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Assessing the Validity of Self-Reported Stress-Related Growth

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The purpose of these studies was to assess the validity of self-reported stress-related growth (SRG). In Study 1, individuals with breast cancer ($n = 70$) generally did not report greater well-being than a matched comparison group ($n = 70$). In Study 2, there were no significant differences in well-being between undergraduate students who said that something positive had come out of their worst stressor ($n = 34$) and those who reported no positives ($n = 34$). In Study 3, specific domains of SRG assessed in undergraduate students ($n = 96$) generally were not uniquely related to corresponding well-being measures. Thus, the authors found fairly little evidence for the validity of self-reported SRG. Future research directions are highlighted.

Keywords: posttraumatic growth, benefit finding, positive life change, stress-related growth

Most research on stressful life events has focused on their negative impact, including increased distress and lower quality of life. A growing body of research suggests, however, that the majority of individuals who experience stressful life events report positive life changes as a result of the stressor (e.g., Tedeschi & Calhoun, 2004). Several authors have called for a paradigm shift in trauma research from a focus on distress and pathology to a focus on thriving and growth posttrauma (e.g., Snyder, Tennen, Affleck, & Cheavens, 2000). Nonetheless, concerns also have been raised about the validity of self-reports of growth and whether they can and should be taken at face value.

The purpose of this research was to assess the validity of self-reports of stress-related growth (SRG). Several different terms are used to refer to SRG, including "perceived benefits," "benefit finding," "posttraumatic growth," and "positive life change." We use the term SRG because it implies actual life change, and our goal is to assess whether self-reported changes are reflected in meaningful life changes. We first briefly review research on SRG among individuals who have experienced various stressful life events, discuss concerns raised about the validity of self-reported growth, and discuss existing research on validity. We then describe the results of three studies that use different methods to assess the validity of self-reported SRG and conclude with an agenda for future research.

Prevalence of Self-Reports of SRG

A growing body of research suggests that the majority of people who have experienced stressful events report experiencing positive life changes as a result of those events. For example, 83% of women with cancer (Sears, Stanton, & Danoff-Burg, 2003) and HIV–AIDS (Siegel & Schrimshaw, 2003) reported at least one positive change in their life resulting from their illness. Similar findings have been reported in individuals who have experienced other stressful or traumatic events, including bereavement (C. G. Davis, Nolen-Hoeksema, & Larson, 1998), disasters (McMillen, Smith, & Fisher, 1997), and sexual assault (Frazier, Conlon, & Glaser, 2001). The positive changes most frequently reported include greater life appreciation, improved relationships with family and friends, changes in life priorities (e.g., more concern for others, more compassion), increased spirituality and religiousness, and positive self-changes (e.g., feeling stronger).

Concerns About the Validity of Self-Reports of SRG

Because virtually all data on SRG consist of survivors' reports that they have experienced various positive life changes, concerns about the validity of these self-reports (i.e., whether they are reflected in actual life changes) are increasingly being raised. The need for further evidence on validity often is described as a crucial area for future research (e.g., Linley & Joseph, 2004; Park, 2004; Tomich & Helgeson, 2004). Wortman (2004) recently commented that propagating the notion that most people experience growth, without further evidence for this claim, can have adverse effects on trauma survivors. As an example, Held (2002) noted that some of her clients apologize for not being able to smile in the face of adversity.

There are several reasons to suspect that reports of SRG may not represent actual life changes. First, reports of growth may reflect self-presentational concerns. People may describe the positives that came out of a stressor because they want to appear to be coping well (Carver, 2005) or because they think that is what their social network members want to hear (Linley & Joseph, 2004; Wortman, 2004). In fact, social network members might react negatively to reports of distress (Wortman, 2004). Self-reports of growth also may reflect adherence to a cultural script: Individuals in the United States may say they have grown because they believe that they are supposed to grow from stress (Linley & Joseph, 2004). In fact, reports of growth following terrorist events were higher in the United States than in Spain (Steger, Frazier, & Zacchanini, in press).

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A second concern is that reports of growth may reflect motivated illusions. In general, people tend to have positive illusions about themselves and their world: They see themselves as better off than other people, are unrealistically optimistic about the future, and exaggerate their control over events (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). These positive illusions generally are adaptive and may be even more important in the face of threatening events (Taylor et al., 2000). Reports of growth following stressors may thus represent illusory perceptions motivated by the desire to alleviate distressing feelings. Indeed, across four studies, McFarland and Alvaro (2000) presented convincing evidence that people report that they have changed as a result of stressful events not because they have actually grown but because they derogate their past selves (see also Wilson & Ross, 2001). In another study, bereaved individuals who had been primed to think about their loss reported greater meaning in life than those who had not been primed (C. G. Davis & McKearney, 2003), suggesting that self-reports of growth at least partly reflect self-protective and self-enhancing processes.

A third finding that casts doubt on the validity of self-reported SRG is that longitudinal studies suggest that there are significant individual differences in SRG trajectories over time. That is, some survivors actually report decreases over time in self-reported growth (Frazier et al., 2001). If growth does not last, then it would not seem to reflect actual growth.

A final issue is that people generally are not very accurate in assessing the degree to which they have changed over time, which calls into question the accuracy of self-reports of growth (Tennen & Affleck, 2005). For example, undergraduate students' assessments of the extent to which their personality changed during the 4 years of college were only modestly (mean $r = .22$) correlated with actual change on standard personality measures (Robins, Noftle, Trzesniewski, & Roberts, 2005). Other studies suggest that people cannot accurately recall the past (Henry, Moffitt, Caspi, Langley, & Silva, 1994). Thus, it may be very difficult for people to recall their past standing on some attribute (e.g., empathy) and the extent to which they have changed on that attribute.

Methods of Assessing the Validity of SRG

The current lack of attention to the validity of self-reports of growth may be partly because early research on SRG focused on documenting that positive life change following a major stressor is possible, given the almost exclusive focus of research on the negative effects of stressful events. The most common method of testing validity is to compare individuals who have experienced a stressful event with those who have not experienced one. If self-reports of growth are "real," then those who have experienced a major stressor should report better functioning on measures tapping typical domains of self-reported growth than do those who have not experienced a major stressor. To illustrate the results of studies using this method, we draw primarily on research on breast cancer because there have been more studies of SRG following breast cancer than following any other event (e.g., Manne et al., 2004).

