)
Gender	85 males; 139 females	167 males; 264 females
Marital status	31.7% single; 37.5% married; 9.4% divorced or separated, and 21.4% other or did not report	99.5% single; 0.5% divorced or separated
Time since the events	Within one to 12 months (32.6%) One to two years (18.7%) Two and three years (24.6%) Three and four years (5.8%) Four and five years (6.3%) Longer than five years (12.0%)	Within one to 12 months (27.6%) One to two years (16.2%) Two and three years (13.9%) Three and four years (8.6%) Four and five years (6.0%) Longer than five years (27.7%)

### **Measures**

All participants were provided with culturally appropriate informed consent options and all agreed to continue. Prior to completing the measures, the participants were asked to provide demographic information, such as gender, age, and marital status for both samples, and ethnicity for the US sample. They either identified a significant personal traumatic event or were instructed to consider a known traumatic event that would serve as the focus when completing the other measures.

#### *Posttraumatic Growth Inventory (PTGI)*

The PTGI (Tedeschi & Calhoun, 1996) and the Japanese version (PTGI-J: Taku et al., 2007) were used to assess the positive changes experienced in the aftermath of an identified traumatic or stressful event. The total score of the 21-item PTGI or PTGI-J<sup>3</sup> was used. Each item on these scales is rated on a six-point 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*). The internal consistencies for the total score in the current US and Japanese sample were .95, and .91, respectively.

#### *Rumination scale*

The rumination scale (Calhoun et al., 2000) for the US participants and the translated version (Taku et al., 2008) for the Japanese participants consists of seven items that reflect a variety of ruminative thoughts. Participants responded to each item two times, once based on their ruminations soon after the event and once based on ruminations recently. In the current study, four out of seven items were used. Two items reflect intrusive rumination (e.g., “I thought about the event when I didn’t mean to”) and two reflect deliberate/constructive rumination (e.g., “I have tried to make something good come out of my struggle”), and each was asked for the two time frames; soon after the event and recently. Responses are given on a four-point scale, with values ranging from 1 (*not at all*) to 4 (*often*). The internal consistencies were: intrusive rumination soon after (.85; .86) and recently (.83; .89), deliberate rumination soon after (.72; .72) and recently (.74; .77) in the US and Japanese sample, respectively<sup>4</sup>.

### **Results<sup>5</sup>**

A simple evaluation of the hypothesized relationships among the four types of rumination, PTG, and time since the event can be accomplished by examining the Pearson correlations. Table 2 shows means, standard deviations, and correlation coefficients among variables included in this study. The results showed that the hypothesized pattern of relationships between rumination and PTG largely held true in both samples. Significant positive correlations were also found among four rumination types in both samples. However, the relationships between time since the event and PTG and rumination showed somewhat different patterns in each sample. In the US sample, a positive correlation was found between time since the event and PTG; whereas no correlation was found in the Japanese sample. In addition, positive correlations were found between rumination styles (except for the recent intrusive

Table 2. Means, standard deviations (*SD*), and intercorrelations<sup>a</sup> of rumination, PTG, and time since the event<sup>b</sup>.

	1	2	3	4	5	6	US		Japanese	
							Mean	<i>SD</i>	Mean	<i>SD</i>
1. PTG <sup>c</sup>		.31**	.29**	.23**	.46**	.23**	52.54	25.08	39.55	21.08
2. Intrusive soon after <sup>d</sup>	.25**		.24**	.64**	.36**	.16*	6.21	1.80	6.15	1.97
3. Deliberate soon after <sup>d</sup>	.45**	.16**		.21**	.54**	.16*	5.20	1.95	4.44	1.99
4. Intrusive recently <sup>d</sup>	.22**	.40**	.22**		.51**	.02	4.14	1.87	3.43	1.81
5. Deliberate recently <sup>d</sup>	.51**	.24**	.46**	.28**		.14*	4.64	1.94	4.56	2.00
6. Time since the event	.05	-.08	-.18**	-.30**	.01		34.91	53.75	40.80	37.59

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

<sup>a</sup>Correlations for the US sample (above the diagonal) and for the Japanese sample (below the diagonal).

