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Title: What Promotes Post Traumatic Growth? A Systematic Review.

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Abstract

People who experience major life crises often report post-traumatic stress. However, the literature suggests that traumatic experiences can also be "catalysts" for positive change (i.e., posttraumatic growth; PTG). PTG (Calhoun & Tedeschi, 2006) can include improved relationships, new possibilities for one's life, a greater appreciation for life, a greater sense of personal strength, and spiritual development.

While the general population isn't confronted with traumatic events regularly, individuals such as firefighters, policemen, and EMTs are. But what factors foster the emergence of PTG? To answer this question, a systematic search of four major database (Psychology and Behavioral Sciences Collection, PsycARTICLES, PsycINFO, and ScienceDirect) was conducted.

Some of the factors that promoted PTG included sharing negative emotions, cognitive processing or rumination, positive coping strategies (e.g. positive reappraisal), personality traits (e.g. agreeableness), experiencing multiple sources of trauma, event centrality, resilience, and growth actions. Other factors may be mediators of PTG rather than direct influencers (e.g., seeking social support coping, social support, optimism, etc.). Finally, studies show a positive correlation between PTG and support for aggressive behavior suggesting that growth may be more nuanced than originally thought. By exploring systematically the factors that foster PTG in trauma-exposed professionals, we hope this systematic review would both provide avenues for future research and help design news methods of prevention and intervention for first responders.

Keywords

PTG, post traumatic growth, contribution factors, trauma, systematic review.

1. Background

The assumption that suffering can make individuals stronger (Tedeschi & Calhoun, 1995) is not new in religious and philosophical literature. The idea that positive changes may result from adversity and trauma has been present across cultures for centuries. Indeed, from the rebirth of the phoenix in Egyptian mythology to the forgiveness of sin for all people who believed in the Christ's resurrection, ancient literature already long recognized the opportunities for growth that come from hardship. Philosophers also introduced this idea, in particular Friedrich Nietzsche with his famous quote "*was mich nicht umbringt macht mich stärker*" ("that which does not kill me makes me stronger", 1888), or "*increscunt animi, virescit volnere virtus*" ("spirits grow and courage increases through wounds", 1888). However, it is only recently that this notion was applied in the field of psychology. The available data suggests that at least a minority of individuals who have been confronted with trauma (e.g., sexual assault, military combat) report meaningful levels of personal growth (e.g., Calhoun & Tedeschi, 1999, 2006, 2013; Tedeschi & Calhoun, 1995, 2004), i.e. the positive changes that may arise from the struggle to cope with a critical or traumatizing situation. Therefore, it is important to note that growth is not a result of the event itself, but rather a result of the struggle to deal with it. The types of changes that may occur as a result of the struggle to cope with major life crises are listed in the *Post-Traumatic Growth Inventory* (PTGI; Tedeschi & Calhoun, 1996), and include "improved relationships, new possibilities for one's life, a greater appreciation for life, a greater sense of personal strength, and spiritual development".

Despite these positive changes, the link between post-traumatic growth (PTG) and "the sense of psychological comfort" remains uncertain. According to Tedeschi and Calhoun

(2014), it would appear that PTG and psychological comfort may be distinct constructs. Indeed, the literature mostly suggests that “growth will not necessarily decrease pain or increase happiness, but on the contrary, significant growth may only occur when it is preceded by, or when it occurs together with significant amounts of subjective distress” (Tedeschi, Park & Calhoun, 1998, p.217). The authors base this affirmation on several studies, including Edmonds and Hooker’s (1992) showing that positive psychological changes will occur after bereavement. Thus, growth experiences do not put an end to distress in trauma survivors (Calhoun & Tedeschi, 1998; Tedeschi & Calhoun, 1995). Tedeschi and Calhoun (2014) add that “the maintenance of the growth experienced may require unpleasant periodic cognitive reminders of what has been lost, so that in an apparently paradoxical way, what has been gained remains in focus” (Tedeschi & Calhoun, 2014, p. 505). Thus, while PTG helps individuals live a fuller and more meaningful life, it does not allow a return to normality. The aim of this systematic review is to better understand in what circumstances posttraumatic growth may occur, and whether or not it has a protective effect on mental health outcomes.

2. Method

2.1 Search strategy: Studies published between 1998 and 2019 were identified through four major database searches: Psychology and Behavioral Sciences Collection, PsycARTICLES, PsycINFO, and ScienceDirect. We used the following keywords: *PTG*, *post-traumatic growth*, *posttraumatic growth*, and *vicarious PTG*.

2.2 Inclusion criteria: Studies were included if the title contained the words “post-traumatic growth” or “posttraumatic growth”.

2.3 Exclusion criteria: Studies were excluded if they didn't measure PTG or positive changes as a result of exposure to potentially traumatic events, and if they did not use the PTGI (*Post-Traumatic Growth Inventory*) to measure growth.

