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Examining posttraumatic growth among Japanese university students

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Abstract
To determine the underlying factor structure of the Japanese version of the Posttraumatic Growth Inventory (PTGI-J), a principal components analysis was performed on data from 312 Japanese undergraduate students who reported growth due to their most traumatic event within the last 5 years. Results showed the PTGI-J has high internal consistency and, of the original five factors reported by Tedeschi and Calhoun (1996), three were replicated: Relating to Others, New Possibilities, Personal Strength, and a fourth factor integrating Spiritual Change and Appreciation of Life emerged. There were neither gender differences nor relationships with time since trauma. PTGI-J scores were positively associated with posttraumatic symptoms and correlated with type of traumatic event experienced. These results and future directions are discussed from a cross-cultural viewpoint.

Keywords: *Posttraumatic growth, PTGI, Japanese, type of trauma, IES-R*

The possibilities for growth from the struggle with suffering and crisis have received considerable attention since the 1990s. Posttraumatic growth (PTG) refers to positive psychological change experienced as the result of the struggle with major life crises or traumatic events (Calhoun & Tedeschi, 1999). An instrument frequently used to assess PTG is the Posttraumatic Growth Inventory (PTGI) (Tedeschi & Calhoun, 1996). As empirical studies about PTG have increased in Western nations (Linley & Joseph, 2004), the impact of socio-cultural elements on this phenomenon has been identified as an important area for investigation (Calhoun & Tedeschi, 2004; McMillen, 2004). McMillen (2004) has suggested that US culture may be responsible for the phenomenon of PTG. However, "the themes ... are prevalent in distal cultural forms, and the ways in which they do or do not influence the individual's own experience of growth remain a largely unexamined area (Calhoun & Tedeschi, 2006, p. 12)." The question arises, then, as to whether this phenomenon is a universal or exclusively Western idea. The main purpose of this study is to investigate PTG among Japanese people by examining the Japanese translated version of the PTGI.

Several studies have been done using translations of the PTGI into other languages, including German (Maercker & Langner, 2001), Bosnian (Powell, Rosner, Butollo,

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Tedeschi, & Calhoun, 2003), Hebrew (Lev-Wiesel & Amir, 2003), Chinese (Ho, Chan, & Ho, 2004), and Spanish (Weiss & Berger, 2006). These studies have shown that PTG is not an exclusively American phenomenon, in that participants across different cultures have reported PTG. However, the factor structures of the non-English versions of the PTGI have shown some differences from that described in the original study reporting the development of the PTGI (Tedeschi & Calhoun, 1996).

With their original sample, American university students who had experienced traumatic events, Tedeschi and Calhoun (1996) identified five factors: Relating to Others, New Possibilities, Personal Strength, Appreciation of Life, and Spiritual Change. The Relating to Others factor implies significant changes in relationships, including an increased sense of compassion, intimacy, and closeness (Calhoun & Tedeschi, 2006, p. 5). A sense of New Possibilities for one's life, or taking a new and different path in life, and a general sense of increased Personal Strength, or the recognition of possessing personal strength, are other domains of PTG based on a changed perception of self (Tedeschi & Calhoun, 2004). The factors Appreciation of Life and Spiritual Change reflect domains of PTG related to changes in one's philosophy of life (Tedeschi & Calhoun, 1996), suggesting an increased appreciation for life in general, and many smaller aspects of it, and a change in spiritual and existential views, including stronger religious beliefs, respectively.

In the German version of the PTGI, four of these original PTGI factors were replicated (Maercker & Langner, 2001), i.e., Relating to Others, New Possibilities, Spiritual Change, and Appreciation of Life. The Bosnian version was composed of three factors: Changes in Self/Positive Life Attitude, Philosophy of Life, and Relating to Others (Powell et al., 2003). The Chinese version also revealed a four-factor structure, Self, Spiritual, Life Orientation, and Interpersonal, as well as a second order two-factor structure: Interpersonal and Intrapersonal dimensions (Ho et al., 2004). The Spanish version had a three-factor structure, similar to the Bosnian version (Weiss & Berger, 2006).