In the first group of studies, individuals with breast cancer were compared with matched control groups on measures assessing positive life changes. Those with cancer reported on positive life changes as a result of the cancer and the comparison group members rated the extent to which their lives had changed during the period corresponding to the time since the patients' diagnosis (Andrykowski et al., 1996; Carpenter, 1997; Cordova, Cunningham, Carlson, & Andrykowski, 2001) or with regard to a stressful event in their own lives that had occurred around the same time as the diagnosis (Tomich & Helgeson, 2002). These studies provide some evidence that individuals with breast cancer report more positive life change than do controls. The overall picture is mixed, however, with evidence of greater change in the breast cancer groups on some measures but not others.

A few studies have compared individuals with breast cancer with control groups (e.g., Cordova et al., 2001, recruited "healthy controls" through newspaper advertisements) using standardized measures of SRG domains. In contrast to studies that assess life change, most of these studies show no differences between those with breast cancer and comparison groups. For example, there are no differences between individuals with breast cancer and matched comparison groups in terms of life satisfaction–quality of life (Andrykowski et al., 1996; Zemore & Shepel, 1989) or in terms of self-esteem, self-acceptance, or personal growth (Carpenter, 1997; Cordova et al., 2001; Zemore & Shepel, 1989). Similarly, most studies show no differences between groups on measures of spirituality, religiosity, or purpose in life (Carpenter, 1997; Cordova et al., 2001; Tomich & Helgeson, 2002), although patients scored higher on a measure of spiritual importance in one study (Andrykowski et al., 1996). There is somewhat more evidence that patients report better relationships than comparison groups, but this has been found on only four out of seven measures across studies (Carlsson, Hamrin, & Lindqvist, 1999; Carpenter, 1997; Zemore & Shepel, 1989).

Although these studies provide some evidence for the validity of self-reports of growth, they also are limited in several respects. First, measures that directly assess change may be inaccurate (Robins et al., 2005) and may lead to overestimates of SRG. In fact, even those who have not experienced a stressor report that their lives have changed for the better (e.g., Cordova et al., 2001). Second, whether studies used change measures or standard well-being measures, participants were aware they were in a study specifically about their adjustment to breast cancer. This context may have elicited threat and the motive to construct self-enhancing illusions of change (C. G. Davis & McKearney, 2003; McFarland & Alvaro, 2000), which could also lead to overestimates of the prevalence of growth. A third limitation of these studies that may either exaggerate or minimize differences between groups is that the breast cancer and comparison groups sometimes were not matched on important demographic variables that may be associated with well-being (e.g., income). Finally, participants were typically drawn from one clinic or geographic area, which may limit the generalizability of the results. In a recent review of the broader SRG literature, none of the 39 studies reviewed used random sampling techniques (Linley & Joseph, 2004).

Overview of Present Studies

We report here the results of three studies that use different methods to assess the validity of self-reported SRG. In Study 1, we compared a group who had experienced a major stressor with a matched control group on measures that tap typical domains of growth, similar to the studies described previously, using data

from a survey of a large nationally representative sample of midlife adults (the Midlife in the United States survey, or MIDUS). Participants in the MIDUS survey answered several questions about their health history. We chose to focus on individuals who had had breast cancer because they have been frequently studied in the SRG literature. The MIDUS surveys contain self-report measures of standard domains of growth, rather than measures of life change, which alleviates concerns about peoples' inability to accurately assess change. Another benefit of using these data is that respondents were not participating in a study specifically about their adjustment to breast cancer. Consequently, their assessments of their current life functioning should not be affected by the motive to construct self-enhancing illusions of change or the need to present themselves as coping well. Because the MIDUS sample is large (N = 7,189), we also were able to create a comparison group that very closely matched the breast cancer group on five demographic variables. Finally, the results may be more generalizable because the data were gathered from a nationally representative sample. Thus, use of the MIDUS data allowed us to address several limitations of previous research.

A limitation of studies that compare those who have experienced major stressors with matched control groups not mentioned previously is that not all individuals who have experienced a major stressor report growth or positive life changes. Including these individuals may result in smaller differences between stressor and no-stressor groups than if the stressor group only contained people who did in fact report that their lives had changed in positive ways. Because we are focusing on whether reports of growth are valid, it is more appropriate to focus on those who actually reported SRG. Specifically, in Study 2, we compared individuals who had experienced the same self-nominated "worst events" and either did or did not report positive life change as a result. If self-reports of growth are valid, then individuals who reported positive life change should score higher on well-being measures than those who did not report positive life change. In Study 3, we assessed SRG using an established measure. If self-reported SRG is valid, then scores on specific SRG subscales should be uniquely correlated with standard well-being measures that tap the same constructs (e.g., quality of relationships). In addition, the correlations should not be solely the result of an underlying third variable and thus should remain when the effects of positive affect are controlled statistically. Finally, we included conditions in which the well-being measures were or were not completed in the context of life since the stressor occurred to assess the extent to which priming the stressful event would result in reports of greater well-being (C. G. Davis & McKearney, 2003).

Study 1

Method

Procedures and Participants

Random-digit-dial phone sampling was used in the MIDUS study to gather a nationally representative sample of noninstitutionalized, English-speaking adults ages 25 to 74 years. Consenting participants completed a phone survey, which lasted 30 min on average, and were sent a written questionnaire. The total number who completed the phone survey was 7,189, which was roughly 70% of those contacted, and 6,240 (87%) of those also completed the mailed survey.

