

## **The Posttraumatic Growth Inventory: Measuring the Positive Legacy of Trauma**

**Richard G. Tedeschi<sup>1</sup> and Lawrence G. Calhoun<sup>1</sup>**

---

*The development of the Posttraumatic Growth Inventory, an instrument for assessing positive outcomes reported by persons who have experienced traumatic events, is described. This 21-item scale includes factors of New Possibilities, Relating to Others, Personal Strength, Spiritual Change, and Appreciation of Life. Women tend to report more benefits than do men, and persons who have experienced traumatic events report more positive change than do persons who have not experienced extraordinary events. The Posttraumatic Growth Inventory is modestly related to optimism and extraversion. The scale appears to have utility in determining how successful individuals, coping with the aftermath of trauma, are in reconstructing or strengthening their perceptions of self, others, and the meaning of events.*

---

**KEY WORDS:** perceived benefits; trauma; growth; coping.

There is overwhelming evidence that traumatic events can produce many negative physical and psychological consequences. Although researchers have extensively studied the negative effects of trauma, there has been much less attention paid to the possibility of positive impact of negative events. However, there is a body of literature suggesting that people exposed to even the most traumatic events may perceive at least some good emerging from their struggle with such tragedies as rape (Burt & Katz, 1987; Veronen & Kilpatrick, 1983), incest (Silver, Boon, & Stones, 1983), bereavement (Calhoun & Tedeschi, 1989-90; Schwartzberg & Janoff-Bulman, 1991), cancer (Collins, Taylor, & Skokan, 1990; Taylor, 1983), HIV infection (Schwartzberg, 1994), heart attacks (Affleck, Tennen, & Croog,

<sup>1</sup>Additional data are available from the authors at the Department of Psychology, University of North Carolina at Charlotte, Charlotte, North Carolina 28223.

1987), disasters (Thompson, 1985), combat (Sledge, Boydstun, & Rabe, 1980), and the Holocaust (Kahana, 1992). At least three broad categories of perceived benefits have been identified: changes in self-perception, changes in interpersonal relationships, and a changed philosophy of life.

### **Perceived Changes in Self**

One class of benefits cited by individuals who have faced trauma is positive change in perception of the self. Affleck and his associates (Affleck, Allen, Tennen, McGrade & Ratzan, 1985; Affleck, Tennen, & Gershman, 1985) reported that parents with ill and high-risk children indicated that "emotional growth" was a positive outcome of dealing with their difficulties. Andreasen and Norris (1972) indicated that some burn patients stated that the reason they had experienced their trauma was to make them better persons. Eighty-three percent of a sample of persons who survived the sinking of a cruise ship reported they felt more experienced about life (Joseph, Williams, & Yule, 1993). Collins et al. (1990) found that the most common positive change reported by cancer patients was feeling stronger and more self-assured. It appears that living through life traumas provides a great deal of information about self-reliance, affecting not only self-evaluations of competence in difficult situations but the likelihood one will choose to address difficulties in an assertive fashion. Persons coping with a traumatic event often draw the conclusion that they are stronger (Thomas, DiGiulio, & Sheehan, 1991), a confidence which may generalize to all kinds of situations, including future traumas.

### **A Changed Sense of Relationships with Others**

Affleck et al. (1985) described reactions of mothers whose newborns were treated for severe perinatal medical problems in a neonatal intensive care unit. Almost 60% of the mothers in this sample reported some perceived benefits, with 20% mentioning benefits involving closer family relationships, emotional growth, and an appreciation of how precious their child is. Malinak, Hoyt, and Patterson (1979) found similar reactions in adults who had lost a parent within the preceding 2 years. Approximately half of these persons reported a deepening of their relationships with others as they realized how important these relationships are, and how quickly they can be lost.

Another aspect of improving relationships after traumatic events was reported by Veronen and Kilpatrick (1983) in a study of rape victims.

Women who came for counseling indicated they had learned from their victimization that they must make decisions in their own best interests, including protecting themselves from abuse in their relationships. This approach to relationships also assisted these women to become better able to establish more positive and intimate relationships with some family members from whom they had been estranged. Burt and Katz (1987) found approximately 25% of rape victims reported that they had come to value themselves more and handle relationships better since being raped, although these positive changes had often taken many years to develop.

When people are confronted with traumatic events, the continuing need for discussion of the consequences of these events can lead to persons becoming more self-disclosing than they may have been before. Although the reactions of persons in the support network vary (Dakof & Taylor, 1990), self-disclosure may provide an opportunity to try out new behaviors that can then be directed at the most appropriate persons in the support network. The recognition of one's vulnerability can lead to more emotional expressiveness, willingness to accept help, and therefore a utilization of social supports that had previously been ignored. Part of the positive development of social relationships comes from the increased sensitivity to other people and efforts directed at improving relationships (Collins et al., 1990).

