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Positive Change Following Trauma and Adversity: A Review

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Empirical studies ($n = 39$) that documented positive change following trauma and adversity (e.g., posttraumatic growth, stress-related growth, perceived benefit, thriving; collectively described as adversarial growth) were reviewed. The review indicated that cognitive appraisal variables (threat, harm, and controllability), problem-focused, acceptance and positive reinterpretation coping, optimism, religion, cognitive processing, and positive affect were consistently associated with adversarial growth. The review revealed inconsistent associations between adversarial growth, sociodemographic variables (gender, age, education, and income), and psychological distress variables (e.g., depression, anxiety, posttraumatic stress disorder). However, the evidence showed that people who reported and maintained adversarial growth over time were less distressed subsequently. Methodological limitations and recommended future directions in adversarial growth research are discussed, and the implications of adversarial growth for clinical practice are briefly considered.

KEY WORDS: posttraumatic growth; stress-related growth; review.

Positive changes following adversity have long been recognized in philosophy, literature, and religion (Tedeschi & Calhoun, 1995; Tedeschi, Park, & Calhoun, 1998). They have been reported empirically following chronic illness, heart attacks, breast cancer, bone marrow transplants, HIV and AIDS, rape and sexual assault, military combat, maritime disasters, plane crashes, tornadoes, shootings, bereavement, injury, recovery from substance addiction, and in the parents of children with disabilities.

These positive changes share the common factor of struggling with adversity, hence we refer to them collectively as *adversarial growth.* It is through this process of struggling with adversity that changes may arise that propel the individual to a higher level of functioning than that which existed prior to the event. These positive changes have been labelled posttraumatic growth, stress-related growth, perceived benefits, thriving, blessings, positive by-products, positive adjustment, and positive adaptation. Throughout this paper we will use the term adversarial growth to refer to these positive changes collectively, but will use specific terms when referring to literature that has used these terms.

Studies of adversarial growth are an important area of research for several reasons. Focusing only on the negative sequelae of trauma and adversity can lead to a biased understanding of posttraumatic reactions. Any understanding of reactions to trauma and adversity must take account of the potential for positive as well as negative changes if it is to be considered comprehensive. Earlier reviews have addressed this literature (Affleck & Tennen, 1996; Calhoun & Tedeschi, 1998; McMillen, 1999; Park, 1998). However, recent research has changed what is known about this phenomenon. There is now a need to establish more clearly the variables that are associated with adversarial growth. This review provides a comprehensive summary of the published empirical data, allowing researchers to quickly and easily compare findings across different studies.

From an applied perspective, clinicians should be aware of the potential for positive change in their clients following trauma and adversity. Positive changes may be used as foundations for further therapeutic work, providing

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hope that the trauma can be overcome (Calhoun & Tedeschi, 1999; Linley & Joseph, 2002). Interventions for posttraumatic stress disorder typically do not take account of the potential for adversarial growth. Although the research findings are preliminary, early indications suggest that the experience of growth is related to lowered levels of distress (e.g., Frazier, Conlon, & Glaser, 2001), hence the facilitation of adversarial growth may be considered a legitimate therapeutic aim (Linley & Joseph, 2002).

In this paper we briefly consider the measurement of adversarial growth, before reviewing those studies that document adversarial growth empirically, in order to review prevalence rates. We examine studies that have investigated the variables associated with adversarial growth, with a particular focus on the nature of the relation between growth and distress. We review studies that have reported the temporal course of adversarial growth. Finally, we consider the potential applications of our findings, and suggest how future research might best proceed to promote our understanding of the structure, process, and potential clinical applications of adversarial growth.

Literature Search Strategies

Three strategies were used to establish the literature to be included in the review. First, three major databases—PsycINFO, PILOTS [Published International Literature On Traumatic Stress], and Ingenta (including Medline)—were searched for peer-reviewed published literature (excluding dissertations) during March 2002 using the specific search terms *posttraumatic growth*, *post-traumatic growth*, and *stress-related growth*. General searches were additionally carried out for the terms *thriving*, *perceived benefit*, *perceived benefits*, *perception of benefit*, *positive adjustment*, and *positive adaptation*. These latter terms have been used to describe processes and outcomes that are consistent with, but not exclusive to, adversarial growth. The search results for these general terms were screened for their relevance to the review. Nonempirical (i.e., theoretical, literary review) publications were excluded. References derived from this first strategy are marked with an asterisk (*) in the reference list.

Second, these identified sources were checked for references to other publications containing any of the search terms. These publications were then collated, and this process repeated until no new references were derived. Third, references were included that were known to the authors and were directly relevant to the review, but that had not otherwise been detected using the previous search strategies. In this way we aimed to select only studies where adversarial growth was a substantial focus of the reported empirical research. Previous reviews (Affleck & Tennen, 1996; Calhoun & Tedeschi, 1998; McMillen, 1999; Park, 1998) covered a number of studies that reported some adjunctive positive outcomes following adversity. However, these were excluded from the present review unless they met the search criteria described above. These strategies collectively identified 40 empirical studies as we report ahead (see also Table 1). One report could not be obtained (Peltzer, 2000) and so is not included in the review.