The MIDUS survey contains several questions on health issues, including whether participants had ever had cancer and, if so, what kind. We identified 70 individuals who indicated that they had had breast cancer. For each individual with breast cancer, an individual in the remaining sample was identified with the same sex, age, marital status, ethnicity, and level of education. Matches also were chosen who did not have other major medical conditions assessed in the MIDUS surveys (i.e., heart problems, AIDS, lupus, or stroke). If someone in the breast cancer group did not provide information about one of these demographic variables, a match was chosen that had the modal response on the missing variable. In both groups, 99% of the sample was female, the average age was 57 years old, 63% were married, the modal education level was 1 to 3 years of college (29%), and the majority was European American (86% of breast cancer group, 96% of comparison group).[1]

Measures

To compare the groups on measures tapping the domains most often cited in the literature on SRG, we identified questions from the phone and mail surveys that assessed life appreciation, relationship quality, life priorities, spirituality, and self-concept. Unless indicated otherwise, the measures were developed for the MIDUS surveys or were considered standard survey questions in their respective areas of inquiry. Because we identified more than one measure for all domains except life appreciation, we generally used multivariate analysis of variance (MANOVA) to compare groups. MANOVA requires that the dependent variables entered together in each omnibus test measure related constructs; thus, we also report the correlations among the measures in each domain.

Life appreciation. This scale contained three items assessing satisfaction with life and self (e.g., "At present, how satisfied are you with your life?"). Because the items were rated on different scales, a composite index was computed using standardized scores (α = .76).

Relationship quality. Both of the measures used to assess relationships were drawn from studies on interpersonal responses to stress (Schuster, Kessler, & Aseltine, 1990). The scale used to assess quality of relationships with family members included four items asking participants to rate, on a scale from 1 to 4, the degree to which they have positive experiences with family members (e.g., "How much do they understand the way you feel about things?"). Another four items asked how often the participant had negative experiences with family (e.g., "How often do they get on your nerves?"). The four negative items were reverse scored and the eight were combined to create a Family Relationships scale (α = .83). The same items were used to assess Quality of Friendships (α = .78). The correlation between these two scales was .45.

Life priorities. A commonly reported aspect of growth in the SRG literature is changes in life priorities. Although the specific nature of the change is not always specified, when it is described it typically involves being more concerned about others. Several items and scales in the MIDUS surveys assessed concerns about others, and these were used to operationalize changed life priorities.

To examine participants' interest in helping others at their own expense, the researchers asked participants to rate 19 hypothetical situations that placed selfish interests and obligations to others at odds on a 0 to 10 scale, reflecting how obligated they would feel to make the sacrifice (e.g., "To raise the child of a close friend if the friend died"). The alpha coefficient for this scale was .87.

Participants also completed six items (e.g., "Many people come to you for advice") indicating the degree to which they felt they could make contributions to others. Items were rated on 4-point scales (α = .84). These

[1] The discrepancy is because we chose matches with the modal ethnicity (i.e., European American) if information on ethnicity was missing for one of the breast cancer group members.

Table 1
Study 1: Comparisons Between Breast Cancer and Control Groups on Well-Being Measures

Measure	Breast cancer (n = 70)		Controls (n = 70)				
	M	*SD*	*M*	*SD*	*F* (*dfs*)	*d*	Partial η^2
Life appreciation	0.10	0.79	0.16	0.75	0.23 (1, 137)	−.08	<.01
Relationship quality					0.63 (2, 127)		.01
Family	3.25	0.45	3.26	0.44		−.02	
Friendship	3.17	0.47	3.25	0.44		−.18	
Life priorities					1.84 (3, 122)		.04
Sacrifices	7.74	1.26	7.72	1.09		.02	
Contributions to others	2.98	0.59	2.82	0.53		.29	
Well-being of others	7.42	1.90	7.69	1.60		−.15	
Spirituality and religiousness					2.57* (4, 120)		.08
Use of prayer	2.70	1.99	2.09	1.80		.32	
Importance of spirituality	3.02	0.52	2.77	0.55		.47*	
Religious service attendance	4.90	6.99	3.86	4.47		.18	
Seeking religious guidance	0.37	0.81	0.23	0.78		.18	
Self-concept					0.93 (2, 127)		.01
Self-worth	5.42	1.24	5.69	0.99		−.24	
Positive personality traits	7.90	1.32	7.98	1.19		−.06	

Note. Positive *d*s indicate greater well-being in the breast cancer group.
* $p < .05$.

items were drawn from the Loyola Generativity Scale (McAdams & de St. Aubin, 1992).

Finally, participants rated two items assessing the extent to which they contribute to or put thought and effort into the well-being of others (i.e., "How would you rate your contribution to the welfare and well-being of other people these days?"). These items were rated on a scale from 0 to 10 (α = .84). The mean correlation among these three indicators of life priorities was .38.

Spirituality and religiousness. One dichotomous item assessed participants' use of prayer: "Have you used prayer or other spiritual practices in the past 12 months, either to treat a physical health problem, to treat an emotional or personal problem, to maintain or enhance your wellness, or to prevent the onset of illness?" (see D. M. Eisenberg et al., 1993). Participants also completed nine items about the extent to which religion–spirituality is important to them (e.g., "How important is spirituality in your life?"). Items were rated on a scale from 1 to 7 (α = .87).

They also indicated the number of times they had attended a list of five religious activities (e.g., "religious services") in the past month. These frequencies were summed to indicate the frequency with which participants attended religious events.

Finally, participants responded to three items regarding the degree to which they seek religious guidance (e.g., "How often do you seek comfort through religious or spiritual means?"). Because the items were rated on different scales, composite scores were computed using standardized scores (α = .84). The mean correlation among these four indicators of spirituality and religiousness was .51.

Self-concept. Three items from Ryff's (1989) Psychological Well Being (PWB) scale were used to assess participants' self-acceptance (e.g., "I like most parts of my personality"). Participants rated each item on a 7-point scale (α = .59). Participants also rated the degree to which they felt six positive personality traits described them on a scale ranging from 0 to 10. These traits included "caring," "wise," and "knowledgeable" (α = .78). The correlation between these two measures was .39.