### **A Changed Philosophy of Life**

Change in philosophy of life regarded as positive by the respondent is another type of benefit reported by many persons coping with trauma. Malinak et al. (1979) indicated that some bereaved respondents reported an increased appreciation for their own existence, and Affleck, Tennen, and Gershman (1985) reported that a better perspective on life was reported by 23% of the mothers of sick newborns in their study. Taylor, Lichtman, & Wood (1984) found that of women who had made changes since their cancer was discovered, 60% reported positive changes in priorities, such as taking life easier and enjoying it more. Ninety-four percent of the survivors of the sinking of the cruise ship *Jupiter* reported they no longer took life for granted and 71% reported they now lived each day to the fullest (Joseph et al., 1993).

While for some, spiritual beliefs may be temporarily weakened by tragedy, and others may become more cynical and less religious (Schwartzberg & Janoff-Bulman, 1991), the struggle to understand the trauma can lead many eventually to have their beliefs strengthened (Andrykowski, 1992). Pargament et al. (1990) point out that a strengthening of religious beliefs may lead to an increased sense of control, intimacy, and finding meaning.

Recognizing meaning in the midst of trauma and its aftermath may allow a person to experience emotional relief and lead to a new philosophy of life that alters basic assumptions people hold about life and what meaning it may have (Janoff-Bulman, 1992; Taylor & Brown, 1988).

Despite this growing body of literature on perception of benefits from traumatic life events, and some initial steps toward reliable measurement of these perceptions (Burt & Katz [1987], with rape victims; Joseph et al. [1993], with victims of a maritime accident), there has been no general measure of the perception of benefits that has applicability to a wide array of different types of traumatic events. Only recently has there been attention paid to assessing the growth that appears to occur in the aftermath of such events (Park, Cohen, & Murch, in press). Using a measure of perceived benefits in studies of trauma would alert researchers to the possibility of positive outcomes in addition to the often documented negative outcomes, and allow a comparison among persons confronted with different traumatic events in varying contexts. The purpose of the present paper is to describe the development of such a measure. The Posttraumatic Growth Inventory (PTGI) measures the extent to which survivors of traumatic events perceive personal benefits, including changes in perceptions of self, relationships with others, and philosophy of life, accruing from their attempts to cope with trauma and its aftermath.

### **Study 1: Item Development and Scale Reliability**

#### *Method*

The first step in developing a scale measuring perceived benefits was to create items that reflect the kinds of benefits mentioned in the literature as described above. In order to create these items, a general review of the studies was conducted where persons had perceived benefits coming from an encounter with trauma. Based on the literature review, 34 items were generated that referred to positive changes frequently mentioned in areas of perceived changes in self (e.g., I developed new interests.), of a changed sense of relationships with others (e.g., I accept needing others.), and of a changed philosophy of life (e.g., My priorities about what is important in life.). Since these items were designed to determine if positive changes had occurred as a result of experienced negative events, the items could not be worded in a negative direction to control for acquiescence in responding.

Respondents were asked: Indicate for each of the statements below the degree to which this change occurred in your life as a result of your

crisis, using the following scale. A 6-point Likert response format was used, ranging from "I did not experience this change as a result of my crisis" (scored 0), to "I experienced this change to a very great degree as a result of my crisis" (scored 5). Intermediate scores were given for a very small degree (1), a small degree (2), a moderate degree (3), and a great degree (4).

The 34 items, and a demographic data form with a space to describe a difficult life event, were administered to groups of undergraduate students who had been recruited from psychology classes at a large university in the southeastern United States. These persons were selected because they stated that they had experienced a significant negative life event during the past 5 years. A total of 199 men and 405 women participated. Ninety two percent ranged in age from 17 to 25, and 95% were single. The events the participants had experienced included bereavement (36%), injury-producing accidents (16%), separation or divorce of parents (8%), relationship break-up (7%), criminal victimization (5%), academic problems (4%), unwanted pregnancy (2%), and a variety of others. Participants reported that these events occurred less than 6 months ago in 22% of the cases, between 7 and 12 months ago in 16%, between 13 and 23 months ago in 17%, between 2 and 4 years ago in 32% and more than 4 years ago in 13% of the cases.

## Results

*Principal components analysis.* A principal components analysis was performed on these items followed by a varimax rotation. This approach was chosen in order to maximize the distinctions among the components, given that these 34 items had produced a very high internal consistency ( $\alpha = .94$ ). The analysis produced six factors<sup>2</sup> with eigenvalues greater than one. Five of the six factors were easily interpretable and therefore the 21 items loading on these factors were retained as having utility. These accounted for 55% of the common variance and loaded greater than .5 on one of the five factors without loading .4 or greater on any other factor. A second principal components analysis and varimax rotation using the selected 21 items produced five factors with eigenvalues greater than one, identical to those found with 34 items, and accounted for 62% of the common variance (Table 1). The factors were labeled Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. There was a Pearson product-moment correlation of  $r = .98$  between total

<sup>2</sup>We use the term "factor" to refer to the results of the rotation of the extracted principal components, following conventional practice (Cooley & Lohnes, 1971).