Measurement of Adversarial Growth

Seven instruments have been published that purport to measure adversarial growth. The Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1995, 1996) has 21-items and five subscales that assess growth across the dimensions of relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. The Stress-Related Growth Scale (SRGS; Park et al., 1996) is a 50-item measure, with various test results suggesting that a single-factor interpretation is most appropriate (Cohen, Hettler, & Pane, 1998). There is also a 15-item short form. The Revised Stress-Related Growth Scale (RSRGS; Armeli et al., 2001) has 43-items and eight subscales assessing affect regulation, religiousness, treatment of others, self-understanding, belongingness, personal strength, optimism, and life satisfaction. The Changes in Outlook Questionnaire (CiOQ; Joseph et al., 1993) is a 26-item measure of positive and negative changes. The Thriving Scale (TS; Abraido-Lanza et al., 1998) is a 20-item measure that uses modified items from the SRGS (15 items) and the PTGI (3-items), together with 2-items developed by the authors. The Illness Cognition Questionnaire (ICQ; Evers et al., 2001) has three 6-item subscales of which the first, Perceived Benefits, was relevant to this review. The Perceived Benefit Scales (PBS; McMillen & Fisher, 1998) consist of 30 positive change items and 8 negative change items. The positive change items yield eight subscales: enhanced self-efficacy, increased community closeness, increased spirituality, increased compassion, increased faith in people, lifestyle changes, enhanced family closeness, and material gain. The negative change items are not scored, but were included to avoid response bias. Associations with the PBS are not included in the review because only subscale scores, and not total scale scores, have been reported.

As noted, different measures of adversarial growth produce different numbers of growth dimensions (from one [SRGS] to eight dimensions [RSRGS; PBS]). However, the dimensional structure of adversarial growth remains an open question. For the purposes of this review,

Table 1. Summary of Studies Examining Adversarial Growth

Study	Event	Gender	*n*	Measure	Mean (*SD*)	Prevalence
Posttraumatic Growth Inventory						
Best, Streisand, Catania, and Kazak (2001)	Parents of children with pediatric leukemia	Mixed	113	PTGI	n/a	
Calhoun, Cann, Tedeschi, and McMillan (2000)	Various	Mixed	54	PTGI	76.5 (22.0)	
Cordova, Cunningham, Carlson, and Andrykowski (2001)	Breast cancer	Women	70	PTGI	64.1 (24.8)	
	Healthy comparison	Women	70	PTGI	56.3 (26.3)	
Polatinsky and Esprey (2000)	Bereaved of child	Male	18	PTGI	79.72 (19.50)	
		Female	49	PTGI	83.47 (20.21)	
Snape (1997)	Accident/assault	Male	40	PTGI	55.43 (18.14)	
		Female	13	PTGI	52.15 (25.59)	
Tedeschi and Calhoun (1996) #1	Various	Male	199	PTGI	67.77 (22.07)	
		Female	405	PTGI	75.18 (21.24)	
Tedeschi and Calhoun (1996) #3	Various	Male	55	PTGI	70.25 (21.87)	
		Female	62	PTGI	81.60 (21.09)	
Weiss (2002)	Breast cancer	Female	41	PTGI	60.21 (18.81)	97.6%
		Husband	41	PTGI	46.00 (22.83)	87.8%
Epel, McEwen, and Ickovics (1998)	Laboratory stressor	Women	58	PTGI-M	n/a	
Milam, Ritt-Olson, and Unger (in press)	Various	Mixed	435	PTGI-M		29.0%
Maercker and Langner (2001)	Medical illness/various	Mixed	141	PTGI/G	48.68 (21.78)	
Stress-Related Growth Scale						
Park, Cohen, and Murch (1996) #1	Various	Female	344	SRGS	51.50 (n/a)	
		Male	162	SRGS	45.73 (n/a)	
Park et al. (1996) #2	Various	Mixed	160	SRGS	52.87 (21.40)	
Park et al. (1996) #3	Various	Male	83	SRGS	45.58 (n/a)	
		Female	173	SRGS	54.88 (n/a)	
		Mixed	142[a]	SRGS	54.57 (20.95)	
King, Scollon, Ramsey, and Williams (2000)	Parents of Down Syndrome child	Mixed	87	SRGS-M	n/a	
Koenig, Pargament, and Nielsen (1998)	Medical illness	Mixed	564	SRGS-S	21.7 (7.5)	
Pargament, Smith, Koeing, and Perez (1998)	Oklahoma City bombing residents	Mixed	296	SRGS-S	10.43 (8.31)	
	Various	Mixed	540	SRGS-S	18.41 (7.47)	
	Medical illness	Mixed	551	SRGS-S	21.69 (7.48)	
Pargament, Koenig, and Perez (2000)	Various	Mixed	540	SRGS-S	18.41 (7.47)	
Armeli, Gunthert, and Cohen (2001)	Various—adults	Mixed	447	SRGS-R	n/a	
	Various—students	Mixed	478	SRGS-R	n/a	
Maercker and Langner (2001)	Medical illness/various	Mixed	141	SRGS-S/G	13.57 (7.66)	
Perceived Benefit Scales						
McMillen and Cook (2003)	Spinal cord injury	Mixed	42	PBS		79%
McMillen and Fisher (1998)	Various	Mixed	289	PBS		
Changes in Outlook Questionnaire						
Joseph, Williams, and Yule (1993)	Ship sinking	Mixed	35	CiOQ	46.97 (9.12)	44–94%
Illness Cognition Questionnaire						
Evers et al. (2001)	Multiple sclerosis	Mixed	167	ICQ	15.53 (4.46)	
	Rheumatoid arthritis	Mixed	263	ICQ	15.20 (4.22)	
Thriving Scale						
Abraido-Lanza, Guier, and Colon (1998)	Arthritis/chronic illness	Female	106	TS		83%
Nonpublished growth measures						
Affleck, Tennen, Croog, and Levine (1987)	Heart attack	Male	287[b]	Single item		58.2%
			205[c]	Single item		59.5%
Davis, Nolen-Hoeksema, and Larson (1998)	Bereavement	Mixed	205[d]	Single item		3–42%
	Bereavement	Mixed	205[e]	Single item		3–41%
Frazier et al. (2001)	Sexual assault	Female	88[f]	17-items		20–80%
			97[g]	17-items		37–81%
			89[h]	17-items		37–72%
			92[i]	17-items		39–76%
McMillen, Smith, and Fisher (1997)	Tornado	Mixed	42[j]	Single item		90.5%
	Shooting	Mixed	136[j]	Single item		76.3%
	Plane crash	Mixed	46[j]	Single item		54.6%
	Tornado	Mixed	39[k]	Single item		94.7%
	Shooting	Mixed	116[k]	Single item		69.2%
	Plane crash	Mixed	41[k]	Single item		35.0%
McMillen, Zuravin, and Rideout (1995)	Child sexual abuse	Female	154	Single item		46.8%

