

UNDERSTANDING PERCEPTIONS OF BENEFIT FOLLOWING ADVERSITY: HOW DO DISTINCT ASSESSMENTS OF GROWTH RELATE TO COPING AND ADJUSTMENT TO STRESSFUL EVENTS?

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Research on stress-related growth typically relies on individuals' retrospective perceptions of growth, not indications of change in personal attributes over time (i.e., measured growth). This longitudinal study sought to: (1) examine the correspondence of perceived and measured growth, (2) elucidate the relations of these forms of growth, coping strategies, and change in adjustment in undergraduates ($N = 162$), and (3) examine whether current measurement approaches for self-perceived growth adequately capture the theoretical construct of psychological growth. Participants were undergraduates assessed at study entry and at 6 weeks. Perceptions of stress-related growth were not correlated with measured growth. In a path model, measured growth predicted increased positive mood and decreased distress. Perceived growth predicted increased positive mood, mediated by approach-oriented coping, as well as increased distress, partially mediated by coping through denial. These findings have implications for the measurement of stress-related growth and highlight the distinction between perceived and measured growth.

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The literature on stressful life events has focused predominantly on their deleterious effects on psychological and physical health. More recently, researchers have examined the positive consequences of stressful experiences, or stress-related growth. A once underexplored point of focus in psychology, the capacity to find benefit and grow through adversity is now a burgeoning area of interest (e.g., Calhoun & Tedeschi, 2006; Park, Cohen, & Murch, 1996; Taylor, 1983; Tedeschi & Calhoun, 1996). Self-reported positive outcomes have been described by adults experiencing bereavement, academic problems, relationship loss, sexual assault, and medical problems (Calhoun & Tedeschi, 1990; Frazier, Conlon, & Glaser, 2001; McFarland & Alvaro, 2000; Tedeschi & Calhoun, 1996). Despite the rapid accumulation of research on stress-related growth, several limitations need to be addressed. First, the validity of these reports has not been demonstrated definitively. Second, findings on the adaptive consequences of perceived stress-related growth are inconsistent and warrant further study. Third, the relations of stress-related growth appraisals with strategies individuals use to manage stressor-related demands (e.g., approach and avoidance coping) are not well characterized. The present study was designed to assess the validity of current measurement approaches for perceptions of stress-related growth reported after a stressful encounter. To achieve this aim, we compared retrospective perceptions of growth to change in the same positive attributes as assessed prior to and following a stressor. In the extant literature, others have used the term *actual growth* (Ransom, Sheldon, & Jacobsen, 2008) but we elected the term *measured growth* in the current study to indicate change over time in self-reported personal attributes. Second, we sought to examine perceived growth and measured stress-related growth as predictors of psychological adjustment to a stressor and to elucidate the roles of approach and avoidance-oriented coping processes in these relationships.

Although a growing body of literature claims support for the veracity of growth reported upon the experience of stressful events, much of this research is conceptually and methodologically limited. Most research involves cross-sectional studies and interviews based on retrospective recall of growth. Rather than documenting pre-stressor to post-stressor change, studies have required participants to report retrospectively how much they changed as a result of the event. A limitation of this method is that retrospectively reported growth might reflect well documented cognitive biases and illusions (e.g., see Tennen & Affleck, 2009).

Several theories have attempted to explain why people grow through the struggle with stressful experiences. Tedeschi and Calhoun (1996) postulate that growth can occur in response to stressful life events that perturb individuals' core beliefs about the self and world. To attain growth, individuals must reprioritize goals while rebuilding self-schemas and world views. Thus, Tedeschi and Calhoun (1996) posit that reports of growth represent veridical changes catalyzed by stressful events. Alternatively, the theory of cognitive adaptation posits that victimization associated with stressful experiences threatens one's sense of meaning, mastery, and self-esteem, and that individuals engage in self-enhancing cognitive distortions or illusions in response to threat that allow them to view their experience in a more positive light (Taylor, 1983; Taylor & Brown, 1988). Although Taylor and Brown (1988) were careful to indicate that reported stressor-related changes are not likely to be entirely illusory, their model raises doubt about whether individuals actually grow from the struggle with adversity. These theories of growth, however, do share a common conjecture that perceived growth represents individuals' attempts to reconcile pre-crisis beliefs about themselves and the world with their transformed, post-crisis beliefs (Park & Folkman, 1997).

Few studies have added to our understanding of whether perceptions of growth are grounded in reality or reflect self-enhancing or other biases. Some evidence suggests, however, that perceived growth is not related to measured growth. In studies that compared undergraduates' current standing on their personal attributes to their recalled past attributes, students derogated their past selves as compared to their current selves, creating the perception of growth (MacFarland & Alvaro, 2000). Another study assessed college students' personal attributes prior to and after they experienced a self-reported traumatic event and compared measured growth in these attributes to perceived growth on the same attributes as measured by the Post-Traumatic Growth Inventory (PTGI; Frazier, Tennen, Gavian, Park, Tomich, & Tashiro, 2009). Perceptions of growth and actual growth were significantly correlated. However, specific PTGI subscales were not significantly correlated with measured growth on separate scales assessing constructs (e.g., life satisfaction, positive relationships) that closely corresponded to PTGI subscales.