<sup>b</sup>Time since the event is measured in months.

<sup>c</sup>Total score of the 21 items are used in the both US and Japanese samples (i.e., score range is 0–105).

<sup>d</sup>Score range of the four types of rumination is 2–8.

rumination) and time since the event in the US sample. In the Japanese sample, negative correlations were found between intrusive rumination recently and time since the event, and between deliberate rumination soon after the event and time since the event.

The hypothesized pattern of relationships between four types of rumination and PTG was tested using hierarchical multiple regression analyses with the total score of the PTGI or PTGI-J entered as the dependent variable. To simulate the time sequence that would be operating after a stressful event, the predictor variables were entered in three steps; time since the event (Step 1), intrusive rumination soon after and deliberate rumination soon after (Step 2), and intrusive rumination recently and deliberate rumination recently (Step 3). As shown in Table 3, in the US sample, the model was significant using only time since the event ( $\beta = .23$ ,  $p < .01$ ). The model was significantly improved after adding the soon after rumination,  $R^2$  change = .11, and was again improved after adding the two types of recent rumination,  $R^2$  change = .10. Both types of soon after rumination were individually significant after the second step, but in the final model only intrusive soon after ( $\beta = .21$ ,  $p < .01$ ), deliberate recently ( $\beta = .42$ ,  $p < .01$ ), and time since the event ( $\beta = .14$ ,  $p < .05$ ) were significant, ( $F = 14.02$ ,  $p < .001$ ). In the Japanese sample, the model including only time since the event was not significant. The model was significantly improved after adding the two types of soon after rumination,  $R^2$  change = .25, and was significantly improved after adding the two types of recent rumination,  $R^2$  change = .10 ( $F = 30.27$ ,  $p < .001$ ) in the final model. Both intrusive rumination soon after and deliberate rumination soon after were individually significant predictors in the second model, but, in contrast with the US sample, they both remained significant ( $\beta = .11$ ,  $p < .05$ ;  $\beta = .29$ ,  $p < .01$ , respectively) when the two types of recent rumination were added while deliberate rumination recently and time since the event also were significant ( $\beta = .34$ ,  $p < .01$ ;  $\beta = .12$ ,  $p < .01$ , respectively). Thus, the results for the two samples differed only in that deliberate rumination soon after the event remained significant in the Japanese sample, but was no longer significant in the US sample after recent rumination was added to the model. In both samples,

Table 3. Hierarchical regression analysis predicting PTG.

	US sample						Japanese sample					
	B	SE	$\beta$	$R^2$	$\Delta R^2$	F	B	SE	$\beta$	$R^2$	$\Delta R^2$	F
Step 1				.05		12.10**				.00		1.08
Time	0.11	0.03	.23**				0.03	0.03	.05			
Step 2				.16	.11**	14.07**				.25	.25**	47.02**
Time	0.07	0.03	.16*				0.08	0.02	.15**			
Intrusive soon after	3.22	0.89	.23**				1.97	0.46	.19**			
Deliberate soon after	2.54	0.83	.20**				4.7	0.46	.45**			
Step 3				.26	.10**	15.06**				.34	.10**	44.31**
Time	0.06	0.03	.14*				0.07	0.02	.12**			
Intrusive soon after	2.91	1.08	.21**				1.11	0.47	.11*			
Deliberate soon after	0.08	0.91	.01				3.05	0.48	.29**			
Intrusive recently	-1.65	1.13	-.12				0.64	0.54	.06			
Deliberate recently	5.38	1.03	.42**				3.59	0.49	.34**			

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

intrusive rumination recently did not significantly predict PTG. Overall the hypothesized relationships were supported.