Previous findings suggest that the factor structure of the PTGI may differ somewhat from one country or cultural group to another, but that the factor structures from these different groups do appear to be compatible with three major domains of PTG (Tedeschi & Calhoun, 1996): changes in self, in relationships, and in philosophy of life. It bears mention that studies reporting findings with translations of the PTGI have been conducted with samples of persons who have all experienced a similar crisis, such as former refugees and displaced people (Powell et al., 2003), cancer survivors (Ho et al., 2004), and Latina immigrants to the USA (Weiss & Berger, 2006), but the original PTGI in English was developed with university students reporting a variety of traumatic life events (Tedeschi & Calhoun, 1996). It remains to be seen, then, whether the difference in factor structure is due to the socio-cultural differences or other sample differences such as education, stage of life, or event type. Consequently, as suggested by Sheikh and Marotta (2005), to examine the cultural impact on the factor structure of the PTGI with a non-American sample, it is important to collect data from participants similar to those in the original development of the inventory (Tedeschi & Calhoun, 1996), and to consider the factor structure from a cultural as well as a theoretical viewpoint.

In the present study, we examine the factor structure of the PTGI in a sample of Japanese university students who reported possible growth after having experienced a variety of highly stressful life events. Because cultural context is expected to influence the experience of PTG (Calhoun & Tedeschi, 2004), exploring PTG in Japan and examining descriptive findings indicating the amount and type of growth as well as the PTGI factor structure, can enhance understanding of the PTG construct and the growth process.

To date, there have been very few reports of PTG from Japan, even though the prevalence of posttraumatic stress disorder (PTSD) and the frequencies of various kinds of traumatic events tend to be similar to those reported in Western countries (Goto & Wilson, 2003; Mizuta et al., 2005). As Joseph and Linley (2005) discussed the relationship between PTSD symptoms and the development of growth, it may be necessary to clarify the meaning of PTG and PTSD. PTSD requires severe psychological and physical symptoms resulting from trauma, prescribed by DSM-IV-TR (American Psychiatric Association, 2000). On the other hand, PTG refers to positive psychological change experienced as a result of the struggle with highly challenging life circumstances, including trauma, crisis, and highly stressful events, and does not necessarily require an event that would be meet the criteria described in the *DSM* (Tedeschi & Calhoun, 2004), in part because PTG emphasizes major challenges to the person's assumptive world (Janoff-Bulman, 2006) and narratives. In other words, PTG focuses on the psychological seismicity of the events and the extent to which they challenge the person's established belief system, rather than the degree of symptoms or the amount of impairment the person would be expected to evidence.

The notion that PTG and emotional distress can co-exist has been described elsewhere (Lev-Wiesel & Amir, 2003; Tedeschi & Calhoun, 2004). Morris, Shakespeare-Finch, Rieck, and Newbery (2005) show that there are moderate to strong correlations between PTSD symptoms and each factor of PTG. In their Australian sample, strong relationships were found between New Possibilities and Appreciation of Life of the PTGI with PTSD symptoms, especially intrusion PTSD symptoms. These findings seem to be consistent with a PTG model (Calhoun & Tedeschi, 2006). However, there are studies that show no relationships between PTSD symptoms and PTG (Cordova, Cunningham, Carlson, & Andrykowski, 2001), underscoring the importance of ongoing examination of the nature of the relationships between these two concepts.

It is expected that Japanese participants might show differences in both overall scores and factor structure of the PTGI, due to cultural and religious elements that differ considerably from the U.S. For example, Buddhism and Shinto have penetrated Japanese customs and have had a great influence on its culture. In comparison with Western countries, exclusive membership in a specific religious organization is quite rare in Japan, and these religions (i.e., Buddhism and Shintoism) do not necessarily play an visible role in the everyday life of most Japanese people today (Miller, 1995; Tange, 2004). It is possible that this religious background could affect PTG, because religious participation has been shown to be related to PTG (Pargament, 1997).

It is also assumed that the domains of PTG people report experiencing may be somewhat different for different life crises. Kumo and Futoyu (2002) interviewed patients with hepatocellular carcinoma and hepatitis C to examine the search for meaning in their illness, and found that Japanese patients also experience personal growth, such as appreciation of social support and life itself in the process of their suffering; however, they did not spontaneously report the changes in personal strength or spirituality which have been reported by American cancer patients (e.g., Bellizzi, 2004; Cordova et al., 2001). Therefore, the Personal Strength or Spiritual Change factor of the PTGI may be well reflected in Western culture, but it is important to examine, using an established measure, whether Japanese people also experience these domains of PTG independently. Kumo and Futoyu's (2002) results were obtained using interview methods, raising the possibility that they did not necessarily capture all domains of growth comprehensively.

