Posttraumatic Growth as Positive Personality Change: Evidence, Controversies and Future Directions

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Abstract

This target article focuses on the construct of posttraumatic growth—positive psychological change experienced as a result of the struggle with highly challenging life circumstances (Tedeschi & Calhoun, 2004). Prominent theories of posttraumatic growth define it in terms of personality change, and as a result this area of research should be of great interest to personality psychologists. Despite this fact, most of the research on this topic has not been sufficiently informed by relevant research in personality psychology, and much of the extant research suffers from significant methodological limitations. We review the literature on posttraumatic growth, with a particular focus on how researchers have conceptualized it and the specific methodological issues associated with these conceptualizations. We outline some ways in which personality science can both be enriched by the study of this phenomenon and inform rigorous research on posttraumatic growth, and provide a series of guidelines for future research of posttraumatic growth as positive personality change.

Posttraumatic Growth as Positive Personality Change: Evidence, Controversies and Future Directions

Nietzsche's (1889/1998) famous claim, "That which doesn't kill me makes me stronger" holds great intuitive resonance for many people. In recent years there has been increasing interest in investigating whether traumatic life events can indeed function as catalysts for positive life change. Tedeschi and Calhoun (2004) coined the term *posttraumatic growth* to capture the positive psychological changes they had witnessed as clinical psychologists among their patients who were coming to terms with highly stressful and challenging life events. They found that people often reported experiencing positive changes since the traumatic events occurred; for example, people reported feeling better connected to the people around them and taking more pleasure in the small things in life.

Although there is some disagreement among theorists on how posttraumatic growth actually manifests in an individual's life—for example, whether it is akin to increases in psychological well-being (Linley & Joseph, 2004), or a cognitive restructuring of an individual's life story (Pals & McAdams, 2004)—many researchers agree that the positive transformations in beliefs and behavior can be manifested in at least five forms: improved relations with others, identification of new possibilities for one's life, increased perception of personal strength, spiritual growth, and enhanced appreciation of life. Since Tedeschi and Calhoun's (1996) initial scale-validation paper on posttraumatic growth, there has been a marked interest in the study of the construct and the presumed associated mental and physical health benefits of this process (Park, 2004). Current research indicates that posttraumatic growth is widely reported; as many as 70% of survivors of various forms of trauma report experiencing some positive change in at least one domain of life (Linley & Joseph, 2004). Explanations for posttraumatic growth highlight the

possible transformational role that the experienced trauma can play in fostering growth. For example, Tedeschi and Calhoun (2004) note: “The individual has not only survived, but has experienced changes that are viewed as important, and that go beyond what was the previous status quo. Posttraumatic growth is not simply a return to baseline-it is an experience of improvement that for some persons is deeply profound” (p. 4). Similarly, Joseph and Linley’s (2008) organismic valuing theory posits that trauma can cause changes in “issues of meaning, personality schemas, and relationships” (p. 33).

Given that the definition of posttraumatic growth focuses on how traumatic life events can have transformative impacts on personality, this should be of great interest to personality psychologists. Personality psychology is the study of individual differences in characteristic patterns of cognition, affect, and behavior, and the psychological mechanisms that underlie these differences (Funder, 2001). Moreover, personality psychologists are concerned with how personality processes contribute to well-being (Fleeson, 2012). Thus, the study of the extent to which enduring patterns of thought, emotion and behavior can be altered by non-normative events such as trauma, as well as the mechanisms that cause such changes is a topic that personality psychologists can examine with methodological precision. Hence it seems worthwhile to draw on their approaches and findings when trying to understand this provocative phenomenon. Whereas some personality theorists may reject the idea that single events can motivate personality change, recent work highlighting the malleability of personality across the lifespan (e.g. Caspi, Roberts, & Shiner, 2005; Edmonds, Jackson, Fayard & Roberts, 2008; see also Blackie, Roepke, Forgeard, Jayawickreme & Fleeson, 2014; Fleeson & Jayawickreme, 2014) as well as some empirical evidence for personality change in the wake of trauma (Park, Cohen & Murch, 1996) supports the view that (to use the words of the authors of a personality

review of posttraumatic growth 18 years previously) "the possibility of profound changes in personality emanating from people's efforts to restructure their views of themselves, others, and the future" (Affleck & Tennen, 1996, p. 918) could be a fruitful area of study by personality psychologists, and potentially provide new avenues for understanding mechanisms of personality change across the life span.

The construct of posttraumatic growth has indeed attracted a considerable degree of attention in the last decade, especially with increased interest in the topic following the advent of positive psychology in the early 2000s (Coyne & Tennen, 2010; Tennen & Affleck, 2002). However, this attention has also been accompanied by controversy. For a topic that has generated much in the way of research interest, public attention and prescriptions for interventions to increase growth in the wake of trauma (Tennen & Affleck, 2009), the questions of what posttraumatic growth actually is and what retrospective reports of posttraumatic growth reflect remain undefined and murky. While theories of posttraumatic growth stipulate that people experience meaningful changes in their characteristic patterns of thoughts, feelings and behaviors (Tedeschi & Calhoun, 2004)—that is, changes in personality—much of the evidence on this topic has been based on cross-sectional studies utilizing retrospective measures of self-reported growth, which do not allow for tests of meaningful hypotheses on the nature and predictors of growth, as we will argue. We believe this target article is especially timely and important given that concerns about the validity of this research program have been raised in prior reviews (e.g. Tennen & Affleck, 2002), yet little has changed in how the construct has been studied.

Indeed, this lack of attention to methodological limitations and over-interpretation of extant findings in current research on posttraumatic growth has led some researchers to question the scientific validity of the construct. In a recent debate on the value of interventions promoting

positive psychological outcomes such as posttraumatic growth for individuals suffering from cancer, Coyne and Tennen (2010) noted: "we urge positive psychologists to rededicate themselves to a positive psychology based on scientific evidence rather than wishful thinking" (p. 16). In a more specific critique of the methodological limitations of posttraumatic growth research, they argued that the current science has failed to shed much meaningful light on how people can grow from trauma:

> We want to be clear that we are not asserting that people cannot grow from confronting life's slings and arrows, including serious illness and other health challenges…. What positive psychology potentially has to offer the concept of posttraumatic growth is scientific scrutiny through careful measurement, sensitive study designs, an attitude that propels investigators to seek facts that will disconfirm positive psychology's elegant hypotheses, and careful attention to credible evidence.
>
> (p. 24)

In this target article, we take these critiques a step forward. We argue that for us to understand whether our intuition of posttraumatic growth as personality change (which is surely what Nietzsche's adage "what does not kill me makes me stronger" indicates), we need to conceptualize posttraumatic growth as actual positive personality change and draw on theoretical and methodological approaches from the field of personality psychology to understand and assess this concept better.

How Has Posttraumatic Growth Been Conceptualized?

There are many different conceptualizations of posttraumatic growth, and a concrete and agreed-upon definition of the construct is currently severely lacking in the literature (Tennen, 2013). Indeed, this phenomenon has been referred to by many names including benefit finding

(Tomich & Helgeson, 2004), stress-related growth (Park et al., 1996), and even positive illusions (Taylor & Armor, 1996), which indicates the lack of integration and clarity in the field. In this section, we review the main theoretical conceptualizations that have been put forward. We focus specifically on four theoretical perspectives—Tedeschi and Calhoun's (2004) model of posttraumatic growth as occurring in five domains of life, Joseph and Linley's (2005) conceptualization of posttraumatic growth as akin to increases in eudaimonic well-being, Pals and McAdams's (2004) model of posttraumatic growth viewed as a change in an individual's life narrative, and Hobfoll and colleagues' (Hobfoll, Hall, Canetti-Nisim, Galea, Johnson et al., 2007) "action-focused growth" theory that posits that posttraumatic growth is akin to gains in social and psychological resources. We reserve discussion of the conditions and psychological mechanisms that may facilitate (or hinder) posttraumatic growth for the following section, given that many of these models share similarities in this regard. In this section, we focus solely on how the theorists differ with respect to how they define posttraumatic growth.

As we mentioned in the introduction, the dominant model in the posttraumatic growth literature is the one proposed by Tedeschi and Calhoun (2004). In this framework, posttraumatic growth is defined quite broadly as "positive psychological change experienced as a result of the struggle with highly challenging life circumstances" (p. 1). Posttraumatic growth is purported to occur in five distinct life domains - individuals report experiencing a greater appreciation of life, more intimate social relationships, heightened feelings of personal strength, greater engagement with spiritual questions, and the recognition of new possibilities for their lives. The development of posttraumatic growth is theorized to lead to a sense of wisdom about the world, and, potentially, over time to greater satisfaction with life. Indeed, this view of posttraumatic growth is unique in that the growth is seen as both a process and outcome – it is a positive outcome in

and of itself, but the process of coming to terms with trauma and identifying positive changes is a long-term process that may also result in greater satisfaction with life in the long run. Thus from the perspective of Tedeschi and Calhoun (2004), posttraumatic growth emerges later in the adjustment process and is a valuable outcome in response to trauma regardless of whether it facilitates greater well-being in the short term.

