



Meg A. Warren and Stewart I. Donaldson, Editors

SCIENTIFIC ADVANCES IN POSITIVE PSYCHOLOGY

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An Imprint of ABC-CLIO, LLC
Santa Barbara, California • Denver, Colorado

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Library of Congress Cataloging in Publication Control Number: 2016058837

ISBN: 978-1-4408-3480-6

EISBN: 978-1-4408-3481-3

21 20 19 18 17 1 2 3 4 5

This book is also available as an eBook.

Praeger


An Imprint of ABC-CLIO, LLC

ABC-CLIO, LLC

130 Cremona Drive, P.O. Box 1911

Santa Barbara, California 93116-1911

www.abc-clio.com

This book is printed on acid-free paper 

Manufactured in the United States of America

Posttraumatic Growth: A Brief History and Evaluation

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Posttraumatic growth (PTG) as an area of research and practice, although often considered a construct within the positive psychology framework (e.g. Carr, 2011; Linley & Joseph, 2004), preceded the definition of positive psychology by Seligman and Csikszentmihalyi (2000). After garnering little attention initially, it has become increasingly influential in the psychology of trauma literature, as there are over 100 citations listed in the PsycINFO database for the period of 18 months prior to this writing, and over 600 in total. PTG has also been introduced to the general public through two recent trade publications (Haas, 2015; Rendon, 2015). In this chapter we will review the history of this concept, contributions of the research literature to the understanding of the PTG process, areas that need to be explored and developed to deepen our understanding, and applications of PTG to interventions for trauma survivors.

History and Development of the Concept of Posttraumatic Growth

PTG was introduced by Tedeschi and Calhoun (1995) in a book that reviewed its literary, philosophical, theological, and psychological roots and described an initial conceptual model for the psychological processes

involved when traumatic events appear to transform how people live their lives. They had been developing the construct for several years (e.g., Calhoun & Tedeschi, 1989–1990), but had not coined the term until they introduced it when describing their quantitative measure, the Posttraumatic Growth Inventory (PTGI) in the 1995 book and in a journal article published almost simultaneously (Tedeschi & Calhoun, 1996). In that article, the definition of PTG was offered as “personal benefits, including changes in perceptions of self, relationships with others, and philosophy of life, accruing from their attempts to cope with trauma and its aftermath” (Tedeschi & Calhoun, 1996, p. 458). In a later book (Tedeschi, Park, & Calhoun, 1998) they defined PTG as “both a process and an outcome” (p.1), and later as “positive psychological change experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p.1).

Pre-PTG Concepts

Besides the work of Tedeschi and Calhoun and their colleagues beginning in the 1980s, there were some other researchers who were developing ideas similar to PTG in the late 20th century. Scholars were interested in how people live healthy lives in the face of difficulty, and in order to explain this, new concepts were introduced, such as sense of coherence (Antonovsky, 1987), hardiness (Kobasa, 1979), and resilience (Garmezy, 1985; Rutter, 1987; Werner, 1984). However, these ideas focused on how people can stay well in the face of difficulty, rather than how people can respond to life events in a fashion that produces personal transformation. Transformative processes are clearer in the work of Gerald Caplan (1964), who described how times of personal crisis can also be opportunities for personal change. Another key figure in the discussion of post-traumatic growth is Victor Frankl (1963), who is well known for his descriptions of how people find meaning in adversity. Further, Stephen Joseph and colleagues described “changes in outlook” that can follow tragedy (Joseph, Williams, & Yule, 1993). Reviews of how PTG relates to these and other constructs can be found in several sources (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 1995; Tedeschi, Park & Calhoun, 1998). O’Leary, Alday and Ickovics (1998) examined eight conceptual models of how people change positively and found that the following concepts tended to appear in at least two: self-efficacy, sense of coherence, meaning-making, locus of control, motivation, optimism, cognitive status, hardiness, past experiences, coping style, social support, community resources, and socio-economic status. They also found many other concepts that were specific

to individual models. In the past 20 years, most research on PTG has been based on Tedeschi and Calhoun's model development.

PTG Based on Assumptive World Theory

Besides the general concept that positive changes or personal transformations can follow traumatic events, an idea that has a long history in literature and religion, perhaps the most influential concept on which PTG has been built is the idea that trauma shatters the assumptive world. The assumptive world is a set of fundamental beliefs that are seldom questioned by a person, as they form the basis for understanding the world, the self, and the future. This idea is found in the work of Piaget (1954) and Kelly (1955) who described how information about our experience must either fit our understandings or these understandings must be revised. These understandings have been called schemas, personal constructs, and the assumptive world. Piaget's and Kelly's concepts were further developed in the literature on trauma and loss. Parkes and Weiss (1983) described how bereavement can "invalidate a large part of our assumptive worlds" (p.71). Seymour Epstein (1985, 1991) noted that the implicit theory of the self that we all construct operates to an extent unconsciously and when it is violated by events results in a profound emotional and cognitive reaction. Ronnie Janoff-Bulman (1985, 1992) described how the assumptive world can be "shattered" by traumatic events. This application of the assumptive world construct to trauma allows a new definition of traumatic events that does not rely on a list of events as found in the psychiatric diagnostic systems. Instead, we can more fully understand trauma as a shattering of the assumptive world, as Janoff-Bulman has suggested. Tedeschi and Calhoun build from this concept in the creation of their PTG model.

