Measuring growth following stressful or traumatic life events is both one of the most challenging and most important tasks facing growth researchers. It is imperative that we use comprehensive and valid measurement strategies to capture this phenomenon. While we have made some advances toward this end, we have a long way to go, and some of the most difficult and exciting research endeavors lie in this direction. In this chapter, we describe the current methods of assessing growth and elucidate the strengths and weaknesses of the various methods. We then turn to a discussion of measurement issues. We address the concept of dimensionality and review notions about whether growth is a unitary or multidimensional construct, weighing the evidence for both of these possibilities.

The chapter continues with a discussion of the implications of methods of scoring the different measures. We then speak to whether a single questionnaire or interview format is appropriate for all populations. We also examine cultural issues and speculate whether growth would be an expected outcome in people of collectivist cultures versus the predominant individualistic/Western culture in which this phenomenon was first identified. We then turn to the topic of life stage-specific issues. The section concludes with a discussion about the possibilities for response choices and item content. Specifically, we consider whether it is necessary to include negative items or assess negative change simultaneously with perceptions of positive growth. We then focus on issues related to implications related to the timing of measurement. Finally, we address validity issues.
related to the measurement of growth. The constructs of social desirability, cognitive bias, self-enhancement, and past self-derogation to inflate current functioning are also important.

We then describe the measurement issues related to the individual’s previous experience with traumatic and stressful events. Specifically, in line with stress inoculation theory (Meichenbaum & Novaco, 1985), we posit that earlier experiences may predispose an individual to cope more effectively with new stressful events, which may lead to more growth. Finally, we address whether groups or communities can experience growth in the manner that individuals do, using the American experience of September 11, 2001 as an example. The chapter concludes with suggestions about the future directions of the measurement of growth.

QUALITATIVE METHODS

Researchers have used two main qualitative methods to ask participants about growth. Some asked participants to identify the ways in which their lives had changed as a result of their trauma (i.e., Collins, Taylor, & Skokan, 1990; Schwartzberg, 1993), whereas others explicitly queried about perceived benefits/growth and positive life changes (i.e., Affleck, Tennen, Gruen, & Levine, 1987; Affleck, Tennen, & Gershman, 1983; Monin, Teten, Affleck, McCune, & Fitzgerald, 1990; Pfeur, Bussch, Weinman, & Booth, 1999; Sears, Stanton, & Danoff-Burg, 2000). One might surmise that the wording of the interview questions may create a bias in the responses of participants. However, to date, this notion has not been formally tested.

Among the qualitative methods, one study used an open question format (combat veterans: Fontana & Rosenheck, 1998). Other researchers employed a written essay (various life events: King & Miner, 2000), a life-story technique (female HIV/AIDS patients: Massey, Cameron, Ouellet, & Fine, 1990), or focus groups (chemical dependency: McMillen, Howard, Nowy, & Chang, 2000). Interview techniques have been used to study growth in a variety of populations, including female survivors of abuse (Fordham, 2002), women with HIV/AIDS (Siegel & Schrieber, 2000; Updegraff, Taylor, Kemeny, & Wyatt, 2002) and women who were survivors of rape (Thompson, 2000).

An early study of positive change illustrates the use of open-ended interviews in 22 individuals in remission from various forms of advanced cancer. Reports of benefits were purely descriptive, and no statistics concerning the positive impact of cancer were presented. Patients reported that they felt they had a more positive attitude as a result of their experience. They felt more tolerant and appreciative, were less concerned about money, and were more religious than they were before the cancer diagnosis. These individuals also reported that they were living each day to its fullest (Kennedy, Tellegen, Kennedy, & Havernick, 1976).

One of the most noteworthy series of studies of growth in cancer patients was conducted by Taylor and her colleagues. All of the patients had breast cancer, the majority of whom had stage 1 or 2 tumors at the initial diagnosis prior to surgery. Subjects were interviewed between 1 and 60 months postsurgery (median length of time since surgery = 25.5 months). Subjects’ progress at the time of the interview ranged between obvious deterioration and subsequent death to small tumors with no nodal involvement. Women were asked how their illness influenced their daily activities, plans for the future, goals, views of themselves, views of the world, and relationships with others. Coded interview data revealed that breast cancer patients felt that their lives had changed in a number of ways. Interviewees reported a new attitude toward life, self-knowledge or self-change,
and a reordering of priorities from mundane and petty events to emphasis on relationships and enjoyment of life (e.g., Collins, et al. 1990; Taylor, 1983; Taylor, Lichtman, & Wood, 1984). In fact, the authors observed that between 53% (Taylor et al., 1984) and 84% (Collins et al., 1990) of respondents felt that they found meaning in the experience. Following the interview, Taylor et al. (1984) asked subjects to fill out a number of questionnaires. Adjustment was measured by a composite score of 10 indicators of psychological adjustment, including a physician rating, self-reports of adjustment and distress, and total mood disturbance from the Profile of Mood States (POMS), among others. Taylor (1983) suggested that positive meaning may lead to better adjustment, although no statistics were provided to address this idea.

Another study using qualitative interviews with women with breast cancer revealed that 43% felt that family and spousal relationships had improved, and 66% reported either a more positive outlook on life, closer family ties, feeling cared for, increased character strength, increased empathy, or more inner feelings of spirituality (Zemore, Rinholm, Shepel, & Richards, 1989). Similarly, Belec (1992) observed that 90% of the survivors of bone marrow transplant expressed that the transplants made them better, more empathic people, with new priorities, fuller and more meaningful lives, and a renewed appreciation of life. Subjects with malignant melanoma also reported similar changes (Longman & Graham, 1986).

Relatedly, Fromm, Andrykowski, and Hunt (1996) conducted interviews with 90 bone marrow transplant (BMT) patients. The interview focused on the negative and positive effects of the BMT on family members, the patient’s life, changes in personal relationships, and the patient’s general outlook on life. Responses were coded and categorized into three broad categories: self, family, and other (comprised of mostly interpersonal sequelae). The most frequently reported positive aspects of cancer were a new philosophy of life (59%), a greater appreciation of life (47%), change in personal attributes (58%), more supportive family relationships (51%), emotional growth of the family (38%), improved family relationships (52%), and more support from friends (39%).

