

Fixing the Growth Illusion: New Directions for Research in Resilience and Posttraumatic Growth

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Abstract

The literature on resilience and posttraumatic growth has been instrumental in highlighting the human capacity to overcome adversity by illuminating that there are different pathways individuals may follow. Although the theme of strength from adversity is attractive and central to many disciplines and certain cultural narratives, this claim lacks robust empirical evidence. Specific issues include methodological approaches of using growth-mixture modeling in resilience research and retrospective assessments of growth. Conceptually, limitations exist in the examination of which outcomes are most appropriate for studying resilience and growth. We discuss new research intended to overcome these limitations, with a focus on prospective longitudinal designs and the value of integrating these disciplines for furthering our understanding of the human capacity to overcome adversity.

Keywords

resilience, posttraumatic growth, adversity, adaptation, methodological approaches to studying adversity

The mantra “what doesn’t kill you makes you stronger” resonates with many people. Given both the degree and types of adversity that almost all individuals confront over the course of their lives, this cultural narrative can be a source of strength. Although this message is strong, uplifting, and ingrained in the societal DNA of contemporary (American) society, there is, however, a significant disconnect between this cultural narrative and the quality of empirical evidence on growth and resilience. This cultural appeal may have led to researchers proclaiming too hastily that growth and resilience are typical responses following adversity.

The interest in posttraumatic growth and resilience has been marked by recent debates and controversies (Infurna & Luthar, 2018; Jayawickreme & Blackie, 2014). Most of the research claiming that a majority of people who experience adversity either remain unscathed or experience positive changes suffers from significant methodological limitations, including an overreliance on retrospective self-perceived assessments of growth. Additionally, resilience research typically focuses on single outcomes and utilizes statistical methods that inflate the prevalence of resilience. Greater clarity in the methodological approaches employed in this area

of research is needed to ascertain the degree to which growth and resilience transpire following adversity and, conceptually, domains through which resilience and growth will manifest.

Resilience

Resilience research has its origins in research dating from the 1950s and 1960s, when developmental researchers observed positive outcomes in children growing up in adverse circumstances (Luthar, Cicchetti, & Becker, 2000; Rutter, 1987). The past 15 to 20 years has seen an emergence of resilience research in adults, which has examined individuals’ ability to overcome various adversities, including bereavement, chronic illness, and military deployment. In the adulthood

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literature, resilience is broadly defined as a trajectory of stable, healthy levels of psychological functioning (mental health or well-being) before and after adversity (Bonanno & Diminich, 2013); this assumes that individuals are largely unperturbed by the adversity. Multiple studies have suggested that resilience is the most likely pathway following adversity (Bonanno & Diminich, 2013); a recent review by Infurna and Luthar (2018) reevaluated the resilience literature on the basis of the issues described below, concluding that resilience is not as common as previously thought.

Two key issues have arisen in the adult resilience literature: (a) Existing findings are an artifact of the methodological approach, and (b) there is an overwhelming focus on single outcomes in empirical studies. This literature has almost exclusively been studied using growth-mixture modeling, which is a statistical method of analysis that illuminates discrete trajectories and relies on two key methodological assumptions: homogeneity of variance and slope variances set to 0. Of the studies that have used growth-mixture modeling in this literature, 86% and 68% have applied the aforementioned assumptions, respectively (Infurna & Luthar, 2018; Fig. 1). These assumptions restrict how much participants' trajectories differ from one another and variations in how much they change over time. That is, between-persons differences in the data are the same for the entire trajectory, and changes over time occur at the same rate within each trajectory. Each assumption typically corresponds to the default settings in several software programs commonly used for statistical analysis.