Table 1. Factor Loadings of 21 Items Selected for the Posttraumatic Growth Inventory<sup>a</sup>

Factor Loadings:	I	II	III	IV	V
<b>PTGI Item and Factor</b>					
<b>Factor I: Relating to Others (17% of Variance)</b>					
6. Knowing that I can count on people in times of trouble.	.67				
8. A sense of closeness with others.	.81				
9. A willingness to express my emotions.	.63				
15. Having compassion for others.	.70				
16. Putting effort into my relationships.	.61				
20. I learned a great deal about how wonderful people are.	.62				
21. I accept needing others.	.67				
<b>Factor II: New Possibilities (16% of Variance)</b>					
3. I developed new interests.		.76			
7. I established a new path for my life.		.80			
11. I'm able to do better things with my life.		.76			
14. New opportunities are available which wouldn't have been otherwise.		.76			
17. I'm more likely to try to change things which need changing.		.63			
<b>Factor III: Personal Strength (11% of Variance)</b>					
4. A feeling of self-reliance.			.62		
10. Knowing I can handle difficulties.			.79		
12. Being able to accept the way things work out.			.54		
19. I discovered that I'm stronger than I thought I was.			.71		
<b>Factor IV: Spiritual Change (9% of Variance)</b>					
5. A better understanding of spiritual matters.				.84	
18. I have a stronger religious faith.				.83	
<b>Factor V: Appreciation of Life (9% of Variance)</b>					
1. My priorities about what is important in life.					.50
2. An appreciation for the value of my own life.					.85
13. Appreciating each day.					.59

<sup>a</sup>Items were selected with factor loadings at least .5 and with loadings of less than .4 on other factors. Loadings and proportions of variance reported are from a principal components analysis and varimax rotation of 21 items selected from the original item pool.

score based on the 21-item version of the PTGI and the total score based on 34 items, indicating no significant loss of information by reducing the number of items in the scale.

There were gender differences for the overall scale, with women reporting more benefits ( $M = 75.18$ ,  $SD = 21.24$ ) than men ( $M = 67.77$ ,  $SD = 22.07$ ) ( $t(1,590) = 3.94$ ,  $p < .001$ ). Women scored higher than men on every factor except New Possibilities (see Footnote 1).

*Internal consistency and test-retest reliability.* The internal consistency of the resulting 21-item PTGI is  $\alpha = .90$ . Deletion of individual items did not result in a drop in alpha below .89, indicating that all items contribute relatively equally to the consistency of the scale. The factors which emerged also showed substantial internal consistency: New Possibilities ( $\alpha = .84$ ); Relating to Others ( $\alpha = .85$ ); Personal Strength ( $\alpha = .72$ ); Spiritual Change ( $\alpha = .85$ ); Appreciation of Life ( $\alpha = .67$ ). In addition, corrected item-total PTGI correlations (the correlation of each item with the total score across all remaining 20 items) were all in the moderate range ( $r = .35$  to  $r = .63$ ). The Pearson product-moment correlations among the factors ranged from  $r = .27$  to  $r = .52$ , and the correlations of the factors with the PTGI ranged from  $r = .62$  to  $r = .83$ , indicating overlap but some separate contributions by these factors.

A sample of 28 persons was obtained in the same fashion as the larger sample in order to determine test-retest reliability over two months. The test-retest reliability for the 21-item PTGI was acceptable at  $r = .71$ . Test-retest reliabilities for the factors ranged from  $r = .65$  to  $r = .74$ , except for Personal Strength ( $r = .37$ ) and Appreciation of Life ( $r = .47$ ).

### Study 2: Concurrent and Discriminant Validity

Once the set of 21 items for the PTGI was established, it was important to determine that the tendency to perceive benefits arising from experiences with trauma was not merely a reflection of some other tendency. For example, it seemed possible that the PTGI could be highly correlated with social desirability, since the benefits described appear to be very desirable. Therefore, the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) was selected in order to examine this possible relationship.

On the other hand, some low to moderate correlations could be expected between the PTGI and certain personality characteristics that appear to be related to the tendency to perceive benefits from trauma. Optimism is an obvious example. Optimists emphasize the positive aspects of difficult situations, allowing them to redirect their attention to appropriate problem-focused coping strategies (Scheier, Weintraub, & Carver, 1986). Perceiving growth also appears to increase optimism (Park et al., in press). Another relationship with the PTGI is suggested by the negative correlations reported between optimism and neuroticism (Smith, Pope, Rhodewalt, & Poulton, 1989). To examine the relationship between optimism and the PTGI, the Life Orientation Test (LOT) (Scheier & Carver,

1985) was used. The eight items scored have an internal consistency of  $\alpha = .76$ , and a test-retest reliability over 4 weeks of  $r = .79$ .

Concepts such as resilience (Rutter, 1987) and hardiness (Kobasa, 1979) also could be expected to relate to the tendency to perceive benefits in the aftermath of trauma, since they involve the ability to cope successfully with stressful events or life circumstances. These concepts are related to other personality characteristics. For example, Rutter (1987) and Garnezy (1994) described personality factors of self-esteem and self-efficacy as associated with resilience in children. Stutman and Baruch (1992) see resilience as including "intrapyschic strengths" of trust, self-regulation, autonomy, self-esteem, empathy, altruism, internal locus of control, flexibility, and optimism.