One noteworthy study of survival in male cardiac patients investigated the relationship between growth and morbidity (Affleck et al., 1987). Using an interview format, the authors found that over 53% of subjects reported that they felt that they had benefited from their experience at seven weeks after their myocardial infarction (MI) and at follow-up eight years later. Patients who did not report any benefits at the initial assessment were more likely to experience another MI, even when age, socioeconomic status, and prognosis were statistically controlled. In addition, reported positive sequelae were negatively associated with the occurrence of another MI during the study period. Again, these findings were independent of age, socioeconomic status, and prognosis. Individuals in this study who were able to perceive benefits, or find positive meaning, were more likely to survive their cardiac event and still be alive eight years later, as compared to men who did not report growth.

Another method of measuring growth was employed by Bower, Kemeny, Taylor, and Fahey (2003). As part of an expressive writing paradigm, themes of positive meaning were derived from participants’ written disclosures. Participants were women who had recently lost a relative to breast cancer. Findings showed that women who reported growth had increases in natural killer cell cytotoxicity, a measure of the effectiveness of the immune system.

Details of the debate regarding the pros and cons of using qualitative versus quantitative data are beyond the scope of this chapter. However, one of the primary advantages of a qualitative approach is that quantitative questionnaires cannot capture all of the domains of growth (McMillen, 2004), because participants provide their information without being
prompted by specific items, researchers can be relatively certain that the growth responses that are given are meaningful and relevant to the participant. Such information is particularly useful in the early phases of research on a given topic, because it allows researchers to identify the content of items that can then be used in quantitative research.

Life narrative techniques have also been used in identifying positive life changes and growth. Life narratives refer to the story that individuals create about their lives and their development as a person. Analyzing life narratives may be another way to accurately measure growth. One recent study identified four themes of growth in adults’ stories of life transitions (integrative, intrinsic, agentic, and communal) and found that communal growth themes were particularly strongly related to well-being (Bauer & McAdams, 2004). Pals and McAdams (2004) suggested that narrative approaches are free from some of the criticisms of quantitative measures, such as constraints on the aspects of growth that are assessed.

EVALUATION OF QUALITATIVE METHODS

It is clear that the wording of the interview questions is of extreme importance in assessing growth. Some have suggested that using different wordings of questions may produce different results. That is, asking participants whether they have experienced any changes, versus experiencing any positive changes, will likely yield different responses. For example, Wortman and her colleagues have used the phrase “Tell me what your life is like these days” as the interview question in a study of persons who had experienced traumatic loss (e.g., Lehman, Wortman, & Williams, 1987). Results indicated that most participants reported at least one positive result of the loss, but that the negative sequelae experienced by participants were highly prevalent and enduring. Contrasted with Sears et al.’s (2003) interview question “Have there been any benefits that have resulted from your experience with breast cancer?”, it is clear that the wording of the question may prime a participant to discuss certain topics. This is not a criticism of the methods used per se. However, because results of qualitative studies may vary widely depending on the specifics of the methodology, caution should be taken when interpreting the results of interview-based studies.

A recently published study that compared a qualitative interview question that queried about benefits (benefit finding) and a quantitative scale (Posttraumatic Growth Inventory [PTGI]) found that there was no correlation between benefit finding and scores on the PTGI (Sears et al., 2003). Benefit finding and growth showed very different patterns of correlations with demographics and adjustment measures. While authors interpreted this result as indicating that benefit finding (conceived as a measure of the process by which growth occurs) and growth are different constructs, there are alternative explanations for the discrepancy. Perhaps the two measures are simply assessing different aspects of growth that are not well represented by the other tool.

Life narratives are a compelling and valuable way to understand a participant’s experience with a challenging life event. However, they are complicated and time consuming to conduct. Moreover, there is no accepted method of comparing the data gleaned from life narratives from one individual to another in the context of measuring growth.

QUANTITATIVE QUESTIONNAIRES

One promising area of research involves the development of quantitative scales to measure growth. Researchers have created a variety of questionnaires to assess growth among...
3. MEASUREMENT ISSUES IN ASSESSING GROWTH

Individually, who have experienced various traumatic or stressful life events (Abraido-Lanza, Giger, & Cohen, 1998; Ables, Leveron, & Spinn, 1996; Andrzejewski, Brady, & Hara, 1993; Bert & Katz, 1984; Eshet-Khar & Pines, 1990; Filo, 1985; Frager, Cordoa, & Glasser, 2001; Haasen & Steen, 1978; Joseph, Williams, & Yale, 1995; McMillan & Fisher, 1998; Ross, Hendrich, & Jacobs, 1978). However, few of these scales have been subjected to psychometric validation procedures.

While most researchers have utilized scales that asked about various positive changes and provided a Likert format in which the participant selects one option from a number of response choices that range from “not at all” to “very much” or equivalent statements, a few researchers have opted for a structured, open-ended questionnaire (Curbow, Somerfield, Baher, Wagena, & Legro, 1993). Responses to this self-report measure were then coded for loss and recovery themes by the research team. Losses included feeling that life was interrupted by the cancer, experiencing difficulties with sexual functioning, and dealing with physical disabilities, and frustration. Recovery themes included more direction in life or redirection, greater compassion for others, spending more time engaged in pleasurable activities, and improved family relationships. Eighty-seven percent of the respondents reported at least one theme of loss (mean = 2.6) and 83% expressed recovery themes (mean = 2.4).