Joseph and Linley's theory (2005) takes a slightly different approach in arguing that posttraumatic growth is not distinct from the construct of psychological well-being (PWB; Ryff, 1989). They argue that researchers are essentially measuring increases in PWB, as the five domains of posttraumatic growth outlined by Tedeschi and Calhoun (2004) are equivalent to the construct of psychological well-being as posited by Ryff (1989). Thus, according to Joseph and Linley posttraumatic growth occurs when an individual's traumatic experience leads to an increase in these specific domains—self-acceptance, purpose in life, environmental mastery, autonomy, and positive relations with others (Ryff, 1989). Thus, traumatic events may leave an individual feeling more capable of mastering challenges in the social environment and navigating their relationships, and more free to act autonomously in accordance with their values without the fear of social disapproval. Joseph and Linley's (2005) model does not require the assumption that trauma is the "necessary ingredient" for the experience of PWB, rather that critical and difficult life transitions are one such pathway to the facilitation of well-being.

This model makes a distinction between subjective and eudaimonic (or psychological) well-being. Subjective well-being refers to an individual's general affective states and global satisfaction with life (cf. Keyes, Shmotkin, & Ryff, 2002), whereas eudaimonic well-being also encompasses constructs including purpose, meaning, and autonomy as important indicators of functioning (Jayawickreme, Forgeard, & Seligman, 2012). Joseph and Linley (2005) assert that it

is highly possible that trauma may leave an individual sadder, yet with an enhanced appreciation of what is important and a greater commitment to live in accordance with these values. For example, consider the individual who has lost his or her child to leukemia, and since has committed himself or herself to raising awareness and funds for this worthy cause. This individual may not say that he or she is happier than before, but may feel a stronger sense of purpose and meaning as a result of the event. Thus, these positive changes – the new-found meaning and clarity of life priorities -- would still be considered forms of growth, even if the individual is not reporting feeling more satisfied with life.

Posttraumatic growth has also been conceptualized more simply and broadly as a process of finding meaning and learning lessons in the aftermath of traumatic and stressful circumstances (Park, 2010; Roepke, Jayawickreme & Riffle, 2013; Wong, Reker, & Peacock, 2006). Although there are many ways that an individual can derive meaning from an event (see Park, 2010; for a thorough review), Pals and McAdams (2004) have argued that the revision of one's life narrative is the engine through which individuals make sense of the traumatic event and the catalyst for the cognitive and behavioral changes that constitute posttraumatic growth. According to McAdams (1994), personality is defined on three parallel levels: dispositional traits, personal concerns (e.g., goals and priorities in life), and life narratives. He argues that while dispositional traits remain stable across adulthood, personal concerns are sensitive to change due to situational circumstances and contribute directly to life narratives as they evolve. From this perspective, revision of this life narrative is the process in which individuals engage specifically to reconstruct their life stories based on understanding how they have changed since the event occurred.

Consequently, there are particular kinds of narratives that may follow particular kinds of changes in an individual's personal concerns that make posttraumatic growth more or less likely. In life narrative research, a life narrative interview involves having participants construct life narratives by reflecting on eight important moments in their lives—described in the task as "scenes"— such as high points, low points and turning points (McAdams, Reynolds, Lewis, Patten, & Bowman, 2001). A redemptive narrative is characterized by a transition from a negative life "scene" to a positive life "scene" in an individual's life narrative, whereas a contamination narrative is characterized by a move from a positive life "scene" to a negative life "scene" In a redemption narrative, the negative situation described in the "scene" either has to change into a positive situation (e.g. an alcoholic whose life is a mess chooses to give up alcohol, leading to situational improvements) or the negative situation has to contribute to at least one positive psychological outcome (e.g. grieving following the death of a spouse leading to greater expression of agreeableness and compassion; McAdams et al., 2001, p. 478). Turning points are episodes that appear to change and redirect the ongoing flow of an individual's life-course (Pillemer, 1998; Sutin, Costa, Wethington, & Eaton, 2010); often a turning point might provide the impetus for the transition that makes a narrative redemptive (McAdams & Bowman, 2006).. Thus, according to this perspective, posttraumatic growth may be an expression of a redemptive narrative generated by the experience of trauma and is more likely to occur in individuals with psychological traits such as generativity (the concern for and commitment to promoting the well-being of future generations) and among those who are low in depression, and high in self-esteem and satisfaction with life (McAdams & de St. Aubin, 1992). For example, individuals high in generativity report more redemption imagery in their narratives (McAdams & Bowman, 2001).

Finally, Hobfoll and colleagues (Hobfoll et al., 2007) have advocated an "action-focused growth" approach that emphasizes behavioral change as an indicator of actual (vs. perceived) growth following trauma. A stressful or traumatic life event often results in high levels of psychological distress, because, according to this theory, such an event poses a significant challenge to the individual's psychosocial resources (e.g., self-esteem, health, and social support networks)."True" posttraumatic growth (i.e., genuine personality change) occurs when self-reported posttraumatic levels leads to growth-related behaviors, which in turn lead to a concomitant reduction in distress. While this theory acknowledges that self-reported experiences of growth frequently occur after adversity, it argues that actual posttraumatic growth does not simply result from cognitive attempts to find meaning and re-structure assumptive beliefs about the world. For true posttraumatic growth to occur individuals must translate these cognitive benefit-finding processes into actual action. Like other theories, this account acknowledges that self-reported posttraumatic growth may reflect some immediate coping benefits, but it is distinctive in that it posits that only action-related growth ultimate leads to actual positive changes.

Purported Mechanisms of Posttraumatic Growth

In this section, we review the psychological and social mechanisms that have been posited either to facilitate (or hinder) reports of posttraumatic growth. We focus specifically on describing the theory, because at this time there is little longitudinal evidence that can speak directly to the direction of these associations. Most of the studies that investigate mechanisms are cross-sectional, and are therefore unable to ascertain reliably whether the mechanism causes posttraumatic growth or vice versa. Although there are differences in the conceptualizations of theories of posttraumatic growth, one notion that is central to many is that experience of trauma

is not sufficient in itself to facilitate growth (Park, 2010; Joseph & Linley, 2005; Tedeschi & Calhoun, 2004). Based on the work of scholars such as Janoff-Bulman (1992) and Parkes (1971), these theories posit that individuals rely on general assumptions about the predictability and safety of the world to successfully interpret, plan, and navigate their social environments. For example, most individuals believe that we live in a fair and just world, and that people get what they deserve (Lerner & Miller, 1978). An experience of trauma is thought to have the capacity to challenge (or "shatter") these assumptions about the benevolence, justice, and controllability of the world, and it is the process of coming to terms with this new reality and rebuilding one's schemas that facilitates posttraumatic growth. The individual must disengage from prior beliefs and assumptions and formulate new beliefs, goals, and identities that incorporate the trauma he/she experienced (Park, 2010).

The posttraumatic growth process has been likened to the physical rebuilding that takes place after an earthquake - an adverse life event severely challenges an individual's assumptive world, and provides an opportunity to reorganize and rebuild cognitive schemas that can withstand future shocks. If an individual does not undergo this process, but rather assimilates the experience into their prior beliefs about the world (e.g., he/she has always believed bad things sometimes just happen), then posttraumatic growth will not occur (Tedeschi & Calhoun, 2004). Additionally, posttraumatic growth is not expected to occur if an individual accommodates this new experience in a negative way (e.g., bad things happen, and nothing can be done to prevent them). Joseph and Linley (2004) have claimed that individuals who accommodate the experience in a negative way are vulnerable to feelings of hopelessness and symptoms of posttraumatic stress disorder. With this framework in mind, Tedeschi and Calhoun (2004; see also Cann, Tedeschi, & Calhoun, 2010) have proposed the most comprehensive model of the mechanisms

that facilitate posttraumatic growth. They argue that deliberative rumination about the event, deriving meaning from the event, and social support are key processes in facilitating growth.

According to Tedeschi & Calhoun's (2004) model, two related processes – deliberative rumination about the event and meaning-making— aid disengagement from the shattered assumptions and eventually may lead to posttraumatic growth. Rumination about the event that involves thinking about how and why the event occurred is accompanied by high levels of distress, at least initially, and characterized by intrusive thoughts, memories, and counter-factual thinking about how the incident could have been avoided. However, when an individual starts to derive meaning from the trauma by contemplating why it happened and what can be learned from the experience (a process they refer to as deliberative rumination that is akin to meaning-making), some of the positive life changes outlined earlier may be experienced. Finally, this perspective argues that social support and self-disclosure to trusted and empathetic others, in particular, may help the individual derive meaning from the event (Tedeschi & Calhoun, 2004). The logic is that others – particularly those who have experienced similar circumstances themselves will be able help survivors make sense of the events and in the process devise new narratives that define how they have changed both cognitively and behaviorally since the events occurred.

Tennen and Affleck (1998) have further proposed an intriguing and currently untested hypothesis - that individuals may be particularly likely to experience growth in areas that match their pre-trauma personality dispositions. For example, extraverted individuals who are normally cheerful and socially interactive might be more likely to perceive positive changes in their social relationships, whereas those open to new experiences may be more likely to find themselves reconsidering their life philosophies and goals. Theorists have also posited that individuals who

are high in cognitive complexity, self-efficacy, and dispositional hope may be especially likely to report growth following trauma (Tennen & Affleck, 1998; Tedeschi & Calhoun, 1995). These accounts suggest that individuals who are fairly well-adjusted prior to traumatic experiences are more likely to report positive life changes, but they await rigorous empirical investigation. These accounts are also in sharp contrast to the basic notion that posttraumatic growth is distinct from resilience (Tedeschi & Calhoun, 2004), as they imply that the people who will grow are those who have more psychological and social resources on which to capitalize pre-trauma, that is, those who were more resilient to begin with.