Infurna and Luthar (2016) found that these a priori assumptions inflate the number and percentage of individuals who are resilient to adversity. Rates of resilience to unemployment were reported to be 81% when the aforementioned methodological assumptions were used; after removing the restrictive assumptions and applying specifications of the model that are more in line with conceptual assumptions, they found that rates were much lower, approximately 48% (similar findings were observed for divorce and spousal loss; Infurna & Luthar, 2016). Diallo, Morin, and Lu (2016) further confirmed the problems of applying these methodological assumptions by showing that their application led to the overextraction of trajectories; removing these methodological assumptions improved the ability to recover the proper number of trajectories (similar issues have been raised by Sher, Jackson, & Steinley, 2011). These findings signify that by applying more justifiable assumptions, estimates of resilience are much lower than have been reported previously. Thus, categorical statements about rates of resilience need to be tempered because findings vary substantially depending on statistical model specifications.

Much of the adult resilience literature is based on the assumption that resilience is a unidimensional reaction to adversity. More than 80% of studies in which growth-mixture modeling was used to examine resilience have included a single outcome at a time, such as depressive symptoms (Infurna & Luthar, 2018). On the basis of single outcomes (Infurna & Luthar, 2018), researchers have suggested that statements of resilience are the normative response to adversity. Assuming that resilience is unidimensional presumes that resilience in the measured outcome will correspond with resilience in other pertinent yet unexamined domains.

Building on research in the developmental literature (Luthar, Doernberger, & Zigler, 1993), recent research has shown that resilience is a multidimensional construct. Infurna and Luthar (2017a) found that the percentage of individuals who displayed a resilient trajectory to spousal loss differed across five outcomes: life satisfaction (66%), negative affect (19%), positive affect (26%), general health (37%), and physical functioning (28%). When all five outcomes were accounted for collectively, 8% showed resilience across all outcomes examined, whereas 20% did not show a resilient trajectory in any of the outcomes (similar findings were observed for child loss; Infurna & Luthar, 2017b). These findings demonstrate that resilience manifests differently across the type and number of outcomes examined; individuals may show resilience in the well-being domain, but this may not transfer to other domains, such as health and vice versa. Because of the substantial variation in adjustment across outcomes, researchers should not "diagnose" resilience on the basis of a single outcome. This underscores the need for a multidimensional operationalization of resilience and a more comprehensive theory about what the key outcomes should be.

Posttraumatic Growth

Although the question of whether failure, trauma, and tragedy can offer benefits is a central theme of literature, religion, and philosophy, its systematic study in psychology arguably has its origins in clinical researchers using principles from humanistic psychology to explain the experience of survivors of clinical trauma (Tedeschi & Calhoun, 2004). Tedeschi and Calhoun (1996) coined the term *posttraumatic growth* to capture the positive psychological changes they witnessed as clinical psychologists among their patients who were coming to terms with highly stressful and challenging life events. Since their initial validation of the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), there has been marked interest in its study and the presumed associated mental and physical health benefits. The focus has been on the transformational