Three psychometrically validated measures are currently in use: the Stress-Related Growth Scale (SRGS) (Park, Cohen, & March, 1996), the PTGI (Tedeschi & Calhoun, 1996), and the Benefit Finding Scale (BFS) (Antoni et al., 2001; also Tomich & Helgeson, 2004). Each of these measures asks respondents to indicate the extent to which they have changed on a variety of items, using a Likert response scale. While these measures have been extremely useful in advancing our understanding of this phenomenon of growth, researchers and theorists have identified numerous shortcomings. It is also important to note that all of them are retrospective measures of perceived change. That is, participants are asked to compare their current functioning to their previous functioning, or to remember who they were prior to the event compared to who they are currently. This method has various shortcomings, as will be discussed in a later section.

The Stress-Related Growth Scale

The Stress-Related Growth Scale (SRGS) (Park et al., 1996), a 50-item scale, asks participants about changes in personal resources, social relationships, life philosophy, and coping skills. Response choices range from 0 (not at all) to 2 (a great deal). Sample items from the SRGS include, “You learned to be open to communicate more honestly with others” and “You learned to be a more confident person.” The SRGS was developed and validated in several samples of college students dealing with a variety of stressful life experiences (e.g., death of a loved one, medical illnesses, relationship breakups). Factor analyses revealed a single overarching factor, suggesting that a total score should be used for this scale. In the validation sample, Cronbach’s alpha was .94 and two-week test-retest reliability was .81. Correlating this measure with other measures, Park et al. found that the SRGS was unrelated to social desirability but was related to expected ways to variables such as optimism, religiosity, and problem-focused coping.

Several versions of the SRGS are available. A short form of the SRGS, comprised of the 15 highest-loading items, was also developed (Cohen, Hettler, & Pans, 1994) and has been used in a number of studies. A revised version of the SRGS was developed by Armeli, Gottsch, and Cohen (2001), in which the items and response format were revised.
to allow for reports of negative in addition to positive change; the authors reported good psychometrics for this new version in samples of college students and adults.

**Posttraumatic Growth Inventory**

The PTGI (Tedeschi & Calhoun, 1996) is a 21-item self-report inventory that measures the individual's perception of positive changes following a traumatic life experience. Subjects are asked to rate, on a scale of 0 to 6, the extent to which their views changed as a result of their crisis. Items on the PTGI include statements such as “Appreciating each day,” and “A feeling of self-reliance.” Like the SRGS, the PTGI was also developed and validated in a sample of college students. A principal components analysis of the validation sample, using varimax rotation, differentiated five subscales: new possibilities, relating to others, personal strength, appreciation of life, and spiritual change. Responses to the items are summed to produce a total score (highest possible score = 126). Scale intercorrelations ranged from \( r = .62 \) to \( r = .83 \), and internal consistency ranged from \( \alpha = .67 \) to \( \alpha = .85 \). The alpha coefficient for the normative sample was \( \alpha = .90 \). Another study found that the PTGI total score had the highest alpha in relation to the five subscales (Sears et al., 2003). Test-retest reliability, measured two months later, was within acceptable limits (\( r = .71 \)) for the total score, but quite low for some of the subscales (e.g., personal strength, \( r = .37 \)).

Tedeschi and Calhoun examined relationships between the PTGI and other validated scales and individual difference variables. To ensure that reports of growth were not merely the result of subjects’ wishes to present a socially desirable response, correlations between the PTGI and the Marlowe-Crowne Social Desirability Scale were reported. Analyses revealed that PTGI scores were not significantly correlated with social desirability scores. Similarly, the PTGI was found to be nonsignificantly correlated with the neuroticism subscale of the NEO scale (Costa & McCrae, 1985), suggesting that growth reports are not due to the lack of chronic negative emotionality.

**The Benefit Finding Scale**

The BFS (Antoni et al., 2001; Tomich & Helgeson, 2004) is a 17-item questionnaire developed to assess growth among women with breast cancer; it has since been used with prostate cancer patients and men and women with HIV/AIDS. The stem for each item is “Having cancer...”, followed by a potential benefit from the experience. The scale includes items such as “has made me a more responsible person” and “led me to be more accepting of things.” Items are scored on a five-point scale ranging from “a little” to “extremely.” The internal consistency of the BFS is very good (Cronbach’s alpha = 0.95).

**Evaluation of Quantitative Methods**

Quantitative measurement appears to be a necessary approach in allowing researchers to conduct large-scale studies with a variety of populations to advance our understanding of growth following stressful life experiences. However, there are many problems with current quantitative approaches that must be addressed. First, although the three psychometrically validated measures have been used to assess growth in individuals with a variety of stressors, trauma, and chronic illnesses, none have been validated on more than one population. The PTGI and SRGS were validated on college students and the BFS was validated with breast cancer patients. It is unclear to what extent they may adequately assess,
or fail to assess, dimensions of growth that are specific to certain populations. More basic psychometric work is needed on the quantitative measures that researchers employ.

Further, currently available instruments are not comprehensive with regard to item content. Qualitative research and anecdotal evidence shows that, following a challenging life event, positive change may occur in domains that are unassessed by current scales. For example, qualitative studies suggest that one of the most prevalent positive changes among individuals with HIV is the adoption of positive health behaviors (Seger & Schmidhaus, 2000; Updegraff et al., 2002). Similarly, many people view cancer as a wake-up call and make positive changes in their health habits, such as dietary changes, increasing regular exercise, and reducing the use of tobacco or alcohol (American Cancer Society, 2004). None of current scales of growth assess the dimension of positive health habits and lifestyle change.

Additionally, the most widely used measures of growth have unipolar response scales (i.e., are positively worded) and thus do not assess whether a participant has experienced a negative change on a domain. For example, it is conceivable that a person might perceive that their family and friends are less supportive following a cancer diagnosis, but the currently available scales only ask whether the change in a particular domain occurred in the positive direction. That is, current scales only allow the participant to respond that significant others are either more supportive and helpful or no change has occurred, but it may be that there has been change in the negative direction. Because this measurement technique limits the ability to fully report change, it should be avoided to accurately assess growth (Linley & Joseph, 2004).

