

## Research Article

# Does Self-Reported Posttraumatic Growth Reflect Genuine Positive Change?

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**ABSTRACT**—*In this study, we evaluated the validity of self-reported posttraumatic growth (PTG) by assessing the relation between perceived growth and actual growth from pre- to posttrauma. Undergraduate students completed measures tapping typical PTG domains at Time 1 and Time 2 (2 months later). We compared change in those measures with scores on the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) for those participants who reported a traumatic event between Time 1 and Time 2 (n = 122). PTGI scores generally were unrelated to actual growth in PTG-related domains. Moreover, perceived growth was associated with increased distress from pre- to posttrauma, whereas actual growth was related to decreased distress, a pattern suggesting that perceived and actual growth reflect different processes. Finally, perceived (but not actual) growth was related to positive reinterpretation coping. Thus, the PTGI, and perhaps other retrospective measures, does not appear to measure actual pre- to posttrauma change.*

Over the past decade, a spate of studies has shown that most people report that they have grown psychologically in the aftermath of trauma. Fueled by enthusiasm for the positive-psychology movement, more than 300 studies have explored the phenomenon variously referred to as posttraumatic growth (PTG; Tedeschi & Calhoun, 1996), stress-related growth (Park, Cohen, & Murch, 1996), and benefit finding (Tennen & Affleck, 2002). More recently, however, this enthusiasm has been dampened by two controversies concerning (a) whether PTG and related constructs reflect genuine positive changes, and (b)

whether the manner in which growth has been measured is valid. To the extent that the resolution of the first controversy turns on the conclusions of the second controversy, the issue of measurement validity is an urgent priority for this area of psychological inquiry. Differences of opinion regarding the validity of the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) and related measures represent far more than an academic debate, as these measures have already reached the general public. For example, the American Psychological Association (2004) includes the PTGI, the most widely used indicator of PTG (see Helgeson, Reynolds, & Tomich, 2006), on its Web site and in its national public education campaign: The Road to Resilience. In the following, we first describe these controversies in more detail and then present the results of a study that assessed the validity of self-reported growth by comparing responses on a measure of PTG (i.e., the PTGI) with actual change in typical growth domains from pre- to posttrauma.

The first controversy concerns whether growth following adversity represents genuine “significant beneficial change” (Tedeschi, Park, & Calhoun, 1998, p. 3), a motivated positive illusion (Taylor, 1983), or a coping process (e.g., McMillen & Cook, 2003).<sup>1</sup> Evidence of significant change consists of numerous reports of PTG by survivors of traumatic events (see Tedeschi et al., 1998). However, McFarland and Alvaro (2000) presented compelling evidence supporting the motivated-illusion perspective. Specifically, individuals who reported growth following a trauma did so not because they actually changed in positive ways following the trauma, but because they derogated their preevent selves. In another experimental study, bereaved individuals who had been primed to think about their loss reported greater meaning in life than those who had not been primed (Davis & McKearney, 2003). This result also suggests

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<sup>1</sup>Some theorists (e.g., Calhoun & Tedeschi, 2006) have asserted that positive illusions may ultimately lead to genuine growth.

that reports of growth following adversity reflect, at least in part, a self-protective strategy. Despite their intuitive appeal, however, these and other studies have not directly demonstrated that the growth reported by individuals facing adversity reflects something other than actual changes in priorities, life appreciation, or relationships with other people.