Katori (1999) investigated the influence of bullying in school, a significant problem for Japanese adolescents, and found increased respect for others, greater toughness of mind, and the choice to go into helping professions, such as social work and nursing, as positive consequences that were reported. These themes of growth may be reactions specific to these circumstances among the Japanese, and the ways in which domains of PTG are related to the event are still not clear, just as they are not clear in other populations (Linley & Joseph, 2004). One could argue that the domains of PTG should vary in amount by the type of the event, because the struggle in the aftermath of each event might require different degrees and types of cognitive processing (Taku, 2005a). Although several studies have examined PTG with participants reporting a variety of traumatic events (e.g., Milam, Ritt-Olson, & Unger, 2004; Tedeschi & Calhoun, 1996), few studies have been performed to clarify the relationships between subscales of PTGI and trauma type. In addition, Linley and Joseph (2004) indicated that there are some inconsistencies about the temporal course of growth among studies. Some studies have found that the longer the time since the event, the greater the extent of growth reported (e.g., Cordova et al., 2001), whereas other studies have found the time frame to be unrelated to PTG (e.g., Bellizzi & Blank, 2006). Examining the relationships between time since the event and PTG may help further understanding of the growth process.

The primary purpose of the current study was to investigate the factor structure of a Japanese version of the PTGI in a sample similar to that on which the original PTGI was developed, since neither a Japanese translation, nor an examination of factor structure of a Japanese translation of the PTGI have been reported. In addition, this study also examined the relationship of time since exposure to the event and level of PTSD symptoms with scores on the Japanese version of the PTGI. Finally, possible differences in domains of PTG for different categories of traumatic events were examined.

Method

Procedures and participants

A total of 445 undergraduate students (179 men, 266 women) enrolled in psychology classes were recruited at five private universities in different cities in Japan in April and May of 2005 and volunteered to participate in this study. The breakdown of majors was: 46.8% sociology, 23.7% psychology, 9.9% human studies, 8.3% health science, and 11.2% other. No one refused to participate in the current survey. Fourteen students (12 men, two women) who answered, "I have never experienced trauma" or "I cannot remember any traumatic event," were excluded from the analyses. In order to replicate the procedures used in the original study and enhance the comparability with that study's results (Tedeschi & Calhoun, 1996), 119 out of 431 participants were excluded from analyses because the event had occurred more than 5 years previously (i.e., the participants of the original study reported on a crisis occurring within the 5 years prior to their participation). These steps resulted in a sample of 312 (124 men, 188 women), with a mean age of 19.82 years ($SD = 1.13$) and an age range of 18 to 25 years. None of them were married, 63.5% were living with family, 32.1% lived on their own, and 4.5% resided in a dormitory.

All participants completed the inventories anonymously without compensation. The cover sheet of the materials indicated that participation was voluntary and could be terminated at any time, and that all responses would be stored and analyzed confidentially. Data collection took place in classroom settings and required approximately 30 min to complete. Order of presentation of the measures was counterbalanced to avoid any order effects.

Measures

Traumatic/stressful life event list for Japanese adolescents. Participants were asked to choose the most traumatic/stressful event in their life from a list developed by Taku (2005a). The list was based on the Life Stressor Scale for Japanese Adolescents (Hayashi & Imabayashi, 1986), consisting of five main categories that cover a full range of traumatic/stressful events experienced by Japanese adolescents. The list was pre-tested (Taku, 2005b) with 920 Japanese adolescents. In the present study, participants indicated which one of five main categories of traumatic/stressful life events they had experienced. One category, involving the "Self," included events such as having a severe illness or accident, being a victim of a crime, or experiencing a natural disaster. A second category, "Family," included parents' divorce or separation, being abused by a parent or other family member, and a family member's illness or accident. A third category, "School," included failure on a university examination or significant academic problems.[1] A fourth category, "Relationship," included relationship break-ups and being bullied at school verbally and/or physically. A fifth category, "Bereavement," included death of a family member or other loved one. A sixth option, "Other," was available for participants whose event did not fit into the previous five categories.

Posttraumatic Growth Inventory – Japanese version (PTGI-J). The original PTGI (Tedeschi & Calhoun, 1996) is a 21-item scale that measures the degree of positive change experienced in the aftermath of a traumatic event. The original version has acceptable validity, internal consistency ($\alpha = .90$), and test-retest reliability over 2 months (.71) with American samples. The PTGI consists of five subscales: Relating to Others (seven items), New Possibilities (five items), Personal Strength (four items), Spiritual Change (two items), and Appreciation of Life (three items). A process of translation and back translation was conducted in order to achieve the greatest possible semantic and content equivalence to the PTGI. First, the PTGI was independently translated into Japanese by three professionals: an American who is a bilingual and bi-cultural, a Japanese translator, and the first author of this article. Second, several versions of the translated PTGI were administered to 31 Japanese college students to make sure they could understand each item. As a result, some changes in the wording were made and three versions of the Japanese PTGI were prepared. Then, two individuals, one American and one Japanese, each a professional translator, independently back translated these three versions of the PTGI from Japanese to English. Third, the authors of the original version of the PTGI examined these back-translated items and selected the best items from the three resulting versions. Based on their response, three Japanese researchers, including the first author of this article, discussed those items and reached a consensus, producing the Japanese version of the PTGI (PTGI-J) used in the study.