Indeed, some correlational evidence does exist supporting the hypothesis that some personality characteristics are associated with higher levels of self-reported posttraumatic growth. Specifically, the traits of optimism, extraversion, and openness to experience have been identified as significant predictors of increased levels of posttraumatic growth (Tedeschi & Calhoun, 1996). However, with the exception of optimism, these conclusions are based on only a few cross-sectional select studies that relied solely on retrospective measurement of posttraumatic growth (Bostock, Sheikh, & Barten, 2009; Prati & Pietrantoni, 2009; Linley & Joseph, 2004). Moreover, results from early studies linking optimism and growth were confounded because items in the original Life Orientations Test assessing optimism (LOT; Scheier & Carver, 1985), overlapped with those in the measures of growth-related constructs. Specifically, early version of the LOT contained two items that seemed to measure the ability to extract positive value from negative events: "I always look on the bright side of things" and "I'm a believer in the idea that 'every cloud has a silver lining." When these items were omitted in a reanalysis of data supporting a relationship between optimism and growth, the relationship was no longer significant (Affleck & Tennen, 1996).

How is Posttraumatic Growth Typically Measured?

Researchers who are interested in studying posttraumatic growth are faced with many unique challenges. Ideally, they would want samples of people before they experience traumatic events, to avoid selection effects. But this is generally impractical. So first, they must recruit samples of individuals who have experienced traumatic life events; in many cases this process requires more time, effort and resources than are needed when recruiting undergraduate student or online samples. Second, they must find sensitive and appropriate measures to determine whether these individuals have indeed changed in positive ways. In this section, we review the most common ways that researchers have overcome these challenges to investigate posttraumatic growth. To describe the standard posttraumatic growth study, we will use an early and well-cited paper as an example - Calhoun, Cann, Tedeschi, and McMillen (2000), which explored the relationships between event-related rumination and religious orientation and posttraumatic growth. They recruited 54 student participants who had experienced traumatic life events in the past 3 years. To screen participants they relied on an established checklist (Norris, 1990), which asked students to indicate whether they had experienced any of the events listed within a set period of time. The events were deemed severe enough to cause posttraumatic stress. The traumatic events most frequently experienced in this sample of students were sudden and unexpected death of a loved one, and serious injury resulting from a motor vehicle accident.

Event-related rumination was measured by asking participants the extent to which they had experienced intrusive thoughts and deliberatively tried to make sense of the event in the 2 weeks after the event occurred. Religious orientation was measured using the QUEST scale (Batson, Schoenrade, & Ventis, 1993) that asks about three domains: readiness to face existential questions, openness to religious change, and doubts about religious faith. Posttraumatic growth

was measured using the 21-item posttraumatic growth inventory (PTGI: Tedeschi & Calhoun, 1996), which asked participants to indicate using a 6-point Likert scale the degree to which they had changed positively from "0" (*not at all*) to "5" (*a very great degree*) in the 5 domains outlined earlier. The 5 domains and example items are: personal strength ("I discovered that I'm stronger than I thought I was"), interpersonal relationships ("I learned a great deal about how wonderful people are"), spirituality ("I have a stronger religious faith"), new possibilities for one's life ("New opportunities are available which wouldn't have been otherwise"), and appreciation of life ("An appreciation for the value of my own life"). The results of the study demonstrated a correlational relationship between posttraumatic growth, event-related rumination, and openness to religious change. Specifically, the more the students ruminated about the event in the 2-weeks following it and the more they expected their religion to change and grow as they did, the more posttraumatic growth they reported.

This study is worth describing in detail as it a good representation of the majority of the current literature on posttraumatic growth for two reasons – it relied on cross-sectional and retrospective assessment. First, reliance on self-reported trauma exposure is a very common method of participant recruitment in posttraumatic growth research when recruiting participants from student or general community populations (e.g., Shakespeare-Finch & Enders, 2008, Wild & Paivio, 2003, Tedeschi & Calhoun, 1996). Researchers use clinical life event checklists (e.g., Gray, Litz, Hsu, & Lombardo, 2004; Norris 1990) that ask potential participants to indicate whether they have experienced any of the traumatic events listed within some specified period of time (although this timeframe varies from study to study). Thus, in the typical study a variety of different traumas is represented, and potential participants who have not experienced any of the listed events are excluded; thus no basis of control comparison is available. These event

checklists focus specifically on discrete and non-normative life events, including diagnosis with life-threatening illnesses, sudden and unexpected death of loved ones, natural disasters, serious accidents, physical assaults, and sexual assaults. These events are defined by clinicians as traumatic as they threaten the integrity of the individual or someone very close to them (Gray et al., 2004). Alternatively, researchers who have access to medical populations often directly recruit samples of participants who have all experienced one specific type of traumatic event (e.g., cancer diagnosis and treatment; see Helgeson, Reynolds, & Tomich, 2006).

Second, the PTGI (Tedeschi & Calhoun, 1996) is the most commonly used method to assess posttraumatic growth. To date, the validation article of the PTGI has been cited 922 times since publication, as reported in the Psycinfo database (November 23rd, 2013). In addition, we carried out a literature search using the Psycinfo database in preparation of this article, which confirmed that the majority of empirical articles published since the meta-analysis by Helgeson et al. (2006) have used the PTGI to assess posttraumatic growth. Thus, the vast majority of studies have assessed posttraumatic growth with cross-sectional designs by asking participants to recall retrospectively how they were before the event, and estimate how much they have changed since the event and the extent to which this change can be attributed solely to the trauma. This is arguably quite a complicated and mentally taxing procedure for participants to carry out, especially as participants have to repeat the process for each item on the questionnaire (Ford, Tennen, & Albert, 2008). Moreover, it may not be something they would have done spontaneously, and being asked to do so for a research study may color the responses they make to the items. We return to a discussion of this procedure later.

Current Empirical Evidence for Posttraumatic Growth

We now turn to a discussion of current research findings on posttraumatic growth. As we have previously mentioned, the majority of studies rely on cross-sectional data. In this section, we selectively review the studies we believe represent the best-quality research in this area. As will become apparent, many of the findings do not tie in neatly with theoretical predictions. Thus far, there have been two distinct lines of empirical inquiry – research that considers posttraumatic growth as a valuable outcome in and of itself, and research that deems growth as meaningful in so far as it predicts important outcomes of adjustment (Park, 2004) or mental health (Affleck & Tennen, 1996; Hobfall et al., 2007). The first line of inquiry characterized most of the initial work on the topic and was predominantly focused on demonstrating the existence and prevalence of the phenomenon (Epel, McEwen, & Ickovics, 1998). As a result, there is considerable evidence that many individuals report experiencing at least one positive change after traumatic events, usually stronger and more intimate interpersonal relationships (Sawyer, Ayers, & Field, 2010; Helgeson, et al., 2006, Stanton, Bower, & Low, 2006). Furthermore, the few longitudinal studies on this topic indicate that the phenomenon is fairly common, with 58-83% of survivors reporting positive change in at least one life domain (Sears, Stanton, & Danoff-Burg, 2003; McMillen, Smith, & Fisher, 1997; Affeck, Tennen, & Rowe, 1991; Affleck, Tennen, Croog, & Levine, 1987).

Given that the PTGI is the most widely used assessment tool, considerable research has examined the underlying factor structure of the domains among different populations. Taku, Cann, Calhoun, and Tedeschi (2008) found that the model that specified the 5 dimensions of posttraumatic growth outlined earlier fit the data better than a 1-factor model in a sample of 926 adults that was comprised by collapsing 14 separate studies. Additionally, this 5-factor model has been established in diverse samples including Iraqi war veterans (Kaler, Erbes, Tedeschi,

Arbisi, & Polusny, 2011; Lee, Luxton, Reger, & Gahm, 2010), former Yugoslavian refugees (Powell, Rosner, Butollo, Tedeschi, & Calhoun, 2003), and war-affected Tamil participants in Sri Lanka (Blackie, Jayawickreme, Jayawickreme & Goonasekera, in prep). Thus, these lines of research show that people can report experiencing posttraumatic growth in the 5 domains outlined by Tedeschi and Calhoun's (2004) model. However, these domains were derived by the researchers and presented to PTG study participants, so they do not necessarily reflect the way the participants themselves might organize their thoughts about growth. In particular, the domains were based in part on clinical interviews with US-based samples, and a recent review of cross-cultural research on posttraumatic growth found that the number of salient posttraumatic growth domains varied from 2 to 5 depending on the study and population (Weiss and Berger, 2010).

The second line of inquiry has focused on the potential clinical significance of self-reported posttraumatic growth—that is, the extent to which reported changes in the five domains assessed by the PTGI are related to improved psychological and physical health. However, comparison of individual studies that have included measures of mental and physical health reveals mixed and inconsistent evidence – with positive, negative, and null relationships between measures of posttraumatic growth and mental and physical health all reported. To address this question more fully, Helgeson et al. (2006) conducted a meta-analysis of 87 cross-sectional studies that directly examined the psychological and physical health associations with posttraumatic growth. This was an important contribution to the literature, not only because it identified inconsistent findings, but also because it examined important moderators of posttraumatic growth findings. To summarize the findings of this meta-analysis, perceiving posttraumatic growth predicted lower levels of depression and higher levels of well-being.