In addition, because the instruments query only about positive life changes, these scales may create a positive response bias. Participants are asked to indicate how much they may have grown or benefitted from their traumatic or stressful experience, and may feel that they must say something positive (Tonich & Helgesen, 2004). This bias undermines the validity of reports of growth because all people are likely to be motivated to believe that they are growing and learning as they mature (McFarland & Alvaro, 2000).

Another criticism of the current measures is that their language may be confusing to participants. For example, in the Powell, Bosser, Butollo, Tedeschi, and Calhoun (2003) study, many of the respondents had difficulties understanding PTGI items in which the aspect of change was not explicitly stated. Although this criticism was directed at the PTGI, it may be applicable to other quantitative scales.

Finally, current growth scales do not provide any information about participants’ intentions when they choose the response choice of “no change.” In one of our preliminary studies, a number of participants wrote in the margin of the PTGI, “I was already this way,” and indicated that they were already as high on that domain as they felt they could possibly be prior to learning that they had cancer. Another option would be to allow respondents two possible choices for reasons why they might not have changed on a domain (e.g., “No change, because no change was needed” or “I just didn’t change in this area”).

A new scale that is currently in development by Park, Lechner, and colleagues is designed to address some shortcomings of the aforementioned measures. The development of the new growth scale involved a number of important preliminary steps. First, we identified the weaknesses of currently available measures. A team of experts on the topic of growth, including researchers from a variety of backgrounds, clinicians, and theorists who have worked with the growth construct in their professional work, provided feedback on the development of the new scale. We then compiled a list of potential items that was broader than the target construct with possibly tangential items (Clark & Watson, 1995). The language is simple and straightforward and avoids trendy expressions. Items were derived
from the qualitative literature on growth, in addition to extant scales. We are currently validating this measure with individuals with various forms of cancer and in a group of students dealing with a variety of life stressors. We intend to validate the scale with a number of additional populations (e.g., HIV+ persons, diabetics) in the future and translate (and subsequently validate) the scale for use with Spanish-speaking participants.

Two other topics in measure development, use of retrospective measures of perceived change and use of test–retest reliability methods, also warrant discussion. With regard to retrospective measures of perceived change, there is an inherent problem with asking people to recall how they were prior to the time of the challenging life event. McFarland and Alvaro (2000) observed that the participants in their studies derogated their former selves in relation to their new selves. This is a serious threat to studies that employ a retrospective self-report format. How can we be sure that participants’ reports are not simply the result of people’s desire to perceive themselves as continually growing and self-actualizing? The lack of pre-event information makes it difficult to evaluate the validity of self-reports.

In all validation studies, authors commonly report test–retest reliability statistics. However, some have questioned the utility of computing this statistic in a construct that is expected to change over time. An example may be drawn from a recent study of sexual assault trauma survivors (Frazier et al., 2001). In these participants, most growth occurred between two-weeks and two-months posttrauma. Growth scores then remained consistent through the first year posttrauma. However, if growth is measured during this time of dynamic changes in scores, there will be many unanswered questions about the stability of the construct. If we expect that growth scores will change, but that they might not change uniformly, what information does test–retest reliability provide about the psychometric properties of the scale in question? We cannot know whether the change in growth scores is due to test–retest instability or due to changes in the construct of interest itself.

Other Measurement Possibilities

As we will discuss in greater detail later in this chapter, many have questioned the validity of reports of growth. To address these concerns, some have suggested that other forms of measurement be employed to authenticate participants’ reports. These include using reports of others, comparison groups, and behavioral measures.

Reports of Others

Can the self-reports of individuals who report growth be corroborated? One suggested method of “verifying” reports of growth is to ask informants (other people close to the traumatized person) about their perceptions of positive change in their loved one. In the Park et al. (1996) study, students completed the SRGS and also had a parent or a close friend complete the SRGS with regard to the student’s change related to the identified stressor. Informants’ reports of growth were significantly correlated with students’ self-reported growth. Similar findings were reported by Weiss (2002) in a sample of breast cancer patients and their husbands.

In a recent study, Munster et al. (2004) examined growth reports in partnered couples (the woman of each heterosexual couple had been treated for breast cancer). Unlike previous studies, they examined vicarious growth—that is, they examined whether the partner of the breast cancer survivor shared her growth as a result of his experience. Although the males partners’ scores were consistently lower than the survivors’ scores, they did indeed experience growth. Partner growth and partner growth correlated significantly over time.
from initial to nine-months and 18-months follow-ups). This would suggest that vicarious
growth is an important topic to investigate (and see Wims, 2004, for a similar cross-
sectional study). In previous reports, the authors did not control whether the informant
was impacted by the event too, and we are not aware of what influence that may have had
on their reports of growth in the participant. This is an intriguing idea worthy of further
investigation.

Using this form of validation of self-reports of growth is problematic and complicated.
Does a high degree of correlation between self-reports and other reports indicate true
growth, or is it simply an artifact of participants’ reports to informants about their positive
changes? Might the domain of growth also influence the degree of correlation between
reports? Perhaps behavior changes may be more easily observed by a significant other
than internal feelings and belief systems.

Control or comparison groups. Some authors have used control or comparison
groups to establish the validity of reports of growth. Corbiac et al. (2001) matched a
cohort of healthy women to a cohort of breast cancer survivors. Both groups rated how
they had changed over the time since diagnosis (for the controls, the time frame was as long
as the survivor’s time since diagnosis) using the PTGI. Results showed that breast cancer
survivors had significantly higher growth scores on the PTGI as compared to the healthy
age- and education-matched participants. However, another study of five-year survivors of
breast cancer found that they did not differ from matched controls in flow, meaningfulness
in life, or perceiving positive changes in their selves or relationships. However, on a single
item assessing benefits, some groups of survivors (those in an education intervention)
reported greater benefits than controls (Tietz & Holgren, 2004). In a study of college
students, reports of growth from the most positive event in the past year were higher than
reports of growth from the most negative event in the past year. Interestingly, general in-
puts of positive change in a comparison group of students were higher than these reports
of growth due to a positive or a negative event (Park et al., 1996).