Table 1. (*Continued*)

Study	Event	Gender	*n*	Measure	Mean (*SD*)	Prevalence
Schnurr, Rosenberg, and Friedman (1993)	Military combat	Male	540	MMPI	n/a	
Tennen, Affleck, Urrows, Higgins, and Mendola (1992)	Rheumatoid arthritis	Mixed	54	5-items	n/a	
Waysman, Schwarzwald, and Solomon (2001)	Combat	Male	348	45-items	n/a	
Qualitative growth measures						
Fontana and Rosenheck (1998)	Combat	Male	1198	Open question	n/a	
Fromm, Andrykowski, and Hunt (1996)	Bone marrow transplantation	Mixed	90	Interview		96%
King and Miner (2000)	Various	Mixed	118	Written essay	n/a	
Massey, Cameron, Ouellette, and Fine (1998)	HIV/AIDS	Female	n/a	Life story	n/a	
McMillen, Howard, Nower, and Chung (2001)	Chemical dependency	Mixed	65	Focus groups	n/a	
Parappully, Rosenbaum, van den Daele, and Nzewi (2002)	Parents of murdered child	Female	13	11 items +		100%
		Male	3	Interview		
Poorman (2002)	Adult abuse	Female	21	Interview		100%
Siegel and Schrimshaw (2000)	HIV/AIDS	Female	54	Interview		83%
Thompson (2000)	Rape	Female	5	Interview		100%
Updegraff, Taylor, Kemeny, and Wyatt (2002)	HIV infection	Female	189	Interview		n/a

Note. Only PBS subscale scores have been reported, hence these are not included. PTGI = Posttraumatic Growth Inventory (range = 0–105); PTGI-M = modified version of the PTGI; PTGI-G = PTGI German version (range = 0–105); SRGS = Stress-Related Growth Scale (range = 0–100); SRGS-M = modified version of the SRGS; SRGS-S. = SRGS-short form (range = 0–30); SRGS-S/G = SRGS-short form German version (range = 0–30); SRGS-R = revised SRGS; PBS = Perceived Benefit Scales; CiOQ = Changes in Outlook Questionnaire (range = 11–66, although only scores >44 indicate positive change); ICQ = Illness Cognition Questionnaire (range = 1–24); TS = Thriving Scale; MMPI = Minnesota Multiphasic Personality Inventory. Scale ranges are reported where appropriate to allow interpretation of mean scores. Studies are organized by measurement scale (and alphabetically within each scale).
[a] At 6-month follow-up.
[b] At 7 weeks.
[c] At 8 years.
[d] At 6 months.
[e] At 13 months.
[f] At 2 weeks.
[g] At 2 months.
[h] At 6 months.
[i] At 12 months.
[j] At 4–6 weeks.
[k] At 3 years.

we treat adversarial growth as a unidimensional phenomenon.

Prevalence of Adversarial Growth

Only 12 of the 39 studies employed published measures that had also been used elsewhere. The remaining 27 studies typically used quantitative measures that had not been subsequently used, or qualitative measures such as focus groups or interviews (see Table 1).

Table 1 provides details of the 39 included studies. Mean scores are given to aid comparison where published measures have been used; otherwise we have given the prevalence rates of positive change reported, or calculated them where possible. These rates reflect the percentage of respondents endorsing positive change items. None of the studies employed random sampling techniques; hence prevalence rates should be interpreted cautiously. Where a range of prevalence rates are given, these reflect the range of endorsements for different positive change items. Prevalence rates for endorsement of positive items ranged from 3% for bereaved persons (Davis et al., 1998) to 98% for women with breast cancer (Weiss, 2002). The prevalence rates of 100% (Parapully et al., 2002; Poorman, 2002; Thompson, 2000) are not considered representative because these studies selected samples on the basis of respondents' reports of positive change, rather than through a nonbiased sampling technique.

Variables Associated With Adversarial Growth

Differences by Event Type

It is potentially misleading to compare across different studies that have not used published instruments. However, tentative comparisons can be made where published instruments have been used. Mothers bereaved of a child scored highest on the PTGI (Polatinsky & Esprey, 2000), whereas the husbands of women with breast cancer scored lowest (Weiss, 2002). Only three studies reported growth outcomes by event type. Two of these effects were

nonsignificant (Milam, Ritt-Olson, & Unger, in press; Park et al., 1996, Studies, 1, 2, and 3). McMillen et al. (1997) reported higher growth in survivors of a tornado, a mass shooting, and a plane crash, respectively. However, this finding can be explained by samples' proximity to the stressor. In the tornado sample, a preexisting community was affected, and the sample was taken from this community. In the mass shooting sample, restaurant employees were sampled whether they were on site or not at the time of the incident, as well as customers who were present, and local residents who were not present but heard the incident. In the plane crash sample, hotel employees were sampled, whether or not they were on site at the time the plane impacted on the hotel. Thus differences in growth scores may not be a function of event type per se. It is more likely that, as with traumatic stress (Briere & Elliott, 2000), it is the characteristics of the subjective experience of the event (e.g., helplessness, controllability, life threat), rather than the event itself, that influence adversarial growth.