The instructions to the Japanese students were to "Indicate for each of the statements below the degree to which this change occurred in your life as a result of your crisis, which is the event/experience you described above, using the following scale." Items were rated on a six-point Likert scale, ranging from 0 (not at all) to 5 (a very great degree).

The Japanese Version of the Impact of Event Scale – Revised (IES-R-J). To examine the impact of each participant's event, the Japanese version of the Impact of Event Scale – Revised (IES-R) was used. The original IES-R (Weiss & Marmar, 1997) is a 22-item scale that measures traumatic symptoms, comprising three subscales: Intrusion, Avoidance, and

Hyperarousal. It has been widely used (Weiss, 2004). The Japanese version of the IES-R, developed by Asukai and colleagues (2002) is in accordance with the original English version in items, subscales, and scoring method, which is a five-point Likert scale (0 to 4), with higher scores implying higher levels of traumatic symptoms. The IES-R-J has demonstrated satisfactory validity and test–retest reliability (.86). The internal consistencies for the Intrusion, Avoidance, and Hyperarousal subscale are at least .88, .81, and .80, respectively (Asukai et al., 2002), and in the current study were .89, .83, and .80, respectively.

Data analysis

After summarizing data on the events reported, analyses proceeded in four steps. First, to explore the factor structure of the PTGI-J, a principal component analysis with Varimax rotation was conducted, thus utilizing the same method as reported in the original scale development (Tedeschi & Calhoun, 1996). Then a confirmatory factor analysis was conducted to test the factor structure of the PTGI-J. Second, the coefficients of internal consistency (Cronbach's α) for the scales identified in the factor analyses were calculated and the correlations among the subscales of the PTGI-J were examined. We also tested for possible gender differences using t tests. Third, the relationships among the time since the event, IES-R-J, and the PTGI-J were examined. Finally, the differences on each subscale of the PTGI-J across the five categories of traumatic events were tested using multivariate analyses of variance (MANOVA), excluding 18 cases which identified the "Other" event category. Significance was considered when $p < .05$ and the α significance level .05 was corrected using the Bonferroni procedure. All analyses were performed using SPSS (version 13.0 for Windows) or AMOS (version 4.01 for Windows).

Results

Traumatic/stressful life events

Among the 312 participants, the most traumatic/stressful events they had experienced were: "Relationships" (33.3%), "School" (20.8%), "Bereavement" (18.6%), "Self"(12.8%), "Family" (8.7%), and "Other" (5.8%).[2] The events our participants reported were relatively compatible with those described in the original study (Tedeschi & Calhoun, 1996). The events Tedeschi and Calhoun's (1996) participants had experienced included bereavement (36% in their study and 19% for the present study), injury-producing accidents (16% for theirs and 9% for this one), separation or divorce of parents (8% for theirs and 6.4% for this one), and relationship break-up (7% for theirs and 11% for this one). Our sample also seemed to be compatible with the original study (Tedeschi & Calhoun, 1996), in terms of the participants' age (92% ranged in age from 17 to 25 years in their study and 100% for this one), marital status (95% single in their study and 99% for this one), and the time the event had occurred (22% less than 6 months ago in their study and 24.4% for this one; 16% between 7 and 12 months ago for theirs and 13.7% for this one; 17% between 13 and 23 months ago for theirs and 21.2% for this one; 32% between 2 and 4 years ago and 31.4% for this one; and 13% more than 4 years ago for theirs and 9.3% for this one). The overall means on the PTGI-J and IES-R-J were 38.9 ($SD = 20.8$, range $= 0–105$) and 23.6 ($SD = 17.1$, range $= 0–88$), respectively.

Exploratory factor analysis

To explore the factor structure of the PTGI-J, a principal components analysis with Varimax rotation on the 21 items was conducted. The analysis produced four factors with eigenvalues greater than one. These accounted for 59.0% of the common variance. Table I shows the factor loadings and the descriptive statistics for each item of the PTGI-J.

Congruent with criteria used in the original study (Tedeschi & Calhoun, 1996), an item was allocated to a factor only if its loading was greater than .5 and if it loaded less than .4 on other factors. As a result, three items, "I changed my priorities about what is important in life (item 1)," "I am able to better things with my life (item 11)," and "I learned a great deal about how wonderful people are (item 20)" were eliminated from further analyses. Then, a

Table I. Factor loadings[a], mean, and standard deviation[b] of the 21 items of the PTGI-J.