## Discussion

The purpose of the present study was to examine the theoretically derived relationships between intrusive versus deliberate rumination that occurred either soon after a traumatic/stressful event or recently, and PTG (e.g., Calhoun & Tedeschi, 1998, 2006; Tedeschi & Calhoun, 2004). The results indicated that both forms of rumination were positively associated with PTG at both points in time. However, the hierarchical multiple regression more clearly supported the expected differential impact of rumination over time. The intrusive ruminations soon after the event were positively related to PTG. It is assumed that this is because they help set the stage for further cognitive processing, not because they are necessarily a direct positive influence on growth. For both samples, it was recent deliberate rumination that most strongly predicted the current extent of PTG. Ongoing constructive cognitive processing was associated with greater growth.

These consistent results across culturally diverse samples provide general support for the model of rumination and PTG proposed by Tedeschi and Calhoun (2004). There were, however, some differences between the two samples as well. In the US sample, deliberate rumination recently, evidence of a continuing process of building back one's assumptive world, was more important than the deliberate rumination in the immediate aftermath of the traumatic event, whereas in the Japanese sample, deliberate rumination both soon after and recently were positively related to PTG. The possible reasons for the differences across samples remain uncertain. The differences could reflect culturally influenced styles of thinking about traumatic/stressful events, and there may be important socio-cultural differences that operate

to alter the cognitive processing that is needed to deal with traumatic events. Alternatively, the differences may be due to the differences between the samples. The US sample included a wider variation in the age of the participants and the average age was higher. Previous research has reported a potential effect of age on PTG (e.g., Sheikh & Marotta, 2005), so these differences might also be reflected in how traumatic events are cognitively processed. Another difference is the type of traumatic events reported. Future studies will have to sort out the possible explanations for the differences found between our two samples.

One limitation of this study is that it was cross-sectional. The reports by participants about their rumination “soon after the event” and “recently” could be biased by the inability to accurately recall thought processes that occurred in the past. In addition, it would be useful to have a clear measure of the actual impact that the traumatic event has had on the participants’ assumptive world, to what extent was their worldview disrupted or shattered (Janoff-Bulman, 1992) in future investigations. These findings may have possible clinical implications, rumination style and timing may have to be considered to fully understand how and whether PTG is, or is not, taking place. Present results suggest that clinicians may also want to attend not only to the individual’s current experience of intrusive ruminative activity, but also to the degree to which clients remember experiencing intrusive ruminations at the time of the event. Identifying and supporting client’s ruminations that may be constructive and deliberate, could significantly enhance the process of successful coping with highly challenging events and experiencing the positive by-products of PTG.

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### Notes

1. We use the word rumination as a form of cognitive processing (see Calhoun & Tedeschi, 2006).
2. A report based on a part of these data was published describing the development of the Japanese version of the PTGI (Taku et al., 2007) and the potential coexistence of distress and growth among bereaved students (Taku et al., 2008).
3. Although the PTGI-J consists of 18 items based on the factor analysis (see Taku et al., 2007), we used the total score of 21 items in the current study, being consistent with the original PTGI, in order to avoid any potential influences of the item differences.
4. The four-factor model (intrusive rumination soon after; intrusive rumination recently; deliberate rumination soon after; and deliberate rumination recently) using the eight items out of 14-item original rumination scale (Calhoun et al., 2000) was evaluated using confirmatory factor analysis and provided a suitable fit in the US sample  $\{\chi^2_{(14)} = 58.38, p < .001, CFI = .990, TLI = .973, \text{ and } RMSEA = .119\}$  and the Japanese sample  $\{\chi^2_{(14)} = 64.14, p < .001, CFI = .993, TLI = .983, \text{ and } RMSEA = .091\}$ .
5. As this study provides a first look at the possible cultural differences, the following data analyses were done in the US and Japanese samples separately rather than assuming cross-cultural consistency. All analyses were performed using SPSS (version 13.0 for Windows).

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