However, perceiving growth was not related to anxiety and measures of global distress, subjective physical health, and global quality of life (which included both mental and physical health). There was a positive association between intrusive thoughts and posttraumatic growth, which was interpreted as supporting Tedeschi and Calhoun's (2004) model in which rumination is the precursor to growth. With the exception of the relationship between positive well-being, and perceived growth which approached a medium effect size (0.22), all effects sizes were small (ranging from 0.09-0.18). Finally, the meta-analysis revealed important moderators and nuances in the literature that may be missed when focusing on single studies. Posttraumatic growth was a stronger predictor of better health outcomes when a longer time had elapsed since the trauma, growth was measured using an established scale, and the sample had a greater percentage of minority participants.

A few studies have tackled the question of the long-term stability of posttraumatic growth, and the implications of these findings. These studies take an individual difference approach to investigate whether self-reported levels of posttraumatic growth remain stable over time. If posttraumatic growth reflects positive personality change then it would be important to examine the stability and malleability of individuals' reports of it. Most of these studies have not supported Tedeschi and Calhoun's (1996) view that growth emerges gradually in the adjustment process (Tennen & Affleck, 2002). For example, Thompson (1985) found that fire victims showed no change in their perceived benefits from 1-2 weeks after the fire to one year post-event. Affleck et al. (1987) tracked heart attack victims for eight years following their attack, and their reports of benefits remained stable from seven weeks to eight years post-event. Dekel, Ein-Dor, and Solomon (2012) also observed temporal stability in posttraumatic stress using a

standard clinical inventory and posttraumatic growth (as measured with the PTGI at 3 time points) over five years in a sample of Israeli veterans.

Furthermore, Frazier, Conlon, and Glaser (2001) observed stability in posttraumatic growth as measured with the PTGI among a sample of rape survivors. However, they also found significant individual variability that was masked in the sample averages. That is, some people reported increases in perceived growth, while others reported decreases. Participants who reported reductions in self-reported posttraumatic growth across time also reported similar levels of psychological distress to those who had never reported any posttraumatic growth. Additionally, a recent study by Danhauer and her colleagues (2013) found that posttraumatic growth, as measured by the PTGI at 3 time points over a period of 9-13 weeks, increased among a small sample of 66 adult Leukemia patients who were hospitalized for chemotherapy treatment. Overall, these findings demonstrate that while there might be some stability to the construct, researchers also need to be more aware of differences in individual stability. For example, individual differences in maturity could predict how individuals respond to traumatic life events, since prior trauma may have already taught lessons and skills (such as better proactive coping). This might lead to increased trait levels of mastery and hardiness (Seery, Holman, & Silver, 2010), but those already high in these traits may experience less subsequent personality change in response to trauma (Roberts et al., 2001). It is also plausible, however, that high pre-existing levels of mastery may provide resources for individuals to grow from events (see Kashdan & Rottenberg, 2010)[1].

Although longitudinal research on this topic has increased very gradually, most studies have not obtained baseline measures of posttraumatic growth domains, but rather have measured them as outcome variables post-trauma (Ai, Hall, Pargament, & Tice, 2013; Pollard & Kennedy,

[1] Thanks to Wendy Johnson for this point.

2007). Additionally, while longitudinal research is essential to investigate the stability of growth over extended periods of time, it is limited to the extent that it only measures individuals' levels of *perceived* change. (i.e. whether they believe have grown in specific domains following events, as opposed to their current standing on that domain) The predictors, outcomes, and stability of actual change (assessed through "current standing" measures of growth-relevant domains) can only be conclusively established by utilizing prospective longitudinal research designs. Such design involves measuring the outcomes associated with posttraumatic growth both before and after trauma has occurred, and is arguably the only way we can examine the actual impact of trauma on individuals' lives (Cohen, Hettler, & Payne, 1998; Tennen & Affleck, 2009).

To our knowledge, the single study that has in fact utilized this design is Frazier et al. (2009). In this study, an undergraduate student sample completed measures tapping domains typically associated with post-traumatic growth at two time points two months apart, and change in those measures was compared with scores on the PTGI for participants who reported a traumatic event between Time 1 and Time 2. PTGI scores were unrelated to actual changes in PTG-related domains. Moreover, perceived growth was associated with increased distress from pre- to posttrauma, whereas actual growth was related to decreased distress. Thus, retrospective reports of growth such as the PTGI may measure something different from actual pre- to posttrauma change. The authors interpreted 'these findings as an indictment of retrospective methods of measuring PTG, of which the PTGI is one example" (Frazier et al., 2009, p. 917).

How Do Current Designs of Posttraumatic Growth Studies Limit Our Knowledge?

Indeed, the cross-sectional and retrospective nature of posttraumatic growth measurement has led some researchers to remain unconvinced that these self-reported changes represent lasting and genuine transformation as argued by Tedeschi and Calhoun (2004), but rather reflect

ability to find silver linings in otherwise devastating circumstances (Tennen & Affleck, 2002; McFarland & Alvaro, 2000), particularly when primed to go looking for them by a questionnaire. The methods currently in use to assess posttraumatic growth allow many alternative explanations to the notion that people experience actual changes in growth-relevant domains. The most noteworthy problems with the measurement of posttraumatic growth are over-reliance on self-reported change, lack of longitudinal studies with baseline data collected prior to the events (Ford et al, 2008), and potential priming effects.

As noted above, these scales also require participants to undertake a mentally taxing procedure, which has led some researchers to argue that these scales measure global perceptions of change, rather than actual "growth" pre- to post-trauma, or possibly a broader positive outlook on life, such as optimism. Participants must attempt the following 5 steps for each item on these questionnaires: 1) deduce current standing on the dimension, 2) recall prior standing on the dimension before the event had occurred, 3) compare these standings, 4) calculate the degree of change, and finally, 5) evaluate how much of the change was due to the traumatic event. Use of these scales therefore assumes that people are able to recall prior trait levels accurately, but, as personality psychologists have demonstrated, perceived change is usually only weakly associated with actual change – participants' self-reported perceptions of change are not actually associated with how they really have changed (Robins, Noftle, Trzesniewski, & Roberts, 2005; Herbst, McCrae, Costa, Feaganes, and Siegler, 2000; Henry, Moffit, Caspi, Langley, & Silva, 1994). For example, Robins et al. (2005) assessed the personality of 290 college students six times over the course of four years, and at the end of the 4 years asked participants to rate how much they believed their personality had changed. The correlation between in vitro-measured actual

personality change and participants' perceived change was modest (around .2). We thus hold that *in terms of assessing actual positive change* the PTGI suffers from a significant limitation.

A further limitation of the PTGI is that it does not provide a balanced picture of the positive *and* negative changes that people have experienced, since no questions on the scale allow for the reporting of negative experiences. This increases the likelihood of positive response bias (Tomich & Helgeson, 2004) and thus of overtly positive reports of growth (Park & Lechner, 2006). One solution to this problem is to include items that assess both positive and negative responses to trauma (Baker, Kelly, Calhoun, Cann & Tedeschi, 2008; Tomich & Helgeson, 2004) and scales assessing both types of changes have been developed and validated (Baker et al., 2008; Joseph, Williams & Yule, 1993). However, the original version of the PTGI remains the mostly widely used measure in posttraumatic growth research.

As noted earlier, the majority of studies have relied on cross-sectional design and fairly small sample sizes. Helgeson et al. (2006), for example, found that there were not sufficient numbers of longitudinal studies on this topic to include in the meta-analysis. Although there have been more longitudinal studies published since 2006, these designs are still underrepresented, and often still lack pre-trauma data on posttraumatic growth-relevant domains. In addition, the sample sizes of the 87 studies reported by Helgeson et al. (2006) ranged from 27 to 1,953 participants. However, only 20 of the 87 (23%) studies had sample sizes of 200 or more participants. Thus, similar to Calhoun et al. (2000), it is common for researchers to have assessed posttraumatic growth retrospectively at one time point with a small sample size. This makes it impossible to deduce the causality of the association - was it specifically the event that caused these self-reports of posttraumatic growth or other unknown factors? Furthermore, with very few notable exceptions (e.g., Cordova, Cunningham, Carlson, & Andrykowski, 2001), research in

this area has not made comparisons to suitable control groups. An exception was Cordova et al. (2001), who recruited a matched control sample of women who were similar in age, income, and education to the trauma group, but had not recently received (nor had previously) diagnosis with breast cancer. This cross-sectional design affords greater confidence that posttraumatic growth is specific to the experience of trauma. Thus, evidence for posttraumatic growth has been drawn from studies relying on retrospective measures from participants whose scores are not compared directly to a no-trauma condition. Therefore it is difficult to infer that the distressing life event is responsible for the positive changes people perceive. Indeed, the lack of longitudinal work actually leaves many alternative explanations plausible.