	PTGI-J item and factor	F1	F2	F3	F4	Original factor[c]	*M* (*SD*)
Factor 1: Relating to Others							
21	I better accept needing others.	.759				I	2.39 (1.8)
6	I more clearly see that I can count on people in times of trouble.	.751				I	2.46 (1.8)
8	I have a greater sense of closeness with others.	.750				I	2.13 (1.7)
9	I am more willing to express my emotions.	.720				I	1.90 (1.7)
16	I put more effort into my relationships.	.659				I	2.29 (1.7)
15	I have more compassion for others.	.590				I	2.39 (1.7)
Factor 2: New Possibilities							
3	I developed new interests.		.743			II	2.02 (1.7)
7	I established a new path for my life.		.734			II	2.06 (1.7)
14	New opportunities are available which wouldn't have been otherwise.		.726			II	1.53 (1.7)
17	I am more likely to try to change things which need changing.		.597			II	2.20 (1.7)
11	I am able to do better things with my life.		.547	.494		II	1.66 (1.5)
1	I changed my priorities about what is important in life.		.490		.436	V	2.13 (1.7)
Factor 3: Personal Strength							
19	I discovered that I'm stronger than I thought I was.			.797		III	1.39 (1.5)
10	I know better that I can handle difficulties.			.736		III	1.88 (1.5)
4	I have a greater feeling of self-reliance.			.625		III	1.52 (1.5)
12	I am better able to accept the way things work out.			.597		III	1.86 (1.6)
Factor 4: Spiritual Change and Appreciation of Life							
2	I have a greater appreciation for the value of my own life.				.749	V	1.67 (1.9)
5	I have a better understanding of spiritual matters.				.628	IV	1.35 (1.6)
18	I have a stronger religious faith.				.625	IV	0.46 (1.1)
13	I can better appreciate each day.				.562	V	1.91 (1.6)
20	I learned a great deal about how wonderful people are.			.445	.508	I	1.18 (1.5)

Note. [a]Only factor loadings > .4 are shown. [b]Range of score: 0–5. [c]Roman numerals for the original factors are as follows: I. Relating to Others; II. New Possibilities; III.Personal Strength; IV. Spiritual Change; V. Appreciation of Life.

second principal components analysis with Varimax rotation was conducted with the 18 items remaining. The solution produced four factors, which accounted for 60.8% of the total variance. The variance accounted for is similar to that obtained with the original version of the PTGI (62%; Tedeschi & Calhoun, 1996). The first factor (F1) included six items (e.g., item 21, "I better accept needing others.") from the original Relating to Others subscale. The second factor (F2) included four items (e.g., item 3, "I developed new interests.") from the original New Possibilities subscale. The third factor (F3) included 4 items (e.g., item 19, "I discovered that I'm stronger than I thought I was.") from the original Personal Strength subscale. The fourth factor (F4) included four items (e.g., item 2, "I have a greater appreciation for the value of my own life.") from the original Spiritual Change and Appreciation of Life subscales.

Confirmatory factor analysis

To evaluate the factor structure of the PTGI-J, one model was tested using structural equation modeling (SEM). We expected that the four subscales of PTGI-J would be interrelated. A model was entered into AMOS 4.01 for analysis using the maximum-likelihood method of estimation. The overall model fit should be assessed using the chi-squared statistic first. Our data showed that χ^2 (129) =436.8, p <.001. But since χ^2 is sensitive to sample size, it is generally suggested that where sample size exceeds 150–200, the χ^2 method of model fit is unreliable and alternative methods are preferred. The alternative methods include the Normed Fit Index (NFI), the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). The fit statistics of the NFI, CFI, and TLI with .90 or greater indicate tolerable fit. As for the RMSEA, the values of roughly .06 or less are generally taken to indicate reasonable model fit. Our results showed that NFI =.938, CFI =.955, TLI =.940, and RMSEA =.088. As a result, this model provides a suitable fit for the data.

Internal consistency

The Cronbach's α coefficient of the total PTGI-J with 18 items was .90. The Cronbach's α coefficients for the four factors which emerged were: Relating to Others (.86); New Possibilities (.82); Personal Strength (.79); and Spiritual change and Appreciation of Life (.66).