Although compelling, using control groups also has its drawbacks. According to
cognitive-processing models of growth, the individual must experience a truly stressful
event to initiate the cognitive processing that is required to begin the process of searching
for meaning (Tedeschi & Calhoun, 2004). Without a clearly stressful life event, there is
no impetus to begin re-evaluating one’s life and its meaning. However, matching someone
with cancer to someone of the same age who did not experience cancer does not take
into account all of the stressful encounters that each group may have had irrespective
of the cancer. Of course, this technique provides information about the validity of reports
of growth, that is, whether simply asking people to report on their growth is the same
whatever the stressor or the individual has experienced a traumatic event. However, it is not useful
as a technique for measuring growth per se.

Behavioral Manifestations of Reported Changes

It has been noted that not all growth can be assessed through self-report. Jarret-Blitman
(2004) proposed three different aspects of growth. In addition to (1) gaining strength
through suffering and bearing burdens, self reliance and respect, and (2) existential
revaluation, which are adequately represented in current measures of growth, there is
a third aspect that is not measured: psychological preparedness. Preparedness involves
changes in one’s assumptive world, where people are better prepared for subsequent
tragedies and less traumatized. Rebuilding a viable assumptive world leads to greater
psychological protection. This is not well represented in the quantitative measures of growth because it does not reflect a self-reported positive change. Preparations is usually a potential benefit of a traumatic experience, but represents the survivor's ontological status rather than perception or self-report. Survivors reestablish generally positive, yet less absolutely positive, core assumptions. In response to the difficulties and limitations posed by self-report, a number of researchers have called for the use of behavioral measures of growth.

The main question with behavioral measures centers on whether it is important to know that a person reports that he or she feels changed, or whether there must be some discernible behavioral change in order for growth to have occurred. For example, it is enough to report feeling altruistic, or must the individual begin to do volunteer work in the community? Certainly this would be one way to measure growth. However, there are many drawbacks to this approach.

Although some have argued for the use of behavioral indicators of growth (Linley & Joseph, 2004), this is not so easy. The main limitation of using observational methods and behavioral indicators to measure growth is that many facets of growth do not have obvious behavioral manifestations. For example, while it is plausible to measure the behavioral manifestation of altruism in the number of hours a participant spends doing volunteer work, it is less straightforward to measure changes in a participant’s feeling that life is precious. Future research may benefit from the inclusion of behavioral indices, where possible. For example, reports of improved interpersonal relations may have many interesting observable behaviors. However, the fact remains that many of the dimensions of growth that appear to be most valuable to participants, and of most interest to researchers, are unobservable experiences that do not have obvious behavioral correlates.

MEASUREMENT ISSUES

Is Growth a Unitary or Multidimensional Construct?

The notion that growth may occur in a variety of distinct domains following a life stressor is intuitively appealing. Several researchers have designed questionnaires to assess these different domains of growth. A number of authors have posited that these different domains of growth may arise through very different pathways and that, perhaps, different models should be developed for each domain (e.g., Janoff-Bulman, 2004; McMillen, 2004).

However, there is little agreement at present on which specific dimensions of growth should be assessed or whether, in fact, dimensions are essential aspects of growth. Whereas the dimensions assessed in most scales encompass changes in personal strengths and competencies, social relationships, and personal life philosophies (Schaefer & Moos, 1992), results of factor analyses of commonly used measures of growth have revealed very different sets of factors. For example, in a study of 416 adults dealing with a variety of stressors, McMillen and Fisher (1998) found eight dimensions of the Perceived Benefits Scale (lifestyle changes, material gain, self-efficacy, family closeness, community closeness, faith in people, compassion, and spirituality).

Meanwhile, using a measure compiled from several sources, including the SRGS and the PTGI, identified a rather different set of six dimensions (positive social orientation, wisdom and skills, self-insight and appreciativeness, honesty and reliability, spirituality, and opportunities in life), in addition to a well-being factor in a sample of undergraduate students (McFarland & Alvaro, 2000). Using a modified version of the SRGS, a study of undergraduate students and university alumni dealing with a variety of stressful encounters experienced in the past two years yielded six
dimensions of growth (affect regulation, treatment of others, self-understanding, belongingness, personal strength, and optimism), along with a dimension of well-being (Antell et al., 2001).

Although it is possible that some of the inconsistency in factors may be due to differences in measures used, factor structures have also been shown to shift across studies using the same measure. For example, in their study of undergraduates dealing with a variety of life stressors, Tedeschi and Calhoun (1996) identified five domains in the PTGI (greater appreciation of life and changed sense of priorities, warmer/more intimate relationships with others, genuine sense of personal growth, recognition of new possibilities or paths for one’s life, and spiritual development), but a study of Russian refugees found only three factors in the PTGI (changes in self-perceptions of life, philosophy of life, and relating to others), and these three factors had a significant amount of cross-loading, suggesting that the factors were not distinct (Powell et al., 2003).

This shifting factor structure also appears to be more than just a function of the stressor encountered, because even within similar groups dealing with similar stressful situations, different factors have been reported. Using Beek, Murphy, and Sonnen’s (1992) scale to assess five different dimensions of growth (personal priorities, daily activities, family, worldviews, relationships) in a sample of women who had survived breast cancer, Tomich and Helgeson (2002) found only two factors (personal growth and acceptance). In a second sample of breast cancer survivors, they again identified only two factors, but found that these factors were highly correlated and had a factor structure that suggested that there was just one common dimension of growth (Tomich & Helgeson, 2004). A factor analysis of results in another study of breast cancer patients using an adaptation of Beek’s scale similarly found only one underlying factor in a factor analysis (Antoni et al., 2001). These findings are similar to the original factor analysis of the SRGS scores of undergraduates reporting on growth from a recent significant life stressor that found a robust single “growth” factor (Park et al., 1996).