Measures of PTG

Measurement of PTG has usually been accomplished with the use of the PTGI, but some measures of similar constructs have been developed as well, including the Stress Related Growth Scale (Park, Cohen, & Murch, 1996), the Benefit-Finding Scale (Antoni et al., 2001), and the Changes in Outlook Questionnaire (Joseph, Williams & Yule, 1993). New versions of the PTGI have been developed, including a short form (Cann et al., 2010) and versions that can be used with children (Cryder, Kilmer, Calhoun, & Tedeschi, 2006; Kilmer et al., 2009). The concept of *posttraumatic depreciation* has also been developed, referring to the negative changes that can result for traumatic experiences within the same five domains of PTG. The

Posttraumatic Growth and Depreciation Inventory measures both positive and negative personal changes after trauma that can occur simultaneously on the same dimensions of change (Baker, Kelly, Calhoun, Cann, & Tedeschi, 2008; Cann, Calhoun, Tedeschi & Solomon, 2010). In addition, the PTGI has been translated and used in various nations and cultures, including China (Liu et al., 2015), Turkey (Senol-Durak & Ayvasik, 2010), and India (Thombre, Sherman, & Simonton, 2010). Weiss and Berger (2010) provide a source that summarizes some of this cross-cultural research using translated versions of the PTGI. Some of these translations are being published with associated validity studies (Garcia & Wlodarczyk, 2016; Lamela, Figueiredo, Bastos, & Martins, 2014; Liu et al., 2015).

The PTGI was developed from earlier qualitative research that yielded statements from participants who reported transformational changes after trauma. Their statements became the basis for the 21 items of the PTGI. In the original publication (Tedeschi & Calhoun, 1996) and in subsequent work (Taku, Cann, Tedeschi & Calhoun, 2008), factor analyses of the PTGI yielded five domains: Appreciation of Life, Relating to Others, Personal Strength, New Possibilities, and Spiritual Change. *Appreciation of Life* refers to the ability to perceive the value of simple aspects of living that are often taken for granted. *Relating to Others* refers to improvements in interpersonal relationships that may come about when people receive support from others, recognize they need help, and are able to be more empathic and compassionate now that they have encountered significant life difficulties. *Personal Strength* refers to the recognition that they have been able to endure their traumatic circumstances and have coping competencies. *New Possibilities* arise when these circumstances close off existing life paths or encourage the consideration of new ways of living. *Spiritual Change* involves the strengthening or revision of spiritual, religious, and perhaps existential understandings of life. Evidence of these domains of PTG have been supported by qualitative research (e.g., Hussain & Bhushan, 2013; Morris & Shakespeare-Finch, 2012), although some factor analyses from other cultures yield somewhat different solutions. Conceptually, these factors seem to cover the ways people experience PTG in the Western world, and this may be due to the fact that the original item pool was derived from qualitative work with trauma survivors in the United States.

It is important to keep in mind that although PTG is an outcome, it is also a process. The conceptual description of the PTG process has undergone change since the first version was offered by Tedeschi and Calhoun in 1995, with modifications published on several occasions. The most significant modifications were the models published over several years (Calhoun, Cann, and Tedeschi, 2010; Tedeschi & Calhoun, 2004). To generally

summarize the PTG model, it is useful to recognize the main variables that are the focus of the PTG process. The model refers to the interaction of the person before the trauma, including various personality characteristics and cognitive and emotional capabilities, with a life event that is described as “seismic.” The term seismic refers to the effect of the event on the person’s core belief system or assumptive world. This set of core beliefs about the self, the world, and one’s future can be either shattered by events or subjected to closer examination in persons not previously prone to considering what they believe about their lives. As this experience is emotionally as well as cognitively challenging, the trauma survivor brings to bear their coping resources in order to calm down the emotional reactions and intrusive rumination that are set off by the trauma. The Tedeschi and Calhoun model emphasizes rumination processes in the wake of trauma that start with intrusive thoughts and images of trauma, or brooding, giving way to more deliberate, reflective thought, as described in more recent models of rumination (Watkins, 2008). Assisting in this process may be people who provide the kind of support that leads to reconsideration and rebuilding of core beliefs so that a new perspective on life can emerge. These people have been described as *expert companions*, as they have the interpersonal skills that encourage exploration of personal change in trauma survivors (Tedeschi & Calhoun, 2010). When core beliefs or the assumptive world are reconstructed, the new system incorporates the experiences of trauma so that these experiences become more comprehensible and meaningful. In this process, the life narrative is elaborated so that the traumatic event can be incorporated into a meaningful story and, therefore, has value rather than be relegated to an event that is an anomaly or something to be avoided. The new life narrative is a further development of PTG for many people, and in this way corresponds to the concept of the “possible self” (Markus & Nurius, 1986). Trauma survivors are introduced to ways they can live that they had never considered before, perhaps because life had not made it necessary, because they were otherwise preoccupied, they did not understand the value of other ways of living, or the new ways have gained new meaning. For any or all of these reasons, trauma survivors may then find that life has taken a turn and they are living out a new narrative and a new life path. For these reasons, the final resolution of trauma for those who report PTG is a sense that they are wiser, that is, they know better how to live life well. Of course, this is known in the colloquial expression “sadder but wiser.” This idea incorporates another aspect of PTG that needs to be understood. The experience of PTG comes after a *struggle*, and a good deal of distress is involved. Recall that the shattering of the assumptive world is an emotional experience as described

by Epstein (1985) and Janoff-Bulman (1992), and this is not merely a cognitive realignment. Although the new understandings of life and the new pathways that are adopted bring some relief, they do not relieve all distress. Some people may report that in retrospect their traumatic event was the “best thing that ever happened” to them (Tedeschi & Calhoun, 1995, p.1), yet most still see the trauma as full of loss and distress that they are continuing to manage, even as they see the benefits of the experience (Tedeschi, Calhoun, & Cann, 2007).