The second controversy—regarding the validity of extant measures of growth—is driven by the unique way that PTG (and related constructs) typically is measured. Essentially, participants must (a) evaluate their current standing on a dimension (e.g., closeness to other people), (b) recall their previous standing on the same dimension, (c) compare their current and previous standings, (d) assess the degree of change, and (e) determine how much of that change can be attributed to the traumatic event. Given the complexity of this task, self-report questionnaires of personal change are typically viewed with skepticism (Nolen-Hoeksema & Davis, 2004). Perceived changes in personal attributes are at best weak predictors of prospective data documenting actual changes (Robins, Nofhle, Trzesniewski, & Roberts, 2005). These findings confirm Costa and McCrae's (1989) conclusion that "self-perceived changes in personality are misperceptions" (p. 65). Such misperceptions have been documented over periods as brief as 3 months (Wilson & Ross, 2000). Similarly, studies of relationship growth have demonstrated that although couples recall that their relationships have improved over time—just as participants in studies of PTG report that their close relationships have deepened and grown—prospective ratings reveal no increases and even show declines in relationship strength and quality (e.g., Karney & Coombs, 2000; Kirkpatrick & Hazan, 1994). Finally, Stone (2005) used the Patient Global Impression of Change scale (Guy, 1976), which requires patients to rate symptom change as a result of treatment, to compare patients who reported that their symptoms had improved somewhat, remained unchanged, or worsened and found that these three groups did not differ discernibly in their daily-symptom trajectories.

Findings such as these help explain why very few measures in the psychosocial literature rely completely on recalled experience. Clinical investigators would not attempt to substitute recollected change in depressive symptoms for measured change in depression, nor would they suggest a new standard for clinical trials in which recalled change following an intervention replaced standard preintervention, postintervention, and follow-up measures of symptoms. Yet measures of PTG and related constructs have been immune to such standards (Tennen & Affleck, 2009).

A decade ago, Cohen, Hettler, and Payne (1998) recommended the following approach to measuring the validity of self-reported PTG: Use a prospective study design to directly compare the difference between pre- and posttrauma indicators of the domains assessed by most PTG measures (actual growth) with perceived change in the same domains as indexed by PTG scores (perceived growth). Although prospective study designs

pose a challenge to investigators, the very nature of PTG demands such studies, and exemplars are available in the trauma literature (e.g., Bonanno et al., 2002). Remarkably, to date, no study in the vast PTG literature has validated PTG reports in this way. Existing efforts to assess validity consist primarily of studies evaluating whether significant others corroborate growth reports (e.g., McMillen & Cook, 2003; Park et al., 1996), whether individuals who have experienced a trauma score higher than matched no-trauma comparison groups on growth-relevant measures (e.g., Frazier & Kaler, 2006), whether trauma survivors who report PTG score higher on growth-relevant measures than trauma survivors who do not report PTG (e.g., Lehman et al., 1993), and whether reports of change on the PTGI (or a similar measure) correspond to higher scores on growth-relevant variables (e.g., Park et al., 1996). A very recent study assessed the relations between PTGI scores and actual change from pre- to post-cancer treatment, but not pre- to post-cancer diagnosis (Ransom, Sheldon, & Jacobsen, 2008). The relations between the PTGI and actual change scores were quite modest. Although these studies shed some light on the correlates of perceived growth, they do not assess whether self-reported change corresponds to actual change from pre- to posttrauma.

Our aim in this investigation was not to take a stand on the reality of PTG. We have little doubt that some people change in profound ways following traumatic events. However, the literature documenting people's inability to accurately recall personal and relationship change leads us to doubt that PTG (and related constructs) measured retrospectively captures the change depicted in theoretical and clinical accounts. The purpose of this study was to determine, within a fully prospective study design, whether self-reported growth following a traumatic event (perceived growth) was associated with actual change from pre- to posttrauma (actual growth). Perceived growth was measured with the PTGI (the most common measure of growth), whereas actual growth was assessed using measures chosen to capture the domains of growth measured by the PTGI, as well as typical growth domains. Moderate (or large) correlations would support the validity of the PTGI as a measure of growth, whereas negligible correlations would suggest that perceived and actual growth are different constructs. To further explore similarities and differences between perceived and actual growth, we also assessed whether they were differentially related to distress and positive reinterpretation coping. If measures of perceived and actual growth are highly related to each other, we would expect them to have similar relations with distress and positive reinterpretation coping.