The idea that growth comprises a single factor is taken to the extreme by Nolen-Hoeksema and Davis (2004), who maintain that a simple score of “yes” or “no” to the question of whether any benefits have been derived from a stressful encounter is not only adequate to assess the construct of growth or benefit finding, but also, in fact argue that multiple-item measures may artificially inflate the amount of growth reported.

In sum, the evidence regarding whether people experience growth in distinct domains is inconclusive. Studies have yet to demonstrate that the major conceptual domains of positive change exist in ways that are distinct from one another. Although, in some studies, the different domains have somewhat different patterns of correlations with other variables, the domains tend to be fairly highly intercorrelated (e.g., Conlon et al., 2001; McIntosh & Cook, 2003). Further, studies employing factor analysis have typically found that the first factor extracted explained a great deal more variance than subsequent factors or that most items loaded on one factor. Finally, total growth scores tend to have higher internal consistency reliability than the individual subscales in spite of comprising a variety of domains of growth (e.g., Tedeschi & Calhoun, 1996).

DO THE PREDOMINANT MULTIDIMENSIONAL SCALES TAP ALL OF THE RELEVANT DOMAINS?

The types of growth that people report experiencing depend, obviously, to some extent, on the instrument used to measure growth. Because investigators determine what comprises these scales, the dimensions measured may vary across instruments, and it appears that
no particular scale captures all of the potentially important domains of growth or positive change that have been theoretically posited or identified through qualitative research. For example, in a study of people living with AIDS, Siegel and Scrimshaw (2000) found that health behavior change was one of the primary domains of growth identified. However, health behavior change items (or other concrete instrumental changes) are not included on any of the primary measures of growth currently in common use. The domain of compassion or increased empathy toward others, along with the ability to help others, is also poorly assessed in existing measures (McMillen, 2004).

Some authors have argued that one’s culture, in large part, determines the types of growth that are likely or even possible. For example, changing one’s priorities and finding new paths in life may imply a degree of flexibility and independence specific to modern Western societies that emphasize individuality over collectivism (Ho, Chan, & Ho, 2004; Pals & McAdams, 2004). Similarly, the emphasis on spiritual development in many studies of growth may reflect the importance of religion and personal spirituality in contemporary American life rather than being a universal positive outcome of stressful experiences (Pals & McAdams, 2004). Thus, studies of different cultural groups may yield different dimensions of growth. For example, in a study of elderly Latinas who were dealing with arthritis, patience emerged as one of the primary dimensions of growth reported; the authors speculated that the prominence of patience may be a function of this particular cultural group (Abraido-Lanza et al., 1998).

It is also possible that highly important aspects of growth cannot be tapped in simple self-report measures. For example, both McMillen (2004) and Janoff-Bulman (2004) speculated that an important aspect of growth is the changes in world assumptions, such as decreased naivete or tempered optimism, that are protective against the effects of trauma that may subsequently be encountered. This “psychological preparedness” against future devastating expectancy disconfirmation is an important dimension of growth or gain, but one that cannot be reported directly as it exists below the person’s level of awareness (Janoff-Bulman, 2004). Perhaps sophisticated research designs will allow the assessment of individuals growing from stressful encounters and then coping more effectively or experiencing less shattering of assumptions in future stressful encounters (cf., Carver, 1998).

In a thoughtful commentary, McMillen (2004) noted that the domains tapped by current measures of growth are “by no means exhaustive” (p. 51) and cautioned, “such an assertion may prematurely limit study of some of the more unusual positive by-products of adversity” (p. 51). For example, he cited increased faith in other people, material or financial gains, increased knowledge about oneself, denouncing harmful alcohol or drug use, increased community closeness and cooperation among neighbors, and increased organizational preparedness for further adversities as areas that most measures of growth ignore. Further, he noted that there are idiosyncratic benefits that any standardized instrument might have trouble assessing, citing the example of a participant meeting her future husband in the context of a crisis (McMillen, 2004).

CAN A SINGLE MEASURE BE USED FOR ALL POPULATIONS?

Studying poststressor positive changes across different populations is a complex venture. First, research has examined growth in groups dealing with very different kinds of stressful events, ranging from divorce and bereavement to environmental disasters and war to cancer and diabetes. Some of these stressors are acute, others chronic; some involve a degree of control, some are brought about by the malfeasance of another. It is well known that
different stressful experiences can bring about different sequelae (e.g., Schnurr, Friedman, & Bernardy, 2002) and it may also be that different types of events tend to bring about different types of change. For example, health crises, such as cancer, may be more likely to bring about improvements in health behavior than would a non-health-related crisis, although this notion remains to be empirically tested. Including health behavior change may improve the sensitivity of measures, but it is always possible that some dimensions will not be particularly relevant to some types of stressors.

Another potential limitation of using the same measure is the potential for cross-cultural differences in the experience and expression of growth, as noted in the preceding text. While most of the research on growth has been conducted in the United States, there is interest in examining growth in other countries in addition to assessing more explicitly on subcultural differences within the United States (e.g., Ho et al., 2004; Powell et al., 2005). Some authors have suggested that growth may be primarily a function of the unique philosophy of the United States and “Americanized cultures” that promote the view that people gain wisdom and experience positive personality change in the aftermath of threatening encounters (McMillen, 2004; Tennen & Affleck, 2002). Indeed, some studies conducted in non-Western countries have found much lower rates of reported growth when compared to those conducted in the United States (e.g., Pettner, 2000; see Powell et al., 2005, for a review).

There may also be issues that are specific or particularly relevant to a particular life stage that limit the appropriateness of using the same scale across samples. For example, aspects of wisdom or gerotranscendence may be particularly relevant in older adults while tempered perceptions of invulnerability may be more relevant to younger adults (e.g., Alwin & Levinson, 2004). While some researchers have questioned whether the same instrument can or should be used across different groups, there are benefits to this approach. For example, aggregating results from different studies can allow comparisons across groups (e.g., see Powell et al., 2005), and the more information that is collected regarding a specific measure, the more that researchers can understand its subtleties.