Alternative Explanations for Posttraumatic Growth

In a critical review of the posttraumatic growth literature, Tennen & Affleck (2008) observed that people's reports of growth have been viewed not only as indicators of real personality change, but variously as maladaptive reality distortions, selective appraisals, coping strategies, personality characteristics, ways of explaining characteristic hedonic levels, reflections of people's implicit theories of change, and even downward temporal comparisons (believing that their past selves were worse than they actually were; Wilson & Ross, 2001). Most of these alternative explanations for posttraumatic growth can be grouped together under the following broad themes: 1) self-enhancement, 2) active coping efforts, 3) violation of post-event recovery expectations, and finally 4) expectations and cultural scripts.

Self-enhancement explanations – motivations to reaffirm important aspects of one's self-concept to feel good and confident about oneself - suggest that posttraumatic growth reflects reappraisal of the situation to reduce a sense of victimization following a traumatic event. Taylor (1983), for example, argued that threatening and stressful life events challenge an individual's

sense of self-esteem (or self-confidence), sense of personal control, and optimism about the future. Based on her research with female cancer patients, she proposed that people rely on cognitive reappraisal strategies that allow them to restore and enhance their self-esteem, perception of control, and optimism. For example, people may compare themselves to others who are less fortunate or inflate their chances of recovery. Taylor claimed that these "positive illusions" protect them from the initial threat and may eventually allow them to accept their situations (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000; Taylor & Armor, 1996).

McFarland and Alvaro (2000) employed an experimental approach to test this idea, in which they asked participants to report stressful events that had happened to them personally and stressful events that had happened to their acquaintances. After recalling each stressful event, participants rated what they were like currently and what they were like two years prior to the stressful event on a series of growth-related adjectives (e.g., kind, tolerant, reflective). In support of the self-enhancement perspective (Taylor et al., 2000), McFarland and Alvaro (2000) interpreted their results as indicating that participants reported experiencing growth by deprecating their past selves to bask in the glow of the progress they believed they had made. Specifically, participants did not differ from their acquaintances on the growth-related attributes when they rated both their and acquaintance's current selves, but participants did rate their past selves more negatively than they rated their acquaintances' past selves. Thus, McFarland and Alvaro concluded that participants derogated their past selves in order to be able to perceive growth, suggesting that people may falsely perceive posttraumatic growth by misremembering what they were like prior to the event.

Similarly, it has been argued that perception of posttraumatic growth may represent an active coping strategy in the process of coming to terms with a stressful and challenging event.

Tennen and Affleck (2002) asserted that the process of searching for benefits and actively reminding oneself of these benefits is effectively a coping strategy. There are definitely similarities between some of the emotional coping strategies proposed by Folkman and Lazarus (1988) and the outcomes that are said to manifest due to posttraumatic growth. For example, finding faith, discovering what is important in life, and feeling stronger are all present in both constructs to some degree. It is possible that when individuals report feeling stronger and better able to cope with difficulties they are doing so as part of the very process of coping defensively with the experience of trauma. It is often difficult for people to accept that terrible things happen without rhyme or reason, so people may perceive growth simply as a strategy to understand and cope with what they have experienced.

It has also been posited that reports of posttraumatic growth may represent more avoidant and defensive coping strategies for people low in hope and optimism, and more adaptive strategies for those higher in these resources (Stanton & Low, 2004). That is, current retrospective measures of posttraumatic growth may not be able distinguish between people low in hope or optimism who report growth as a defensive response to stress and people high in hope or optimism who are responding in a more adaptive manner.

Finally, the notion that one can grow from suffering is central to many works of philosophy, literature, and theology, and therefore is likely to be part of implicit theories of change held by many (especially in the West). As such, people may report posttraumatic growth simply because they have expected it (Splevins, Cohen, Bowley, & Joseph, 2010; Tennen & Affleck, 2002). Such reports may thus be significantly influenced by expectation biases.

What, If Anything, Have We Learned from Research on Posttraumatic Growth?

At this point, it would be beneficial to pause and evaluate the evidence for posttraumatic growth, and determine what, if anything, we have learned from the current research. Indeed, in light of the many severe methodological limitations already discussed, some have argued that we have learned very little, and that it would be better to "start over" employing more appropriate methods that are able to test the theoretical questions regarding posttraumatic growth directly (Tennen, 2013). This is a strong claim, and as such one that deserves serious consideration, especially given the role that posttraumatic growth may have in psychological recovery from trauma, and the clinical significance of the outcomes theoretically purported to be associated with posttraumatic growth (e.g., reductions in psychopathology and increases in well-being and wisdom; Tedeschi & Calhoun, 2004).

What do we know for certain about posttraumatic growth given the current status of the literature? First, people readily report experiencing it following traumatic life events (Joseph & Linley, 2004), at least when asked to think about it directly. For example, as discussed earlier, research has demonstrated that self-reports of posttraumatic growth are fairly common – ranging from 58-83% among survivors of a range of different traumas (Sears et al., 2003; McMillen et al., 1997; Affeck et al., 1991; Affleck et al., 1987). This is not trivial – if people believe they have changed, this phenomenon is then worthy of greater study. Although the work to date has not spoken to whether people have truly changed as a result of their experiences, it has demonstrated that the *belief* that one has experienced positive personality change is fairly common.

Second, there is evidence from the meta-analysis of the cross-sectional studies (Helgeson et al., 2006) and some longitudinal work (Danhauer et al., 2013) that posttraumatic growth if measured with a tool considered validated may predict improved psychological and physical

health, although this relationship has not been consistent across studies (e.g. Hobfoll et al., 2007), and there are reasons to question the actual validity of the most commonly-used tool, as noted above. Additionally, these adaptive benefits of posttraumatic growth are further supported by the hallmark prospective longitudinal study in this literature (Frazier et al. 2009), which directly measured students' current-standing on posttraumatic growth-relevant domains before and after a trauma occurred and their retrospective reports of how they had changed since the event. While actual growth assessed prospectively using students' standings on posttraumatic growth before and after the traumatic event was associated with lower distress levels, retrospective reports were associated with positive coping strategies. Thus, this study demonstrated that "perceived growth" potentially has some functional value in that it predicted more effective coping, as well as the clinical significance of actual positive personality change.

Third, nascent research investigating the long-term stability of posttraumatic growth as is currently assessed suggests that retrospectively assessed posttraumatic growth may in fact reflect an individual difference trait. Contrary to what Tedeschi and Calhoun's (2004) theory proposes, posttraumatic growth reports have remained stable over time, rather than gradually increasing. As noted earlier, Thompson (1985) and Affleck et al. (1987) did not observe significant increases in self-reports of posttraumatic growth either one or eight years following the event. Self-reported retrospective posttraumatic growth may thus be best understood as an individual difference trait that could be related to how people personally interpret life transitions and challenges (Cantor & Kihlstrom, 1987; Bauer & Bonanno, 2001). While this may be interesting to assess in its own right (as we discuss later in this article), it in fact tells us very little about posttraumatic growth understood as positive personality change—that is, posttraumatic growth as it is actually conceptualized theoretically.

As we have noted earlier, posttraumatic growth has been described in terms of positive personality change – for example, Tedeschi and Calhoun (2004) claim that "posttraumatic growth is not simply a return to baseline-it is an experience of improvement that for some persons is deeply profound" (p. 4). However, given the current over-reliance on retrospective and self-reported measurement, which requires people to report on how they have *changed* since the event, rather than on their current standing at regular intervals, we feel that the skeptical researcher's doubts cannot be fully eased. Furthermore, the only prospective longitudinal study to date did not find conclusive evidence for actual personality change among the majority of their participants (Frazier et al. 2009), although that study's authors concluded by saying "it would be inappropriate to conclude from our findings that people cannot change in positive ways following threatening life experiences" (p. 917) as a relatively small proportion of their sample did demonstrate actual change.

We do not underestimate the value of perceived change to the individual. Indeed, as Fraizer et al. (2009) demonstrated, these perceptions of positive change are associated with adaptive coping strategies following trauma, and it is possible that, if followed over a suitable period of time, these beliefs may be the precursors for actual personality change. However, at the current time, we feel that the skeptical researcher is right to doubt whether the current evidence supports the view that reports of posttraumatic growth reflect *actual* positive personality change.

Towards a Personality Science of Posttraumatic Growth

Tennen & Affleck (2009) have noted that while posttraumatic growth is intuitively appealing as an idea, current assessment strategies cannot successfully distinguish real growth (personality change directly in response to the traumatic event) from the alternative explanations discussed above. They caution that without rigorous measurement strategies, research on

posttraumatic growth will remain "a myriad of post hoc explanations for a provocative phenomenon" (p. 45). In our view, there are many issues that need to be clarified in the posttraumatic growth literature, and believe that our field can address these questions. Indeed, as noted earlier, we believe that personality psychologists should be very interested and excited to examine this "provocative phenomenon."

In this section, we discuss how personality scientists can advance the study of posttraumatic growth by a) defining what posttraumatic growth is in a way that allows us to identify the conditions under which trauma can lead to real (and positive) personality change, b) examining the impact of a broader range of trauma and adverse life events on personality change, c) employing methods from personality science to study posttraumatic growth, d) focusing on both cognitive and behavioral changes following trauma, and e) using existing knowledge about personality change to develop interventions that may promote such change.