In order to track this process of PTG, some new measures were developed. The two most important are measures of core belief change (Core Beliefs Inventory [CBI]; Cann et al., 2009) and rumination about the traumatic event (Event Related Rumination Inventory [ERRI]; Cann et al., 2011). The CBI is composed of nine items that ask trauma survivors to indicate the degree to which they seriously examined certain core beliefs as a result of experiencing the event. The core beliefs on this measure involve their understandings of other people, the course of their own life, what is meaningful, under control, etc. This measure of the disruption of the assumptive world is predictive of PTG (Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012). The ERRI is a measure of both intrusive, or brooding, rumination and deliberate, or reflective, rumination. Unlike other measures of rumination that are focused on the tendency toward rumination as a trait, this measure determines the degree to which the trauma survivor has been ruminating about the traumatic event and its aftermath. Furthermore, it incorporates both types of rumination, with the expectation that intrusive rumination must give way to deliberate rumination for PTG to occur. Deliberate rumination tends to be more highly predictive of PTG than intrusive rumination, as measured by the ERRI. Other measures of the PTG process that have been introduced but are not as highly developed are measures of disclosure tendencies (Lindstrom, Cann, Calhoun, & Tedeschi, 2013) and the degree to which the traumatic experience has been resolved (Triplett, et al., 2012). These concepts are contained in the PTG model and await further development of measurement instruments.

In recent years, PTG applications have been built on the PTG process model and the underlying assumption that expert companions are crucial in the facilitation of growth (Calhoun & Tedeschi, 1999, 2013). The descriptions of expert companions are rather general (Tedeschi & Calhoun, 2010), and there is currently no measure of expert companionship. However, expert companions are described as possessing relationship qualities that resemble Roger’s (1957) concept of therapeutic relating, and individuals are not expected to be professionals in order to provide this type of companionship. Trauma survivors can be adept at describing the

kind of relating that helped them most, and the “expertise” of expert companions has little to do with knowledge of trauma theory, and mostly involves good listening, patience, acceptance, and humility. PTG occurs “naturally” without professional intervention in most cases, and untrained individuals are routinely able to serve in the role of expert companions. Beyond expert companionship, clinicians find it helpful to be aware of how the PTG process works and how to facilitate it. Tedeschi and McNally (2011) first described the clinical application of the PTG process in a schematic designed for working with military veterans, and Calhoun and Tedeschi (2013) expanded it into a more general clinical approach. This approach includes phases of PTG processes that begin with psychoeducation about trauma and methods of managing emotional distress and intrusive rumination, encouragements to self-disclose, work on narrative development, and attention to elements of PTG that can lead to altruistic behavior.

Established Knowledge and Areas for Further Development

Much of the PTG process described earlier has been found to operate in trauma survivors who have encountered a variety of traumatic events. The availability of appropriate measures has allowed researchers to uncover these relationships. Next we will review measures that have been developed to examine crucial components of the PTG process.

Core Belief Challenge and Rumination

The more “seismic” an experience is, the more one is caused to question fundamental assumptions and schemas regarding safety, predictability, identity, and meaning. As a result, an individual may either revert back to previously held schemas and core beliefs or begin a process whereby new schemas and belief systems are created, presenting the opportunity for a new sense of meaning and enhanced ability to manage and cope with future shocks (Tedeschi & Calhoun, 2004; Cann et al., 2011). This process of shift in core beliefs, measured by the CBI, has been shown to be a catalyst for rumination and, ultimately, PTG (Taku, Cann, Tedeschi, & Calhoun, 2015; Triplett et al., 2012). The importance of rumination, measured by the ERRI, in predicting PTG is also being established (Zhou & Wu, 2016). Evidence suggests that intrusive ruminations relating to traumatic events are positively associated with distress and a failure to cope (Cann et al., 2011). For outcomes of PTG to occur, ruminative processes must shift from predominately intrusive and unintentional patterns to more

deliberate and contemplative patterns. A moderate degree of insight, cognitive organization, and other factors, including personality characteristics, coping style, gender, self-disclosure, and the sociocultural context in which trauma and corresponding self-disclosure exist, can contribute to constructive processes of deliberate and reflective rumination (Tedeschi, 2011).

Self-Disclosure and Responsiveness

Constructive processes of self-disclosure support the shift from intrusive to deliberative reflection. Self-disclosure has been identified as an important component of cognitive processing and coping in the aftermath of trauma and has been associated with a variety of positive outcomes, including lower levels of distress, enhanced physical functioning, a resilient self-concept, and outcomes of PTG (Calhoun & Tedeschi, 2013; Pennebaker & Stone, 2003; Taku et al., 2009). As one reveals aspects of one's identity or experience to another through verbal or written modes of communication, there is an opportunity to reorganize and reconstruct the system of core beliefs and the life narrative (Taku et al., 2009). The frequency and complexity of disclosure are important and may occur within the context of psychotherapy, prayer, expressive writing or journaling, or conversations with trusted friends and skilled companions (Pennebaker & Stone, 2003; Taku et al., 2009). Recounting and disclosing traumatic experiences can be a difficult process for survivors to engage in and requires a great deal of courage and vulnerability (Calhoun & Tedeschi, 2013; Lindstrom et al., 2013; Taku et al., 2009).