Another key question in the stress-related growth literature is whether perceived growth contributes to favorable adjustment to stressful experiences. Certainly, measured growth in the life do-

mains reported by young adults, which indicate strengthened personal relationships, self-view, life appreciation, spirituality, and a sense of new possibilities, would be expected to bolster psychological adjustment, as we hypothesized in the current study. According to theories of growth, however, individuals may need only to perceive growth, regardless of any actual change, in order to experience positive psychological outcomes.

Studies examining the relationship between perceived growth and adjustment reveal mixed findings. Some studies yield positive relationships between perceived growth and favorable adjustment (e.g., Carver & Antoni, 2004; Park et al., 1996), some yield no relationship (e.g., Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003; Tennen, Affleck, Urrows, & Higgins, 1992), some reveal a curvilinear relation between perceived growth and adjustment (Lechner, Carver, Antoni, Weaver, & Phillips, 2006), and a few suggest that perceived growth predicts maladjustment (e.g., Cordova, Cunningham, Carlson, & Andrykowski, 2001; Tomich & Helgeson, 2004). In a meta-analysis of 87 cross-sectional studies, Helgeson, Reynolds, and Tomich (2006) concluded that perceptions of growth were related to lower depressive symptoms and greater well-being, but also more stressor-related intrusive and avoidant thoughts. Reviewing longitudinal studies of individuals affected by serious disease, Algoe and Stanton (2009) found inconsistent relations between perceived stress-related growth and change over time in psychological adjustment. Hence, we advanced no directional hypothesis regarding the predictive utility of perceived growth.

One explanation for the obtained variable relations of perceived growth and adjustment is that reports of growth might serve diverse motivational functions (Rini et al., 2004; Stanton, Danoff-Burg, & Huggins, 2002; Stanton & Low, 2004; Tomich & Helgeson, 2004). On one hand, reports of growth might indicate a tendency to approach stressors actively. In the literature, stress-related growth has been conceptually linked to processes indicating active engagement with the stressor, particularly information processing and meaning-making (Davis, Nolen-Hoeksema, & Larson, 1998; Park & Folkman, 1997). In a study of college students dealing with a recent stressor, greater perceived growth related to more use of approach-oriented coping strategies such as coping through seeking emotional support (Park et al., 1996). On the other hand, reports of stress-related growth might indicate denial-like processes. Reporting that only good has come from a difficult experience might be motivated by a

wish to stave off any negative implications of the stressor (Stanton et al., 2002; Tomich & Helgeson, 2004).

The notion of diverse functions of reported stress-related growth is represented in the Janus-Face model of self-perceived growth (Zoellner & Maercker, 2006), which posits that growth following adversity is a phenomenon that can have co-existing components, a self-transforming or constructive purpose (e.g., self-transcendence) and a dysfunctional purpose (e.g., self-deception or denial). The two components of the model are related differentially to adjustment with self-transcendence being related to favorable adjustment and self-deception being related to poor adjustment. In that reviews of the literature have suggested a more salutary effect of approach-oriented coping and a detrimental effect of avoidant coping on physical and emotional outcomes (e.g., Stanton, Revenson, & Tennen, 2007; Taylor & Stanton, 2007), a positive relation obtained between stress-related perceived growth and improved adjustment might be mediated by approach-oriented coping, whereas a link between growth perceptions and declining adjustment might be mediated by attempts to cope through denial. We explored this possibility in the current research.

In sum, despite the considerable body of research regarding perceptions of growth following threatening encounters, researchers have only begun to examine whether retrospectively reported positive changes reflect growth measured across time. This report extends prior research in a number of ways: (1) by validating reports of growth in a prospective study that assessed young adults before and after they experienced a naturalistic stressful event, (2) by testing a model that clarifies the predictive utility of two distinct forms of growth on adjustment, (3) by exploring approach and avoidance-oriented responses as potential explanatory mechanisms in the relationship between perceived growth and adjustment, and (4) by examining whether current measurement approaches for perceptions of growth capture the concept of growth as developed by Tedeschi and Calhoun (1996). Unlike previous longitudinal studies which only measured *retrospective* perceived stress-related growth soon after a threatening encounter (Affleck, Tennen, Croog, & Levine, 1987; McMillen, Smith, & Fisher, 1997), we also assessed participants' measured growth by comparing self-perceptions on various positive attributes typically associated with stress-related growth prior to and after a self-nominated stressful event with their retrospectively reported perceived growth, measured by the PTGI.