## METHOD

### Participants and Procedure

Participants were undergraduate students recruited from four large universities in the United States. Undergraduate students were chosen as the study sample because they are at the peak

age for trauma exposure (Breslau et al., 1998). Participants completed on-line surveys at Time 1 (T1;  $N = 1,528$ ) and 8 weeks later, at Time 2 (T2;  $N = 1,281$ ; 84%), in return for extra credit in their psychology courses. At T1, most participants were between 18 and 21 (88%), female (73%), and Caucasian (80%). The sample used in the present analyses consisted of 122 participants (10% of the T2 sample) who reported a traumatic event between T1 and T2 (see Results for event details). As was the case for the total sample, most participants in this subsample were between 18 and 21 (89%), female (85%), and Caucasian (77%).

## Measures

### *Traumatic Events*

We used the Traumatic Life Events Questionnaire (TLEQ), a reliable and valid measure of exposure to traumatic events (Kubany, 2004). Participants indicated whether they had experienced each of 17 nonchildhood events or any other traumatic event in the 8 weeks between T1 and T2. They briefly described their experienced event (or their worst event if they reported more than one) and indicated if it caused intense fear, helplessness, or horror. Twenty-seven percent ( $n = 348$ ) reported at least one traumatic event between T1 and T2. Participants also rated their worst event in terms of how much distress it caused them at the time it occurred (1 = *no distress*, 5 = *extreme distress*). Because we were interested in studying the effects of truly traumatic events, we excluded 162 individuals whose worst events were rated as causing less than “considerable” distress (i.e., less than 4 on the 5-point distress scale) and excluded 64 additional individuals because their data were questionable for various reasons.

### *Perceived Posttraumatic Growth on the PTGI*

To assess perceived change from pre- to posttrauma, we asked participants to complete the PTGI (Tedeschi & Calhoun, 1996) at T2 with regard to the event they had experienced between T1 and T2. The PTGI measures the extent to which individuals believe they have changed in positive ways as the result of a traumatic event. The 21 items were rated with regard to the previous 2 weeks. We chose this time frame for all measures because we wanted to assess current, rather than global, self-assessments of functioning. If longer time frames had been used, ratings might have encompassed pre- as well as posttrauma functioning. Similarly, short time frames have been used in other longitudinal studies (e.g., Ransom et al., 2008). The PTGI has five subscales: Relating to Others (7 items; e.g., “I have a greater sense of closeness with others”), Personal Strength (4 items; e.g., “I have a greater feeling of self-reliance”), New Possibilities (5 items; e.g., “I am able to do better things with my life”), Appreciation of Life (3 items; e.g., “I can better appreciate each day”), and Spiritual Change (2 items; e.g., “I have a stronger

religious faith”). The alpha for the full scale was .94; alphas for the five subscales ranged from .77 to .90.

### *Actual Posttraumatic Growth on the PTGI Items*

To assess actual change from pre- to posttrauma on the same items used to assess perceived growth following trauma, we created a “current standing” version of the PTGI (C-PTGI) that participants completed at T1 and T2. The C-PTGI items were phrased to reflect participants’ feelings over the past 2 weeks (e.g., “I have had a sense of closeness with others,” “I have had a feeling of self-reliance,” “I have been able to do good things with my life,” “I have appreciated each day,” “I have had a strong religious faith”), rather than changes resulting from the trauma. The alphas for the full scale and all five subscales were .77 or greater at both T1 and T2.

### *Actual Posttraumatic Growth on Measures of PTG Domains*

To assess actual change from pre- to posttrauma, at T1 and T2 we administered five measures that corresponded to the domains of growth assessed by the PTGI and the general domains reported in the broader PTG literature (i.e., positive changes in relationships, changes in priorities, greater life appreciation, and greater spirituality). All measures were standard scales with good evidence of reliability and validity. Specifically, the first domain, relationship quality, was assessed using the Positive Relationships subscale (nine items) from Ryff’s (1989) Psychological Well Being (PWB) scale (e.g., “I enjoy personal and mutual conversations with family members or friends”). The second domain, participants’ perceptions that their lives were meaningful (chosen to reflect the domain of changed priorities), was assessed using the five-item Presence of Meaning subscale (e.g., “I have a good sense of what makes my life meaningful”) from the Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006). The third domain, life satisfaction, was assessed using the five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; e.g., “I am satisfied with my life”). The fourth domain, gratitude (e.g., “I have so much in life to be thankful for”) was assessed using the six-item Gratitude Questionnaire (McCullough, Emmons, & Tsang, 2002). Both life satisfaction and gratitude were chosen to reflect the PTG domain of greater life appreciation. The fifth domain, religiosity-spirituality, was assessed using the five-item Religious Commitment Inventory (Worthington et al., 2003; e.g., “I have spent time trying to grow in understanding of my faith”). The alphas for the five domain-specific scales at T1 and T2 ranged from .79 to .95. Although it was difficult to find measures that corresponded to every PTGI subscale, these measures seemed to reflect the general domains of growth reported in the literature and assessed by the PTGI.