Gender differences and inter-correlations

There were no significant differences between men (M =35.2, SD =18.0) and women (M =33.0, SD =17.8) for the 18-item PTGI-J total scale [t(1,302) =.107]. Also, there were no gender differences in the four subscales of the PTGI-J. There were no significant differences between men (M =25.7, SD =18.0) and women (M =22.3, SD =16.4) for the IES-R-J total score [t(1, 306) =3.25]. Although there were no gender differences on the Intrusion and Hyperarousal subscales, a significant difference was found for the Avoidance subscale of the IES-R-J between men (M =1.3, SD =1.0) and women (M =1.1, SD =0.8), [t(1, 307) =8.2, p <.01].

All four subscales of the PTGI-J were significantly related to each other (with r's ranging from .39 to .61); the moderate strength of these relationships is consistent with the original study by Tedeschi and Calhoun (1996).

The Relationships of time since the event and the PTGI-J

Pearson product-moment correlations were calculated for the time since the event with the total score of 18-item PTGI-J, and each of the subscales of the PTGI-J. None of the relationships were significant: 18-item total score ($r = .03$), Relating to Others ($r = -.05$), New Possibilities ($r = .06$), Personal Strength ($r = .11$), and Spiritual Change and Appreciation of Life ($r = -.01$).

The relationships between the IES-R-J and the PTGI-J

There was a positive relationship between the total score of the IES-R-J and the 18-item total score of the PTGI-J ($r = .23$, $p < .001$). There were also several relationships between three subscales of the IES-R-J and four factors of the PTGI-J (Table II). The Relating to Others factor and the Spiritual Change and Appreciation of Life factor were positively correlated with all three subscales of the IES-R-J. The New Possibilities factor was also positively correlated with two subscales, Intrusion and Hyperarousal. The Personal Strength factor was not related to the IES-R-J.

The PTGI-J and categories of events

To examine the event-specific differences in response to the PTGI-J, a MANOVA was performed on the subscales of the PTGI-J (Table III). The five event categories were the levels of the independent variable, and the four subscales of the PTGI-J were the dependent variables. Box's test of equality of covariance matrices (Box's $M = 52.9$, $F = 1.27$, $p = .12$) indicated that the assumption of homogeneity of variance–covariance was not violated. The main effect of the event category was significant: Wilks' $\lambda = .636$, F (4, 281) $= 8.49$, $p < .001$, partial $\eta^2 = .107$. The pairwise comparisons based on estimated marginal means using a Bonferroni approach showed that people who reported a "Relationship"-related event had higher scores on the Relating to Others subscale than those who reported a "School"-related event, and those who reported a "Bereavement" event had higher scores on the Spiritual Change and Appreciation of Life subscale than those who reported any other type of event.

Discussion

This study provides a preliminary exploration of PTG among Japanese people and it appears to be the first to employ a standardized measure of PTG to assess the dimensions of growth in a Japanese sample. Present results indicate that the Japanese version of the PTGI

Table II. The correlation between the IES-R-J and the PTGI-J.

	IES-R-J			
PTGI-J	Total	Intrusion	Avoidance	Hyperarousal
Total (18-item)	.225**	.235**	.134*	.246**
F1: Relating to Others	.229**	.247**	.125*	.256**
F2: New Possibilities	.119*	.112*	.065	.149**
F3: Personal Strength	.066	.047	.037	.106
F4: Spiritual Change and Appreciation of Life	.288**	.307**	.203**	.256**

Note. *$p < .05$. **$p < .01$.

Table III. Means and SDs of the PTGI-J by five categories of events[a] and MANOVA (F value and pairwise comparisons)[bc].

	Score range	(1) Self ($n=39$)	(2) Family ($n=26$)	(3) School ($n=64$)	(4) Relationship ($n=100$)	(5) Bereavement ($n=57$)	F	Pairwise comparisons
F1: Relating to Others	0–5	2.06 (1.3)	2.24 (1.1)	2.04 (1.5)	2.69 (1.2)	2.26 (1.3)	3.26*	C <D
F2: New Possibilities	0–5	1.60 (1.4)	1.62 (1.4)	2.34 (1.3)	2.11 (1.4)	1.87 (1.3)	2.66	
F3: Personal Strength	0–5	1.51 (1.3)	1.68 (1.3)	1.97 (1.2)	1.77 (1.1)	1.50 (1.3)	1.55	
F4: Spiritual Change and Appreciation of Life	0–5	1.38 (1.3)	1.19 (1.0)	1.02 (0.9)	1.22 (1.0)	2.32 (1.1)	14.87***	A, B, C, D <E

Note. [a]The values in parentheses are standard deviations. [b]Eighteen cases who identified "Other" event are excluded. [c]All four subscales of PTGI-J were included in a single MANOVA using SPSS' GLM procedure. *p <.05, ***p <.001.

has good internal consistency and a factor structure with significant similarity to that reported in the original study (Tedeschi & Calhoun, 1996). The average score of the PTGI-J showed that over 40% of the sample reportedly perceived growth to a small or moderate degree (i.e., the PTGI-J total score >42).