In order to explore the possible relationships between the ability to perceive benefits in trauma and various personality characteristics, we decided to use a general, comprehensive, and well-validated measure of the "big five" personality factors (McCrae, 1992). We chose the NEO Personality Inventory (Costa & McCrae, 1985), which is comprised of scales of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Internal consistency of the five scales is .85 or above, and test-retest reliabilities for the first three scales is .86 or greater over 6 months (Costa & McCrae, 1985). Neuroticism, Extraversion, and Openness have correlated  $r = -.17$ ,  $r = .20$ , and  $r = .19$ , respectively, with use of a coping strategy of "drawing strength from adversity" (McCrae & Costa, 1986).

Finally, since changes in religious beliefs have been found among persons coping with trauma, and since religion serves as a coping strategy for many people, we included a measure of religious participation in order to determine if persons who are more actively religious are more likely to have perceived benefits. We used a three-item measure (Pressman, Lyons, Larson, & Strain, 1990) for this purpose.

We expected that the PTGI should be unrelated to social desirability, moderately and positively correlated with optimism, extraversion, openness, and religious participation, and negatively correlated with neuroticism.

### *Method*

Some participants in Study 1 were administered, in addition to the PTGI, in random order, the NEO Personality Inventory ( $n = 325$ ) (Costa & McCrae, 1985), the LOT ( $n = 449$ ), the Marlowe-Crowne Social Desirability Scale ( $n = 318$ ), and the index of religious participation ( $n = 237$ ). Participants also completed two 6-point Likert ratings: the positive effect



and the negative effect the event had on the person, ranging from “no effect” to “extreme effect.”

### Results

Correlations between the PTGI and other measures mentioned here are at the  $p < .01$  or  $p < .001$  levels, although others reached significance at  $p < .05$ .

*Demographic and situational variables.* There was no relationship between age of the participants (although the range was quite restricted) and PTGI score ( $r = .01$ , n.s.), or between time since the event and the PTGI ( $r = .02$ , n.s.). Sixty percent of participants reported some to extreme positive effect on themselves, and 94% reported some to extreme negative effect of these events. The correlation between the rated positive effect of the event, using the 6-point Likert scale, and PTGI scores was  $r = .24$ ,  $p < .01$ . The correlation between the PTGI and rated negative effect was  $r = .21$ ,  $p < .01$ .

*Social desirability.* The PTGI was not related to social desirability, but persons reporting greater Appreciation of Life tended to respond in a slightly less socially desirable fashion ( $r = -.15$ ,  $p < .01$ ).

*Personality.* There were many relationships between the PTGI, the PTGI factors, and personality. The PTGI was positively correlated with optimism, religiosity, and all the major dimensions of personality except neuroticism (Table 2). Persons scoring higher on the New Possibilities factor also reported themselves to be more optimistic, extraverted, and open to experience. Persons scoring higher on Relating to Others reported themselves to be more optimistic, extraverted, and agreeable. Persons scoring higher on Personal Strength reported themselves to be more optimistic, extraverted, open to experience, and conscientious. Persons scoring higher on Appreciation of Life reported themselves to be more optimistic and extraverted. Persons scoring higher on Spiritual Change reported themselves to be more optimistic, religious, and extraverted. Certain specific facets of the major NEO personality domains were primarily responsible for the relationships between those personality factors and the PTGI and its factors. Three facets in particular were related to all PTGI factors and to the total PTGI most strongly: the Extraversion facets of Activity ( $r = .31$  with PTGI) and Positive Emotions ( $r = .34$  with PTGI), and the Openness facet of Feelings ( $r = .28$  with PTGI). Some specific facets were related to the PTGI factors even though the major domain they comprise were not. For example, the Openness to Experience facet of values was negatively correlated with PTGI Spiritual Change ( $r = -.15$ ).

**Table 2.** PTGI and Factors Correlated with Marlowe-Crowne Social Desirability, Life Orientation Test Optimism, Religious Participation, and NEO Personality Inventory Factors<sup>a</sup>

PTGI Factor	M-C Social Des	LOT Optimism	Relig Partic	NEO Neurotic	NEO Extraver	NEO Openness	NEO Agreeable	NEO Conscien
I: Relating to others		.14			.28		.18	
II: New possibilities		.22			.16	.25		
III: Personal strength		.22			.15	.25		.15
IV: Spiritual change		.17	.50 <sup>b</sup>		.26			
V: Appreciation of life	-.15	.15			.16			
Total PTGI		.23	.25		.29	.21	.18	.16

<sup>a</sup>Only correlations significant at  $p < .01$  or greater are included.

<sup>b</sup> $p < .001$ .