Cross-Cultural and Individualistic Characteristics Associated with PTG

Survivors of a wide range of traumatic events from individualistic and collectivistic cultures have reported experiences of PTG. For example, PTG has been reported in first responders and emergency personnel in the United States and Australia (Chopko & Schwartz, 2009; Shakespeare-Finch, Gow, & Smith, 2005); military veterans and active duty service members (Bush, Skopp, McCann, & Luxton, 2011; Gallaway, Millikan, & Bell, 2011; Maguen, Vogt, King, King, & Litz, 2006; Tedeschi, 2011; Tsai, Mota, Southwick, & Pietrzak, 2016); Chinese and Japanese earthquake survivors (Taku, Cann, Tedeschi, & Calhoun, 2015; Wu, Xu, & Sui, 2016; Zhou & Wu, 2016), patients with severe/chronic illness in the United States, Australia, Japan, and Eastern and Western Europe (Castonguay, Crocker, Hadd, McDonough, & Sabaston, 2015; Coroiu, Körner, Burke,

Meterissian, & Sabiston, 2015; Danhauer et al., 2015; Matsui & Taku, 2016; Yi, Zebrack, Kim, & Cousino, 2015); Iraqi schoolchildren (Magruder, Kilic, & Koryurek, 2015); and a wide variety of other traumatic events (Calhoun & Tedeschi, 2013).

Although people in a wide variety of situations and contexts experience trauma, the extent of PTG may vary based on individual characteristics. For example, younger individuals tend to report greater levels of PTG than older individuals (Dekel & Nuttman-Shwartz, 2009; Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009; Pietrzak et al., 2010; Shakespeare-Finch & Lurie-Beck, 2014; Solomon & Dekel, 2007). Additionally, a 2010 meta-analysis revealed a trend in gender differences, such that women report higher PTG than men, regardless of trauma type (Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010). Several psychological factors, including optimism, extraversion, sense of coherence, positive reappraisal, and problem-focused coping (Forstmeier, Kuwert, Spitzer, Freyberger, & Maercker, 2009; Helgeson, Reynolds, & Tomich, 2006; Levine et al., 2009; Linley & Joseph, 2004; McCaslin et al., 2009); cognitive factors including bravery, fortitude, and perseverance (Peterson, Park, Pole, D'Andrea, & Seligman, 2008); and social factors including increased perceptions of social support (Cadell, Regehr, & Hemsworth, 2003; Dirik & Karanci, 2008; Rosenbach & Renneberg, 2008; Schroevers, Helgeson, Sanderma, & Ranchor, 2010), and spirituality and religious coping (Calhoun, Cann, Tedeschi, & McMillan, 2000; Linley & Joseph, 2004) have been associated with PTG.

Event type may also have a unique influence on outcomes of PTG. A study by Shakespeare-Finch and Armstrong (2010) suggested that bereaved individuals and survivors of motor vehicle accidents report greater levels of PTG than survivors of sexual assault. Survivors of different types of cancer also report differing amounts of PTG, with breast cancer survivors having the highest PTG scores (Morris & Shakespeare-Finch, 2011b). In addition, there is some evidence to suggest that shared traumas that target a community in addition to the individual (i.e., natural disaster, terrorist attacks) may result in higher levels of growth than individually experienced trauma (Kilic, Magruder, & Koryurek, 2016).

Event Centrality, PTG, and PTD

Posttraumatic distress (PTD) and PTG are distinct, yet related, constructs. Although one may assume that PTG and PTD represent two sides of the same coin, evidence suggests the possibility of independent positive and negative trauma consequences (Cann et al., 2010; Linley, Joseph,

Cooper, Harris, & Meyer, 2003). For instance, posttraumatic distress has been associated with suicide and decreased life satisfaction in a wide variety of samples, whereas PTG has been associated with increased meaning in life and well-being (Bush et al., 2011; Gallaway et al., 2011). How central one views the traumatic event to the life narrative, identity, and attribution of new experiences may have meaningful implications for outcomes of PTSD and PTG (Berntsen & Rubin, 2006; Blix, Birkeland, Hansen, & Heir, 2015; Groleau, Calhoun, Cann, & Tedeschi, 2013). For example, several studies have demonstrated associations between event centrality and symptoms of PTSD, including agitation, guilt, anxiety, and sleep difficulties (Blix, Solberg, & Heir, 2014; Brown, Antonius, Kramer, Root, & Hiurst, 2010; Robinaugh & McNally, 2011). Studies have also demonstrated a link between PTG and event centrality, independent of PTSD symptoms or diagnoses, suggesting that event centrality may contribute to both PTG and PTSD independently (Barton, Boals, & Knowles, 2013; Blix et al., 2015; Groleau et al., 2013; Roland, Currier, Rojas-Flores, & Herrera, 2014).

Although some degree of distress is necessary to initiate the ruminative processes essential to the development of PTG, evidence suggests that an inverted curvilinear relationship exists between PTSD and PTG (Colville & Cream, 2009; Dekel & Nuttman-Shwartz, 2009; Kleim & Ehlers, 2009; Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009; Shakespeare-Finch & Lurie-Beck, 2014; Solomon & Dekel, 2007; Taku, Tedeschi, & Cann, 2015). Specifically, these studies suggest that a certain degree of PTSD is necessary for PTG to occur and that greater PTSD leads to increases in PTG. However, this relationship is demonstrated only to a certain point, and once the severity of PTSD symptoms reach a certain threshold, outcomes of PTG begin to decrease.