Cognitive Appraisal

Greater levels of perceived threat and harm are associated with higher levels of adversarial growth (see Table 2). However, there does not appear to be a consistently positive linear relation between the degree of trauma and growth. Fontana and Rosenheck (1998) and Schnurr

Table 2. Variables Significantly Associated With Adversarial Growth

Variables	Studies
Cognitive appraisal	
Awareness	Park et al. (1996) #2
Control	Evers et al. (2001); Park et al. (1996) #2; Tennen et al. (1992)
Harm	Fontana and Rosenheck (1998); McMillen and Fisher (1998); Pargament et al. (1998); Park et al. (1996) #1; Tedeschi and Calhoun (1996)
Threat	Armeli et al. (2001); Cordova et al. (2001); Fontana and Rosenheck (1998); Fromm et al. (1996); McMillen et al. (1997)
Sociodemographic	
Age	Milam et al. (in press)
Age (negative)	Davis et al. (1998); Evers et al. (2001); Polatinsky and Esprey (2000)
Education	Fontana and Rosenheck (1998); Updegraff et al. (2002)
Gender (female)	Park et al. (1996) #1, #3; Tedeschi and Calhoun (1996) #1, #3; Weiss (2002)
Income	Cordova et al. (2001); Updegraff et al. (2002)
Personality	
Agreeableness	Tedeschi and Calhoun (1996)
Conscientiousness	Tedeschi and Calhoun (1996)
Extraversion	Evers et al. (2001); Tedeschi and Calhoun (1996)
Hardiness	Waysman et al. (2001)
Neuroticism (negative)	Evers et al. (2001)
Openness to experience	Tedeschi and Calhoun (1996)
Optimism	Davis et al. (1998); Evers et al. (2001); Tennen et al. (1992); Updegraff et al. (2002)
Self-efficacy	Abraido-Lanza et al. (1998)
Self-esteem	Abraido-Lanza et al. (1998); Joseph et al. (1993); McMillen et al. (1995); Tedeschi and Calhoun (1996)
Coping	
Emotion-focused coping	Maercker and Langner (2001)
Negative religious coping	Koenig et al. (1998); Pargament et al. (1998, 2000)
Positive religious coping	Koenig et al. (1998); Pargament et al. (1998, 2000)
Problem-focused coping	Armeli et al. (2001); Evers et al. (2001); Koenig et al. (1998); Maercker and Langner (2001)
Religion	
Existential openness	Calhoun et al. (2000)
Intrinsic religiousness	Park et al. (1996)
Religious participation	Koenig et al. (1998); Milam et al. (in press); Tedeschi and Calhoun (1996)
Social support	
Social support received	
Social support satisfaction	Park et al. (1996)
Cognitive processing	
Cognitive processing	Calhoun et al. (2000); Cordova et al. (2001); Maercker and Langner (2001); Snape (1997)
Affect	
Positive affect	Abraido-Lanza et al. (1998); Evers et al. (2001); Park et al. (1996); Tennen et al. (1992)
Negative affect (negative)	Abraido-Lanza et al. (1998); Evers et al. (2001)
Psychological distress	
Depression (negative)	Frazier et al. (2001); Updegraff et al. (2002)
Anxiety (negative)	Best et al. (2001)

Note. All associations are positive, that is, the variable specified is associated with more growth, unless otherwise indicated.

et al. (1993) reported a curvilinear relationship between psychological benefits and traumatic exposure: benefits were stronger at intermediate, rather than high or low, levels of exposure. In terms of cognitive appraisal variables, awareness and controllability of the event were generally associated with higher levels of adversarial growth.

Sociodemographic Variables

There have been suggestions that women tend to experience higher levels of adversarial growth than do men, but the evidence remains mixed (see Table 2). Studies with student populations reporting on a range of events (Park et al., 1996; Tedeschi & Calhoun, 1996), or women with breast cancer being compared to their husbands (Weiss, 2002), have found that women reported more growth than men. Between parents bereaved of a child, no differences were reported (Polatinsky & Esprey, 2000). However, this study used a much smaller sample size than others and showed a nonsignificant trend in the direction of women reporting more growth.

Younger respondents were generally more likely to report adversarial growth once a given level of developmental maturation was achieved (i.e., older adolescents were more likely to report posttraumatic growth; Milam et al., in press). However, there are a number of potential confounds in age effects. Polatinsky and Esprey (2000) cautioned that their findings may have been skewed by outlier scores of two younger participants. The temporal proximity to one's own death (Davis et al., 1998) may mean that older people are more likely to be concerned about the imminence of their own demise, and so perhaps are less likely to report growth. A longer perceived duration of living with chronic illness may have prompted more benefit finding in younger people as they sought to adapt to their illness (Evers et al., 2001).

Two studies suggested that higher levels of education and income were associated with more adversarial growth. However, one of these (Updegraff et al., 2002) was conducted with participants of low socioeconomic status, meaning that "higher income" was closer to a national average, rather than higher income per se. The causal mechanisms of these relations are not clear, and it seems reasonable to suggest that they may be confounded with more pertinent psychosocial variables that have a clearer theoretical relation to adversarial growth.

Personality

Of the Big Five constellation, extraversion, openness to experience, agreeableness, and conscientiousness were all positively associated with growth (see Table 2). Neuroticism appears to be negatively associated. Evers et al. (2001) replicated the association between extraversion and perceived benefits in people suffering from rheumatoid arthritis and multiple sclerosis, but this association was nonsignificant in a partial correlation controlling for neuroticism. The personality variables self-efficacy and hardiness were both associated with growth, although sense of coherence was not. People with higher self-esteem and who were more optimistic also tended to report more growth.