### Study 3: Construct Validity

In order to examine the construct validity of the PTGI, an attempt was made to determine if the PTGI measures some benefits unique to trauma, comparing persons who had experienced only ordinary life events with those who experienced severely traumatic events. Since the PTGI is designed to measure benefits perceived as arising from the struggle with trauma, it was hypothesized that persons experiencing severe trauma would report more benefits than those whose beliefs and perceptions were not challenged by extraordinary events. This may occur because traumatic events trigger rumination focused on searches for meaning, and ways to reconfigure goals given that certain possibilities in life have become impossibilities (Martin, Tesser, & McIntosh, 1993; Tedeschi & Calhoun, 1995). As suggested by the relationship between reports of negative effects of trauma and PTGI scores in Study 2, there is emerging evidence that more intense experiences with trauma may produce greater benefits (Stutts, Calhoun, Tedeschi, & Cann, 1994). Furthermore, it is important to determine if people who have *not* experienced trauma would be likely to report similar positive developments as those who *have* experienced traumatic events, given that people have a general tendency to engage in self-enhancing thinking (Fiske & Taylor, 1991), and in particular may revise their own personal histories (Greenwald, 1980) in response to trauma.

### Method

*Subjects.* Data were obtained from a sample of 194 participants recruited from general psychology laboratory courses at the same university as students from Studies 1 and 2. The responses of 117 were selected for analysis based on an index of the presence and severity of trauma experience. Fifty four (23 men and 31 women) reported at least one major trauma of great severity in the previous year, and 63 (32 men and 31 women) reported none. Ninety five percent of participants were between the ages of 18 and 28, 93% were single, and 85% were Protestant.

*Materials and procedure.* In groups of approximately 25, participants completed PTGI items with instructions that asked individuals to respond by rating "the changes that had occurred to them during the past year." This was a modification of the instructions used in Study 1, since a particular event was not referred to as responsible for change. Participants also completed the Traumatic Stress Schedule (Norris, 1990), an epidemiologic screening instrument designed to assess the occurrence and impact of traumatic events (e.g., robbery, criminal assault, natural disaster, etc.). Responses to this instrument were used to separate persons who had reported no traumatic events from those who had reported at least one intensely traumatic event in the past year, resulting in a 2 (gender)  $\times$  2 (severe trauma or no trauma) design.

### Results

A gender  $\times$  severity of trauma analysis of variance with the total PTGI score as the dependent variable showed that women reported more benefits ( $M = 81.60, SD = 21.09$ ) than did men ( $M = 70.25; SD = 21.87$ ) ( $F(1,113) = 10.69, p < .001$ ), and persons experiencing severe trauma reported more benefits ( $M = 83.16, SD = 19.27$ ) than those who did not ( $M = 69.75, SD = 20.47$ ) ( $F(1,113) = 12.33, p < .001$ ). The gender  $\times$  severity interaction was not significant ( $F(1,113) = 1.70$ ).

A gender  $\times$  severity of trauma multivariate analysis of variance with the five PTGI factors as dependent variables also demonstrated that women reported more benefits than did men ( $F(53,5) = 3.68, p < .01$ ), and persons experiencing severe trauma reported more benefits than those who did not ( $F(53,5) = 3.61, p < .01$ ). The gender  $\times$  severity interaction was not significant ( $F(53,5) = 1.36$ ). Univariate tests showed that women had higher scores than men for the New Possibilities factor ( $F(1,113) = 6.15, p < .05$ ), the Relating to Others factor ( $F(1,113) = 6.93, p < .01$ ), the Personal Strength factor ( $F(1,113) = 4.96, p < .05$ ), and the Spiritual Change factor

**Table 3.** Means for PTGI and Factors for Persons in Study 3 Reporting One or More Severe Traumas in the Past 12 Months Versus Those Reporting No Trauma

PTGI Factor	Women		Men	
	No trauma ( <i>n</i> = 31)	Trauma ( <i>n</i> = 31)	No Trauma ( <i>n</i> = 32)	Trauma ( <i>n</i> = 23)
I: Relating to others	23.94	29.68	22.16	23.30
II: New possibilities	18.26	20.94	15.19	18.35
III: Personal strength	14.65	17.90	13.63	15.30
IV: Spiritual change	6.48	8.29	5.56	4.96
V: Appreciation of life	10.16	13.45	9.59	11.70
Total PTGI	73.49	90.26	66.13	73.61

( $F(1,113) = 14.09, p < .001$ ), but not for the Appreciation of Life factor ( $F(1,113) = 3.26, n.s.$ ) (Table 3).

Persons who had experienced severe trauma, compared to persons experiencing no trauma, had higher scores on the New Possibilities factor ( $F(1,113) = 6.54, p < .05$ ), the Relating to Others factor ( $F(1,113) = 4.95, p < .05$ ), the Personal Strength factor ( $F(1,113) = 9.23, p < .01$ ), and the Appreciation of Life factor ( $F(1,113) = 17.58, p < .001$ ), but not the Spiritual Change factor ( $F(1,113) = 1.12, n.s.$ ).

## Discussion

The studies described here indicate that the PTGI has good internal consistency, acceptable test-retest reliability, and that among persons reporting a variety of life difficulties, scores on the scale are approximately normally distributed. In addition, responses are generally unrelated to the motive to appear socially desirable. Although some might find fault with the use of college student samples in the development of this measure, college students are comparable to the general population in terms of experience with trauma (Vrana & Lauterbach, 1994). It is clear our participants experienced significant trauma, especially the trauma group in Study 3 that was selected for their experience of severe trauma.