The present factor analysis of the PTGI-J yielded a four-factor structure. The first three, Relating to Others, New Possibilities, and Personal Strength replicated original PTGI factors, whereas the other two original factors, Spiritual Change and Appreciation of Life, were combined in the present sample. This pattern has also been reported in a sample of Latina immigrants responding to the Spanish version of the PTGI (Weiss & Berger, 2006). But, unlike the Spanish version, the present study revealed that the New Possibilities and Personal Strength factors were clearly distinct from each other. The New Possibilities factor might have been distinctive in this sample because the participants were in a transitional developmental period, whereas the Personal Strength factor might be perceived in any phase of adult life.

The factor analysis also revealed that three items from the original PTGI showed double-loadings. "I changed my priorities about what is important in life," loaded equally on the Appreciation of Life and the New Possibilities factors. It is expected that changing priorities could also lead to new paths for Japanese university students. "I am able to do better things with my life," loaded on the New Possibilities and the Personal Strength. "I learned a great deal about how wonderful people are" unexpectedly did not load on the Relating to Others, but on both the Personal Strength and the Spiritual Change and Appreciation of Life. This last finding suggests that Japanese respondents were likely to see this item in terms of their view of people in general, rather than their specific relationships.

The current study also appears to demonstrate some unique features of PTG among Japanese university students. First, there were no gender differences in our sample. Prior results regarding gender differences in PTG have been somewhat inconsistent (Linley & Joseph, 2004), but, in studies in which differences have been found, women have reported more growth than men (e.g., Bellizzi, 2004; Sheikh & Marotta, 2005; Tedeschi & Calhoun, 1996). Women in Western countries may be more religious than men, and this may be one of the potential explanations of the gender differences of PTG (Rayburn, 2004). If so, the present results can be explained by insignificant or at least smaller gender differences in religiousness among Japanese than among Americans (Miller & Stark, 2002).

There was no significant relationship between the time since the event and scores on the PTGI-J, consistent with the findings on the original PTGI study (Tedeschi & Calhoun, 1996). This finding suggests that PTG may not occur automatically as time goes by, and that growth can, at least in some circumstances, continue for extended periods of time. Conditions that may produce adaptive cognitive processing, such as social support (Hogan & Schmidt, 2002) or successful coping behaviors (Sheikh, 2004), may contribute to PTG months or years after event exposure. Longitudinal studies can help us better understand why some studies have found that the longer the time since the event, the greater growth reported by individuals (e.g., Cordova et al., 2001).

There were relationships between posttraumatic stress symptoms and the amount of PTG reported. Relating to Others, and Spiritual Change and Appreciation of Life, had a positive association with all three subscales of the IES-R-J. Moreover, the greater the intrusion and hyperarousal symptoms, the more growth in New Possibilities reported by participants. These findings are largely consistent with those reported for German adult university students (Maercker & Langner, 2001) and for Australian undergraduate students (Morris et al., 2005). It provides support for the idea that emotional distress and PTG can

co-exist, perhaps underscoring that PTG is a distinct construct from "good adjustment" (Cadell, Regehr, & Hemsworth, 2003; Calhoun & Tedeschi, 2004; Salter & Stallard, 2004).

There were also some differences among PTGI-J subscales depending on the type of traumatic/stressful event reported. Growth on the Relating to Others factor was higher for those who reported a "Relationship"-related event than those who reported a "School"-related event. These findings suggest that interpersonal growth may be more likely when the crisis experienced is interpersonal in nature. It is possible that participants who went through pain in the arena of human relationships may have seen themselves as more compassionate, intimate, or aware of others' worth.

The findings for New Possibilities (i.e., no significant differences by type of event reported) suggest that perceptions of New Possibilities were not affected by the specific nature of the event experienced. The New Possibilities factor may reflect a realistic transformation at the behavioral level in the sense that it includes items representing both finding new paths and establishing new priorities. As mentioned above, some traumatic/stressful events can mark a turning point specifically for people who have intrusion or hyperarousal symptoms, rather than the specific event itself, because the relationship between intrusion PTSD symptoms and PTG is suggestive of the rumination process that occurs after a traumatic experience (Calhoun & Tedeschi, 2006; Morris et al., 2005).