Mechanics of Measurement

In addition to the above-mentioned shortcoming regarding the limited item selection inherent in all standard measures of growth, there are several other issues regarding the mechanics of measurement that researchers have recently addressed. These include issues of directionality of change, ceiling effects, and timing.

Assessing Directionality of Change

One important issue in questionnaire design is whether all of the items assessing growth should be worded in a positive direction (e.g., “my relationships improved”) or whether both positively and negatively directed changes should be included in the questionnaire, as some researchers have proposed (e.g., Tomich & Helgeson, 2004). These researchers noted that many people who experience stressful life experiences, such as cancer, report both positive and negative changes and that including both on a questionnaire allows participants to more accurately report their experiences. Further, positive and negative change items would help to minimize potential biases that may result from using uniformly positive wording, and may help to reduce the potential for a socially desirable response set (Tomich & Helgeson, 2004). Such changes in wording, however, appear to essentially
be an issue of semantics rather than a substantial improvement in measurement (e.g., “my relationships got worse” is simply the opposite of the item mentioned previously).

A more elegant solution to this issue is to simply define the domain and allow the participant to report whether he or she experienced change in this dimension and, if so, whether the change was considered to be positive or negative. Although none of the most widely used measures of growth currently employ this system, it has several advantages over the use of positive wording (or positive and negative wording) (see Armeli et al., 2001 and Frazier, Tashiro, Berman, Steger, & Long, 2004 for examples of this approach). First, it eliminates the inherent value judgment involved when the designer of the questionnaire, rather than the participant, determines what changes are considered “positive.” Second, it allows the tracking of positive and negative changes on the same items or dimensions over time in longitudinal research.

It is important to note, however, that because people often report experiencing both positive and negative outcomes of stressful encounters, the scoring for positive changes and the scoring for negative changes should be kept separate (e.g., Frazier et al., 2001; Klauer & Filipp, 1997). Otherwise, an individual who has experienced many positive changes and many negative changes may appear to have experienced no change at all (e.g., Frazier et al., 2004). The notion that in the midst of great suffering and damage, an individual can also experience positive changes is the driving notion behind much of the research on growth. However, scores of positive change must be examined separately from negative change scores in order for these assessments to be accurate reflections of the changes in participants. It remains to be determined what the negative changes might mean, particularly in the context of positive change.

**Ceiling Effects**

One potential problem with growth scales is that people may feel that they are already very high on some dimensions of growth being assessed, leaving little room to show positive change (e.g., those who are self-actualized), or do not desire to change in particular dimensions, for whatever reasons. This makes interpretation of results problematic. For example, a person who was already fully actualized prior to a stressful event would score very low compared to a person who, prior to the event, was functioning poorly. While the concept of growth or positive change would still be adequately captured, its meaning would be less clear. For example, correlations with adjustment measures would be attenuated.

**Timing Issues in Measurement**

When is the best time to assess positive changes or growth—during a crisis? Immediately afterward? One month, six months, a year later? Theoretical conceptualizations of growth have not directly addressed the question of when growth occurs or what comes first, although a number of researchers have suggested that early reports of growth may be a less valid reflection of true growth or be less likely to relate to psychological well-being than later reports of growth (e.g., Emich & Helgeson, 2004) and that substantive positive changes are more likely to occur when considerable time has passed, to allow for the coping or cognitive processing that leads to growth (e.g., King & Raspin, 2004; Tedeschi & Calhoun, 2004).

However, reviewing the evidence for these contentions, Tennen and Affleck (1992) noted that there is minimal support for the view that growth occurs later in the coping process. They cited several studies that found that growth or positive changes occurred early.
in the process of adjusting to stressful experiences. Further, they cited several longitudinal studies that found that growth assessed early in the process of coping and assessed again later was remarkably stable. For example, one study of heart attack patients found remarkable stability in reports of growth from the first assessment, seven weeks after the heart attack, and to the follow-up, eight years later (Affleck, Tennen, Croog, & Levine, 1987). Practically speaking, the answer to when to assess growth depends on the specific research question being addressed, such as how soon after an event growth is manifested, whether growth lasts or dissipates over time, and how growth may change over time.

Assessment at each of the various points in time has both advantages and drawbacks. Assessing growth immediately following a stressful encounter allows the researcher to examine growth while the event is still vivid and the person may still be in the throes of coping. While some have argued that positive change may occur immediately after an event (e.g., Lechner & Zakowski, 2002; Miller & C'deBaca, 2001), others have argued that such reports may be unreliable because they are more influenced by coping efforts in addition to such artifacts as euphoria over simply having survived.

Most research has used a time frame of several months to several years, more consistent with the notion that growth occurs only after a period of coping and struggle (Tedeschi & Calhoun, 2004). However, because the processes of growth are still poorly understood, the implications of delayed assessments of various lengths are not known. The varied lengths of time used in various studies make cross-study comparisons even more difficult.

As the field of growth research has matured, more researchers have employed longitudinal designs that allow for the tracking of patterns of growth over time (e.g., Frazier et al., 2004). Longitudinal approaches are still in the early stages of development and much remains to be known, such as how often and at what intervals assessments must be made to capture growth processes. Still, longitudinal research represents an advance in the area of growth. An even better approach would be prospective studies that assess people on important domains prior to their experiencing events and then follow up after the occurrence of a highly stressful event. Given the fact that most highly stressful events are unpredictable, prospective studies are very difficult to conduct.

Validity Issues

Perhaps the greatest challenge for researchers in the area of growth following trauma or significant life stressors is establishing whether growth actually occurs. Tennen and Affleck (2002) argued that concepts of “reality” and “gains ‘actually made’” are “quaint notions” (p. 393) and suggested that the establishment of the veridicality of positive changes or growth may not only be impossible, but also not particularly important or desirable. It may be that perceptions of growth, regardless of any grounding of those perceptions in reality, are what may make a difference in psychological or even physical well-being. Still, most researchers in this area (although not all; see, e.g., Collins et al., 1990; Klauer & Filipp, 1997) express an interest in the phenomenon of “veridical transformative life changes” that go beyond “ illusionary” (Tedeschi) that are experienced as “an outcome or ongoing process” rather than a coping mechanism (Tedeschi & Calhoun, 2004, p. 6). However, one of the most difficult aspects of this research is empirically establishing the validity of growth or positive change as a construct distinct from psychological processes such as self-enhancement, illusion, or defensiveness that result in inaccurate reports of growth, or “pseudo-growth” (Lechner & Annis, 2004).