Furthermore, the current study employs a methodology that allows for direct comparisons between measured and perceived growth (Frazier et al., 2009) by using an altered form of the PTGI to assess measured growth rather than using different measures that assess similar domains on the PTGI (Ransom et al., 2008). The PTGI is the most commonly employed measure of perceived growth and has been validated in samples of college students experiencing stressful events akin to those we anticipated in the current sample (Tedeschi & Calhoun, 1996).

It is important to stress that the purpose of the current study was not to refute the existence of actual growth following adversity, but rather to examine whether current measurement approaches for perceptions of growth adequately correspond to indicators of measured growth (Tedeschi & Calhoun, 1996). Consistent with the tenets of the Janus-Face Model of self-perceived growth, we were interested in examining the two component sides of perceived growth: the constructive component (e.g., seeking support, emotional processing) and the dysfunctional component (e.g., self-deception or denial; Zoellner & Maercker, 2006). To that end, a testable model (see Figure 1) was developed to examine the predictive utility of perceived growth and measured growth on changes in adjustment, including depressive symptoms, negative and positive mood, and stressor-related intrusive thoughts. Items assessing perceived growth, unlike measured growth, were stressor specific; coping mechanisms in response to the stressful event were posited to function as factors that facilitate or hinder psychological adjustment.

METHOD

PARTICIPANTS AND PROCEDURES

Participants were undergraduates who received course credit in introductory psychology courses at the University of California, Los Angeles. After being informed of the study's purpose to investigate how individuals deal with stressful experiences and providing informed consent, participants were followed at study entry (Time 1), and 6 weeks later (Time 2).¹ One hundred sixty-two participants (M age = 19.66 years, SD = 1.75) completed the T1 assessment, and 152 (94%) completed at T2. Of the 152 participants, 45% were Asian,

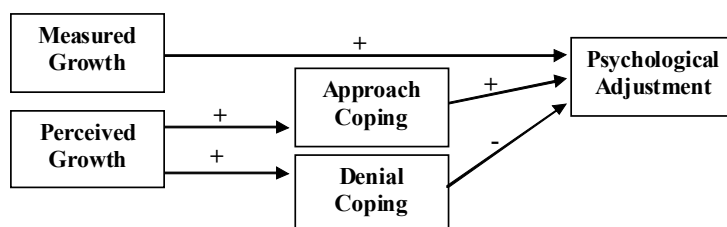


FIGURE 1. Hypothesized model of measured growth, perceived growth, and coping processes as predictors of change in psychological adjustment.

23% were Caucasian, 18% were Latino, 2% were African American, and 11% self-identified as other race/ethnicity; 83% were women.

Participants completed psychological adjustment measures (positive and negative mood, depressive symptoms) and an assessment of their current status on various personal attributes at both time points. Current status scores on personal attributes were used to calculate change scores (i.e., measured growth) from study entry to 6 weeks. At the 6-week assessment, participants described the most stressful event they had experienced within the previous 6 weeks. Instructions were: "Take a few moments to think about a current situation that is *most stressful for you that occurred within the past 6 weeks*. By 'stressful' we mean a situation that is difficult or troubling to you, either because it upsets you or because it takes considerable effort to deal with it. It may be a problem with someone close to you, a problem at school, a medical problem, a separation from someone you care about, etc. Please briefly describe the situation here" (Dunkel-Schetter, Folkman, & Lazarus, 1987; Stanton, Kirk, Cameron, & Danoff-Burg, 2000). Participants then rated the stressfulness of and their efforts to cope with the self-nominated stressor, and completed measures of stressor-related distress. They also completed assessments of perceived growth (PTGI) resulting from the identified stressor. A 6-week time frame was selected in light of previous evidence to suggest that individuals report perceptions of growth in the weeks following the onset of the stressor (Affleck et al., 1987; Frazier et al., 2009; McMillen et al., 1997). All data were collected via questionnaire.

1. Measures also were collected at 12 weeks. However, the majority of the students were unable to return for the 12-week assessment, which took place during the summer. Analyses pertaining to this time point were deemed unreliable and are not included in the current report.

MEASURES

Perceived Growth. The original PTGI (Tedeschi & Calhoun, 1996) is a 21-item self-report inventory that measures perceptions of positive change or growth after a threatening experience. Respondents rate how much they have changed as a result of an event (e.g., I changed my priorities about what is important in life) on a scale ranging from 0 (not at all) to 5 (a great deal). The PTGI was administered at T2 with reference to the self-nominated stressor that students wrote about ($\alpha = .91$). The PTGI was selected for the current study as it was validated in a sample of undergraduate students reporting stressors ranging from academic problems to injuries (Tedeschi & Calhoun, 1996), has been previously utilized with undergraduates (Frazier et al., 2009), and is similar to other established measures of growth (Park et al., 1996).