Defining Posttraumatic Growth as Personality Change

One significant challenge to the study of posttraumatic growth is that significant uncertainty remains about what the construct actually is (Tennen, 2013). One important research question on which personality psychologists can potentially take the lead is defining and measuring posttraumatic growth in a manner that allows alternative views on the construct to be empirically tested. For example, posttraumatic growth theories talk in explicit terms about personality change, and as such measuring current levels of growth-relevant traits over time represents one valid method for assessing growth (Tennen & Affleck, 2009). We believe that posttraumatic growth should be conceptualized and assessed in terms of actual personality change. Alternatively, however, if growth is manifested primarily in changes in individuals' personal life narratives (Pals & McAdams, 2004), then other researchers may prefer that

posttraumatic growth be conceptualized and measured in terms in changes in life narratives. The point here is that researchers need to be clear in defining posttraumatic growth, and then measure that conceptualization in the most methodologically rigorous manner possible (see Jayawickreme et al, 2012, for a similar discussion on the myriad definitions of well-being).

As the field stands now, the currently used retrospective measures limit even the inferences that can be made from longitudinal studies. As noted earlier, prospective longitudinal studies involving *current-standing measures* of growth-relevant traits offer the most rigorous test of the predictors, outcomes, and stability of actual change (Frazier et al., 2009)[2]. Recent research emphasizing such methods utilizing large longitudinal datasets has for example shed light on the potentially positive impact of trauma on life satisfaction (Lucas, 2007) and resilience (Seery et al., 2010) if posttraumatic growth takes place. Such studies should remain the gold standard for measuring personality change following trauma, as opposed to the retrospective measurement strategies currently favored by posttraumatic growth researchers. Moreover, only these types of studies will provide insight into the mechanisms behind posttraumatic growth, which would be critical for both understanding the phenomena and developing successful interventions to promote change in target populations. As Tennen & Affleck (2009) noted, "we know of no other area of psychological inquiry in which the gold standard for assessing change in a skill is to ask people whether their skill level changed since the previous assessment" (p. 45; see also Tennen & Affleck, 2002). Retrospective measures such as the PTGI may be related to and predictive of important outcomes such as positive coping (Frazier et al., 2009) and have value as meaningful psychological constructs as a result, but it is unlikely that they capture the type of personality

[2] We note that the excellent work of Frazier and her colleagues (Frazier et al., 2009) provides a good example of the type of posttraumatic growth research that should be emulated by other researchers to move the field forward.

change posited by theoretical accounts of growth given their significant methodological limitations discussed earlier.

Examining How Multiple Forms of Trauma Impact Personality

Future research should also examine variance in frequency of personality change with type of trauma. As we noted earlier, most researchers studying posttraumatic growth employ life event checklists that include such clinically-relevant events as diagnosis with an immediately life-threatening illness, sudden and unexpected death of a loved one, natural disaster, serious accident, physical assault, and sexual assault (Gray et al., 2004). Researchers focus on these events since posttraumatic growth theories propose that growth only occurs from the struggle with highly adverse and traumatic circumstances (Tedeschi & Calhoun, 2004).

However, similar outcomes have been observed among people with chronic health conditions (Tennen, Affleck, Urrows, Higgins, & Mendola, 1992). People suffering from severe health problems who reported benefits caused by the trauma had lower levels of quality of life (Tomich & Helgeson, 2004). Additionally, research on normative changes in absolute trait levels across the life-span raises important questions about the types of events that do end up impacting personality across the life-span. The extant data show evidence for positive changes in self-confidence, warmth, self-control and emotional stability with age, as well as mean-level increases in the Big Five traits of agreeableness and conscientiousness (Srivastava, John, Gosling, & Potter, 2003). While such change is especially likely to occur between the ages of 20 and 40, change can occur throughout the lifespan, lending credence to the notion of human beings as open systems that can change at all life stages (Baltes, 1987; Baltes & Nesselroade, 1973; Roberts & Mroczek, 2008).

One explanation for these general trends may be that (most) people invest in specific social roles tied to their families, work and communities, which in turn serve as catalysts for increasing psychological maturity (Roberts & Wood, 2006; see also Helson & Wink, 1987), defined as warmth, self-control and emotional stability (Hogan & Roberts, 2004). A second possible explanation for this increasing maturity is increases in openness, self-acceptance and self-actualization (Allport, 1961; Roberts, Robins, Caspi, & Trzesniewski, 2003). While this conceptualization of maturity as being driven by openness and self-acceptance— influenced by the humanistic psychology tradition (Donnellan, Conger, & Burzette, 2007)— mirrors the types of change posited by posttraumatic growth accounts in that it posits the development of generative traits in response to life events, the existing data do not provide support for systematic changes in these traits (Roberts, Walton, & Vietchtbauer, 2006).

Research on this form of change is relevant to posttraumatic growth research, as has been shown through the recent work of Seery and colleagues examining the impact of trauma and adversity on subsequent resilience and life satisfaction (Seery, 2011; Seery et al., 2010). They found that moderate amounts of trauma experienced across the lifespan were associated with increases in *subsequent* levels of resilience and life satisfaction, and argued that moderate stress may be linked to mean-level changes in traits associated with psychological maturity such as mastery and toughness (Seery et al., 2010, p. 1038), although this specific hypothesis remains untested. Interestingly, these findings provide support for the view that an accumulation of relatively minor stressors can promote growth (Alwin & Levenson, 2004), and contradict Tedeschi and Calhoun's (2004) notion that "schema-shattering" events are necessary for growth to occur. In fact, posttraumatic growth may be most common following the types of moderate "traumas" that are part and parcel of most people's lives, as opposed to the "schema-shattering"

events posited by posttraumatic growth theorists[3]. Thus, what many people recognize as posttraumatic growth may in fact reflect maturity that individuals normatively accrue across time.

A related issue is the distinction between *adjustment* to traumatic events and *growth* following such events (Staudinger & Kunzmann, 2005) and the extent to which personality change reflects one or the other. As noted earlier, personality change in adulthood may occur because (most) people invest in specific social roles tied to their families, work and communities, which in turn serve as catalysts for increasing psychological maturity (Roberts & Wood, 2006). Such personality change is best characterized as *adjustment*, in that such *normative* change is occurring with the prime intention to function successfully in the community—that is, to live well and be happy in the context of one's social conditions. However, *growth* is arguably distinct in that it can also include development of specific virtues and strengths that are important over and above their contributions to proper functioning in society. That is, growth should be defined as going beyond adjusting to one's new social conditions (Staudinger & Kunzmann, 2005). Current strategies of assessing personality change and posttraumatic growth do not provide clear conceptual distinctions between adjustment and growth. It remains an open question, however, whether such a distinction is empirically meaningful if adjustment and growth simply represent different examples of positive changes in response to trauma. For example, successful adjustment in the face of trauma or some other non-normative event should count as posttraumatic growth, in so far that it leads to the emergence of traits that were previously dormant.

Using Personality Methods to Study Posttraumatic Growth

[3] See Elder & Clipp (1989) however for evidence that heavy combat World War II veterans became more resilient and less helpless over time compared to noncombatants and light combat veterans.

Future research should also utilize daily process methods such as experience sampling (Fleeson, 2007; Conner, Tennen, Fleeson, & Barrett, 2009) and the day-reconstruction method (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004) to examine intra-individual personality development as a function of traumatic life events. Such research can establish the extent to which perceived personality change is accompanied by changes in behavior, as well as the extent to which broader beliefs about growth and wisdom translate into observable differences in daily life. Given that daily methods can capture the psychological meaning of everyday behavior (Fleeson, 2007), such studies have the potential to address the extent to which posttraumatic growth is primarily a cognitive vs. behavioral phenomenon, which is an important question as we will discuss further in the following section. Daily methods would also allow for greater freedom for participants to define domains in which they have experienced growth over and above the five posited by posttraumatic growth accounts, which would be especially useful when assessing non-US samples, as noted earlier.

Informant reports of personality have become increasingly important in personality research, in part because an accurate assessment of personality traits requires multiple methods, and also because they provide unique information over and above self-reports about an individual's personality (Vazire, 2006). Some posttraumatic growth research has utilized informants to corroborate reports of growth (Helgeson, 2010; Shakespeare-Finch & Enders, 2008). Informant ratings of personality growth can help assess the veracity of growth (Helgeson, 2010) given both the difficulty of setting up prospective studies to examine the nature of posttraumatic growth and the relative ease with which informant reports can be collected (Vazire, 2006). However, we note two questions regarding informant reports in studies of posttraumatic growth that researchers should consider when conducting such studies. First, who

is the ideal informant for corroborating reports of posttraumatic growth? On the one hand, it makes sense that someone very close to the target (a partner, best friend or close relative) would be in the best position to provide insight into the cognitive, affective and behavioral changes that have occurred since the traumatic life event. Moreover, such ratings may be less susceptible to response biases than self-reports (Lucus, 2007; see also Funder, Kolar, & Blackman, 1995) and better reflect true changes in personality following adverse life events. For example, Watson & Humrichouse (2006) showed evidence for patterns of personality development in self-reports, but these self-ratings were not corroborated by spousal reports. On the other hand, close informants could be susceptible to shared biases given their close personal relationships with targets (e.g. the "letter of recommendation" effect; Leising, Erbs, & Fritz, 2010), which means that high levels of corroboration may not necessarily reflect actual changes in target personality. This could be especially true if an informant had also undergone an adverse life event similar to that of the target. Thus, selecting appropriate informants involves resolving the thorny question of whether one can separate the most knowledgeable informants from the most biased informants. One option involves assessing the degree of informants' personal acquaintance with targets using a multidimensional measure (e.g. the Personal Acquaintance Measure; Starzyk, Holden, Fabrigar & MacDonald, 2006) and selecting acquaintances high on specific factors (e.g. knowledge of the target's goals and frequency of interaction) as opposed to factors such as physical intimacy that may bring on the "letter of recommendation" effect.