Research suggests that PTSD and PTG often coexist and may have similar initial pathways. Both PTSD and PTG occur in response to a highly stressful or traumatic event that elicits heightened levels of distress. This distress is typically characterized by unwanted and intrusive thoughts or a re-experiencing of the trauma, and several studies have found positive associations between PTSD, PTG, and intrusion (Dekel, Ein-Dor, & Solomon, 2012; Salsman, Segerstrom, Brechting, Carlson, & Andrykowski, 2009; Shigemoto & Poyrazli, 2013). As described earlier, it is not uncommon for seismic and highly stressful experiences to prompt disruptive thoughts about the event and one's life; however, for PTG to occur this intrusive pattern of thought must eventually shift to a more deliberate pattern of cognitive processing (Calhoun & Tedeschi, 2013; Calhoun et al., 2010; Cann et al., 2011). When symptoms of both PTSD and PTG are present, it is possible that PTG may protect or buffer against some of the

more negative symptoms of post-traumatic stress disorder (PTSD). For example, PTG has been associated with reduced revictimization following sexual assault (Kunst, Winkel, & Bogaerts, 2010), increased social affiliation and reduced avoidant coping following a breast cancer diagnosis (Silva, Moreira, & Canavarro, 2012), higher psychological well-being and reduced distress following a diagnosis of cardiovascular disease (Bluvstein, Moravchick, Sheps, Schreiber, & Bloch, 2013), and better self-reported physical health in HIV/AIDS and cancer patients (Sawyer, Ayers, & Field, 2010). In addition, PTG has been associated with decreased suicide ideation in military personnel post-deployment (Bush et al., 2011) and with increased life satisfaction in a variety of samples (Triplett et al., 2012).

Conceptual Challenges

PTG has attracted considerable attention since its initial introduction into the psychological literature, and research seeking to explore and validate the construct has grown exponentially (Blackie, Jayawickreme, Helzer, Forgeard, & Roepke, 2015; Frazier et al., 2006; Jayawickreme & Blackie, 2014; Linley & Joseph, 2004). However, this attention has not been without controversy since researchers have challenged the definition of PTG and questioned the scientific validity of the construct (Coyne & Tennen, 2010; Hobfoll, Hall, Canetti-Nisim, Galea, Johnson, & Palmieri, 2007; Jayawickreme & Blackie, 2014; Tennen & Affleck, 2009; Zoellner & Maercker, 2006). Skepticism has arisen due to the cross-sectional and retrospective measurement design of many existing PTG studies (Jayawickreme & Blackie, 2014; Tennen & Affleck, 2009). Scholars have also posited that reports of PTG may represent a self-enhancing cognitive bias reflective of “positive illusions.” Rather than reflecting actual positive psychological change, they have argued that PTG is instead motivated by a desire to restore self-esteem, optimism for the future, and a sense of control in threatening situations while attempting to cope and derive meaning from the experience (Hobfoll et al., 2007; Jayawickreme & Blackie, 2014; Park, 2010; Roepke, Jayawickreme, & Riffle, 2014; Sumalla, Ochoa, & Blanco, 2009; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000; Tennen & Affleck, 2009). Similarly, skeptics have suggested that only when individuals translate cognitive benefit-finding processes into behavioral action can we be sure PTG is real (Hall et al., 2008; Hobfoll et al., 2007).

Although we agree that a degree of caution is warranted whenever interpreting self-reported and retrospective information, existing evidence largely supports the theoretical model of PTG and confirms that outcomes of PTG are valid and representative of psychosocial change. Specifically,

research has demonstrated that reports of PTG tend to be accurate (Blackie et al., 2015; Shakespeare-Finch & Barrington, 2012; Shakespeare-Finch & Enders, 2008). This has been supported by studies illustrating that outcomes of PTG can be observed, often in distinctive ways, by individuals in the social network who describe significant and beneficial changes in trauma survivors both behaviorally (Shakespeare-Finch & Barrington, 2012; Shakespeare-Finch & Enders, 2008) and psychologically (Blackie et al., 2015; Shand, Cowlshaw, Brooker, Burkey, & Ricciardelli, 2014). Additionally, recent prospective evidence has supported the assertion that PTG trajectories remain generally stable over time and are associated with better long-term adjustment following trauma (Wang, Chang, Chen, Chen, & Hsu, 2014; Danhauer et al., 2015). There is also recent evidence that event centrality may be a crucial distinction in understanding the effects of trauma on growth outcomes. Highly central events tend to produce the findings predicted by the Tedeschi and Calhoun model, whereas events low in centrality may not (Johnson & Boals, 2015).

This evidence helps to further validate the overall construct of PTG and is aligned with our notion that growth follows seismic events and represents lasting positive psychological change (Calhoun & Tedeschi, 2013); however, further longitudinal research and self-other corroboration is needed to continue to establish the reliability and validity of PTG theory and related outcomes. Employing methodologically rigorous analyses will help advance the existing research related to PTG and allow scientists to answer critical questions about the degree and extent of psychosocial change following experiences of seismic adversity.