### *Distress*

Participants’ distress was assessed at T1 and T2 using the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovi-

**TABLE 1**  
*Descriptive Data on All Measures*

Variable	Mean at Time 1	Mean at Time 2	Change score	Participants reporting reliable increase	Participants reporting reliable decrease
PTGI (scale from 1 to 6)	—	2.62 (1.09)	—	—	—
C-PTGI (scale from 1 to 6)	4.19 (0.91)	4.12 (0.87)	-0.08 (0.65)	14%	8%
Positive relationships (scale from 1 to 6)	4.50 (0.97)	4.49 (0.90)	-0.00 (0.92)	5%	8%
Meaning in life (scale from 1 to 7)	4.08 (1.14)	4.37 (1.25)	0.28 (0.99)	12%	5%
Life satisfaction (scale from 1 to 7)	4.46 (1.41)	4.91 (1.43)	0.46 (1.24)	25%	7%
Gratitude (scale from 1 to 7)	5.74 (1.05)	5.77 (1.13)	0.01 (1.24)	8%	12%
Religious commitment (scale from 1 to 5)	2.22 (1.19)	2.25 (1.22)	0.04 (0.83)	7%	11%
Distress (scale from 0 to 3)	1.83 (0.55)	1.76 (0.66)	-0.07 (0.65)	13%	20%
Coping (scale from 1 to 4)	—	2.20 (0.83)	—	—	—

**Note.**  $N = 119$ – $121$ . Standard deviations are given in parentheses. Higher values indicate higher levels of the measured construct. PTGI = Posttraumatic Growth Inventory; C-PTGI = “current standing” version of the PTGI.

bond, 1995), a reliable and valid measure consisting of three subscales measuring anxiety, depression, and stress. Participants rated the degree to which each of the 21 items applied to them over the prior 2 weeks (e.g., “I found it hard to wind down”). Alphas at T1 and T2 were .90 and .95, respectively.

#### Coping

Positive reinterpretation coping with regard to the recent trauma was assessed at T2 using a four-item subscale from the COPE (Carver, Scheier, & Weintraub, 1989), a well-known measure of coping. Items (e.g., “I look for something good in what is happening”) were rated with regard to the past 2 weeks ( $\alpha = .82$ ).

## RESULTS

### Descriptive Data

Table 1 presents descriptive data for all measures. The last two columns indicate the percentage of participants who reported reliable change (i.e., change that cannot be explained by measurement error; see Jacobson & Truax, 1991, for details) on the C-PTGI and the five PTG-domain measures, as well as reliable change in distress. Between 5% and 25% of the sample reported reliable increases on the various PTG-domain measures.

### Traumatic Events

The most common “worst” traumatic events reported between T1 and T2 were a loved one experiencing a life-threatening accident, assault, or illness (28%); sudden and unexpected death of a close friend or loved one (27%); any other event that was life threatening, caused serious injury, or was highly distressing (11%); unwanted sexual attention (8%); and a motor-vehicle accident for which the participant received medical attention or that badly injured or killed someone (6%). The majority (71%) of these events were rated by the participants as causing intense fear, helplessness, or horror, which is part of the definition of a traumatic event according to the fourth edition of

the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994).

### Relations Between the PTGI and the Five Domain Measures

Prior to assessing the relations between perceived and actual growth, we examined whether the domain measures we chose assessed the same general constructs as the PTGI by correlating scores on the C-PTGI at T2 with scores on the five domain measures at T2 (Table 2). These analyses revealed moderate to large correlations between the total score on the C-PTGI and the five domain measures. Each C-PTGI subscale correlated at least .49 with one of the domain measures.