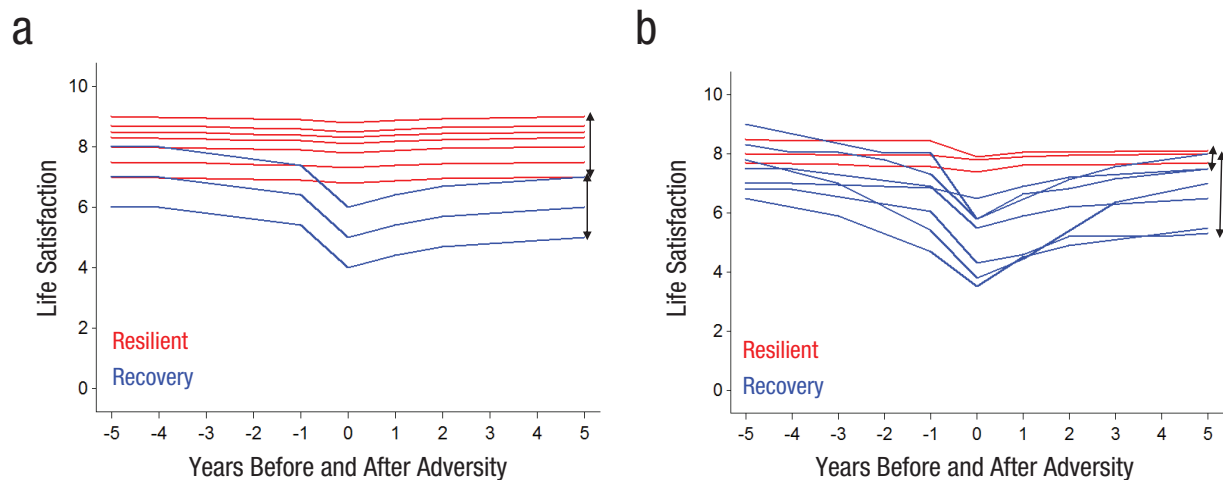


Fig. 1. Conceptual representation of the two core methodological assumptions underlying the use of growth-mixture modeling: homogeneity of variance and slope variances set to 0. The graphs illustrate changes in life satisfaction when (a) these assumptions are implemented and (b) these assumptions are relaxed. Each line represents 1 individual's change in life satisfaction before and after an adverse event. In (a), each participant who belongs to the resilient or recovery trajectory exhibits the same amount of change, differing only in his or her overall level of life satisfaction. The double-headed arrows signify that the two groups show the same amount of between-person differences in life satisfaction (distribution of scores across the two groups is the same). Setting the slope variances to 0 is demonstrated by all the individuals who belong to the resilient or recovery groups exhibiting the same rate of change in life satisfaction. Trajectories for the same 10 individuals are shown in (b). Note that there are three important differences between (a) and (b). First, the length of the double-headed arrows in (b) differs between the resilient and recovery groups. The resilient group, as a whole, shows less variability than the recovery group, which shows more variability around the group mean. Relaxing the homogeneity-of-variance assumption does not assume that the distribution of scores between the resilient and recovery groups is the same. Second, when the slope variances are freely estimated, individuals are allowed to exhibit different rates of change between one another. Some individuals classified in the recovery trajectory show larger drops in life satisfaction (e.g., 2 or 4 points) at adversity onset, whereas others show smaller changes. A third difference between the two panels is the difference in the percentage of people classified in the resilient and recovery groups. In (b), there are more individuals classified in the recovery trajectory (70%) than the resilient trajectory (30%). Ultimately, both panels illustrate outcomes of the major decisions made when using growth-mixture modeling. The methodological assumptions shown in (a) have been shown to misclassify participants into the wrong group and inflate the percentage of individuals who belong to the resilient group. Conversely, research has shown that the methodological assumptions shown in (b) lead to a more accurate representation of the data (see Diallo, Morin, & Lu, 2016; Infurna & Luthar, 2016).

role that adversity can play in fostering growth (Joseph & Linley, 2008; Tedeschi & Calhoun, 2004). People frequently report such benefits following the experience of adversity. An early review of the literature found that among survivors of different traumas, 58% to 83% retrospectively reported experiencing growth following adversity (Joseph & Linley, 2008). More recently, a study claimed that 92.8% of a sample of adolescents reported growth following adversity (Vloet et al., 2014; for further examples of the ubiquity of self-perceived growth, see Tedeschi, Shakespeare-Finch, Taku, & Calhoun, 2018, Chapter 5).

The PTGI remains the most commonly used method to assess posttraumatic growth; 94% of articles published between 2016 and 2017 utilized it as the main assessment of growth (Jayawickreme, Rivers, & Rauthmann, 2018). In most studies, posttraumatic growth was assessed with cross-sectional designs by asking participants to recall retrospectively how they were before the adversity, estimate how much they have changed since the

adversity, and describe the extent to which they believe this change can be attributed to the adversity. This requires a mentally taxing procedure involving five steps: (a) Deduce one's current standing on the dimension, (b) recall one's prior standing before the adversity, (c) compare those standings, (d) calculate the degree of change, and (e) evaluate how much of the change was due to the adversity (Ford, Tennen, & Albert, 2008). The use of this scale assumes that people can recall prior trait levels accurately. However, self-reported perceptions of change are not strongly associated with actual change (Robins, Nofhle, Trzesniewski, & Roberts, 2005). People likely do not have the ability to ascertain the extent to which specific adversities caused personality change (Jayawickreme & Zachry, 2018) and may not be able to consistently identify key adversities retrospectively that led to growth (Jayawickreme et al., 2018).