Results

As currently recommended (e.g., Wilkinson & The Task Force on Statistical Inference, 1999), we focus on effect sizes versus statistical significance and report both the amount of variance accounted for by group (partial η^2) for the five domains and standardized mean differences (Cohen's *d*) for the separate variables.[2] We had power of .80 to detect medium effect sizes in this study. In general, the group variable (breast cancer vs. control) accounted for a small amount of the variance in the well-being measures (partial η^2 = .01 to .08; see Table 1). Only the omnibus MANOVA for the spirituality–religiousness domain was significant, with group accounting for 8% of the variance and individuals in the breast cancer group reporting greater spirituality than the control group. Post hoc follow-up tests showed that the largest difference between groups was on the importance of spirituality measure, with the breast cancer group rating spirituality as more important than the control group. There also was a small-to-medium difference between groups in use of prayer, with the breast cancer group reporting greater use of prayer. The omnibus multivariate tests for the other domains (relationship quality, life priorities, and self-concept) and the univariate test of differences in life appreciation were not significant, and all effect sizes were small (mean $|d|$ = .13).[3]

[2] For interpreting partial η^2, .01 is a small effect, .06 is a medium effect, and .14 is a large effect. For *d*, .2 is small, .5 is medium, and .8 is large.

[3] We also compared individuals who had suffered heart attacks (n = 161) or who were in treatment for multiple sclerosis (MS; n = 107) with matched control groups. For the heart attack group, two of the five omnibus tests were significant (life appreciation and self-concept). In both cases, the matched control groups reported greater well-being than the heart attack group. For the MS group, the one significant omnibus test indicated that the control group scored higher on the self-concept measures than the MS group. Thus, these analyses provided no evidence for greater well-being in heart attack survivors or MS patients, although both groups frequently report SRG (e.g., Mohr, Dick, Russo, Likosky, & Goodkin, 1999; Sodergren, Hyland, Singh, & Sewell, 2002).

Discussion

The results of this study provide little evidence for the validity of self-reports of growth. Individuals with breast cancer did not report greater life satisfaction, better relationships, more concern for others, or more positive self-images, despite that these are commonly reported positive life changes among survivors of breast cancer (see Thornton, 2002, for a review) and other stressful or traumatic events (e.g., Frazier et al., 2001). These findings are, however, largely consistent with those of other studies in which trauma groups have been compared with matched (or unmatched) control groups on standard well-being measures (e.g., Carpenter, 1997; Cordova et al., 2001; Zemore & Shepel, 1989). The one exception to this trend was that breast cancer survivors did score higher on a measure of the importance of spirituality (see also Andrykowski et al., 1996) and somewhat higher on a measure of use of prayer.

Although this study improved on prior research in several ways (e.g., use of a nationally representative sample, respondents were not participating in a study of breast cancer), it also had its limitations. As mentioned, although the majority of breast cancer survivors do report positive life changes, some do not. Combining those who do and do not report growth may mask differences between stressor and comparison groups and hinder our ability to test the validity of self-reported SRG. Second, because the MIDUS study was not designed to assess SRG, we had to rely on the available measures. We were able to find appropriate measures for most constructs, although there was no measure of empathy, which is a commonly reported type of SRG.

Therefore, in Study 2, we compared individuals who had experienced the same stressful events (e.g., sudden bereavement) and either did or did not report positive life change resulting from the event. We specifically chose measures that tapped the five most common domains of SRG. We also assessed whether participants were willing to volunteer or had actually volunteered to work with others who had experienced similar stressors as behavioral indicators related to empathy. If self-reports of SRG are valid, then we would expect those who reported positive change to score higher on well-being measures than those who did not report positive change.

Study 2

Method

Participants and Procedures

Initial survey. Participants ($N = 268$) were recruited from psychology classes for a study of life stressors and completed surveys in large group sessions. Most were women (72%), between 18 and 21 years of age (87%), and European American (65%). They received course extra credit for participating. As part of the initial survey, participants completed the Traumatic Life Events Questionnaire (TLEQ; Kubany, 2004), along with several other measures not relevant to the purposes of this study. Respondents indicated whether they had experienced each event and, if they had experienced more than one, indicated which event causes the most distress. For the most distressing event, they also answered a yes–no question regarding whether anything positive came out of the event (along with a brief description of the positive change). More than 80% of the sample had experienced at least one stressful event—the event most frequently nominated as most distressing was sudden bereavement—and 56% indicated that something positive came out of their worst event. Positive outcomes mentioned were similar to those typically reported (e.g., feeling more compassionate toward others in distress, feeling closer to loved ones).

Online survey. To create the growth and no growth groups, we identified pairs of individuals who had nominated the same event as their most distressing event but who differed with regard to whether anything positive had come out of it. Individuals also were paired on age range (e.g., 18–21 years), ethnicity, and sex. As in Study 1, when information was missing on one of these variables or when an individual had no exact match in our sample, the individual was paired with someone with the modal value on that variable. Fifty pairs of individuals were sent an e-mail message requesting their participation in a study of well-being that involved completing an online survey for which they would be given extra credit in their psychology course. The online survey was completed 6 to 8 weeks after the initial survey.

Of the 100 recruited, 76 individuals responded. The 68 who completed over half of the survey were retained for the sample (34 in each group). The two groups were very similar demographically: Most of the respondents were women (82%), 18 to 21 years old (88%), and European American (88% in the growth group, 79% in the no growth group). The most frequent worst events were sudden bereavement (31%), witnessing domestic abuse while growing up (12%), unwanted sexual attention (7%), and parental divorce (7%). The average number of events reported was five, and the average time since the worst event occurred was 3.62 years ($SD = 4.03$ years).[4]

Measures

All measures except the TLEQ were completed as part of the online survey.

Stressful events. The TLEQ contains a list of 22 different stressful events (e.g., sudden bereavement, life threatening illness); we added six events to the list that primarily involved relationship stressors (e.g., partners' infidelity). Participants indicated whether and how many times they had experienced each event. The validity of the TLEQ items was assessed primarily through comparing responses across time and to interviews (Kubany, 2004).

Life appreciation. Life appreciation was assessed in terms of life satisfaction and gratitude. The Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) consists of five items (e.g., "I am satisfied with my life") that participants rate on a scale ranging from 1 (*absolutely untrue*) to 7 (*absolutely true*). The alpha coefficient for this scale was .89. Gratitude was assessed using the six-item Gratitude Questionnaire (McCullough, Emmons, & Tsang, 2002). Participants rated items (e.g., "I have so much in life to be thankful for") on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The alpha coefficient was .86. The correlation between these two measures was .53.