Future Directions and Potential Applications

Tremendous progress has been made in furthering the science of PTG, but several areas that warrant further study remain. The frontiers of this research field hold promise for better understanding the variables underlying when, why, and how individuals undergo positive transformation in the wake of trauma. Furthermore, given the universality of trauma to the human experience, many can benefit from applications of PTG aimed at maximizing the positive outcomes survivors are able to elicit from their experiences. Here, we consider how future research might examine two populations in which the presentation and mechanisms of PTG are less understood and perhaps differ: (1) children and adolescents and (2) relationships, groups, and larger systems of people. We also discuss two approaches to PTG research, longitudinal studies and interventions, which may elucidate its mechanisms and applications to both clinical and

general populations. This is not an exhaustive exploration of possibilities for the future of PTG, but rather a survey of a few promising directions.

PTG in Children and Adolescents

Although there remains a relatively small literature on PTG in younger individuals, researchers are increasingly attending to understanding this process in children and adolescents and how it might resemble or differ from that in adults (Alisic, van der Schoot, van Ginkel, & Kleber, 2008; Kilmer, 2006; Meyerson, Grant, Carter, & Kilmer, 2011). Several recent studies have investigated PTG in youth who experienced a range of traumatic events, including natural disasters (e.g., Hafstad, Gil-Rivas, Kilmer, & Raeder, 2010; Kilmer & Gil-Rivas, 2010), terrorism (e.g., Laufer, Solomon, & Levine, 2010; Levine et al., 2009), traffic accidents (e.g., Salter & Stallard, 2004), cancer (e.g., Turner-Sack, Menna, & Setchell, 2012), and parental bereavement (e.g., Wolchik, Cox, Tein, Sandler, & Ayers, 2008). Researchers recognize that the means by which PTG unfolds may differ in children by virtue of ongoing emotional and cognitive development, but have found that children still possess, to some extent, the capability to reflect on how they and their situations have changed as a result of a traumatic event (Cryder, Kilmer, Tedeschi, & Calhoun, 2006; Kilmer et al., 2009). There is mixed evidence regarding specific variables, but a recent literature review of 25 studies indicated that many of the correlates of PTG in children and adolescents are fairly consistent with those in adults (Meyerson et al., 2011). For example, social support, intrusive and deliberate rumination, and certain coping strategies (e.g., religious coping) relate to PTG in a manner similar to existing evidence from adult samples.

However, there are ways PTG can be explored further in children. Future studies need to more clearly distinguish between reported growth that is trauma related and that which is simply due to normative development. Two studies thus far have suggested that in children, positive changes associated with trauma are distinct from those due to nontrauma-related maturational growth (Alisic et al., 2008; Taku, Calhoun, Kilmer, & Tedeschi, 2008); however, most studies lack nontrauma comparison groups and therefore they are limited in the ability to make this discernment (Meyerson et al., 2011). Researchers can attempt to replicate these few findings with prospective-longitudinal designs that control for normative growth. Furthermore, mixed results in a few studies make it difficult to conclude how PTG is unique in youth. There is some evidence that PTG may decay over time more quickly in children than in adults, that there may be an “optimal” age to experience a traumatic event in terms of potential growth,

and that gender differences may not emerge until early adulthood (Meyerson et al., 2011). Replication will be key to address these possibilities. Finally, future research should address the extent to which culture and context, particularly the role of caregivers, influence children's PTG. For instance, one sample of children reported particularly large increases in religiosity and spirituality as compared to other domains of PTG (Kilmer et al., 2009), an effect that might have been a reflection of the especially religious community and families from which these children came. Parents could certainly promote certain types of coping strategies and explanations or interpretations of a traumatic event, a variable unique to children and adolescents and worth exploring.

PTG in Relationships, Groups, and Larger Systems

Traumatic events often affect several people at once (e.g., natural disasters, acts of terror, war conflict), and even those events that are seemingly individual (e.g., chronic illness, sexual assault) significantly affect one's loved ones and surrounding social network. Human systems of any size—romantic partners, families, communities, and even an entire nation's citizens—can come together in the wake of trauma to support and enhance one another's psychological growth (Calhoun & Tedeschi, 2006). Thus far, research on relationships in PTG has focused mostly on the role of social support in promoting a trauma survivor's PTG (Calhoun & Tedeschi, 2006), with a meta-analysis illustrating a moderate positive relationship (Prati & Pietrantonio, 2009). However, researchers are now seeking a more sophisticated and nuanced understanding of how PTG might function interpersonally, extending beyond the individual to affect close others, as well as how PTG manifests in larger groups and systems of people.

At the most proximal and intimate level, growth may occur between two individuals in a close relationship. One way in which this manifests is the “spreading” of PTG between partners. Several studies have demonstrated that when one partner in a close relationship reports PTG, the other reports a corresponding level of PTG (Shakespeare-Finch & Barrington, 2012; Shakespeare-Finch & Enders, 2008; Thornton & Perez, 2006). This effect is seen in bereaved parents (Büchi et al., 2009), cancer patients and their partners or caregivers (Moore et al., 2011; Weiss, 2004), and married couples who have endured a severe flood (Canevello, Michels, & Hilaire, in press-b). Canevello, Michels, and Hilaire (in press-a) found that this “contagious” effect was mediated by increased interpersonal responsiveness—when one person experiences PTG, they become more responsive to and understanding of their partner, which in turn leads to