With regard to Personal Strength, there was no difference associated with the type of event, suggesting that perceived positive changes in Personal Strength may be a common and stable theme in the PTG of Japanese university students, independent of the type of event experienced. Weiss and Berger (2006) argued that this factor might be related to cultural differences relative to individualism vs. collectivism because the Spanish version of the PTGI did not yield this factor independently. Since Japan is also a collectivistic culture (Miyahara, Kim, Shin, & Yuun, 1998), and our findings revealed that Japanese university students perceived the Personal Strength as a separate dimension of PTG, this suggests that some other difference must be associated with the failure to find this dimension in the Spanish sample.

Finally, participants who reported an event in the "Bereavement" category had the highest level of Spiritual Change and Appreciation of Life. As previously indicated, obvious religious commitment does not always exist among young people in Japan. Nevertheless, it is interesting to note that Japanese university students in this sample perceived spiritual change and appreciation of life, especially in the aftermath of the death of a loved one.

In interpreting our findings, there are several limitations that need to be considered. One possible limitation is the nature of the events participants identified. Although they identified their most stressful event, events chosen may not necessarily always have been "seismic" enough in nature, i.e., sufficiently challenging to the basic components of the assumptive world, as some models of PTG require (Calhoun & Tedeschi, 1998, 2006; Janoff-Bulman, 2006; Tedeschi & Calhoun, 2004). Bellizzi and Blank (2006) have taken emotional intensity into account to examine PTG and found that perceived intensity plays an important role in predicting growth. It will be critical to measure the severity of the event or how much the event shakes the subject's assumptive world. Furthermore, the categorization of the traumatic events reported may have potential problems. That is, the five categories have utility in providing a general view of the differences in the amount of growth among each type of event; however, this simplification clearly has overlooked the qualitative differences of each event in the same category (e.g., parents' divorce or separation is different from being abused by parents, or relationship break-up is different from being bullied by peers). Further studies are needed to examine the differences in PTG

among the types of events experienced. The results of the factor analysis should be carefully interpreted, then, since some of the events chosen may not have been severe enough to shake the assumptive world. Another possible limitation relates to potential differences among the subscales of the IES-R-J. Both Intrusion and Avoidance subscales have items that are phrased to reflect responses to a specific event, whereas Hyperarousal items are not worded in this specific way. Some IES-R-J items might reflect responses to other traumatic events, since the instructions asked for ratings regarding responses manifested in the previous 7 days.

In spite of its limitations, this study points to several directions for future work. First, since PTG appears to be initiated by challenges to the assumptive world in the aftermath of trauma, further study of the relationship between PTG and the changes in the various components of one's assumptive world seems desirable. No studies of growth following trauma have investigated carefully the impact of a traumatic event on the full range of beliefs that comprise the assumptive world. Second, present findings, along with other studies, suggest that people immersed in different cultural settings may experience PTG differently, but considerable work is necessary to fully understand the nature of these differences and how the proximate and distal cultures of individuals may relate to PTG. Third, contrary to previous studies in Western countries (e.g., Sheikh & Marotta, 2005), the averages of some items were relatively low, especially for the item "I have a stronger religious faith." One possible reason is that in Japanese culture, spirituality tends to be understood from an existential perspective, rather than as religiosity in the more narrow sense of a specific creed or set of beliefs (Morita, Tsunoda, Inoue, & Chihara, 2000), and making a strong and serious commitment to specific religions is quite rare (Miller, 1995). Finally, in the present study, the events reported by participants included what appear to be Japanese-specific crises that are related to a sense of guilt, such as "couldn't satisfy other person's expectation," "hurt someone unintentionally," and failure on highly important university admission exams. It would be interesting to examine more precisely how these experiences may be related to PTG in Japan (e.g., Sato & Sakano, 2000; Taku, 2005a).

Notes

A copy of the Japanese version of the PTGI used in this study can be obtained from K. Taku.

1 A failure on a competitive university examination can be a traumatic event specific to Japanese adolescents (e.g., Sato & Sakano, 2000). Presumably, this experience might produce a sense of failure and hopelessness. For instance, this category includes students who had to wait more than a year to retake an exam to enter a university they wished to attend.

2 The breakdown of the event category follows: Relationships (38% being bullied, 33% relationship breakup, 26% friendship problems, and 3% other), School (49% failure on a university examination, 43% academic problems, and 8% other), Bereavement (60% death of a family member, 26% death of a friend, and 14% other), Self (70% having a severe illness or accident, 2% being a victim of a crime, 1% a natural disaster, and 27% other), and Family (74% separation or divorce of parents, 22% being abused, and 4% other).

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