Relationship quality. The measures used to assess the quality of relationships with family and friends were the same as those used in Study 1 (Schuster et al., 1990). Both scales had alpha coefficients of .88 in this sample. The nine-item Positive Relationships subscale from Ryff's (1989) PWB scale also was used to assess relationship quality. Items (e.g., "I enjoy personal and mutual conversations with family members or friends") were rated on a 6-point scale ($\alpha = .85$). The mean correlation among the three measures was .49.

Life priorities. Changes in life priorities were assessed in terms of current purpose and meaning in life. The Purpose subscale from the PWB

[4] Time since the trauma occurred was not significantly related to any of the well-being measures in either Studies 2 or 3, and no absolute r exceeded .12. The absolute value of the average correlation between number of events reported and well-being was .10 in Study 2 and .16 in Study 3.

(Ryff, 1989) scale was used to assess the extent to which participants felt that they have a purpose or goals in life (e.g., "I am an active person in carrying out the plans I set for myself"). The alpha for this scale was .84. Participants' perceptions that their lives were meaningful were assessed using the five-item Presence subscale from the Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006). Participants rated on a 7-point scale their agreement with items such as "I have a good sense of what makes my life meaningful." The alpha coefficient for this scale was .82. The correlation between these two measures was .64.

Spirituality and religiousness. Three items were used to assess spiritual and religious involvement. The first two items asked participants to rate on a 5-point scale the extent to which they considered themselves to be religious or spiritual (Worthington et al., 2003). The third item asked participants how often they attended religious services with response options ranging from "At least once a week" to "Never." This item was from the MIDUS survey. Because the response options on the items varied, standard scores for the items were averaged to generate the scale score ($\alpha = .81$).

Self-concept. The nine-item version of the Self-Acceptance subscale from the PWB (Ryff, 1989) scale was used to measure general feelings of self-worth and accomplishment ($\alpha = .86$).

Compassion and empathy. The seven-item Empathic Concern subscale from the Interpersonal Reactivity Index (IRI; M. Davis, 1983) was used to assess compassion. Items such as "I often have tender, concerned feelings for people less fortunate than me" were rated on a scale from 0 (*Does not describe me very well*) to 4 (*Describes me very well*). When one item with a low item–total correlation was deleted, the alpha coefficient was .75.

Two yes–no items assessed willingness to volunteer to work with people who have experienced various stressful or traumatic events and actual volunteer experiences. These items were included as behavioral indicators related to empathy and compassion.

Results

The analytic strategy was much the same as in Study 1. Specifically, the growth and no growth groups were compared using analyses of variance (ANOVAs; when there was one measure per domain) and MANOVAs (when there was more than one measure per domain). Chi-square tests were used to compare groups on the two dichotomous behavioral measures of volunteerism. We again focus on estimates of effect size versus statistical significance, which is particularly important in this study because our sample size only gave us power of .34 to .51 across analyses to detect medium effects at $p < .05$.

Across domains, group accounted for a small to medium amount of the variance in the well-being measures (partial $\eta^2 = .00$ to .10). Most differences between groups on the specific measures also were small to medium in size, but none of the group differences were statistically significant, possibly because of the small sample size (see Table 2). For example, those who reported that something positive had come out of the event (growth group) had higher scores on the life appreciation (mean $d = .33$), relationship quality (mean $d = .39$), life priority (mean $d = .28$), and self-concept ($d = .37$) measures than the group who reported nothing positive (no growth group). However, the growth and no growth groups did not differ with regard to whether they were willing to volunteer (38% vs. 35%, respectively), $\chi^2(1, N = 68) = 0.06$, *ns*, or had actually volunteered (9% vs. 18%, respectively), $\chi^2(1, N = 68) = 1.15$, *ns*. There also was no difference ($d = .00$) between groups on the measure of spirituality and religiousness. Finally, the group that did not find anything positive in the event reported more empathic concern than did the growth group ($d = -.28$). Again, this difference was small to medium in size.

Discussion

In Study 2, the validity of self-reported growth was assessed by comparing individuals who had experienced the same events and either did or did not report that something positive came out of the event. If self-reported growth is valid, then we would expect those who reported growth to score higher on standard measures of the typical domains of growth (e.g., life appreciation, spirituality). Our results suggest that there are small to medium size differences between groups in terms of life appreciation, relationship quality, life priorities (i.e., meaning and purpose in life), and self-concept,

Table 2
Study 2: Comparisons Between Growth and No Growth Groups on Well-Being Measures

Measure	Growth group ($n = 34$)		No growth group ($n = 34$)				
	M	*SD*	*M*	*SD*	*F* (*dfs*)	*d*	Partial η^2
Life appreciation					1.58 (2, 65)		.05
Life satisfaction	5.07	1.09	4.81	1.25		.22	
Gratitude	6.22	0.76	5.86	0.89		.44	
Relationship quality					2.36† (3, 64)		.10
Family	3.56	0.68	3.28	0.67		.41	
Friendship	3.35	0.71	3.18	0.69		.24	
Positive relationships	4.75	0.71	4.29	1.02		.52	
Life priorities					1.26 (2, 65)		.04
Meaning	4.98	0.91	4.79	1.19		.18	
Purpose	4.90	0.58	4.63	0.83		.38	
Spirituality and religiousness	0.01	0.82	0.01	0.92	0.00 (1, 66)	.00	<.001
Self-concept	4.62	0.74	4.33	0.84	2.28 (1, 66)	.37	.03
Empathy	3.97	0.52	4.12	0.57	1.20 (1, 65)	−.28	.02

Note. Positive *d*s indicate greater well-being in the growth group.
† $p < .10$.

with the growth group reporting greater well-being than the no growth group. This was true even though the well-being measures were completed as part of an unrelated study 2 months later, which should reduce self-presentational concerns and threat-motivated reports. However, those who reported positive change were not more likely to be interested in volunteering or to have actually volunteered and, in fact, scored somewhat lower than the no growth group in terms of empathy for others. Unlike Study 1, there was no difference between groups in terms of spirituality and religiousness, which could be due either to differences in the measures or differences in the samples. The one other study that compared individuals who did and did not report positive change following a trauma found no significant differences between groups on measures of psychological symptoms or positive affect (Lehman et al., 1993), although symptoms and affect do not represent typical domains of growth.