### Relations Between Measures of Perceived and Actual Growth

The primary purpose of this study was to assess whether perceived growth following a traumatic event (assessed via the PTGI) was associated with actual growth from pre- to posttrauma (on the C-PTGI and on the five measures chosen to assess the general PTGI domains). To assess actual growth, we calculated change scores by subtracting T1 scores from T2 scores on the C-PTGI and the five PTG-domain measures.<sup>2</sup>

As Table 3 shows, there were small positive correlations between perceived growth on the PTGI and actual growth from pre- to posttrauma on the C-PTGI and small to moderate positive correlations between perceived growth on the PTGI and change in religious commitment. However, perceived growth was not related to pre- to posttrauma improvements in positive rela-

<sup>2</sup>We performed two additional sets of analyses: one in which we used residual scores and one in which we regressed PTGI scores on the T2 domain measures controlling for T1 scores. All analyses yielded the same results. Williams and Zimmerman (1996) provided justification for use of change scores. Results also were the same when we used a larger trauma sample that included events that caused less than considerable distress ( $n = 264$ ).

**TABLE 2**  
*Correlations Between the C-PTGI and the PTG-Domain Measures at Time 2*

C-PTGI score	PTG-domain measure				
	Positive relationships	Meaning in life	Life satisfaction	Gratitude	Religious commitment
Total score	.38***	.63***	.56***	.45***	.49***
Relating to Others	.49***	.47***	.45***	.48***	.34***
Personal Strength	.26**	.59***	.53***	.28**	.27**
New Possibilities	.27***	.56***	.50***	.39***	.38***
Appreciation of Life	.38***	.63***	.55***	.40***	.35***
Spiritual Change	.05	.42***	.31***	.24**	.80***

**Note.**  $n = 118$ – $121$ . C-PTGI = “current standing” version of the Posttraumatic Growth Inventory; PTG = posttraumatic growth.

\*\* $p < .01$ . \*\*\* $p < .001$ .

tionships, meaning in life, life satisfaction, or gratitude. Even the correlations between the specific PTGI subscales and the domain measures that most closely corresponded to those subscales were nonsignificant.

#### Relations of Perceived and Actual Growth With Distress and Coping

We next examined how perceived and actual growth correlated with change in distress from pre- to posttrauma (see Table 4). Perceived growth was associated with increased distress, whereas actual growth generally was associated with decreased distress. The primary exception was that increased religious commitment was associated with an increase in distress from pre- to posttrauma.

Finally, perceived growth was strongly related to positive reinterpretation coping, whereas actual growth generally was unassociated with coping (see Table 4). Again, the one exception was that increased religious commitment was associated with more positive reinterpretation coping at T2.

#### DISCUSSION

In this study, we assessed the validity of self-reported PTG by examining the relation between perceived growth and actual growth from pre- to posttrauma. Results were similar to those of studies that have compared perceived and actual change in personality (e.g., Robins et al., 2005), relationships (e.g., Kirkpatrick & Hazan, 1994), and health (e.g., Stone, 2005) in that perceived posttraumatic growth as measured by the PTGI did not appear to measure actual growth from pre- to posttrauma. PTGI scores were unrelated to most measures of actual growth in PTG-related domains (positive relationships, meaning in life, life satisfaction, and gratitude), even though those measures appear to tap the same domains as the PTGI. For example, meaning in life at T2 was highly correlated ( $r = .63$ ) with the Appreciation of Life subscale on the C-PTGI (which suggests that they measure similar constructs), but increases in meaning from pre- to posttrauma were unrelated ( $r = .01$ ) to perceived growth on the PTGI Appreciation of Life subscale. Even when we used virtually the same items (PTGI and C-PTGI), the

**TABLE 3**  
*Correlations Between the PTGI at Time 2 and Change in C-PTGI and PTG-Domain Measures From Time 1 to Time 2*