Coping, Social Support, and Religion

Problem-focused coping, as well as acceptance, positive reinterpretation, and positive religious coping were positively associated with growth (see Table 2). Emotion-focused coping, including emotional social support, was also positively associated with growth. Social support generally tended not to be associated with growth, but social support satisfaction was positively associated with growth. A potential confounding of this relationship may be found in McMillen et al. (1997): perceived enhanced closeness was associated with friendship satisfaction 3 years later. When improved interpersonal relationships are being assessed as a potential growth outcome, this is likely to be confounded with assessment of social support variables, especially satisfaction. Hence the causal nature of the relationship is unclear: appropriate social support may promote adversarial growth, or adversarial growth (at least within the domain of interpersonal relationships) may be an artefact of perceived positive social support. Religious activities and intrinsic religiousness were both positively associated with growth.

Cognitive Processing, Affect, Quality of Life, and Psychological Distress

Rumination, intrusions, and avoidance were all positively associated with growth (see Table 2). This is indicative of the cognitive processing necessary for the rebuilding of shattered world views following trauma (e.g., Calhoun & Tedeschi, 1998; Janoff-Bulman, 1992). Positive affect was consistently positively associated with adversarial growth, whereas negative affect was consistently negatively associated. However, the association between negative affect and adversarial growth was rendered nonsignificant in a partial correlation controlling for neuroticism (Evers et al., 2001). This study suggests that negative affect is only associated with adversarial growth to the

extent that it is a proxy for neuroticism. Quality of life was not associated with adversarial growth.

Depression was generally not associated with adversarial growth, but the significant relations that have been reported were all negative: people who were depressed were less likely to report growth (see Table 2). Anxiety was generally not associated with adversarial growth (but significant reported associations were negative), nor were preincident mental health diagnoses or prior trauma. PTSD diagnoses were negatively associated with positive life changes 2 weeks following sexual assault, but not 1 year later. In contrast, PTSD diagnoses were positively associated with stress-related growth in residents of Oklahoma City following the 1995 bombing (Pargament, Smith, Koenig, & Perez, 1998). Adolescents who used more alcohol, tobacco, and marijuana were less likely to report posttraumatic growth (Milam et al., in press).

Longitudinal Prediction of Adversarial Growth

Two studies provided details of variables associated longitudinally with adversarial growth (Abraido-Lanza et al., 1998; King et al., 2000). Of the variables considered, only positive affect, negative affect, and self-efficacy were significantly associated with adversarial growth longitudinally over 3 years. Nonsignificant associations were reported for pain experienced, level of disability, age, length of time living with the illness, self-esteem, acculturation, acceptance, and emotional support (Abraido-Lanza et al., 1998). King et al. (2000) reported nonsignificant associations with growth for optimism, self-esteem, life satisfaction, sense of coherence, and ego development over 2 years. These longitudinal associations do not allow a consideration of how these predictor variables might be associated with each other, nor how they may operate together to predict adversarial growth over time. Four multivariate longitudinal studies (Abraido-Lanza et al., 1998; Davis et al., 1998; McMillen et al., 1997; Park et al., 1996) were identified in the review that provided information about the longitudinal prediction of adversarial growth.

Park et al. (1996) examined potential predictors of stress-related growth in college students. Multiple regression analyses revealed six significant individual predictors of stress-related growth at 6-month follow-up: positive reinterpretation; intervening positive life events; acceptance coping; intrinsic religiousness; initial stressfulness of the event; and social support satisfaction. Positive affect was nonsignificant in this model. In a path analysis, social support and acceptance of one's illness did not predict thriving over 3 years in women suffering from chronic illness, but positive affect did so directly (Abraido-Lanza et al., 1998). By contrast, perceiving benefit at first assessment was associated with increases in positive mood within 1 year, with neuroticism controlled.

Optimism predicted benefit finding among bereaved persons (Davis et al., 1998), but not among parents of a disabled child (King et al., 2000). In these parents of a disabled child, accommodation (characterized by a concerted effort to deal with the situation) predicted stress-related growth, as did the accommodation–closure interaction (characterized by high closure—acceptance and moving on—together with high accommodation; King et al., 2000). In contrast, Park et al. (1996) reported that event resolution did not predict stress-related growth. Respondents who thought they were going to die and who had preincident mental disorders were more likely to perceive benefit 3 years after a tornado, a mass shooting, and a plane crash (McMillen et al., 1997).

Given the inconsistent nature of these findings, and the dearth of studies providing longitudinal prediction of adversarial growth, few conclusions can be drawn. Taking the correlational and longitudinal evidence together, we conclude that greater traumatic experience, dealt with by means of positive reinterpretation and acceptance coping, in people who are optimistic, intrinsically religious, and experience more positive affect, is likely to lead to reports of greater adversarial growth.

Temporal Course of Adversarial Growth

Several studies have found that the longer the time since the critical event, the greater the extent of adversarial growth that is reported (Cordova et al., 2001; Evers et al., 2001; Park et al., 1996, Study 3, Time 2; Polatinsky & Esprey, 2000). However, other studies have not found this to be the case (Fromm et al., 1996; Milam et al., in press; Park et al., 1996, Studies 1 and 2; Study 3, Time 1). It is unlikely that the passage of time per se influences adversarial growth, but rather intervening events and processes. Three longitudinal studies provided some insights into the temporal course of adversarial growth. Two weeks posttrauma, sexual assault survivors reported increased empathy and improved relationships. Positive changes in self and spirituality were generally established by 2 months following the event. The period between 2 weeks and 2 months accounted for most changes in growth, with reported levels remaining fairly consistent through 1 year (Frazier et al., 2001). Overall reported benefits were stable over extended periods of 3 years (McMillen et al., 1997) and 8 years (Affleck et al., 1987). Significant increases over time were reported for positive changes in life philosophy, priorities, and spirituality (Affleck et al.,

1987; McMillen et al., 1997). Closeness in relationships tended to decline over time, especially as these relationships became more distal, that is, community relationships compared to family relationships (McMillen et al., 1997).