Current Attributes Scale. The Current Attributes Scale is a modified version of the 21-item PTGI that was administered at T1 and prior to the PTGI at T2 to capture participants' current status on each domain. Sample items include, "I know my priorities about what is important in life," "I try to change things that need changing," "I appreciate the value of my own life," "I put effort in my relationships," and "I am aware of how strong I am." Responses range from 0 (not at all) to 5 (a great deal). Measured change was obtained by subtracting scores on the Current Attributes Scale from T1 to T2. Cronbach's coefficient alpha was .90 at T1 and .93 at T2.

Perceived Stressfulness. After describing the self-nominated stressful event (T2), participants rated its stressfulness on a 7-point scale (not at all stressful to extremely stressful).

Coping. Coping processes were assessed at T2 with items from the COPE (Carver, Scheier, & Weintraub, 1989) and the Emotional Approach Coping Scales (Stanton et al., 2000). Participants rated their coping behaviors in response to their nominated stressor (1 = I don't do this at all; 4 = I do this a lot). Based on correlational patterns observed in prior research (Stanton et al., 2000), five coping subscales were identified to make a composite factor score for approach-oriented coping: problem-focused coping (e.g., I take action to try to make the situation better), instrumental social support seeking (e.g., I get help and advice from other people), emotional social support seeking (e.g., I get comfort and understanding from someone), emotional expression (e.g., I let my feelings come out freely), and emo-

tional processing (e.g., I take time to figure out what I'm really feeling). Internal consistency reliability for the five scales ranged from $\alpha = .70$ to $.94$.

Three COPE subscales measure avoidance-oriented coping. The 4-item Denial (e.g., I refuse to believe that it has happened) and Behavioral Disengagement (e.g., I admit to myself that I can't deal with it, and quit trying) subscales evidenced sufficient internal consistency reliability ($\alpha = .73$ for Denial, $.71$ for Behavioral Disengagement), but Mental Disengagement did not ($\alpha < .70$) and was excluded from further analyses. Although moderately correlated ($r = .55, p < .01$), the two remaining subscales were examined separately in analyses because they represent different degrees of attempting to deny the stressor and hence might be differentially related to perceived growth (Tomich & Helgeson, 2004).

Psychological Adjustment. Three measures of psychological adjustment were administered to assess the presence of depressive symptoms, experience of positive and negative mood, and event-related distress. The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item scale designed to measure depressive symptomatology in the general population. The scale assesses depressive symptoms experienced within the past week. The CES-D was administered at both time points. The Cronbach's alpha was $.77$ at T1 and $.89$ at T2. The 14-item Profile of Mood States-Short Version (POMS-SV; Guadagnoli & Mor, 1989) measures positive and negative mood during the previous week on a 5-point scale (not at all to extremely). Two subscales measure positive and negative mood, with internal consistency ranging from $\alpha = .76$ to $.82$ for T1 and T2. The Intrusion scale of the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979), a 7-item measure of intrusive thoughts regarding the self-nominated stressor, was administered at T2 to assess event-related distress. Participants reported the frequency of symptoms in the past seven days on a 4-point scale ranging from not at all to often ($\alpha = .86$).

In light of the observed pattern of correlations between positive mood and other indicators of psychological adjustment (e.g., distress, negative mood), as reported below, positive mood was considered a unique dependent variable and indicated by POMS-Positive Mood. Factor scores comprised of T2 values from the CES-D, POMS-Negative Mood, and IES-Intrusion for psychological distress were computed in Mplus statistical software (Version 3.01; Muthén & Muthén, 2004).

TABLE 1. Descriptive Statistics on Primary Variables (*N* = 152)

Study Variable	Pre-stressor (T1)		Post-stressor (T2)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Growth-Related Measures				
Current Attributes Scale	74.21	12.28	75.39	11.62
Measured Growth*	—	—	1.18	7.21
Perceived Growth	—	—	41.05	23.39
Psychological Adjustment				
CES-D	16.28	10.18	18.82	10.43
POMS Negative	8.47	6.09	10.17	6.14
POMS Positive	17.24	4.47	16.68	4.85
IES Intrusion	—	—	16.03	8.97
Coping Processes				
Denial Coping	—	—	1.38	.52
Behavioral Disengagement Coping	—	—	1.63	.58
Coping through Emotional Expression	—	—	2.56	.87
Coping through Emotional Processing	—	—	2.77	.73
Seeking Instrumental Support	—	—	3.09	1.00
Seeking Emotional Support	—	—	2.94	.96
Problem-Focused Coping	—	—	2.95	.68

Notes. POMS = Profile of Mood States; CES-D = Center for Epidemiologic Studies Depression Scale; IES = Impact of Event Scale; *Measured Growth was computed by subtracting pre-stressor from post-stressor values on the Current Attributes Scale.