A harder question involves whether informant reports are even the most appropriate methodology for assessing actual growth. It may be that informants may be helpful for corroborating explicit behavioral changes that may result from trauma (for example, a commitment to better social relationships in the wake of trauma may lead an individual to

behave in a more agreeable manner, which is easily observable by informants), but it is unclear whether increases in more humanistic constructs such as insight and integrity that often characterize growth (Staudinger & Kunzman, 2005) can be accurately perceived even by close informants, especially if informants rate low on those traits[4]. These are different questions that await future empirical exploration.

Is Personality Change Following Trauma Cognitive or Behavioral?

There are two broader conceptual questions involved in examining posttraumatic growth as positive personality change. The first is the question of whether personality change following trauma should be conceived as primarily cognitive or "perceived" in nature (Tedeschi & Calhoun, 2004), or whether such change should be considered also to have significant behavioral components (Hobfoll et al., 2007). On the one hand, posttraumatic growth theories present the changes associated with trauma as occurring at the narrative level of personality, and constructs characteristic of growth at this level, such as maturity, wisdom and self-transcendence, are primarily cognitive rather than behavioral in nature. On the other hand, it seems implausible that any meaningful personality change occurring following trauma would occur in the absence of measurable behavioral change. It seems likely that significant changes in worldview (which encompasses life goals as well as attitudes about the self and the world) would lead to significant changes in behavior. Theoretical accounts of growth following trauma indeed explicitly focus on behavioral changes (e.g. the construct of *altruism born of suffering*;, which is associated with increased prosocial behavior; Staub & Vollhardt, 2008). Moreover, the domains of posttraumatic growth identified by Tedeschi & Calhoun (2004) include constructs such as personal strength and importance of relationships: it is very likely that changes in these domains would necessarily be characterized by behavioral as well as cognitive changes, such as more

[4] Thanks to Simine Vazire for a helpful discussion of this issue.

prosocial behavior and a broadening of one's perceived in-group (Cozzolino, Staples, Meyers & Samboceti, 2004; Blackie & Cozzolino, 2011). Given that personality consists of action, thoughts and feelings (Carver & Connor-Smith, 2010), a complete assessment of positive personality change following trauma should pay particular attention to patterns of changes in action, as well as thoughts and feelings in relevant domains.

Can Personality Variability Be Harnessed to Promote Posttraumatic Growth?

The density distribution model of personality (Fleeson, 2001) can potentially afford opportunities to promote interventions that can foster personality change following trauma and adversity. Fleeson (2001, 2004) has argued that possessing a specific trait level – such as high extraversion – consists simply of behaving in a trait-relevant manner (e.g., talkative, bold, and assertive) more or less often than others who possess other levels. In other words, while a highly extraverted individual's behavior varies quite rapidly and frequently across different occasions, his/her behavior is reliably more extraverted than that of other individuals when averaged across a larger period of time such as a few days or a week. Thus, personality traits are stable in the sense that there is reliable between-person variation in the aggregate over time, and flexible in the sense that there is also substantial within-person variation in an individual's behavior depending on situational cues. The model thus focuses on the distribution of "personality states", which are similar to personality traits in affective, cognitive, and behavioral content, but are manifested for a few minutes or hours rather than for months or years (Canter, 1990; Cattell, Cattell, & Rhymer, 1947; Fleeson, 2001). While each individual's distribution of personality states is very wide, people's distributions occupy different locations on the dimension and may have different variances and degrees of skewness and kurtosis. The location can be represented

by a distribution's mean or median. These central points seem to show remarkable consistency from week to week, with correlations around .9 (Fleeson, 2004)

One important implication of this model is the exciting proposition that by shifting people's personality *states*, over time interventions may be able to change people's personality *traits*, and improve their well-being as a result. For example, Fleeson et al. (2002) found that instructing participants to act in a more extraverted manner by asking them to be talkative, bold, and energetic in a group discussion led to higher levels of positive affect. Building on related evidence for the benefits of manipulating personality states—that is, instructing people to behave in trait-concordant ways (Fleeson, Malanos, & Achille, 2002; McNiel & Fleeson, 2006; McNiel, Lowman, & Fleeson, 2010; Zelenski, Santoro, & Whelan, 2012), it is possible that instilling behaviorally-based personality states may facilitate positive psychological growth after adverse life events. Preliminary research has shown that the Big Five traits of openness to experience, extraversion, and agreeableness are associated with greater self-reported levels of posttraumatic growth (Linley & Joseph, 2004), and if careful prospective research indicates that these traits are indeed likely to promote growth, then interventions that help individuals to enact these behavioral states in relevant domains before and/or after their exposures to adverse experiences may also help them build these traits, thus also encouraging posttraumatic growth. Researchers may for example identify relevant behavioral manifestations of openness to experience, and help people to "try on" these open behaviors in order to explore opportunities to grow and extract meaning from their struggles with difficult events. Similar methods have been used successfully in cognitive-behavior therapy (Blackie et al., 2014; McNiel et al.,2010).

How Would the Study of Posttraumatic Growth Enrich Personality Psychology?

As we noted at the beginning of this target article, we believe that personality

psychologists have much to gain by studying posttraumatic growth. For one, research on the possibilities for personality change following adversity can lead to greater clarity about the mechanisms underlying personality malleability and stability. Traditionally, personality was understood to exhibit high levels of stability over the lifespan, and while trait stability over the lifespan is indeed high (Terracciano, Costa, & McCrae, 2006), recent research has shown that personality can and does change in response to certain life transitions, including those related to work, health and relationships (Roberts & Mroczek, 2008). It could be that specific types of adversity may lead to personality change, and future research can focus on specific adverse life events that could potentially lead to changes in personality. Moreover, it is likely that not everyone will respond to a given traumatic event in the same manner, given that not everyone responds to the other events in the same way, as well as that substantial heterogeneity exists in mean-level changes in personality (Johnson, Hicks, McGue, & Iacono, 2007; Roberts & DelVecchio, 2000). However, examining those individuals who experiences real changes following different traumas represents an exciting area for future research.

Can We Expect Changes in the Big 5 Following Trauma?

In this regard, the recent work of Hoerger and colleagues (Hoerger et al., 2014) bears mentioning. They hypothesized that bereaved caregivers of patients with terminal lung cancer would experience greater changes than controls in interpersonal facets of extraversion (sociability), agreeableness (prosocial and nonantagonistic), and conscientiousness (dependability). These hypotheses came from research showing that caregivers may seek additional social support during bereavement (Ownsworth, Henderson, & Chambers, 2010), and that the loss of a spouse could lead to significant restructuring of social networks (Bergman & Haley, 2009), having implications for specific facets of extraversion, such as sociability.

Moreover, they argued that personality change should result from being a bereaved caregiver in part because clearer social norms exist about how one copes and responds to death from an illness with a predictable course (such as lung cancer; Hoerger et al., 2014, p. 2). Consistent with these hypotheses, bereaved caregivers experienced an increase in interpersonal orientation, becoming more sociable, pro-social, and dependable. No changes were observed in the control sample.

This pioneering work presents an exciting example of how research on positive personality change following traumatic life experiences can potentially deepen our understanding of the mechanisms surrounding personality stability and change. Given that personality science has moved from addressing criticisms regarding the existence and consistency of personality to more fundamental questions about the mechanisms underlying personality (Fleeson, 2012; Fleeson & Jayawickreme, 2014), research on how different types of adverse and traumatic life events affect personality can provide important insights into the various mechanisms underlying specific personality traits. Moreover, given that the sociogenomic model of personality (Roberts, 2009) posits that repeated reinforcement of state changes in personality-relevant thoughts, behavior, and emotions through established social norms is needed to foster personality development incrementally over time (Hoerger et al., 2014), understanding whether some and which changes in personality states following adversity "stick" and lead to subsequent long-term trait change can provide important insights for future interventions that foster posttraumatic growth (Blackie et al., 2014; Fleeson et al., 2002; Zelenski, et al., 2012)

However, given that it is likely that fewer individuals will experience actual personality change following adversity compared to those who retrospectively report growth, this raises interesting questions related to current lifespan developmental models of personality, which

argue that personality develops over the lifespan in part because people adapt to social pressures to take on mature social roles (Roberts, 2009; Specht, Egloff, & Schmukle, 2011). For example, as we have noted earlier, the Big Five traits of agreeableness and conscientiousness have been shown to increase between the ages of 20 and 40 (Srivastava et al., 2003). However, just as Erikson (1950) emphasized how individuals either successfully or unsuccessfully mastered different stages of psychosocial development at different life stages, it is worth acknowledging that not all individuals experience this form of positive personality change, as evidenced indirectly by current rates of psychopathology (Kessler et al., 2005). Just as not all people will experience positive personality changes following trauma and adversity, not all people successfully adapt to new social roles and pressures, and future research should strive to understand the predictors of successful personality adjustment across the life span.