Adversarial growth, when measured longitudinally, is relatively stable over time. This longitudinal evidence is inconsistent with much of the cross-sectional evidence reviewed above, and may reflect self-serving biases in temporal comparison (McFarland & Alvaro, 2000). Longitudinal evidence should be afforded greater weight than cross-sectional evidence when examining the temporal course of adversarial growth, and further research is required before the temporal course of adversarial growth may be understood with confidence.

Predicting Adjustment From Adversarial Growth

Growth and distress might be considered as bipolar, consisting of a single dimension with opposite endpoints. If so, they must be consistently negatively associated. However, growth and distress may also be viewed as two separate, independent dimensions of experience that may have a range of associations. High scores on one dimension do not necessarily imply low scores on the other dimension.

Frazier et al. (2001) found that sexual assault survivors demonstrated negative changes in beliefs about the goodness of other people and the safety and fairness of the world in parallel with positive changes in philosophy of life and sense of personal strength. Positive changes in areas of self and spirituality were associated with less distress, whereas negative changes in these areas were associated with more distress, as were negative changes in relationships. Changes in beliefs were not associated with distress. Survivors who reported growth at 2-week posttrauma but not at 12-month posttrauma were as distressed as survivors who did not report growth at either time point, whereas survivors who reported growth at both time points were the least distressed of all participants.

A similar pattern of associations between benefit finding and distress was found in bereaved persons (Davis et al., 1998). For participants who found benefit between 6- and 13-month postloss, the mean distress level declined to a level comparable to those participants who had reported benefit at both time points. In contrast, those who lost benefits between 6- and 13-month postloss changed from a low level of distress at 6 months (when they reported benefit) to a relatively high level of distress at 13 months (when they had lost this benefit).

Perceived benefits at 7 weeks following a heart attack significantly predicted heart attack recurrence and general health morbidity at an 8-year follow up: patients who perceived benefits were less likely to have suffered a subsequent attack and were more likely to have better general health (Affleck et al., 1987).

Joseph et al. (1993) found no association between reports of positive and negative changes in outlook in survivors of a shipping disaster, whereas significant positive associations between positive and negative changes have been reported following combat exposure (Fontana & Rosenheck, 1998) and bone marrow transplants (Fromm et al., 1996).

The evidence reviewed demonstrates a range of associations between growth and distress, and hence suggests these constructs are not ends of a continuum. With regard to clinical applications, the evidence indicates that while the alleviation of distress does not necessarily promote growth, the experience of growth does act to promote postevent adjustment and to alleviate distress (Davis et al., 1998; Frazier et al., 2001). Hence the facilitation of growth in survivors may be considered as a clinical intervention that is different from interventions designed to alleviate distress. However, through facilitating growth, distress may be alleviated, which suggests a new mechanism of potential therapeutic change in trauma survivors. However, on the basis of this early evidence, it remains too early to make prescriptive recommendations.

Methodological Considerations

From a research perspective, the need for greater methodological rigor and the use of well-validated measures is evident. A review of controlled disaster studies noted that as the methodological rigor of empirical research increased, the probability of establishing high effect sizes decreased (Rubonis & Bickman, 1991). As the quality of adversarial growth research increases, a different picture may emerge from that presented on the basis of the evidence reviewed here.

Particular attention to several design issues is merited. First, overreliance on self-report measures that do not allow for negative responses should be avoided. The Changes in Outlook Questionnaire (Joseph et al., 1993) and the Revised Stress-Related Growth Scale (Armeli et al., 2001) both allow for the measurement of positive and negative changes. Second, the issues of prospective longitudinal pre–post designs and appropriate control groups in traumatic stress research (Norris, 1996) are also found in adversarial growth research. The lack of preevent data makes it difficult for self-reported changes to be verified, but third party reports have reliably validated adversarial growth (Park et al., 1996; Weiss, 2002). Third, the

lack of objective indicators of adversarial growth suggests a need for collateral assessment of related behavioral and physiological indicators. Bloom (1998) reported social and political antecedents of adversarial growth, and Epel et al. (1998) linked posttraumatic growth reports with more adaptive hormonal stress responses. Researchers should consider how behavioral and physiological indicators may be built into their research to validate self-reported changes. Fourth, the overlap between "positive reinterpretation" coping and adversarial growth calls into question the distinction between these constructs. Is adversarial growth simply a way of coping or does it represent an objective outcome? Are closer relationships indicative of effective social support or an objective outcome of adversarial growth? These are difficult questions to untangle, although using multitrait-multimethod assessment procedures (Campbell & Fiske, 1959) may allow them to be teased apart. Fifth, to what extent is adversarial growth simply the adherence to some cultural script? That is to say, do people report growth simply because they have been led to believe that good things do come from traumatic events? Taking as a whole the evidence reviewed, we consider this unlikely. As difficult as it may be from an empirical perspective to demonstrate adversarial growth experimentally, the expanding body of research evidence endorses its validity.

From an applied perspective, it is important to emphasize that the studies reviewed here are nomothetic. Although they allow cautious generalizations to be made across populations, the findings do not necessarily correspond to any given individual's experience of adversarial growth. Group results may mask significant individual differences, and the idiographic level of analysis may be more appropriate when considering the needs and experiences of a presenting client (e.g., Frazier et al., 2001; Saakvitne, Tennen, & Affleck, 1998).