RESULTS

PARTICIPANT ATTRITION

Preliminary analyses were conducted to identify differences between participants who completed T2 and those who did not. Results of *t*-tests on continuous variables and chi-square tests on categorical variables indicated that participants who completed the study did not differ ($p > .05$) from noncompleters on demographic factors (i.e., age, gender, ethnicity), T1 scores on the Current Attributes Scale, and all dependent variables.

DESCRIPTIVE STATISTICS

Table 1 displays descriptive statistics for T2 completers ($n = 152$). CES-D means were slightly higher than those of an undergraduate validation sample ($M = 15.5$; Radloff, 1991) and above the suggested clinical cut-off of 16. However, reports of depressive symptoms for college students tend to be higher than that of the general popula-

TABLE 2. Zero-Order Correlations for All Measured Variables in the Final Model

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Perceived Growth	—														
Measured Growth	.10	—													
Emotional Expression	.27**	.05	—												
Emotional Processing	.36***	-.02	.72***	—											
Instrumental Support	.16	-.15	.38***	.31***	—										
Emotional Support	.24**	-.12	.59***	.44***	.72***	—									
PF Coping	.17*	-.01	.43***	.38***	.18*	.27**	—								
Behavioral Disengagement	.12	-.78***	-.03	-.08	.07	-.10	-.23**	—							
Denial Coping	.22**	.04	-.05	-.09	.09	.06	-.15	.55***	—						
T2 IES - Intrusion	.34***	-.08	.25**	.28***	.21**	.30***	.17*	.14	.26**	—					
T1 CES-D	.25**	.05	-.14	-.02	-.06	-.07	-.11	.30**	.23**	.31***	—				
T2 CES-D	.25**	-.10	.02	.07	.10	.04	.09	.36**	.25**	.38***	.61***	—			
T1 POMS Positive	.09	-.19*	.36***	.28**	.18*	.31***	.25**	-.14	-.13	.06	-.31***	-.13	—		
T1 POMS Negative	.24**	.06	.05	.09	.07	.15	.01	.18*	.25**	.39***	.72***	.50***	-.04	—	
T2 POMS Positive	.16*	.12	.37***	.29***	.11	.25**	.22**	-.23**	-.09	.01	-.24**	-.39***	.53***	-.03	—
T2 POMS Negative	.24**	-.11	.09	.13	.11	.14	.13	.23**	.26**	.44***	.44***	.70***	-.02	.52***	-.18*

Note. PF = Problem-Focused; IES = Impact of Event Scale; CES-D = Center for Epidemiologic Studies Depression Scale; POMS = Profile of Mood States. * $p < .05$; ** $p < .01$; *** $p < .001$.

tion (Hoban, 2007). Correlations among study variables are reported in Table 2. Following Stanton et al. (2000, Study 3), the first author coded participants' self-nominated stressors into several categories: interpersonal-friend/significant other, interpersonal-family, academic/achievement, finances, health, employment, combination/other. Legal problems was added as a category. All participants provided a stressful experience. The most commonly reported stressors (34.2%) were in the academic (e.g., academic probation) or interpersonal-friend/significant other (30.9%; e.g., romantic relationship dissolution) domains. Approximately 14% reported a combination of stressors (e.g., hospitalization for illness that increased school-related stress). The remaining students reported problems with their families (e.g., divorce), health (e.g., hospitalization), finances (e.g., unable to pay rent), employment (e.g., job loss), legal problems (e.g., police citation), or other stressors (e.g., identity theft). On average, participants rated the self-nominated stressors above the midpoint on the stressfulness scale ($M = 4.68$, $SD = 1.74$, range = 1-7); 76% were at or above the midpoint, indicating that participants generally did not perceive their stressors to be trivial. However, stressfulness ratings were not significantly correlated with perceived growth or measured growth. On average, time elapsed since stressor onset at T2 was 20 days ($SD = 13.23$). Elapsed time was significantly correlated with perceived growth ($r = .20$, $p = .03$), but not measured growth ($r = -.05$, $p = .58$).

PERCEPTIONS OF STRESS-RELATED GROWTH

Age, gender, and ethnicity were not related to perceived growth, measured growth, coping, and all dependent variables measured at T2 ($ps > .05$). Mean PTGI scores were lower than those of undergraduates who reported experiencing a stressful event within the past five years ($M = 71.47$; Tedeschi & Calhoun, 1996) and breast cancer patients ($M = 64.10$; Cordova et al., 2001) assessed an average of 24 months post-treatment. The mean item response on the PTGI at 6 weeks was 1.95, suggesting a small amount of perceived change across items. All participants endorsed perceived growth on the PTGI. Regarding measured growth, 84 participants reported growth. Of the remaining 68 participants, 59 reported a loss in attributes and nine reported no change.