Self-perceived growth likely reflects multiple sources of information. Retrospective self-perceived measures such as the PTGI may reflect meaningful personality

change to some degree but also maladaptive reality distortions, selective appraisals, coping strategies, personality characteristics, ways of explaining emotion levels, reflections of people's implicit theories of change, and beliefs that their past selves were worse than they actually were (Tennen & Affleck, 2009). For example, people may derogate their past selves to be able to perceive growth, suggesting that people may perceive growth by misremembering their pretrauma personality (McFarland & Alvaro, 2000) and use this as a strategy to understand and cope with their experience (Tennen & Affleck, 2009). Such reports may also be influenced by expectation biases stemming from dominant cultural scripts and salient "master narratives" (McLean & Syed, 2015). Moreover, being asked this in a research study may color their responses because reporting on growth may not have been something people would have done spontaneously otherwise.

This is problematic given that posttraumatic growth has been conceptualized explicitly in terms of positive personality change (Jayawickreme & Blackie, 2014, 2016). Tedeschi and Calhoun (2004) note 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). Given the 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, little is in fact known about the nature of positive changes following adversity. The few prospective longitudinal studies to date have not found conclusive evidence for actual personality change among their participants (Frazier et al., 2009; Yanez, Stanton, Hoyt, Tennen, & Lechner, 2011). Frazier et al. (2009) found that depending on the outcome, only 5% to 25% of participants exhibited real growth following trauma. Furthermore, these studies found low correlations between scores on the PTGI and actual change from before trauma to after trauma, which calls into question research that uses measures such as the PTGI.

Although self-perceived growth has been found to be associated with adaptive coping strategies following trauma (Frazier et al., 2009; Wang et al., 2017), it is not associated with actual change, suggesting that reporting growth may be a coping strategy rather than a reflection of real personality change. Marshall, Frazier, Frankfurt, and Kuijer (2015) additionally showed that when given the opportunity to report positive, negative, or no change, most people reported no change. Most assessments do not provide a balanced picture of positive *and* negative changes that people have experienced; no questions on the PTGI focus on the reporting of negative experiences (Boals & Schuler, 2018). More broadly, it is unclear what self-perceived growth as a

psychological construct represents and whether it is distinct from coping strategies such as benefit finding (Davis, Nolen-Hoeksema, & Larson, 1998) or secondary control (Frazier, Tennen, & Meredith, 2017). Given these concerns, we believe that researchers interested in positive changes following adversity should show extreme caution when interpreting posttraumatic-growth research that has utilized retrospective self-perceived measures such as the PTGI.

Future Directions in Resilience and Posttraumatic-Growth Research

Our review reveals that although the two lines of research developed almost simultaneously and focus on closely related concepts, the strengths of the one have not been applied to the other. For example, a strength of the resilience literature is the use of prospective research designs, whereas the posttraumatic-growth literature relies on cross-sectional designs. A weakness of resilience studies is their unidimensional approach, but researchers who conduct posttraumatic-growth studies have long had a multidimensional conceptualization of growth following adversity. This could be due to the nature of how each literature developed. The posttraumatic-growth literature was largely developed by clinical researchers seeking to explain the narratives of survivors of clinical trauma. The resilience literature, on the other hand, developed from the examination of different trajectories of change in longitudinal research designs following adversities, such as bereavement. We also note that the issues raised here are not confined to these two literatures but also to research that has exclusively relied on life-event and coping checklists, despite compelling (and longstanding) evidence that both approaches are flawed (Coyne & Gottlieb, 1996).