Conclusions

This review identifies concordant and discordant findings in the adversarial growth literature. We recommend four research priorities. First, the associations between growth and distress, especially longitudinally, have not been comprehensively addressed. Second, the process of adversarial growth over time, both developmentally and longitudinally, requires attention. We did not identify a single study that considered adversarial growth in children, for example. Although necessarily resource-intensive, it is only through multivariate longitudinal research that the predictors and process of adversarial growth may be more reliably understood. Third, associations between psychosocial variables and adversarial growth are typically small. It is unlikely that adversarial growth will be substantially explained by one or even several factors. Researchers should endeavor to identify new variables that contribute to adversarial growth. Fourth, comprehensive theoretical models are needed that account more fully for the range of mediating and moderating variables involved (e.g., Calhoun & Tedeschi, 1998). The most important research questions, in our view, center on the potential clinical applications of adversarial growth research. As longitudinal relations between adversarial growth, distress, and adjustment are reliably measured and understood, we can begin to identify points of potential therapeutic leverage in work with survivors of trauma and other adversity.

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References

References marked with one asterisk indicate studies identified through database searches, as described above. References marked with two asterisks indicate studies identified through our further literature search strategies, that are also included in the review.

*Abraido-Lanza, A. F., Guier, C., & Colon, R. M. (1998). Psychological thriving among Latinas with chronic illness. *Journal of Social Issues*, *54*, 405–424.

Affleck, G., & Tennen, H. (1996). Construing benefits from adversity: Adaptational significance and dispositional underpinnings. *Journal of Personality*, *64*, 899–922.

*Affleck, G., Tennen, H., Croog, S., & Levine, S. (1987). Causal attribution, perceived benefits, and morbidity after a heart attack: An 8-year study. *Journal of Consulting and Clinical Psychology*, *55*, 29–35.

*Armeli, S., Gunthert, K. C., & Cohen, L. H. (2001). Stressor appraisals, coping, and post-event outcomes: The dimensionality and antecedents of stress-related growth. *Journal of Social and Clinical Psychology*, *20*, 366–395.

*Best, M., Streisand, R., Catania, L., & Kazak, A. E. (2001). Parental distress during pediatric leukemia and Posttraumatic Stress Symptoms (PTSS) after treatment ends. *Journal of Pediatric Psychology*, *26*, 299–307.

Bloom, S. L. (1998). By the crowd they have been broken, by the crowd they shall be healed: The social transformation of trauma. In R. G. Tedeschi, C. L. Park, & L. G. Calhoun (Eds.), *Posttraumatic growth: Positive changes in the aftermath of crisis* (pp. 179–213). Mahwah, NJ: Erlbaum.

Briere, J., & Elliott, D. (2000). Prevalence, characteristics, and long-term sequelae of natural disaster exposure in the general population. *Journal of Traumatic Stress, 13,* 661–679.

*Calhoun, L. G., Cann, A., Tedeschi, R. G., & McMillan, J. (2000). A correlational test of the relationship between posttraumatic growth, religion, and cognitive processing. *Journal of Traumatic Stress, 13,* 521–527.

Calhoun, L. G., & Tedeschi, R. G. (1998). Posttraumatic growth: Future directions. In R. G. Tedeschi, C. L. Park, & L. G. Calhoun (Eds.), *Posttraumatic growth: Positive changes in the aftermath of crisis* (pp. 215–238). Mahwah, NJ: Erlbaum.

Calhoun, L. G., & Tedeschi, R. G. (1999). *Facilitating posttraumatic growth: A clinician's guide*. Mahwah, NJ: Erlbaum.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56,* 81–105.

Cohen, L. H., Hettler, T. R., & Pane, N. (1998). Assessment of posttraumatic growth. In R. G. Tedeschi, C. L. Park, & L. G. Calhoun (Eds.), *Posttraumatic growth: Positive changes in the aftermath of crisis* (pp. 23–42). Mahwah, NJ: Erlbaum.

*Cordova, M. J., Cunningham, L. L. C., Carlson, C. R., & Andrykowski, M. (2001). Posttraumatic growth following breast cancer: A controlled comparison study. *Health Psychology, 20,* 176–185.

**Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefiting from the experience: Two construals of meaning. *Journal of Personality and Social Psychology, 75,* 561–574.

*Epel, E. S., McEwen, B. S., & Ickovics, J. R. (1998). Embodying psychological thriving: Physical thriving in response to stress. *Journal of Social Issues, 54,* 301–322.

*Evers, A. W. M., Kraaimaat, F. W., van Lankveld, W., Jongen, P. J. H., Jacobs, J. W. G., & Bijlsma, J. W. J. (2001). Beyond unfavourable thinking: The Illness Cognition Questionnaire for chronic diseases. *Journal of Consulting and Clinical Psychology, 69,* 1026–1036.

**Fontana, A., & Rosenheck, R. (1998). Psychological benefits and liabilities of traumatic exposure in the war zone. *Journal of Traumatic Stress, 11,* 485–505.

*Frazier, P., Conlon, A., & Glaser, T. (2001). Positive and negative life changes following sexual assault. *Journal of Consulting and Clinical Psychology, 69,* 1048–1055.

**Fromm, K., Andrykowski, M. A., & Hunt, J. (1996). Positive and negative psychosocial sequelae of bone marrow transplantation: Implications for Quality of Life assessment. *Journal of Behavioral Medicine, 19,* 221–240.

Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. New York: Free Press.

**Joseph, S., Williams, R., & Yule, W. (1993). Changes in outlook following disaster: The preliminary development of a measure to assess positive and negative responses. *Journal of Traumatic Stress, 6,* 271–279.

*King, L. A., & Miner, K. N. (2000). Writing about the perceived benefits of traumatic events: Implications for physical health. *Personality and Social Psychology Bulletin, 26,* 220–230.

*King, L. A., Scollon, C. K., Ramsey, C., & Williams, T. (2000). Stories of life transition: Subjective well-being and ego development in parents of children with Down Syndrome. *Journal of Research in Personality, 34,* 509–536.

*Koenig, H. G., Pargament, K. I., & Nielsen, J. (1998). Religious coping and health status in medically ill hospitalized older adults. *Journal of Nervous and Mental Disease, 186,* 513–521.