the partner's increased growth. Dyadic research in PTG has also turned to examining the consequences of one partner's PTG for the other. For instance, Canevello, et al. (in press-b) found that in close relationships, one partner's PTG was associated with downstream effects for the other partner, particularly increased relationship quality and decreased psychological distress. Another growth process that has been demonstrated between two people is that of *vicarious* or *secondary* PTG (Arnold, Calhoun, Tedeschi, & Cann, 2005; Shoji et al., 2014). Mental health professionals treating traumatized clients often experience growth and benefits from secondary exposure to a traumatic experience. These findings demonstrate that close others are sensitive to victims' PTG (Shakespeare-Finch & Barrington, 2012; Shakespeare-Finch & Enders, 2008; Thornton & Perez, 2006; Weiss, 2004) and extend them to examine the mechanisms by which this sensitivity occurs. Future research might examine how to use interventions to promote relationship-focused coping strategies (e.g., Bodenmann & Randall, 2012) in order to improve close others' psychological well-being, reduce distress, and potentially, foster their PTG.

The scope of possible growth after trauma can extend to encompass several people, from family systems to communities, organizations, entire cultural subgroups, or nations. Families have traditionally been considered as a context for supporting or hindering an individual's growth (Berger, 2015; Harvey, Barnett, & Rupe, 2006), but there has been some consideration of interpersonal and collective growth processes among family members (e.g., Figley, 1989), such as the family's shared changes in assumptive world beliefs and increased conviction that together, they can successfully brave future stressors (Antonovsky & Sourani, 1988). Future research might address suggestions for formally extending the PTG model to families (Berger & Weiss, 2009) and expand upon how trauma shapes individual members' experiences and collective processes (Berger, 2015).

On a larger scale, entire communities and cultural subgroups can share particular post-traumatic responses and consequent coping strategies in response to major world events (e.g., Abu-Raiya, Pargament, & Mahoney, 2011). Often, in the wake of trauma, communities develop a *collective narrative*, or a way for members to interpret and give meaning to the event—a process not unlike schema reconstruction that happens on an individual level (Calhoun & Tedeschi, 2006). Bloom (1998) and Tedeschi (1999) pointed out that larger groups and societies appear to respond to widespread or collective trauma with social change efforts. Perhaps this perspective is more sociological, but there are likely links between the transformations of cultures and the transformations of individuals. There may be a reciprocal relationship where individuals and larger social

systems experience PTG by continually influencing each other through the exchange of narratives, reconsideration of social norms, and breaking apart of traditions.

Longitudinal Research

Most of the PTG literature has examined its many correlates, spanning environmental, social, psychological, and demographic factors through cross-sectional design (see Helgeson, Reynolds, & Tomich, 2006 and Prati & Pietrantonio, 2009 for meta-analyses). However, few studies have examined PTG over time, which remains a barrier to fully understanding causality in PTG: What precedes and succeeds personal transformation after trauma? Vazquez, Perez-Sales, and Ochoa (2015) claim that no standard causal model exists, leading to varied interpretations of how this transformation might be occurring, such as improved coping strategies (e.g., Zoellner & Maercker, 2006), distortions of reality (Frazier et al., 2009; Taylor & Armor, 1996; Tennen & Affleck, 2009), personality changes (e.g., Jayawickreme & Blackie, 2014), manifestation of a natural tendency to change and grow with time (Tennen & Affleck, 2002), or genuine changes in behavior and identity (Tedeschi, Addington, Cann, & Calhoun, 2014). To answer this question of mechanism(s), more longitudinal examination of PTG is necessary to better understand its predictors and consequences. For instance, in the months and years following a traumatic event, which individual and environmental factors differentially predict PTG, and does PTG predict changes in well-being and adjustment over time?

To date, only a handful of longitudinal studies have addressed these questions. One study of female breast cancer patients found that greater social support seeking and cognitive coping at the time of surgery were associated with greater PTG five months later (Silva, Crespo, & Canavarro, 2012). In a sample of patients undergoing treatment for acute leukemia, Danhauer et al. (2013) found that a longer period of time since diagnosis, younger age, greater deliberate rumination, and greater challenge to core beliefs all predicted greater increases in PTG in the weeks following diagnosis and initiation of chemotherapy. These researchers have also reported stability of PTG over time in breast cancer patients (Danhauer, et al., 2015). In contrast, Wang et al. (2014) reported stable high (27.4 percent), high decreasing (39.4 percent), low increasing (16.9 percent), and low decreasing (16.9 percent) trajectories of PTG over one year in breast cancer patients. Blix and colleagues (2015) reported stable levels of PTG over two years in trauma survivors of the Oslo bombing. Finally, Valdez and Lilly (2014) examined longitudinal changes in assumptive beliefs in women who were

recent victims of intimate partner violence, finding that they experienced significant positive changes to their beliefs about themselves and the world one year later as compared to women who had not experienced this trauma. These changes in assumptive world beliefs accounted for 37 percent of the variance seen in PTG changes from baseline to follow-up. Thus, there seems to be evidence for PTG stability over time, but not in everyone. Predicting what will determine lasting PTG requires much more research consideration.