In summary, the magnitudes of the effect sizes in Study 2 were somewhat larger and more consistently positive than those in Study 1 although they were not statistically significant, possibly because of the small sample size. Effect sizes derived from smaller samples (such as that in Study 2) are also less reliable estimates of population effect size. Study 2 also was limited by the imprecise measure of growth. That is, participants reported whether anything positive had come out of the event but provided only minimal information about the nature of those positive changes. To address this issue, participants in Study 3 completed a standard measure of SRG and scores on specific subscales of that measure were correlated with corresponding well-being measures. If self-reports of growth are valid, then we would predict that specific subscale scores would be more highly related to corresponding measures than to measures assessing other growth domains. For example, positive changes in empathy should be more highly related to standard measures of empathy than to standard measures of self-concept. A pattern of results in which growth in one domain was as highly or more highly related to well-being measures in another domain would undermine our confidence in those reports of growth.

In Study 3, we built on the previous studies in two additional ways. First, we added a stressor-prime condition to assess whether scores on the well-being measures would be higher if participants were primed to think about the stressful event. To the extent that well-being scores were higher in the primed group, self-reported well-being may be motivated by the need to reduce the threat to cherished worldviews induced by thinking about the trauma (C. G. Davis & McKearney, 2003). We also assessed whether the relations among the SRG subscales and corresponding measures were stronger among the stressor-prime group by assessing whether prime condition moderated the relation between SRG scores and corresponding measures. Second, we assessed the extent to which both reports of growth and well-being reflect positive affect. That is, individuals who are higher in trait positive affect may be more likely to report that they have grown from a stressful event and to score higher on well-being measures. If self-reported growth truly is related to greater well-being, then correlations between measures of the two constructs should be related beyond their joint relations with this third variable. We chose positive affect as the third variable to consider because it is one of the central components of subjective well-being (Frazier, Oishi, & Steger, 2003), although other constructs, such as hope or optimism, may also be related to both SRG and well-being.

Study 3

Method

Participants

Initial survey. Participants ($N = 188$) were recruited from psychology classes for a study of life stressors and completed surveys in large group sessions. Most were women (68%), between 18 and 21 years of age (80%), and European American (73%). They received extra course credit for participating. As part of the initial survey, participants again completed the TLEQ (Kubany, 2004), indicated whether they had experienced each event, and, if they had experienced more than one, indicated which event causes the most distress. They then completed the Perceived Benefits Scale (PBS; McMillen & Fisher, 1998) with regard to their most distressing event (see the *Measures* section below). More than 80% had experienced at least one major stressful event. The events most frequently nominated as most distressing were the break-up of a serious relationship and sudden bereavement.

Online survey. Individuals who had experienced at least one major stressful event and who indicated that they were willing to participate in future studies were contacted by e-mail to participate in an online study of well-being. The recruitment e-mail was sent to 143 individuals, and 103 individuals responded (72%).

Prime versus no-prime manipulation. One half of the sample was sent the same survey as participants in Study 2 (no-prime control condition). The other half was sent a survey that began with the TLEQ and a description of their worst event. Participants then were asked to respond to the well-being measures "with regard to your life following the event you identified as most distressing" (stressor-prime condition). The final sample consisted of 96 individuals, evenly divided between conditions, who completed more than half of the survey. Those who completed the online survey were compensated with extra credit in their course. The no-prime group ($n = 48$) was 69% female, most were between 18 and 21 years old (73%), and 79% were European American. The stressor-prime group ($n = 48$) was also predominantly female (81%), between 18 and 21 years of age (77%), and European American (73%). The worst events most frequently mentioned were the sudden and unexpected death of a loved one (16%), relationship dissolution or divorce (16%), and parents' divorce (9%). The average time since the worst event occurred was 4.56 years ($SD = 4.89$ years). The online survey was completed 6 to 8 weeks after the initial survey.

Measures

All measures except the TLEQ (Kubany, 2004, Study 2 Method), the PBS (McMillen & Fisher, 1998), and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) were completed as part of the online survey. The online survey was the same as in Study 2. All measures were used to compare means on the well-being measures across the two conditions (stressor prime vs. no prime). However, to reduce the number of analyses performed we combined scales in some domains to create composite factor scores when correlating the PBS subscales with the well-being measures.

Stress-related growth. We used the PBS to assess participants' perceptions of positive life changes resulting from their self-nominated worst event. The PBS contains 30 items and assesses growth in eight separate domains. All items are rated from 0 (*not at all like my experience*) to 4 (*very much like my experience*). The PBS has adequate reliability and validity (see Frazier et al., 2003, for a review). We analyzed scores on five subscales that corresponded most closely to the domains of reported

growth we examined in Studies 1 and 2. Specifically, the Family Closeness subscale consists of three items (e.g., "I am more aware of how much my family means to me;" $\alpha = .88$), the Lifestyle subscale has four items (e.g., "My priorities in life are different;" $\alpha = .78$), the Spirituality and Religiousness subscale has three items (e.g., "I have a greater faith in God;" $\alpha = .92$), the Self-Efficacy subscale has six items (e.g., "I am a stronger person;" $\alpha = .91$), and the Compassion subscale has four items (e.g., "I am more sensitive to the needs of others;" $\alpha = .83$). The correlations among the PBS scales were all significant and ranged from .38 to .68 (mean $r = .54$).

Positive affect. The PANAS (Watson et al., 1988) is a widely used and well-validated measure of affective well-being. It consists of 10 positive (e.g., interested, excited, strong) and 10 negative (e.g., distressed, upset, afraid) emotions. Participants rate the extent to which they have experienced each emotion in the past week on a 5-point scale (1 = *very slightly or not at all*, 5 = *extremely*). We used the Positive Affect scale in our analyses ($\alpha = .90$).