PTGI score	C-PTGI	Change measure				Religious commitment
		Positive relationships	Meaning in life	Life satisfaction	Gratitude	
Total score	.22*	-.15	.03	.06	.03	.29***
Relating to Others	.21*	-.10	.04	.11	.09	.21*
Personal Strength	.29***	-.14	.05	.07	.04	.32***
New Possibilities	.10	-.24**	.07	.02	-.06	.20*
Appreciation of Life	.22*	-.04	.01	.09	.05	.34***
Spiritual Change	.03	-.09	-.13	-.10	-.06	.21*

**Note.**  $n = 119$ – $121$ . PTGI = Posttraumatic Growth Inventory; C-PTGI = “current standing” version of the PTGI; PTG = posttraumatic growth.

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

**TABLE 4**  
**Correlations of Perceived and Actual Growth With Change in Distress and With Coping at Time 2**

Measure of growth	Change in distress	Time 2 coping
Perceived growth		
PTGI	.26**	.52***
Actual growth		
Change in C-PTGI	-.10	.12
Change in positive relationships	-.43***	-.07
Change in meaning in life	-.24**	.08
Change in life satisfaction	-.22*	.02
Change in gratitude	-.28**	.11
Change in religious commitment	.28**	.18*

Note.  $n = 119-120$ . PTGI = Posttraumatic Growth Inventory; C-PTGI = "current standing" version of the PTGI.

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

relation between perceived and actual growth was small. Moreover, perceived growth was associated with increases in distress from pre- to posttrauma, whereas actual growth was related to decreased distress, a pattern suggesting that perceived and actual growth reflect different processes. Finally, perceived growth (but not actual growth) was strongly related to positive reinterpretation coping. All of this suggests that retrospective reports of growth measure something different from actual pre- to posttrauma change. We interpret these findings as an indictment of retrospective methods of measuring PTG, of which the PTGI is one example.

The one exception to this general pattern of results involves religious commitment. Change in religious commitment was the only measure of actual change that was related to perceived change on the PTGI, and, like the PTGI, it was related to more rather than less distress and to greater use of positive reinterpretation coping. One explanation of these results is that increased religious commitment in the face of trauma, like self-reported PTG, may be a way of coping with the trauma. In contrast, increases in life satisfaction or gratitude seem more likely to reflect actual growth (outcomes) than to reflect coping strategies (processes).

We want to underscore that some of our participants demonstrated actual growth. For example, 25% of our sample reported reliable increases in life satisfaction from pre- to posttrauma. However, the PTGI was not useful for identifying those people because they did not generally report greater appreciation of life on the PTGI. Perhaps these people were actually doing well posttrauma and did not need to make themselves feel better by reporting growth or using positive reinterpretation coping.

Like all studies, ours is limited in several respects. One limitation is that our study participants were (mostly female) undergraduates, some of whom may not have experienced truly traumatic events. In an attempt to avoid this problem, we started with a large enough sample ( $N = 1,528$ ) to enable us to have

enough participants ( $n = 122$ ) who had experienced highly traumatic events (e.g., a close friend killed by a drunk driver) over a 2-month period. All of the events were rated as causing considerable to extreme distress, and most met the criteria for a traumatic event as outlined in the diagnostic criteria for posttraumatic stress disorder in the DSM-IV (American Psychiatric Association, 1994). Nonetheless, our results are generalizable only to similar samples. This is an important limitation in that most studies of PTG do not use undergraduate samples (cf. Tedeschi & Calhoun, 1996). A second limitation is that we may have assessed perceived and actual growth too soon. Perhaps PTG is a coping strategy soon after a trauma, but subsequently is transformed into actual growth. However, in an unpublished study of cancer survivors assessed postdiagnosis and several months later, the relation between actual growth (change over time) and perceived growth (inferred change) was rather modest (Tomich & Helgeson, 2004). Thus, perceived and actual growth may not be highly related whenever they are measured. This is an empirical question that can be answered only with further study. Finally, the PTG-domain measures we chose did not exactly match the constructs assessed by the PTGI subscales. However, even when the scores on the measured constructs were highly related (e.g., PTGI Appreciation of Life subscale and meaning in life as measured by the Meaning in Life Questionnaire), perceived and actual change were uncorrelated.