A number of theories have been advanced to explain how people may report growth that is not factual, including both conscious and unconscious processes, such as social
desirability, cognitive bias, self-enhancement, and past self-derogation to inflate current functioning (e.g., Tennen & Affleck, 2002; Wortman, 2004). For example, motivated self-enhancement involves perceiving oneself in ways that make one feel better about one’s current self relative to others or to a previous self (e.g., Ross & Conway, 1986), such that the standards by which one judges oneself or one’s quality of life are altered, leading to perceptions of positive change. A recent series of studies directly examined the self-enhancement motive relative to perceptions of stress-related growth (McFarland & Alvaro, 2000). Participants were asked to describe their previous and current selves under a variety of experimental conditions. Essentially, findings indicated that participants reporting on their personal changes following a stressful experience tended to shift their self-reports of their previous selves to be more negative (relative to controls), while their current ratings of themselves did not differ from controls who were not reporting on growth. The net effect of denigrating recollected previous selves was to give an impression of positive change. These results suggest that reports of positive change are, at least in part, theory and cell into question the validity of self-reports of growth. This set of studies is not conclusive, however. For example, participants were not selected because of their experiencing of a particular stressful event. Further, it is possible that asking participants to focus on a previously experienced negative event could create a marker in time by which people would be able to more accurately recollect who they were at that point. Still, researchers must take this challenge to our self-report methodology seriously and design research that can address the issue of self-enhancement tendencies.

A related problem concerns the common tendency of people to cope with stressful situations by identifying positive aspects of the situation (e.g., positive reinterpretation) (Carver, Scheier, & Weintraub, 1989). These coping strategies are often related to growth (e.g., Park & Peterson, 2006) in that individuals may cope with trauma by attempting to perceive growth from it, but this perception does not necessarily reflect genuine positive change. Instead, individuals may exaggerate self-improvement to help alleviate their distress. The motivation to identify benefits is driven by distress reduction and makes reports suspect. On the other hand, having identified positives may be an accurate report. Further, reminding oneself of these positive changes (benefit finding; Tennen & Affleck, 2002) may again be a coping strategy.

To date, researchers have attempted to demonstrate the validity of growth in several ways, including relying on informant reports of growth, examining changes in psychological resources across time, and examining growth in the context of adjustment. We are aware of only three studies that attempted to establish the validity of growth independent of self-report by asking informants to report on the growth experienced by the participants (i.e., McMillen & Cook, 2003; Park et al., 1996; Weiss, 2002). All of these studies found moderately strong relations between self-reports and informant reports of growth. Because much that individuals regard as growth involves private inner processes, it is encouraging that significant others would be aware of it. However, it is possible that study participants discussed many of their perceived positive changes with informants and that these results simply reflect informants’ reports of participants’ self-reports to them.

Some researchers have examined changes in resources across time as a reflection of growth. For example, in two longitudinal studies of college students reporting on their most stressful event in the past six months, stress-related growth was related across time to increases in positive affectivity, optimism, and social support (Park et al., 1996) and to increases in mastery and intrinsic religiosity (Park & Fenster, 2004). Another method used to examine validity is to examine how closely direct reports of growth match with more indirect reports elsewhere in the interview. Wortman (2004) noted that in their study...
of bereaved spouses or parents who had lost a loved one in a motor vehicle accident, reports of growth were not reflected in their responses elsewhere in the interview and were not evident when comparing their responses with those of other participants who had not reported growth or with control participants (Lehman et al., 1987).

Group and Community Growth

Several writers have observed that the positive changes that arise in the aftermath of crises may not only be of a personal nature, but may also involve benefits to families, communities, or even nations (e.g., Bloom, 1998). For example, after the 9/11 terrorist attacks, there was a brief period in the United States in which people reported that the attacks had made Americans closer and more united in purpose (e.g., Bosco, Margaritis, Lichtenstein, & O'Connor, 2002; Trenth & Sae, 2004). This community-wide growth was evidenced by outpourings of volunteerism and altruism, seen particularly in New York City. However, as time progressed, altruism and volunteerism dropped off and closely resembled pretrauma levels. In discussing the concept of social transformation, Sandra Bloom (1998) presented an eloquent overview of the many ways that personal and group trauma can be converted into community resources.

However, most empirical studies of positive changes following stressors have focused on changes perceived by individuals to have taken place internally or within their immediate social environment. It was noted previously that in some studies, measures asking participants whether they had derived any benefits from their experience and quantitative scores of growth were unrelated (e.g., Sears et al., 2003). It is possible that this is because when individuals report on benefits that have arisen from a stressful event, they refer to positive changes that have occurred outside their own personal lives rather than only the very personal changes that are tapped by current quantitative measures of growth. For example, the death of someone due to a drunk driver may shatter one family, but also serve as an example to others to not drink and drive.

SUMMARY

We urge researchers in this area to take the issues of operational definition and validity very seriously. We suggest that qualitative methods continue to be employed to fully illustrate the many ways that growth is manifested. However, sophisticated longitudinal designs will require the use of valid quantitative measures. While the first generation of these measures has provided a good start in this new area of research, the development of better measures will require future work and refinement. Serious challenges to the validity of our self-report methodologies have been posed (e.g., McFarland & Alvaro, 2000), compelling us to deal with the vexing issue of validity head-on. Only very carefully designed and sophisticated research that takes into account these challenges will advance the field by allowing us to explore the nature, character, and complexity of the positive changes that some people experience following stressful life events.

REFERENCES


3. MEASUREMENT ISSUES IN ASSESSING GROWTH


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