In the wording of the PTGI items, the possible benefits are treated as *outcomes* of coping with traumatic events. The perception of benefits, however, has also been treated as a coping *process* of positive reinterpretation, positive reframing, interpretive control, or reconstrual (e.g., Carver et al., 1993; Rothbaum, Weisz, & Snyder, 1982) of events. The PTGI ap-

pears to measure a general tendency to experience difficult events in a way that produces perceptions of benefits, but its focus is on the variety of possible benefits that may be discovered or construed, given that people may find some benefits and not others.

Although there is some variation in the pattern of correlations of the five factors of the PTGI and other measures, perceiving these benefits is most consistently associated with the personality traits of extraversion, to the tendency to be open to internal experience, and to optimism. It is unclear whether these traits existed before the traumatic events or were affected by them. Longitudinal study of personality before and after bereavement (McCrae & Costa, 1993) suggests that these general personality traits existed before the traumatic events, and endured relatively unchanged afterward. Therefore, personality might allow for perception of particular benefits. For example, people who are open to experience are used to examining their experiences and seeing them as less threatening and potentially beneficial. Extroverts can better tolerate stimulation and use social support. The only relationship NEO Agreeableness had with the PTGI involved the Relating to Others factor, suggesting that people who are agreeable may find that others respond more supportively to them after trauma. NEO Conscientiousness related only to PTGI Personal Strength, suggesting that people who are already disciplined and orderly rely on, develop, and appreciate this ability after trauma. Although we measured religious participation only after the traumas, the strong correlation between the religious participation measure and the PTGI Spiritual Change factor suggests that religious persons may also rely on this form of coping and strengthen themselves in this area.

The issue of whether the experienced events produced changes in fundamental assumptions or strengthened existing beliefs cannot be answered unambiguously by referring to the PTGI scores. Persons reporting benefits may have experienced a qualitative shift in their views, and therefore report an "extreme" change, or a quantitative shift might also feel "extreme" to some persons. Means on the scale indicate that persons experiencing severe trauma (Study 3) tend to report a great degree of change, while persons reporting no extraordinary events report a "small" to "moderate" degree. This may indicate that an event which is so extreme as to "shatter" fundamental assumptions (Janoff-Bulman, 1992) may produce more positive change than less challenging circumstances. However, it appears that there is a tendency to perceive *some* positive change as occurring regardless of the circumstances, at least among late adolescents and young adults. But, this perception of positive change is stronger for persons who have experienced trauma. We also found that these positive changes were unrelated to the passage of time, indicating that it is likely that variables such as

characteristics of survivors, and what circumstances they face as they recover, are more important in determining perception of benefits than mere passage of time after a trauma.

The tendency of women to score higher than men on the PTGI suggests that men and women differ in their responses to trauma. Factor scores indicate that the greatest differences exist in ability to perceive spiritual and relationship changes. These are areas that women may rely on more as they cope, allowing the experience of using the coping strategies related to these areas of life to have a greater effect (Bijur, Wallston, Smith, Lifrak, & Friedman, 1993). Somewhat less of a gender difference was found in perceptions of new possibilities and personal strength, but still women were more likely to perceive these changes than men. Given that the PTGI scores of severely traumatized women were twice as high as those of traumatized men, using the "no trauma" group in Study 3 as a baseline, it is suggested that these events have a greater effect on women in that women may be more capable than men of learning or benefiting from difficult life experiences. A prospective study is needed to determine if this is indeed the case.

The construal of benefits has appeared to be related to "objective" measures of psychological adjustment and well-being in some studies (Goodhart, 1985; Smith, Houston, & Stucky, 1982) but not others (Carver et al., 1993; Joseph et al., 1993; Lehman et al., 1993). The lack of a relationship between NEO Neuroticism and the PTGI in Study 2 indicates that the PTGI is not generally related to psychological health, but represents a separate construct. Positive and negative effects of traumatic events probably coexist in the same person (Aldwin, 1994), and this was apparent when virtually all participants in Study 2 reported negative effects of their traumas, and 60% also perceived positive effects. When people perceive benefits, they do not appear to deny the difficulties.

A key issue in further addressing the construct validity of the scale, is investigating the degree to which benefits measured by the PTGI are "illusory" (Taylor & Brown, 1988). Our initial study of construct validity suggests that scores on the PTGI are not simply a function of a positivity bias that operates in many areas (Fiske & Taylor, 1991). Additional work will determine the extent to which perceived benefits can be objectively assessed. For example, perceptions of trauma survivors might be compared with persons in their support networks (Park et al., in press). However, it appears that to trauma survivors, the changes reported are quite real. The particular benefits described may even be elements of a developing wisdom, given that wisdom has been described as a dialectic "bounded by the transcendence of limitations and . . . by their acceptance . . . tested by circumstances in which we have to decide what is changeable and what is not"

(Birren & Fisher, 1990, p. 324). Adopting these beliefs and seeing the traumatic event as an experience with some meaning and benefit is almost certainly a comfort. The tendency to see good coming from trauma may be more fruitfully addressed with a measure that can be used to compare or contrast the experiences of persons who are survivors of trauma. With the development of the PTGI, investigators who are interested in the personalities, coping styles, and other processes related to a tendency to respond to difficult life experiences in a positive fashion now have a measure to use to compare responses of men and women of different ages to a variety of traumatic events in different contexts. This can further our understanding of the natural processes people use as they struggle with the aftermath of trauma to derive meaning, feel wiser, and face uncertain futures with more confidence.