Relationship quality (family). We used the same measure to assess family closeness (Schuster et al., 1990) as in Studies 1 and 2. In Study 3, it had an alpha coefficient of .82.

Life priorities factor. The three measures closest to the PBS Lifestyle subscale were Meaning in Life (Steger et al., 2006), Purpose (Ryff, 1989), and Gratitude (McCullough et al., 2002). Because they were highly intercorrelated (mean $r = .55$), we performed a principal axis factor analysis of the three scales using maximum likelihood procedures. All three scales loaded on one factor, which accounted for 70% of the variance. The factor loadings all exceeded .73 ($M = .74$).

Spirituality and religiousness. The same three-item measure used to assess religiousness and spirituality in Study 2 was used in Study 3 ($\alpha = .77$).

Self-concept factor. To create a composite self-concept measure to correspond to the PBS Self-Efficacy scale, we factor analyzed the Environmental Mastery, Autonomy, and Self-Acceptance subscales of the PWB (Ryff, 1989) scale using the procedures outlined previously. The mean intercorrelation among the three scales was .51. The three scales loaded on one factor, which accounted for 68% of the variance. The factor loadings all exceeded .43 ($M = .73$).

Compassion and empathy. As in Study 2, a six-item version of the Empathic Concern subscale of the IRI was used to assess empathy ($\alpha = .79$), along with the two behavioral measures related to volunteering to help others who have experienced major stressors.

Results

Scores on the well-being measures first were compared for the stressor-prime and no-prime groups using ANOVA and MANOVA procedures. The primed group did not score higher than the no-prime group on the well-being measures; in all cases, group accounted for a negligible amount of variance (partial $\eta^2 = .00$ to .03). We next assessed whether the relations among the five PBS subscales and the corresponding well-being measures were stronger among the stressor-prime group. Five regression analyses were performed in which the well-being measure was regressed on the corresponding PBS subscale (z scored), stressor-prime condition (effects coded), and their interaction. One of the five interaction terms was significant. Specifically, the relation between the PBS Compassion scale and the empathy measure was stronger in the stressor-prime group ($r = .55$) than in the no-prime group ($r = .24$), with the interaction accounting for 4% of the variance. Because the relations among the PBS scales and the corresponding well-being measures generally did not differ for the stressor-prime and no-prime conditions, the two groups were combined for the correlational analyses to maximize power (which is more than .80 to detect medium effects in the full sample).

Correlations among the five PBS subscales and the five well-being measures, controlling for positive affect, are in Table 3. Three of the five correlations between the PBS scales and their corresponding well-being measures were significant (partial rs = .24 to .54). However, several of the off-diagonal correlations also were significant, indicating that scores on the PBS scales also were correlated with other well-being domains, sometimes more strongly than with the corresponding well-being measure. For example, self-reported positive changes in family relationships were more strongly related to the Self-Efficacy (partial $r = .41$) and Lifestyle (partial $r = .43$) scales than with the Family Relationship measure (partial $r = .17$). The mean partial correlation among the five PBS scales and the corresponding measures was .29, which was not significantly higher (using an r-to-z transformation to test differences in correlations) than the mean correlation among the PBS scales and noncorresponding measures (mean partial $r = .16$). The PBS Compassion scale had negligible point-biserial partial correlations with willingness to volunteer ($r = -.06$) and actual volunteer experience ($r = -.03$).

Discussion

Study 3 also revealed little evidence for the validity of SRG. Specifically, after controlling for positive affect, the PBS subscales were not more highly related to the corresponding well-being measures than to the other well-being measures. In some cases, PBS scores assessing growth in one domain (e.g., family relationships) were more highly related to well-being measures in other

Table 3
Study 3: Partial Correlations Among Measures of Perceived Growth and Well-Being, Controlling for Positive Affect

PBS	Self-concept	Religiousness–spirituality	Empathic concern	Life priorities	Family relationships
Self-Efficacy	.24*	.21	.26*	.25*	−.06
Spirituality	.15	.54***	.21*	.27**	−.01
Compassion	.13	.19	.35***	.13	−.02
Lifestyle	.14	.09	.17	.17	−.11
Family Closeness	.41***	.20	.23*	.43***	.17

Note. $N = 88$. PBS = Perceived Benefits Scale.
* $p < .05$. ** $p < .01$. *** $p < .001$.

domains (e.g., self-efficacy) than to well-being in the same domain. In addition, individuals who reported that they were more empathic as a result of their stressor were not more likely to have volunteered to help others who had experienced similar events or to be willing to help others in the future. Finally, when participants were instructed to answer the well-being measures with regard to their life since the traumatic event (stressor-prime condition), the relations between the PBS scales and corresponding well-being measures generally were not stronger.

Limitations of Study 3 include the following. First, the constructs assessed by the well-being measures did not always perfectly map onto the constructs assessed by the PBS scales. For example, the items on the PBS Lifestyle scale assess living more simply, living more for the moment, being less materialistic, and having different priorities. It seems reasonable to assume that individuals who report these changes also would report more meaning, purpose, and gratitude, but the match is not perfect. One way to address this problem is to revise established measures of growth so that they reflect current standing on the growth domains (Tennen & Affleck, 2005). Second, the stressor-prime condition may not have been powerful enough to induce threat. Thus, the conclusion that threat does not increase reports of growth or the relations between measures of growth and well-being should be made cautiously. Finally, as was the case with Study 2, not all of the events experienced by our participants may have been severe enough to produce SRG, although many were quite severe (e.g., suicide of family member). In Study 2, half of the respondents reported that the event still caused them at least moderate distress; in Study 3, it was only 28%.