The prospective tracking of change is not without its critics, particularly among investigators concerned about the *response-shift* phenomenon. However, a considerable proportion of variance in what has been interpreted as response shift is actually attributable to recall bias (Schwartz, Sprangers, Carey, & Reed, 2004). Moreover, the response-shift perspective does not endorse the current PTG methodology of asking people how much they have changed and how much of their change is attributable to a particular threatening encounter. Overall, the available evidence favors the prospective repeated assessment of people's current status to document growth.

It would be inappropriate to conclude from our findings that people cannot change in positive ways following threatening life experiences. Indeed, a relatively small proportion of our participants demonstrated actual change, although we have no way of knowing if this change can be attributed to their traumatic experience. Nor do our findings challenge evidence that perceived positive change in the face of adversity can predict subsequent health and well-being (Tennen & Affleck, 2002). Finally, these findings are not directly relevant to evidence that in some situations, behavior is better predicted by recalled experience than by actual experience (Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993). Rather, the message we hope to convey is that existing approaches to the assessment of posttraumatic growth and related constructs such as benefit finding are not in keeping with current practice in all other areas of psychological research, and this significant flaw impedes progress in what we believe is a most promising area of inquiry.

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## REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- American Psychological Association. (2004). *The road to resilience*. Retrieved July 18, 2008, from <http://apahelpcenter.org/featuredtopics/feature.php?id=6>
- Bonanno, G., Wortman, C., Lehman, D., Tweed, R., Haring, M., Sonneg, J., et al. (2002). Resilience to loss and chronic grief: A prospective study from preloss to 18-months postloss. *Journal of Personality and Social Psychology, 83*, 1150–1164.
- Breslau, N., Kessler, R.C., Chilcoat, H.D., Schultz, L.R., Davis, G.C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: The 1996 Detroit area survey of trauma. *Archives of General Psychiatry, 55*, 626–632.
- Calhoun, L., & Tedeschi, R. (2006). The foundations of posttraumatic growth: An expanded framework. In L. Calhoun & R. Tedeschi (Eds.), *Handbook of posttraumatic growth: Research and practice* (pp. 1–23). New York: Routledge.
- Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267–283.
- Cohen, L., Hettler, T., & Payne, N. (1998). Assessment of posttraumatic growth. In R. Tedeschi, C. Park, & L. Calhoun (Eds.), *Posttraumatic growth: Positive changes in the aftermath of crisis* (pp. 23–42). Mahwah, NJ: Erlbaum.
- Costa, P.T., Jr., & McCrae, R.R. (1989). Personality continuity and the changes of adult life. In M. Storandt & G.R. VandenBos (Eds.), *The adult years: Continuity and change* (pp. 41–77). Washington, DC: American Psychological Association.
- Davis, C.G., & McKearney, J.M. (2003). How do people grow from their experience with trauma or loss? *Journal of Social and Clinical Psychology, 22*, 477–492.
- Diener, E., Emmons, R.A., Larsen, R.J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49*, 71–75.
- Frazier, P.A., & Kaler, M.E. (2006). Assessing the validity of self-reported stress-related growth. *Journal of Consulting and Clinical Psychology, 74*, 859–869.
- Guy, W. (1976). *ECDEU assessment manual for psychopharmacology* (DHEW Publication No. ADM-76-338). Washington, DC: U.S. Government Printing Office.
- Helgeson, V., Reynolds, K., & Tomich, P. (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology, 74*, 797–816.
- Jacobson, N.S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*, 12–19.
- Kahneman, D., Fredrickson, B.L., Schreiber, C.A., & Redelmeier, D.A. (1993). When more pain is preferred to less: Adding a better end. *Psychological Science, 4*, 401–405.
- Karney, B.R., & Coombs, R.H. (2000). Memory bias in long-term close relationships: Consistency or improvement? *Personality and Social Psychology Bulletin, 26*, 959–970.
- Kirkpatrick, L.A., & Hazan, C. (1994). Attachment styles and close relationships: A four-year prospective study. *Personal Relationships, 1*, 123–142.
- Kubany, E. (2004). *Traumatic Life Events Questionnaire and PTSD Screening and Diagnostic Scale*. Los Angeles: Western Psychological Services.
- Lehman, D., Davis, C., DeLongis, A., Wortman, C., Bluck, S., Mandel, D., & 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.
- Lovibond, P.F., & Lovibond, S.H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*, 335–343.
- McCullough, M.E., Emmons, R.A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*, 112–127.
- McFarland, C., & Alvaro, C. (2000). The impact of motivation on temporal comparisons: Coping with traumatic events by perceiving personal growth. *Journal of Personality and Social Psychology, 79*, 327–343.
- McMillen, J.C., & Cook, C.L. (2003). The positive by-products of spinal cord injury and their correlates. *Rehabilitation Psychology, 48*, 77–85.
- Nolen-Hoeksema, S., & Davis, C.G. (2004). Theoretical and methodological issues in the assessment and interpretation of posttraumatic growth. *Psychological Inquiry, 15*, 60–64.
- Park, C.L., Cohen, L.H., & Murch, R.L. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71–105.
- Ransom, S., Sheldon, K., & Jacobsen, P. (2008). Actual change and inaccurate recall contribute to posttraumatic growth following radiotherapy. *Journal of Consulting and Clinical Psychology, 76*, 811–819.
- Robins, R.W., Noffle, E.E., Trzemieski, K.H., & Roberts, B.W. (2005). Do people know how their personality has changed? Correlates of perceived and actual personality change in young adulthood. *Journal of Personality, 73*, 489–521.
- Ryff, C.D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*, 1069–1081.
- Schwartz, C., Sprangers, M., Carey, A., & Reed, G. (2004). Exploring response shift in longitudinal data. *Psychology & Health, 19*, 51–69.
- Steger, M.F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80–93.
- Stone, A.A. (2005, April). *Real-time ePRO data collected using eDiaries: Comparisons to recall-based measures of change*. Paper presented at the Drug Information Association conference on Benefits and Challenges With ePRO, Arlington, VA.
- Taylor, S. (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist, 38*, 1161–1173.
- Tedeschi, R., & Calhoun, L. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471.
- Tedeschi, R., Park, C., & Calhoun, L. (1998). Posttraumatic growth: Conceptual issues. In R. Tedeschi, C. Park, & L. Calhoun (Eds.),