Paired samples *t*-tests revealed a significant increase in depressive symptoms on the CES-D from T1 to T2 $t(151) = -3.42, p = .001$ and on negative mood on the POMS from T1 to T2 $t(151) = -3.49, p = .001$. Cohen's *d* effect sizes were .25 and .28, respectively, which indicate a small change. Positive mood (POMS) did not change significantly, $t(151) = 1.54, p = .12$, Cohen's *d* = .12. The mean score on the Current Attributes Scale was significantly higher at T2 than at T1, $t(151) = -2.01, p = .046$, indicating significant measured growth; however, the Cohen's *d* was modest at .10. Measured growth, which was obtained by subtracting scores on the Current Attributes Scale, was not related to perceived growth at T2 ($r = .09, p = .24$).

TEST OF HYPOTHESIZED PATH MODEL

The pattern of correlations observed between perceived growth and measures of adjustment in Table 2 were consistent with findings from previous studies which reported that perceived growth was associated with maladjustment and positive adjustment (e.g., Cordova et al., 2001; Tomich & Helgeson, 2004). In addition to examining the direction of correlations, our interpretation of correlations was guided by their magnitude. Ferguson (2009) recommends a minimum of $r = .2$ to represent a strength of association of potential practical value for social sciences data; most of the correlations between perceived growth (but not measured growth) and the dependent variables exceed this value.

In light of these initial findings and our interest in predicting change across time in the dependent variables, we proceeded with the development of a path model to examine potential explanatory factors in the relationship between perceived growth and adjustment. Kline et al. (2005) recommends a ratio of 10 cases to one parameter to determine the minimum satisfactory sample size; therefore, a sample of 140 participants would be satisfactory for the proposed model. Path analysis was used to assess the relative direct and indirect (mediated through coping processes) contributions of measured and perceived growth to the change in psychological adjustment. Path models were tested using maximum likelihood estimation in Mplus (Version 3.01; Muthén & Muthén, 2004). Coping through denial is reported as the sole measure of avoidance-oriented coping because coping through behavioral disengagement was not significantly related to perceived growth ($r = .12, p = .15$).

and was therefore excluded from path analysis. To account for initial values on dependent variables, positive mood and indicators of distress measured at T1 were controlled in the model (note that the IES-Intrusion, which is stressor-specific, could not be completed at T1). To evaluate goodness of model fit, multiple fit indices were computed: including χ^2 , root mean squared error of approximation (RMSEA), standardized root mean squared residual (SRMR), and the comparative fit index (CFI).

The initial hypothesized model had a relatively good fit, $\chi^2(10) = 16.64$, $p = .12$; CFI = .97; RMSEA = .058; SRMR = .042. Examination of modification indices did not suggest the addition of new paths. An examination of the parameter estimates indicated that two relationships (i.e., approach coping and psychological distress; denial coping and positive mood) were not significant ($ps > .05$). Thus, the model was trimmed to reflect the most parsimonious solution for the data (Kline, 2005). These modifications resulted in a model with good fit, $\chi^2(12) = 17.14$, $p = .15$; CFI = .97; RMSEA = .053; SRMR = .044, as depicted in Figure 2. The final model accounted for 38% of the variance in positive mood and 37% of the variance in psychological distress.^{2,3}

The mediated effects were tested based on bootstrapped standard errors for indirect paths generated in Mplus (Muthén & Muthén, 2004). This method makes fewer assumptions about the sampling distribution than existing statistical methods for assessing mediation effects (e.g., Sobel test; Kobrin, Rothman, & Aiken, 2008). The mediated effect statistic is the product of the unstandardized path for the relation between the independent variable and the mediator and the unstandardized path of the relation between the mediator

2. To examine the possibility that the modeled relationships among variables are a function of perceived stressfulness of nominated events, a multiple group path model was tested for high (≥ 4 ; $n = 94$) vs. low (< 4 ; $n = 58$) perceived stressfulness. Although several relationships no longer reached significance, the direction and relative magnitude of modeled relationships remained across groups. Thus, this possibility was not supported and the hypothesized model was retained.

3. To build confidence in our final path model, we employed an additional analytical approach in which the measured growth variable was dichotomized by those who reported growth and those who reported loss in attributes over time. This dichotomized variable replaced the continuous measured growth variable. The resulting path model was similar to the model presented in the manuscript in terms of overall fit, direction of relationships among variables, and strength of relationships. Analysis of variance also was conducted to test for differences in coping processes as a function of this dichotomy. Consistent with the presented model, no significant differences were found in the use of approach or denial coping for those who gained attributes versus those who reported reduction in attributes, yet relationships with adjustment variables remained.