Summary, Limitations, Clinical Implications, and Future Research Agenda

The purpose of these studies was to assess the validity of self-reported SRG. In general, we found little evidence of validity. In Study 1, comparisons between a group of individuals who had experienced a major stressor (breast cancer) and a carefully matched comparison group revealed few between-group differences. This lack of difference could be because our sample likely included those who did and did not believe they had grown as a result of their struggle with cancer. To ensure that those who had experienced major stressors actually reported growth, in Study 2 we compared individuals who explicitly said that something positive had come out of their worst major stressor with those who did not report anything positive. Those who reported growth tended to report greater well-being in several domains (e.g., relationship quality, gratitude), with differences in the small to medium range. The small sample size and resulting low power may account for the lack of statistical significance, or it may be that there is no reliable effect. In Study 3, we correlated reports of growth in five specific domains with measures of those domains. If self-reported SRG is "real," then we would expect reports of growth in a domain to correlate with better functioning in that domain. However, reports of growth in specific domains were as highly correlated with functioning in other domains as with measures of functioning in corresponding domains.

The conclusions that can be drawn must be tempered by the limitations of the studies. First, the generalizability of the findings is limited because most participants in all three studies were European American. Second, the events experienced by the undergraduates in Studies 2 and 3 were not all severe traumas. Finally, the measures were all self-report. As noted below, behavioral measures are needed.

The clinical implications of data on the validity of self-reported SRG are unclear. It is not the clinician's job to assess whether self-reported SRG is real. However, it may be useful for clinicians to be attuned to reports of growth and to explore with clients how they might capitalize on these perceived areas of growth. SRG might also be examined as a treatment outcome.

Because of the dearth of research on the validity of self-reported SRG, we conclude with an agenda for future research. We focus on three strategies: prospective studies, behavioral studies, and studies of coping with future life events. We hasten to add that there are several other conceptual and methodological issues that we do not address (e.g., whether SRG is best conceptualized and measured in terms of a unitary process or multiple dimensions).

The best way to determine whether an individual has experienced actual growth following a stressful event is to obtain assessments both prior to and after the event. Ideally, assessments would be made at several points after the stressor and would include standard well-being measures (to assess actual growth) and measures of perceived growth. To ensure that the measures of perceived and actual growth are assessing the same constructs, standard measures of growth could be revised to reflect current standing on relevant attributes, such as empathy (Tennen & Affleck, 2005). Right now, we have virtually no information on how perceived growth is related to actual growth. On the basis of the personality literature, this relation may be quite modest (Robins et al., 2005). In fact, one recent study in which individuals were assessed prior to and following cancer treatment found a small correlation ($r = .15$) between actual and perceived growth (Ransom & Jacobsen, 2005).

In addition to assessing the relation between perceived and actual growth, we need to determine the antecedents and consequences of both, which may very well differ. For example, different factors are associated with perceived versus actual personality change (Robins et al., 2005) and benefit finding versus reported growth (Sears et al., 2003). We now have quite a bit of data on factors that are associated with perceived growth and the relations among measures of perceived growth and adjustment (Linley & Joseph, 2004). Intuitively, actual growth should be more strongly associated with well-being than perceived growth. However, in the social support domain, the perception of support is more strongly related to beneficial outcomes than is the actual receipt of support (Lakey & Drew, 1997). Thus, the relative importance of perceived versus actual growth in predicting outcomes cannot be assumed.

Studies of the relations among measures of growth (perceived or actual) and outcomes also need to test more sophisticated models. For example, existing data suggest that measures of perceived growth may be more strongly related to outcomes for some people (e.g., those higher in hope) than for others (Stanton, Danoff-Burg, & Huggins, 2002) and that the relation between perceived growth and outcomes may be curvilinear rather than linear (Carver, 2005). If these more complex relations are not taken into account, research on the relation between growth and outcomes will continue to be inconsistent. There may also be factors that moderate the relation between perceived and actual growth, such that perceived

growth is more associated with actual change for some people than for others.

Assessing actual and perceived growth is complicated by a phenomenon called "response shift," which refers to a change in the meaning of an individual's evaluation of a construct (e.g., quality of life) because of changing internal standards, values, or definition of the construct (Sprangers & Schwartz, 1999). For example, if an individual completes a life satisfaction measure before and after a major stressor, his or her definition of what constitutes a satisfying life may have changed. Thus, the same score on the same measure may mean different things. Schwartz and Sprangers (1999, 2000) reviewed several different methods of assessing response shift (see Schwartz, Sprangers, Carey, & Reed, 2004, for an empirical example) that should be incorporated into research on SRG.

Another way to validate self-reports of growth, in addition to prospective studies, is to assess whether those reports are evident in actual behaviors either in laboratory or real-life situations. For example, trauma survivors commonly report that they have more compassion and empathy for others as a result of their trauma. Non-self-report measures of empathy could be used to validate these reports, including helping behaviors, physiological responses, or facial reactions (N. Eisenberg & Lennon, 1983). Outside of the lab, daily diary studies could be used to assess whether self-reported growth is manifest in daily behaviors. In one such study, individuals with breast cancer who reported more perceived growth were more likely to engage in activities that expressed their true values (Bower, 2005). In summary, we need to be more creative in designing ways to assess whether different forms of self-reported growth are evident in behavior.

A final way of assessing validity is to examine whether individuals who report that they have grown from a stressful event are better able to cope with and are less affected by future stressors. This issue has received little empirical attention, although one interesting study found that individuals who reported more growth showed quicker cortisol habituation to a laboratory stressor (Epel, McEwen, & Ickovics, 1998). Ideally, studies of future coping would incorporate prospective assessments of growth following the initial event and follow people over time to assess coping with subsequent events.

In conclusion, the studies presented here contributed to the literature on the validity of self-reported SRG in several ways. First, rather than asking participants to assess the extent to which they have changed or grown as a result of a stressful event—a notoriously difficult task—we assessed well-being using standardized measures. Second, we assessed well-being outside of the context of the stressful event, which should reduce the extent to which people feel the need to say they are coping well or to report growth to reduce the threat induced by thinking about the stressor. Using an experimental design, we also specifically assessed whether inducing threat would lead to reports of greater well-being. Finally, we examined the extent to which relations among measures of growth and well-being are due to a third variable (i.e., positive affect), an issue that has not been given much attention. After addressing these issues, we found little evidence that those who say they have grown also report greater well-being, which underscores the need for future research on when and for whom self-reported growth is real.

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