Does Perceived Posttraumatic Growth Reflect a Personality Characteristic?

As noted earlier in this target article, it may be that retrospective perceptions of growth reflect conscious decisions to self-appraise and utilize personal and environmental resources to restore pre-existing or enhanced levels of self-regulation (Staudinger & Kessler, 2009). Such decisions enable individuals actively to modify their behaviors to match their situations, and this ability to successfully navigate the social world in manners that maximize mental health is related to the construct of *psychological flexibility* (Kashdan & Rottenberg, 2010). Psychological flexibility refers to a series of dynamic processes that enable an individual to adapt to fluctuating situational demands, reconfigure psychological resources, shift perspective and successfully balance competing desires, needs and life domains. Research on this topic has been fragmented across many sub-fields in psychology (Kashdan & Rottenberg, 2010), but it is conceptually related to the personality construct of ego-resiliency (Block & Kremen, 1996), defined as the

dynamic ability to respond adaptively to the situational demands of daily life (Block & Block, 2006, p. 318; see also Kashdan & Rottenberg, 2010). Moreover, ego-resilient children and young adults are characterized by vitality, curiosity, openness and speedy recovery following stress (Gjerde, Block, & Block, 1986). Thus, individual differences in ego-resiliency may predict successful navigation of trauma, and moreover may lead people high in ego-resiliency to perceive their own resilient response to trauma as growth. This may explain why some people report high levels of posttraumatic growth soon after adverse events (Danhauer et al., 2013; Tennen & Affleck, 2002). It may be that people high in ego-resiliency have the resources necessary to experience actual growth from their experience; alternatively, it may be that such individuals merely interpret the unusual activation of their strong coping resources as growth. Whether people high in ego-resiliency are more or less likely to report actual (prospective) changes following trauma remains an untested question.

Ipsative change measures can be relevant to the question of the causes of personality change in the aftermath of trauma. Ipsative change measures allow focus on intra-individual shifts in structure of personality traits over time (Lonnqvist, Makinen, Paunonen, Henriksson, & Verkasalo, 2008). This approach allows consideration of the possibility that there can be differences over time in degree of prominence in a person's personality of various traits. It also reflects recognition that there can be significant individual variability in trait development, and that these individual developmental patterns can be markedly different from mean-level developmental trajectories.

Given that ipsative approaches focus on development of personality traits over time within the individual as well as the social-cognitive and contextual factors associated with different developmental pathways (McAdams & Olson, 2010; Syed & Seiffge-Krenke, 2013),

they can help address the question of the extent to which the manifestation of posttraumatic growth is primarily a function of the influence of the traumatic event on an individual's personality or a "mindset" or motivational orientation toward personal growth that influences whether an individual interprets an adverse life event as an opportunity for growth or not. In other words, individual differences in motivational orientation may dictate the degree of flexibility individuals exert in responding to trauma with growth. This topic awaits further empirical investigation.

Conclusion

In this target article, we have argued that personality psychologists should become interested in the phenomenon of posttraumatic growth. Moreover, given that posttraumatic growth has been defined explicitly as a form of personality change, research on this topic must move beyond assessing retrospective assessments of change as opposed to actual change. We reviewed the literature on posttraumatic growth, with a particular focus on how researchers have conceptualized posttraumatic growth and the specific methodological issues associated with these conceptualizations. Specifically, it remains unclear why retrospective measures of posttraumatic growth are routinely employed to make claims about "positive psychological changes" when such measures are only correlated modestly with actual change (Frazier et al., 2009). As noted earlier, in our discussion of the Helgeson et al. (2006) meta-analysis, retrospective measures of growth have been shown to relate moderately to well-being outcomes. . We note that these associations are worthy of study in their own right, For example, even if research ultimately shows that perceived growth following trauma is only an illusion and reflection of pre-existing resilience, if this change is *reliably* associated with relative well-being following trauma, we will have learned something about what promoted recovery post-trauma.

However, such observations would not provide compelling support for the idea that perceived growth following trauma actually reflects positive personality change (as posited by posttraumatic growth theories), not that actual change occurred in the first place. Indeed, such reports may instead be indicative of pre-existing traits such as psychological flexibility and ego-resiliency. As Tennen & Affleck (2008) have pointed out, inability to distinguish among such alternative possibilities significantly hampers progress in scientifically understanding individual differences in ability to recover psychologically from trauma. Future research should move away from retrospective measures and instead employ "current-standing" pre-trauma baseline measures of potential growth domains (as utilized in Frazier et al., 2009) and other methods used in personality science discussed above. The employment of research designs such as the prospective longitudinal study described above should ideally replace cross-sectional assessments as the gold standard of posttraumatic growth research (Roepke et al., 2013). Moreover, greater attention needs to be paid to important methodological questions related to assessing posttraumatic growth, such as the validity of informant reports and the extent to which such change manifests itself in terms of beliefs or behavior.

As an illustration of how we think personality psychologists interested in posttraumatic growth should proceed with research on this topic, we end this target article with description of a study design that we believe both improves significantly on studies similar in design to the Calhoun et al. (2000) paper discussed earlier, and affords the opportunity to test specific predictors of actual change following trauma. One 'dream' study would use a prospective longitudinal approach to examine growth trajectories among a sample likely to experience a stressful life event in the near future. For the purpose of this example, we focus on one relevant clinical population - patients with breast cancer. We would recruit women who have scheduled

routine mammographies, and follow the women who agree to participate – both those who are diagnosed with breast cancer and whose who are not (control condition) for up to 1 year. It would be difficult to recruit women before the mammography stage simply due to the time and resources it would take to screen every women who is scheduled for a routine mammogram check, but routine mammography is standard after certain ages. Participants would complete an online study that tracks change in current-standing growth-relevant domains and their processes of coping with their present health conditions. As we discussed earlier, posttraumatic researchers are faced with unique difficulties and in this case a "true" baseline would be very difficult to collect. However, this study design, as discussed in detail below, does offer many improvements on the correlational designs typically conducted in this field.

In phase 1 of the study, participants would complete an online survey before they have received their biopsy result, which asks about personality, well-being, education level, and current and past health history, as well as current-standing measures on domains associated with potential posttraumatic growth and depreciation. These scores would function as baseline measures that we would use to map trajectories of posttraumatic growth. On completion of this initial online survey, participants would be asked to undertake a daily diary procedure, in which they would be asked to report on their thoughts, feeling, and behaviors at the end of each day for 7 days. The questions would specifically ask about how their thoughts, feelings, and behaviors that day reflected domains of potential posttraumatic growth – for example, perception of the self (e.g., "I felt that I was in control of my life today"; "I felt satisfied with myself today"), interpersonal relationships (e.g., "I had mutually enjoyable conversations with family members or friends today" & "I chose not to share my concerns with anyone else today"), and life philosophy (e.g., "I felt a sense of serenity, was lifted out of my daily concerns" and "I

experienced a sense of deep inner peace or harmony"). We would also include reports of current-standing negative attitudes in these domains (Baker et al., 2008). We would expect that individuals who report higher levels of actual posttraumatic growth using a current-standing version of the PTGI would also report that their thoughts, feelings, and behaviors better reflected relevant domains of potential growth. After a period of time (at least following the conclusion of their treatment), we would invite the participants to complete the questionnaires and daily diary procedure a second time. It would be advisable to avoid treatment phases for two reasons: 1) this is a very stressful time for the women and they will be unlikely to wish to complete a survey during this period, and 2) their daily behavior will have been disrupted by the treatment process – so it would be difficult to determine whether any changes are due to the treatment of manifestation of posttraumatic growth. The study outlined would enable us to assess whether their daily standing on growth-relevant domains changed relative to their daily ratings one year earlier. Participants would be asked to complete the same questions as before and answer in reference to their current standings, as well as a measure of severity of their diagnosis and prognosis. We would also assess their scores on a retrospective measure of growth, such as the PTGI, and compare their scores with their actual change scores over time.

This relatively feasible study design allows for the assessment of the predictors, temporal dynamics and consequences of posttraumatic growth measured both in terms of actual changes over time. For example, the study allows for the longitudinal assessment of actual changes following diagnosis of breast cancer, how an individual's beliefs about personality change in terms of retrospectively recalled growth (Tennen & Affleck, 2009) moderate actual personality change on traits such as positive affectivity and optimism (which has been reported in a single

prior study; Park et al., 1996). Moreover, the daily diary design can establish the extent to which beliefs about posttraumatic growth translate into differences in daily life.

In line with Tennen & Affleck (2009), we hold that such prospective studies need to become the norm in posttraumatic growth research. We believe that Tedeschi and Calhoun (2004) and other posttraumatic growth researchers have done a valuable service in bringing this important and intuitively compelling idea of growth following trauma into the realm of psychological research, and are grateful for their pioneering work. Yet methodological limitations in much of the research thus far have generated considerable debate concerning the validity of many of the findings related to posttraumatic growth. We believe that our critical review has shown that research on the topic has been hampered by significant theoretical and measurement limitations. As personality psychologists, we believe that our field should be excited about this construct, and hold that personality researchers are ideally suited to study posttraumatic growth defined as personality change in response to trauma with appropriate attention to "careful measurement, sensitive study designs… and careful attention to credible evidence" (Coyne and Tennen, 2010, p.24). We hope that our field will bring its theories and methods to bear on this engaging and important topic.

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