Integrating the resilience and growth literatures can provide important mutual benefits. Conceptually, integration would allow investigation of the degree of overlap across the manifestations of resilience and growth, as well as the inclusion of outcomes germane to each literature. Methodologically, this would involve research designs that prospectively examine (positive or negative) change before and after adversity, along with a stronger sense of and rationale involved in the statistical analyses behind the research (e.g., proper use of growth-mixture modeling and moving away from retrospective assessments).

Examining changes in personality dimensions over and above mental health and well-being represents an important avenue for future research. Given the link posited between adversity and optimal functioning (Ryff & Singer, 2002), the impact of adversity on

character strengths and wisdom-related constructs should be examined (Jayawickreme & Blackie, 2016). Considering such dimensions would make it possible to identify factors that foster adversity-exposed individuals' tendencies for compassion, empathy, or humility. Whereas posttraumatic-growth researchers have long examined multiple domains from which growth could occur, resilience researchers have only recently incorporated a multidimensional approach.

Utilizing methods beyond global self-report assessments, such as informant reports, is important. For adults who have experienced adversity, examining whether one's social network rated that individual as exhibiting resilience or growth could provide valuable information (Blackie, Jayawickreme, Helzer, Forgeard, & Roepke, 2015; Clement & Bollinger, 2016; Infurna & Luthar, 2018). Examining manifestations of constructs relevant to resilience and posttraumatic growth in individuals' daily life also represents an important alternative method (Blackie et al., 2017). We caution, however, that although informant reports have promise, there are significant caveats when using them to study posttraumatic growth. Informant reports may be influenced by reports of growth shared with them by targets (Frazier, Coyne, & Tennen, 2014). Furthermore, self-confirming interpersonal dynamics may lead targets to insulate close others from information that contradicts their "growth-oriented" self-concept (see Swann, Rentfrow, & Guinn, 2003). Moreover, it remains unclear which dimensions of posttraumatic growth are best corroborated by informants. Further research is needed to examine the value of informant reports as a meaningful assessment of both resilience and posttraumatic growth.

Little is known about the timing at which resilience and growth manifests. Resilience research has mostly been tethered to the spacing of assessments from longitudinal panel surveys as opposed to theoretical considerations, whereas the posttraumatic-growth literature has stipulated that growth happens but without elucidating a clear trajectory. Most of these studies have retrospectively assessed growth from 3 months to 1 year following trauma. Future research that utilizes a prospective longitudinal design will allow researchers to examine the time course through which resilience and growth manifests and provide clarity on whether long-term changes in fact occur. The mental health of some individuals may rebound 6 months following adversity, whereas it may take others several years to fully recover. This issue is largely unexplored. When annual assessments are used and individuals show a resilient trajectory, how are we certain that they did not show any declines between assessments? The resilient trajectory of stability could be a function of sparse assessments as opposed to the individuals' capability to be resilient.