### References

- Affleck, G., Allen, D. A., Tennen, H., McGrade, B. J., & Ratzan, S. (1985). Causal and control cognitions in parents' coping with chronically ill children. *Journal of Social and Clinical Psychology, 3*, 367-377.
- Affleck, G., Tennen, H., & Croog, S. (1987). Causal attributions, perceived benefits, and morbidity after a heart attack: An 8 year study. *Journal of Consulting and Clinical Psychology, 55*, 29-35.
- Affleck, G., Tennen, H., & Gershman, K. (1985). Cognitive adaptations to high-risk infants: The search for mastery, meaning, and protection from future harm. *American Journal of Mental Deficiency, 89*, 653-656.
- Aldwin, C. M. (1994). *Stress, coping, and development*. New York: Guilford Press.
- Andreasen, N. L., & Norris, A. S. (1972). Long-term adjustment and adaptation mechanisms in severely burned adults. *Journal of Nervous and Mental Disease, 154*, 352-362.
- Andrykowski, M. A. (1992, August). *Positive psychosocial adjustment among cancer survivors*. Paper presented at the Annual Convention of the American Psychological Association, Washington, D.C.
- Bijur, P. E., Wallston, K. A., Smith, C. A., Lifrak, S., & Friedman, S. A. (1993, August). Gender differences in turning to religion for coping. Paper presented at the Annual Convention of the American Psychological Association, Toronto, Ontario, Canada.
- Birren, J. E., & Fisher, L. M. (1990). The elements of wisdom: Overview and integration. In R. J. Sternberg (Ed.), *Wisdom: Its nature, origins, and development* (pp. 317-332). Cambridge: Cambridge University Press.
- Burt, M. R., & Katz, B. L. (1987). Dimensions of recovery from rape: Focus on growth outcomes. *Journal of Interpersonal Violence, 2*, 57-81.
- Calhoun, L. G., & Tedeschi, R. G. (1989-90). Positive aspects of critical life problems: Recollections of grief. *Omega, 20*, 265-272.
- Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., Ketcham, A. S., Moffat, Jr., F. L., & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: A study of women with early stage breast cancer. *Journal of Personality and Social Psychology, 65*, 375-390.
- Collins, R. L., Taylor, S. E., & Skokan, L. A. (1990). A better world or a shattered vision? Changes in life perspectives following victimization. *Social Cognition, 8*, 263-285.
- Cooley, W. W., & Lohnes, P. R. (1971). *Multivariate data analysis*. New York: Wiley.