Although studies are beginning to point to individual characteristics that may differentially predict PTG, including demographic variables and nature of the traumatic event (e.g., Morris & Shakespeare-Finch, 2011a), many more psychosocial variables remain contenders for future study as predictors and/or consequences of PTG longitudinally. Possibilities include optimism (Prati & Pietrantonio, 2009; Zoellner, Rabe, Karl, & Maercker, 2008), self-efficacy (e.g., Cieslak et al., 2009), emotion regulation (e.g., Larsen & Berenbaum, 2015; Wild & Paivio, 2003), personality traits like openness to experience (e.g., Wilson & Boden, 2008; Zoellner et al., 2008), coping strategies (e.g., Prati & Pietrantonio, 2009), meaning in life (Triplett et al., 2012), social support (e.g., Prati & Pietrantonio, 2009), mindfulness (e.g., Chopko & Schwartz, 2009), gratitude (e.g., Vernon, 2012), empathy (Morris, Shakespeare-Finch, & Scott, 2011), and many others. Ultimately, studies that address changes in growth over time can elucidate possible causal consequences of PTG, which holds tremendous potential for developing and implementing interventions to garner growth and associated positive changes.

PTG Interventions

As we further clarify the processes underlying PTG, attention can turn to supporting and fostering growth through interventions. Several researchers have cited general guidelines for how PTG might be promoted, often applying elements of various psychotherapeutic approaches in order to alleviate pain and disruptions in functioning while fostering well-being and resolution (e.g., Berger, 2015; Calhoun & Tedeschi, 2012; Tedeschi & McNally, 2011). This often centers on the use of cognitive processing of the event through self-disclosure (Berger, 2015). From a constructive narrative perspective, this provides the means for trauma survivors to rework their core beliefs and life narrative and to consider alternative perspectives that can assist them in schema change (Berger, 2015; Meichenbaum, 2006; Neimeyer, 2001; Tedeschi & Calhoun, 2004). However, few studies have applied this theoretical discussion to formal development and empirical

testing of interventions aimed at increasing PTG. Given the critical roles of schema reconstruction (Janoff-Bulman, 2006) and self-disclosure (Taku et al., 2009) in the growth process, a promising framework upon which to build PTG interventions is verbal and/or written expression. As explored later, such interventions can be developed through experimental studies with both clinical and general populations, as well as in the context of psychotherapeutic treatment.

Expressive writing, a means of mitigating the negative psychological impact of a traumatic event by writing about one's deepest thoughts and concerns surrounding the experience (Pennebaker & Beall, 1986), is a promising strategy for PTG intervention, as it helps survivors form a more coherent trauma narrative, which promotes positive outcomes such as reduced intrusive rumination, depressive symptomatology, and perceived stress (Danoff-Burg, Mosher, Seawell, & Agee, 2010; Lu, Zheng, Young, Kagawa-Singer, & Loh, 2012; Smyth, 1998; Smyth, Hockemeyer, & Tull-och, 2008). For decades, expressive writing interventions have been associated with improved physical and psychological health outcomes in various populations (see Frattaroli, 2006; Smyth, 1998), but only recently have studies implemented this strategy specifically to promote PTG (Danoff-Burg et al., 2010; Groleau, 2015; Knaevelsrud, Liedl, & Maercker, 2010; Slavin-Spenny, Cohen, Oberleitner, & Lumley, 2011; Smyth et al., 2008; Stockton, Joseph, & Hunt, 2014; Ullrich & Lutgendorf, 2002). The format of these interventions is generally an online, short-term (4–8 weeks) program entailing multiple 15-minute writing sessions per week. Overall, these studies have demonstrated the ability of such interventions to significantly increase PTG pre- to post-treatment. Future studies that replicate and refine expressive writing PTG interventions should consider differential effects of the treatment by traumatic event type, dosage (Pennebaker & Chung, 2011), and underlying mechanisms like increased deliberate rumination.

In clinical settings, mental health professionals can foster PTG by serving as expert companions to traumatized clients (see Calhoun & Tedeschi, 2012; Tedeschi, Calhoun, & Groleau, 2015). Beyond this type of relationship for the facilitation of PTG, a few reports suggest that standard trauma treatment may generate PTG. There is some evidence that trauma survivors undergoing prolonged exposure therapy for PTSD experienced significant increases in PTG from pre- to post-treatment, particularly in the domains of relating to others, new possibilities, and personal strength (Hagenaars & van Minnen, 2010). Other cognitive-behavioral interventions have also produced PTG outcomes (Zollner & Maercker, 2006), even though they were not designed specifically to do so. Alternatively,

Senol-Durak and Ayvasik (2010) suggested that interventions should aim to enhance problem-focused coping skills in trauma survivors to enhance PTG. In developing a therapy approach more clearly focused on PTG facilitation, Tedeschi and McNally (2011) and Calhoun and Tedeschi (2013) proposed an integrative therapy utilizing several approaches for promoting PTG. These approaches include psychoeducation about trauma and PTG, teaching strategies for managing autonomic nervous system hyperactivation, encouraging constructive self-disclosure about the event and its aftermath, shaping this story into a trauma narrative that explores each domain of growth, and using a revised life narrative to establish life principles of service and mission (i.e., ways of thinking and acting in the future to solidify and even enhance their growth) that will be robust to future trauma and foster resilience. This integrated approach is anchored in the Tedeschi and Calhoun model of PTG.

Conclusion

In conclusion, it is safe to say that the concept of PTG continues to attract attention at a time when mental health professionals as well as the public are more aware of widespread trauma and there is a need to find ways to help traumatized persons. The PTG concept offers for trauma survivors and those who wish to assist them a possibility for life that is more than mere survival in the aftermath of trauma. Although PTG is not a universal outcome, it is common enough to suggest that with additional understanding of the PTG process, it can be facilitated and become even more common. Hopefully, through this process, trauma survivors will make major contributions to others around them through their hard-earned wisdom.

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