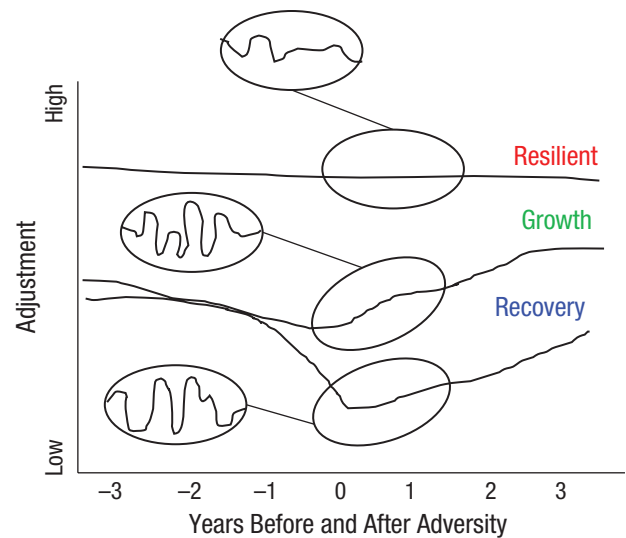


Fig. 2. Potential trajectories that individuals may exhibit following adversity. The resilient trajectory is characterized by stable, healthy levels of adjustment; the growth trajectory is characterized by improvements in adjustment that are enduring; and the recovery trajectory is characterized by declines because of the adversity, followed by gradual improvements to near-previous levels over time. With the use of sparse longitudinal assessments, it is difficult to examine the course of adjustment during the time immediately following adversity as shown in the bubble inserts (which represent changes over months). More frequent assessments will permit researchers to examine whether changes in adjustment that occur immediately following the adversity are associated with enduring changes.

To overcome these limitations, researchers need to make more frequent (and closely spaced) assessments (for a discussion, see Infurna & Luthar, 2018). Figure 2 illustrates three trajectories that are typically observed when annual assessments are utilized. The more interesting questions center on what happens during the yearly intervals: Are individuals showing stability or is there variability, as shown in each bubble insert of Figure 2? And does this variability signify how individuals are coping with adversity? The individual's immediate response to adversity could transform into an enduring response. This leads to the following question: When do we classify the change following adversity to be resilience or growth? At 3 months, 6 months, or 1 year? The decision will heavily depend on the assessment interval. Researchers should further acknowledge and be cognizant of the fact that there are large between-persons differences in the degree to which adversities affect individuals, which can lead to resilience and growth manifesting at different times across persons and resulting in different outcomes. Such a design will be instrumental in the examination of whether change is transient or enduring and the mechanisms underlying resilience and growth.

Conclusion

The research on resilience and posttraumatic growth is compelling because it delivers a message of hope and optimism following adversity. The significance of this research, as well as the manner in which empirical findings are portrayed in the public eye (Rendon, 2012), makes it of utmost importance to carefully consider the methodological approaches that are utilized and to provide greater conceptual clarity on what constitutes resilience and growth. This issue takes on special significance in the wake of psychology's discussion of the validity and replicability of key findings (Vazire, 2018). Current research suggests that interventions are not necessary to help individuals affected by adversity (given that resilience is seen as the most common outcome) and that those who struggle are not "strong enough" to grow from their experience (given the apparent ubiquity of growth). Being both more circumspect about claims regarding resilience and growth and more open about the methodological challenges of such work represent important initial steps.

Recommended Reading

- Frazier, P., Tennen, H., Gavian, M., Park, C., Tomich, P., & Tashiro, T. (2009). (See References). A representative study that prospectively examined posttraumatic growth following adversity.
- Infurna, F. J., & Luthar, S. S. (2016). (See References). A detailed discussion of the various methodological assumptions surrounding growth-mixture modeling.
- Infurna, F. J., & Luthar, S. S. (2018). (See References). A systematic review of the resilience literature that reevaluates the commonness of resilience to adversity, discusses directions for future research, and introduces a conceptual framework for studying resilience to adversity.
- Jayawickreme, E., & Blackie, L. E. R. (2014). (See References). A comprehensive, highly accessible overview of the issues surrounding the literature on posttraumatic growth.
- Tennen, H., & Affleck, G. (2009). (See References). A book chapter that systematically raises attention to the issues surrounding the use of retrospective assessments for examining posttraumatic growth.