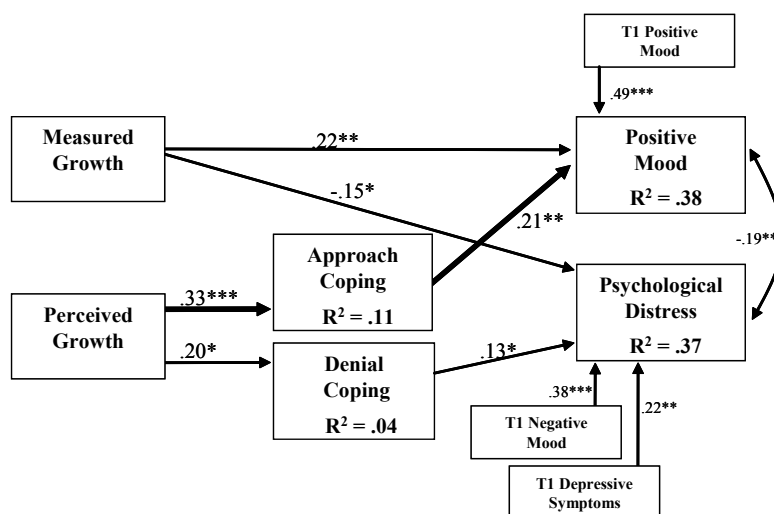


FIGURE 2. Path diagram depicting relationships among perceived and measured growth, coping processes, and indicators of psychological adjustment. Coefficients are standardized path coefficients derived from path analysis. The bold path represents a fully mediated path. Unless specified, variables measured at Time 2.

$\chi^2(12) = 17.14, p = .15$; CFI = .97; RMSEA = .053; SRMR = .044.

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

and the outcome. Significance of the mediated effect is determined by dividing the mediated effect by the bootstrapped standard error generated in Mplus (Muthén & Muthén, 2004). The mediated effect of coping processes was significant for approach coping ($p < .05$), but not for denial coping ($p = .07$).

The model revealed that greater measured growth from T1 to T2 was associated with an increase in positive mood and decline in distress over six weeks, as predicted. Perceived growth at six weeks was also associated with an increase in positive mood, and this relationship was mediated by greater use of approach-oriented coping. At the same time, perceived growth was related to increased distress. Attempting to cope through denial partially mediated this relationship, suggesting that perceived growth may be operating on adjustment through both approach and denial-like processes.

DISCUSSION

This study attempted to address a major limitation in the stress-related growth literature; namely, to establish the validity of retro-

spective reports of growth in order to ascertain whether the concept of stress-related growth is being adequately captured by current measurement approaches. Analyses revealed significant pre- to post-stressor change on the Current Attributes Scale at T2, but the effect size was small. Similar to Frazier et al. (2009), participants experienced little measured growth across the course of the study, which is not surprising in light of the short-term longitudinal design.

Regarding the statistically reliable but small change in measured growth across six weeks, one could question whether this change represents "actual" change, citing the evidence that major facets of personality change little in adulthood. We should point out that the positive changes measured in the present study are different from the personality changes measured in long-term personality stability studies. McAdams and Pals (2006) describe various levels of personality, including dispositional traits (e.g., Big Five) and characteristic adaptations (e.g., goals, domain-specific schemas). Under the conceptual model posited by McAdams and Pals (2006), it is possible to experience change in goals and schemas with little or no change in dispositional traits. We argue that it is this change in goals and schemas that measurement instruments of perceived growth should be capturing.

Regarding the measurement of perceived growth, we view the current study as a conservative estimate of growth perceptions following adversity in that undergraduate participants were less likely to endorse growth following their self-nominated stressor compared to a sample of individuals experiencing trauma. Nonetheless, participants did report a small amount of growth. Replicating findings by Ransom et al. (2008), perceived growth on the PTGI did not correlate with measured growth, suggesting that they represent distinct psychological processes. This lack of relationship brings into question the utility of current instruments used to assess growth following stressful events as indicators of actual change. Furthermore, the possibility that measured growth was unrelated to the self-nominated stressful event offers additional support for the argument that measurement tools used to assess perceived growth may not adequately capture the phenomenon of growth developed by Tedeschi and Calhoun (1996).

We also sought to address two questions regarding the utility of perceptions of growth. First, do perceptions of growth and measured growth relate to coping and predict adjustment to adversity; and

second, how can we explain the literature's mixed findings regarding the utility of perceived growth? Consistent with our hypothesis, measured growth directly predicted an increase in positive mood and a decline in distress. These findings support the notion that growth in the domains measured by the Current Attributes Scale (e.g., personal strength, life appreciation) are likely to enable individuals to recover from stressful events. It is important to note that the indicator of measured growth (i.e., change scores on the Current Attributes Scale), unlike perceived growth, was not linked to the specific stressor that participants experienced. In other words, participants were not asked to complete the Current Attributes Scale in response to a self-nominated stressful event. We do not regard this methodology as a study limitation because linking instructions for the Current Attributes Scale to the stressor would have required a retrospective causal attribution of change, which replicates a flaw in existing growth measures. However, this difference might provide an alternative explanation for the lack of a significant relationship between perceived and measured growth, and we cannot conclude from this study that the small measured growth across time was linked directly to the stressful experience.