- Posttraumatic growth: Positive changes in the aftermath of crisis* (pp. 1–23). Mahwah, NJ: Erlbaum.
- Tennen, H., & Affleck, G. (2002). Benefit-finding and benefit-reminding. In C.R. Snyder & S.J. Lopez (Eds.), *Handbook of positive psychology* (pp. 584–597). New York: Oxford University Press.
- Tennen, H., & Affleck, G. (2009). Assessing positive life change: In search of meticulous methods. In C.L. Park, S.C. Lechner, M.H. Antoni, & A.L. Stanton (Eds.), *Medical illness and positive life change: Can crisis lead to personal transformation?* (pp. 31–49). Washington, DC: American Psychological Association.
- Tomich, P.L., & Helgeson, V.S. (2004, March). *Personal growth following a cancer diagnosis: Actual or illusory?* Paper presented at the annual meeting of the Society of Behavioral Medicine, Baltimore, MD.
- Williams, R., & Zimmerman, D. (1996). Are simple gain scores obsolete? *Applied Psychological Measurement, 20*, 59–69.
- Wilson, A.E., & Ross, M. (2000). The frequency of temporal-self and social comparisons in people's personal appraisals. *Journal of Personality and Social Psychology, 78*, 928–942.
- Worthington, E.L., Wade, N.G., Hight, T.L., Ripley, J.S., McCullough, M.E., Berry, J.W., et al. (2003). The Religious Commitment Inventory—10: Development, refinement, and validation of a brief scale for research and counseling. *Journal of Counseling Psychology, 50*, 84–96.

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