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References

- Blackie, L. E. R., Jayawickreme, E., Helzer, E. G., Forgeard, M. J., & Roepke, A. M. (2015). Investigating the veracity of self-perceived posttraumatic growth: A profile analysis approach to corroboration. *Social Psychological & Personality Science*, *6*, 788–796.
- Blackie, L. E. R., Jayawickreme, E., Tsukayama, E., Forgeard, M. J., Roepke, A. M., & Fleeson, W. (2017). Post-traumatic growth as positive personality change: Developing a measure to assess within-person variability. *Journal of Research in Personality*, *69*, 22–32.
- Boals, A., & Schuler, K. L. (2018). Reducing reports of illusory posttraumatic growth: A revised version of the Stress-Related Growth Scale (SRGS-R). *Psychological Trauma: Theory, Research, Practice, and Policy*, *10*, 190–198.
- Bonanno, G. A., & Diminich, E. D. (2013). Annual research review: Positive adjustment to adversity – trajectories of minimal-impact resilience and emergent resilience. *The Journal of Child Psychology and Psychiatry*, *54*, 378–401.
- Clement, S., & Bollinger, R. (2016). Perspectives on character virtue development. *Research in Human Development*, *13*, 174–181.
- Coyne, J. C., & Gottlieb, B. H. (1996). The mismeasure of coping by checklist. *Journal of Personality*, *64*, 959–991.
- Davis, C. G., Nolen-Hoeksema, S., & Larson, J. (1998). Making sense of loss and benefiting from the experience: Two construals of meaning. *Journal of Personality and Social Psychology*, *75*, 561–574.
- Diallo, T. M. O., Morin, A. J. S., & Lu, H. (2016). Impact of misspecifications of the latent variance-covariance and residual matrices on the class enumeration accuracy of growth mixture models. *Structural Equation Modeling: A Multidisciplinary Journal*, *23*, 507–531.
- Ford, J. D., Tennen, H., & Albert, D. (2008). A contrarian view of growth following adversity. In S. Joseph & P. A. Linley (Eds.), *Trauma, recovery, and growth: Positive psychological perspectives on posttraumatic stress* (pp. 297–324). Hoboken, NJ: John Wiley & Sons.
- Frazier, P., Coyne, J., & Tennen, H. (2014). Post-traumatic growth: A call for less, but better, research. *European Journal of Personality*, *28*, 337–338. doi:10.1002/per.1970
- Frazier, P., Tennen, H., Gavian, M., Park, C., Tomich, P., & Tashiro, T. (2009). Does self-reported posttraumatic growth reflect genuine positive change? *Psychological Science*, *20*, 912–919.
- Frazier, P., Tennen, H., & Meredith, L. (2017). Three generations of research on perceived control. In J. W. Reich & F. J. Infurna (Eds.), *Perceived control: Theory, research, and practice in the first 50 years* (pp. 171–200). New York, NY: Oxford University Press.