Findings regarding the relationship between perceived growth and adjustment are more complex, in that perceived stress-related growth predicted an increase in both positive mood (mediated by approach-oriented coping) and distress (partially mediated by attempting to cope through denial). Findings support the suggestion that perceptions of growth are not always adaptive, especially if they signal denial (Tomich & Helgeson, 2004), and are similar to those of Frazier et al. (2009), in that greater perceived growth was related to increased distress. It should be noted that distress ultimately can have adaptive functions (Tedeschi & Calhoun, 2004; Janoff-Bulman, 1992); extended longitudinal assessment would be necessary to examine this possibility.

Consistent with evidence that growth perceptions can serve diverse motivational functions (Rini et al., 2004; Stanton et al., 2002) and with the Janus-Face model of perceived growth (Zoellner & Maercker, 2006), individuals may use perceptions of growth both to face stressor-related demands directly through approach-oriented strategies and to deny the stressor's negative impact. It is interesting that coping through behavioral disengagement was not related to perceived growth. Unlike denial, behavioral disengagement involves the acknowledgment and then avoidance of the stressor.

Behavioral disengagement coping might involve failed attempts at approach-oriented coping, an appraisal that the stressor exceeds the individuals coping resources, or resignation to disengagement. More intensive attempts at denial might be the pathway through which growth perceptions carry more toxic effects. Our findings offer partial support for cognitive adaptation theory, which posits that individuals often respond to negative events through self-enhancing evaluations (Taylor, 1983). The current findings add the important condition that perceptions of stress-related growth may be adaptive to the extent that they prompt individuals to use approach-oriented coping.

The study's findings should be evaluated in light of its limitations. First, participants were young adults, most were women, and most reported interpersonal or academic stressors. Although the events were rated as stressful by participants, most were not of the magnitude to be considered traumatic. Thus, study findings might not generalize to individuals confronting more profound events, although Frazier et al. (2009) also did not find a substantial link between perceived and measured growth in young adults who had experienced more profound stressors. Both this study and Frazier et al. (2009) share the limitation of a brief follow-up period. Some longitudinal studies with both long-term and short-term follow-up assessments after the stressful event do not support the conjecture that the passage of time is related to greater perceived growth (Affleck et al., 1987; McMillen et al., 1997). However, there is evidence to suggest that perceived stressor-related growth might increase over several months (Manne et al., 2004). It also should be noted that perceptions of benefit shortly after a stressful event have been demonstrated to predict psychological and physical health outcomes years later (e.g., Affleck et al., 1987; McMillen et al., 1997). Nonetheless, it is essential that extended follow-up be undertaken in studying the validity of perceived growth as a longer time frame may provide more opportunity for the development of stressor-related growth.

Another limitation is that measured growth reflected change in participants' perceptions of their current attributes, not verifiable growth measured by observable behaviors. Finally, the coping mediators were assessed concurrently with growth measures, and the design was longitudinal; thus, causal priority cannot be established. Hence, we cannot exclude the possibility that the current model is one of a number of possible models that characterize the relation-

ships among growth, coping, and adjustment. For example, it is possible that increases in positive mood from T1 to T2 predict perceptions of growth rather than the reverse relationship supported by the current model. This possibility of reverse causality was tested in a post hoc regression equation with T2 positive mood predicting perceived growth, after controlling for T1 positive mood, and was not significant ($p = .09$). However, mediators of the relation between growth and adjustment other than coping (e.g., schema repair) were not assessed and should be included in future studies.

If replicated in research with large samples of individuals experiencing profound stressors and conducted over longer time frames, the present findings carry important implications. First, findings from this study and previous research (e.g., Frazier et al., 2009; Tomich & Helgeson, 2004) suggest that conceptualizing perceived growth solely as an indicator of positive change may be misleading and raise doubts about the unequivocal benefit of promoting perceptions of growth in individuals who are struggling with adversity. Second, results suggest that perceptions of growth may serve distinct functions that can impede or facilitate adjustment. This study's findings suggest that understanding the coping strategies associated with individuals' reports of growth can bring some clarity to these distinct motivational functions, and other research suggests that individual differences also are relevant (Rini et al., 2004; Stanton et al., 2002). However, improvement in the measurement of growth after adversity also is essential. Finally, although findings raise doubt about the correspondence between perceptions of stress-related growth and measured growth, this is not to say that individuals do not make remarkable changes catalyzed by a struggle with adversity. Rather, findings from the present research suggest that current measurement approaches for perceptions of growth do not accurately capture the concept of growth developed by Tedeschi and Calhoun (1996). Indeed, for some individuals, the experience of finding benefit may be decidedly beneficial. Yet, given the available measurement instruments, researchers may not be able to disentangle perceived from measured growth (Frazier et al., 2009). The distinction between these two concepts is critical for adjustment and should be the focus of continued research.

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