Linley, P. A., & Joseph, S. (2002). Posttraumatic growth. *Counselling and Psychotherapy Journal, 13,* 14–17.

*Maercker, A., & Langner, R. (2001). Persoenliche Reifung durch Belastungen und Traumata: Validierung zweier deutschsprachiger Fragebogenversionen. [Posttraumatic personal growth: Validation of German versions of two questionnaires.] *Diagnostica, 47,* 153–162.

*Massey, S., Cameron, A., Ouellette, S., & Fine, M. (1998). Qualitative approaches to the study of thriving. What can be learned? *Journal of Social Issues, 54,* 337–355.

McFarland, C., & Alvaro, C. (2000). The impact of motivation on temporal comparisons: Coping with traumatic events by perceiving personal growth. *Journal of Personality and Social Psychology, 79,* 327–343.

McMillen, J. C. (1999). Better for it: How people benefit from adversity. *Social Work, 44,* 455–468.

**McMillen, J. C., & Cook, C. L. (2003). The positive by-products of spinal cord injury and their correlates. *Rehabilitation Psychology, 48,* 77–85.

*McMillen, J. C., & Fisher, R. H. (1998). The Perceived Benefit Scales: Measuring perceived positive life changes after negative events. *Social Work Research, 22,* 173–187.

*McMillen, C., Howard, M. O., Nower, L., & Chung, S. (2001). Positive by-products of the struggle with chemical dependency. *Journal of Substance Abuse Treatment, 20,* 69–79.

*McMillen, J. C., Smith, E. M., & Fisher, R. H. (1997). Perceived benefit and mental health after three types of disaster. *Journal of Consulting and Clinical Psychology, 65,* 733–739.

*McMillen, C., Zuravin, S., & Rideout, G. (1995). Perceived benefits from child sexual abuse. *Journal of Consulting and Clinical Psychology, 63,* 1037–1043.

**Milam, J. E., Ritt-Olson, A., & Unger, J. (in press). Posttraumatic growth among adolescents. *Journal of Adolescent Research.*

Norris, F. H. (1996). Designing trauma studies: Basic principles. In E. B. Carlson (Ed.), *Trauma research methodology* (pp. 22–55). Lutherville, MD: Sidran Press.

*Parappully, J., Rosenbaum, R., van den Daele, L., & Nzewi, E. (2002). Thriving after trauma: The experience of parents of murdered children. *Journal of Humanistic Psychology, 42,* 33–70.

*Pargament, K. I., Koenig, H. G., & Perez, L. M. (2000). The many methods of religious coping: Development and initial validation of the RCOPE. *Journal of Clinical Psychology, 56,* 519–543.

**Pargament, K. I., Smith, B. W., Koenig, H. G., & Perez, L. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal for the Scientific Study of Religion, 37,* 710–724.

Park, C. L. (1998). Stress-related growth and thriving through coping: The roles of personality and cognitive processes. *Journal of Social Issues, 54,* 267–277.

*Park, C. L., Cohen, L. H., & Murch, R. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64,* 71–105.

*Peltzer, K. (2000). Trauma symptom correlates of criminal victimization in an urban community sample, South Africa. *Journal of Psychology in Africa, 10,* 49–62.

*Polatinsky, S., & Esprey, Y. (2000). An assessment of gender differences in the perception of benefit resulting from the loss of a child. *Journal of Traumatic Stress, 13,* 709–718.

*Poorman, P. B. (2002). Perceptions of thriving by women who have experienced abuse of status-related oppression. *Psychology of Women Quarterly, 26,* 51–62.

Rubonis, A. V., & Bickman, L. (1991). Psychological impairment in the wake of disaster: The disaster–psychopathology relationship. *Psychological Bulletin, 109,* 384–399.

Saakvitne, K. W., Tennen, H., & Affleck, G. (1998). Exploring thriving in the context of clinical trauma theory: Constructivist self-development theory. *Journal of Social Issues, 54,* 279–299.

**Schnurr, P. P., Rosenberg, S. D., & Friedman, M. J. (1993). Change in MMPI scores from college to adulthood as a function of military service. *Journal of Abnormal Psychology, 102,* 288–296.

*Siegel, K., & Schrimshaw, E. W. (2000). Perceiving benefits in adversity: Stress-related growth in women living with HIV/AIDS. *Social Science and Medicine, 51,* 1543–1554.

*Snape, M. C. (1997). Reactions to a traumatic event: The good, the bad and the ugly? *Psychology, Health and Medicine, 2,* 237–242.

Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma and transformation: Growing in the aftermath of suffering*. Thousand Oaks, CA: Sage.

*Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, *9*, 455–471.

Tedeschi, R. G., Park, C. L., & Calhoun, L. G. (Eds.). (1998). *Posttraumatic growth: Positive changes in the aftermath of crisis*. Mahwah, NJ: Erlbaum.

**Tennen, H., Affleck, G., Urrows, S., Higgins, P., & Mendola, R. (1992). Perceiving control, construing benefits, and daily processes in rheumatoid arthritis. *Canadian Journal of Behavioral Science*, *24*, 186–203.

**Thompson, M. (2000). Life after rape: A chance to speak? *Sexual and Relationship Therapy*, *15*, 325–343.

*Updegraff, J. A., Taylor, S. E., Kemeny, M. E., & Wyatt, G. E. (2002). Positive and negative effects of HIV infection in women with low socioeconomic resources. *Personality and Social Psychology Bulletin*, *28*, 382–394.

**Waysman, M., Schwarzwald, J., & Solomon, Z. (2001). Hardiness: An examination of its relationship with positive and negative long term changes following trauma. *Journal of Traumatic Stress*, *14*, 531–548.

**Weiss, T. (2002). Posttraumatic growth in women with breast cancer and their husbands: An intersubjective validation study. *Journal of Psychosocial Oncology*, *20*, 65–80.