- Infurna, F. J., & Luthar, S. S. (2016). Resilience to major life stressors is not as common as thought. *Perspectives on Psychological Science, 11*, 175–194.
- Infurna, F. J., & Luthar, S. S. (2017a). The multidimensional nature of resilience to spousal loss. *Journal of Personality and Social Psychology, 112*, 926–947.
- Infurna, F. J., & Luthar, S. S. (2017b). Parents' adjustment following the death of their child: Resilience is multidimensional and differs across outcomes examined. *Journal of Research in Personality, 68*, 38–53.
- Infurna, F. J., & Luthar, S. S. (2018). Re-evaluating the notion that resilience is commonplace: A review and distillation of directions for future research, practice, and policy. *Clinical Psychology Review, 65*, 43–56.
- Jayawickreme, E., & Blackie, L. E. R. (2014). Post-traumatic growth as positive personality change: Evidence, controversies and future directions. *European Journal of Personality, 28*, 312–331.
- Jayawickreme, E., & Blackie, L. E. R. (2016). *Exploring the psychological benefits of hardship: A critical reassessment of posttraumatic growth*. New York, NY: Springer.
- Jayawickreme, E., Rivers, J., & Rauthmann, J. R. (2018). Do we know how adversity impacts human development? *Research in Human Development, 15*, 294–316.
- Jayawickreme, E., & Zachry, C. E. (2018). Positive personality change following adversity. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *The SAGE handbook of personality and individual differences* (pp. 450–464). Thousand Oaks, CA: SAGE.
- Joseph, S., & Linley, P. A. (2008). Psychological assessment of growth following adversity: A review. In S. Joseph & P. A. Linley (Eds.), *Trauma, recovery, and growth* (pp. 21–36). Hoboken, NJ: John Wiley & Sons.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543–562.
- Luthar, S. S., Doernberger, C. H., & Zigler, E. (1993). Resilience is not a unidimensional construct: Insights from a prospective study of inner-city adolescents. *Development and Psychopathology, 5*, 703–717.
- Marshall, E. M., Frazier, P., Frankfurt, S., & Kuijer, R. G. (2015). Trajectories of posttraumatic growth and depreciation after two major earthquakes. *Psychological Trauma: Theory, Research, Practice, and Policy, 7*, 112–121.
- McFarland, C., & Alvaro, C. (2000). The impact of motivation on temporal comparisons: Coping with traumatic events by perceiving personal growth. *Journal of Personality and Social Psychology, 79*, 327–343. doi:10.1037/0022-3514.79.3.327
- McLean, K. C., & Syed, M. (2015). Personal, master, and alternative narratives: An integrative framework for understanding identity development in context. *Human Development, 58*, 318–349.
- Rendon, J. (2012, March 22). Post-traumatic stress's surprisingly positive flip side. *The New York Times*. Retrieved from <https://www.nytimes.com/2012/03/25/magazine/post-traumatic-stress-surprisingly-positive-flip-side.html>
- Robins, R. W., Nofle, E. E., Trzesniewski, K. H., & Roberts, B. W. (2005). Do people know how their personality has changed? Correlates of perceived and actual personality change in young adulthood. *Journal of Personality, 73*, 489–521.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*, 316–331.
- Ryff, C. D., & Singer, B. (2002). Flourishing under fire: Resilience as a prototype of challenged thriving. In C. L. M. Keyes & J. Haidt (Eds.), *Flourishing: Positive psychology and the life well-lived* (pp. 15–36). Washington, DC: American Psychological Association.
- Sher, K. J., Jackson, K. M., & Steinley, D. (2011). Alcohol use trajectories and the ubiquitous cat's cradle: Cause for concern? *Journal of Abnormal Psychology, 120*, 322–335.
- Swann, W. B., Jr., Rentfrow, P. J., & Guinn, J. S. (2003). Self-verification: The search for coherence. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 367–383). New York, NY: Guilford Press.
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–472. doi:10.1002/jts.2490090305
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*, 1–18.
- Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., & Calhoun, L. G. (2018). *Posttraumatic growth: Theory, research, and applications*. New York, NY: Routledge.
- Tennen, H., & Affleck, G. (2009). Assessing positive life change: In search of meticulous methods. In C. L. Park, S. C. Lechner, M. H. Antoni, & A. L. Stanton (Eds.), *Medical illness and positive life change: Can crisis lead to personal transformation?* (pp. 31–49). Washington, DC: American Psychological Association.
- Vazire, S. (2018). Implications of the credibility revolution for productivity, creativity, and progress. *Perspectives on Psychological Science, 13*, 411–417.
- Vloet, A., Simons, M., Vloet, T. D., Sander, M., Herpertz-Dahlmann, B., & Konrad, K. (2014). Long-term symptoms and posttraumatic growth in traumatised adolescents: Findings from a specialised outpatient clinic. *Journal of Traumatic Stress, 27*, 622–625.
- Wang, A. W. T., Chang, C. S., Chen, S. T., Chen, D. R., Fan, F., Carver, C. S., & Hsu, W. Y. (2017). Buffering and direct effect of posttraumatic growth in predicting distress following cancer. *Health Psychology, 36*, 549–559.
- Yanez, B. R., Stanton, A. L., Hoyt, M. A., Tennen, H., & Lechner, S. (2011). Understanding perceptions of benefit following adversity: How do distinct assessments of growth relate to coping and adjustment to stressful events? *Journal of Social and Clinical Psychology, 30*, 699–721.