- Costa, P. T., Jr., & McCrae, R. R. (1985). *The NEO Personality Inventory Manual*. Odessa, FL: Psychological Assessment Resources.
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*, 349-354.
- Dakof, G. A., & Taylor, S. E. (1990). Victims' perceptions of social support: What is helpful to whom? *Journal of Personality and Social Psychology, 58*, 80-89.
- Fiske, S., & Taylor, S. E. (1991). *Social cognition* (2nd Ed.). New York: McGraw-Hill.
- Garnezy, N. (1994). Reflections and commentary on risk, resilience, and development. In R. J. Haggerty, L. R. Sherrod, N. Garnezy, & M. Rutter (Eds.), *Stress, risk and resilience in children and adolescents*. Cambridge: Cambridge University Press.
- Goodhart, D. E. (1985). Some psychological effects associated with positive and negative thinking about stressful event outcomes: Was Pollyanna right? *Journal of Personality and Social Psychology, 48*, 216-232.
- Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist, 35*, 603-618.
- Janoff-Bulman, R. (1992). *Shattered assumptions*. New York: The Free Press.
- Joseph, S., Williams, R., & Yule, W. (1993). Changes in outlook following disaster: The preliminary development of a measure to assess positive and negative responses. *Journal of Traumatic Stress, 6*, 271-279.
- Kahana, B. (1992). Late-life adaptation in the aftermath of extreme stress. In M. Wykel, E. Kahana, & J. Kowal (Eds.), *Stress and health among the elderly* (pp. 5-34). New York: Springer.
- Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37*, 1-11.
- Lehman, D. R., Davis, C. G., DeLongis, A., Wortman, C., Bluck, S., Mandel, D. R., & Ellard, J. H. (1993). Positive and negative life changes following bereavement and their relations to adjustment. *Journal of Social and Clinical Psychology, 12*, 90-112.
- Malinak, D. P., Hoyt, M. F., & Patterson, V. (1979). Adults' reactions to the death of a parent. *American Journal of Psychiatry, 136*, 1152-1156.
- Martin, L. L., Tesser, A., & McIntosh, W. D. (1993). Wanting but not having: The effects of unattained goals on thoughts and feelings. In D. M. Wegner & J. W. Pennebaker (Eds.), *Handbook of mental control* (pp. 552-572). Englewood Cliffs, NJ: Prentice-Hall.
- McCrae, R. R. (1992). The five-factor model: Issues and applications [Special issue]. *Journal of Personality, 60*.
- McCrae, R. R., & Costa, P. T., Jr., (1986). Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality, 385-405*.
- McCrae, R. R., & Costa, P. T., Jr., (1993). Psychological resilience among widowed men and women: A 10-year follow-up of a national sample. In M. S. Stroebe, W. Stroebe, & R. O. Hansson (Eds.), *Handbook of bereavement: Theory, research, and intervention* (pp. 196-207). Cambridge: Cambridge University Press.
- Norris, F. H. (1990). Screening for traumatic stress: A scale for use in the general population. *Journal of Applied Social Psychology, 20*, 1704-1718.
- Pargament, K. I., Royster, B. J. T., Albert, M., Crowe, P., Cullman, E. P., Holley, R., Schaefer, D., Sytniak, M., & Wood, M. (1990, August). *A qualitative approach to the study of religion and coping: Four tentative conclusions*. Paper presented at the Annual Convention of the American Psychological Association, Boston, MA.
- Park, C. L., Cohen, L. H., & Murch, R. L. (in press). Assessment and prediction of stress-related growth. *Journal of Personality*.
- Pressman, P., Lyons, J. S., Larson, D. B., & Strain, J. J. (1990). Religious belief, depression, and ambulation status in elderly women with broken hips. *American Journal of Psychiatry, 147*, 758-760.
- Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*, 5-37.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*, 316-331.



- Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219-247.
- Scheier, M. F., Weintraub, J. K., & Carver, C. S. (1986). Coping with stress: Divergent strategies of optimists and pessimists. *Journal of Personality and Social Psychology, 51*, 1257-1264.
- Schwartzberg, S. S. (1994). Vitality and growth in HIV-infected gay men. *Social Science and Medicine, 38*, 593-602.
- Schwartzberg, S. S., & Janoff-Bulman, R. (1991). Grief and the search for meaning: Exploring the assumptive worlds of bereaved college students. *Journal of Social and Clinical Psychology, 10*, 270-288.
- Silver, R. L., Boon, C., & Stones, M. (1983). Searching for meaning in misfortune: Making sense of incest. *Journal of Social Issues, 39*, 81-102.
- Sledge, W. H., Boydston, J. A., & Rabe, A. J. (1980). Self-concept changes related to war captivity. *Archives of General Psychiatry, 37*, 430-443.
- Smith, T. W., Houston, B. K., & Stucky, R. J. (1982). Positive evaluation as a strategy for coping with stress. *Journal of Social and Clinical Psychology, 1*, 193-208.
- Smith, T. W., Pope, M. K., Rhodewalt, F., & Poulton, J. L. (1989). Optimism, neuroticism, coping, and symptom reports: An alternative interpretation of the Life Orientation Test. *Journal of Personality and Social Psychology, 56*, 640-648.
- Stutman, S., & Baruch, R. (1992, August). A model for the process of fostering resilience. In H. Tömes (Chair), *The process of fostering resilience: Roles for psychologists and the media*. Symposium conducted at the meeting of the American Psychological Association, Washington, DC.
- Stutts, W., Calhoun, L. G., Tedeschi, R. G., & Cann, A. (1994, August). Religion, assumptive worlds, and the aftermath of trauma: What changes? Paper presented at the Annual Convention of the American Psychological Association, Los Angeles.
- Taylor, S. E. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38*, 1161-1173.
- Taylor, S. E., Lichtman, R. R., & Wood, J. V. (1984). Attributions, beliefs in control, and adjustment to breast cancer. *Journal of Personality and Social Psychology, 46*, 489-502.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103*, 193-210.
- Tedeschi, R. G., & Calhoun, L.G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Newbury Park, CA: Sage.
- Thomas, L. E., DiGiulio, R. C., & Sheehan, N. W. (1991). Identifying loss and psychological crisis in widowhood. *International Journal of Aging and Human Development, 26*, 279-295.
- Thompson, S. C. (1985). Finding positive meaning in a stressful event and coping. *Basic and Applied Social Psychology, 6*, 279-295.
- Veronen, L. J., & Kilpatrick, D. G. (1983). Rape: A precursor of change. In E. J. Callahan & K. A. McCluskey (Eds.), *Life-span developmental psychology: Nonnormative life events* (pp. 167-191). New York: Academic Press.
- Vrana, S., & Lauterbach, D. (1994). Prevalence of traumatic events and posttraumatic psychological symptoms in a nonclinical sample of college students. *Journal of Traumatic Stress, 7*, 289-302.