A total of 281 articles met inclusion criteria. Thirty-eight studies were longitudinal while 243 were cross-sectional. Samples were comprised of firefighters, HIV-positive individuals, cancer survivors, natural disaster survivors, sexual assault survivors, veterans, refugees, accident survivors, students, bereaved adults, medical staff, homeless women, police officers, and parents of children with severe illness. Studies were carried out in various countries: United States, Australia, Romania, Japan, Poland, France, Germany and Portugal.

[INSERT FIGURE 1 HERE]

3. Results

3.1 The role of “cognitive engagement” and “cognitive processing” in PTG

Tedeschi and Calhoun (2014, p. 506) compare traumatic events (or *life challenges*) to "earthquakes" that can severely “shake, challenge, or sometimes shatter” the way individuals perceive the world and their place in it. Therefore, because they challenge the individual's assumptive world (Parkes, 1970), these “seismic events” have a great life-changing potential. However, Tedeschi and Calhoun (2014) insist on the fact that, in order for growth to be possible, traumatic events must have a big enough impact to "force" individuals to reassess their representation of themselves and others, the world they live in, and what the future may bring. It had been demonstrated empirically that core beliefs must be challenged in order for growth to occur (Ramos et al., 2018; Wilson et al., 2014; Krosch & Shakespeare-Finch, 2017). Once they have been challenged or shattered, these representations (or "assumptive worlds") must be reconstructed. Calhoun and Tedeschi (2004) extend their seismic metaphor

by comparing this reconstruction to the physical rebuilding that occurs after an earthquake. According to them, the "reconstruction" that occurs after a trauma leads individuals to rethink repeatedly about the circumstances of the traumatic event they have experienced, in the hope of giving it some meaning: They refer to this process as "cognitive engagement". This first step towards growth may lead individuals to realize that some of their life goals are no longer feasible, and that some of their representations and beliefs do not reflect the world they live in anymore. These deep reconsiderations are what will enable individuals to establish new life goals. This process can sometimes take months or years and, in some cases, individuals who have been confronted with trauma may never experience positive psychological changes, as PTG also depends on personal and individual characteristics.

Furthermore, Tedeschi and Calhoun (2014) explain that individuals who face major life challenges generally tend to "cognitively engage" with two main purposes: 1) Finding an explanation to the immediate circumstances of the event ("why did this happen?"), and 2) understanding the fundamental issues raised by the event ("what impact does the event have in my life?"). Tedeschi and Calhoun (2014) refer to this process as "cognitive processing". Empirical studies suggest that cognitive processing is associated with higher levels of PTG. For example, Calhoun, Cann, Tedeschi and McMillan (2000) investigated rumination and growth in a group of 54 young adults who had experienced a traumatic event. Their results indicated a positive relationship between event-related rumination and the level of reported PTG: The more rumination participants reported experiencing soon after the event, the greater the degree of posttraumatic growth. Palmer, Murphy, and Spencer-Harper (2016) add in one of their studies that veterans tend to report growth after reaching a certain "turning point" following the traumatic event. This turning point typically occurs after several years of living with PTSD symptoms and is generally prompted by the veterans themselves after reaching extreme levels of despair due to their symptoms. In other words, the authors suggest that, in

some cases, growth may be triggered by a posterior crisis situation caused by dealing with PTSD symptoms. This “crisis” may be what leads individuals to “cognitively engage” when rumination about the event hasn’t occurred yet. Furthermore, they note that the individuals’ acknowledgment of their PTSD symptoms is an important part of the growth process, as it enables them to separate these symptoms from their own identity and restore a sense of control. Thus, when dealing with individuals who are diagnosed with PTSD, focusing on helping them recognize and understand their symptoms may help promote PTG.

Going back to Tedeschi and Calhoun’s (2014) model, the authors also make a distinction between cognitive engagement characterized by “deliberate rumination” and cognitive engagement characterized by “intrusive rumination”. While intrusive rumination is often associated with PTSD and depression, Taku, Cann, Tedeschi, and Calhoun (2009) showed that both types of rumination were in fact associated with higher levels of PTG. More specifically, Taku et al. (2009) examined the effects of four types of rumination across US (n=224) and Japanese (n=431) samples: Intrusive and deliberate rumination soon after the event, and intrusive and deliberate rumination recently (still present well after the traumatic event).

The results indicate that both rumination types (intrusive and deliberate) were positively associated with posttraumatic growth; however, intrusive rumination **recently** did not significantly predict PTG, which is consistent with Cann et al.’s (2010) study. Furthermore, the authors assume that intrusive rumination **soon after the event** was positively correlated to PTG because it may subsequently help trigger deliberate cognitive processing: Intrusive rumination soon after the event may therefore be considered as a “catalyst”. Indeed, several studies confirm the positive link between intrusive rumination and PTG (Ramos et al., 2018; Jeon et al., 2015; Hallam & Morris, 2014; Wilson et al., 2014).

In addition, for both samples, recent deliberate rumination predicted the strongest levels of PTG, possibly because, according to Taku et al. (2009), the presence of deliberate rumination long after the event occurred was proof of an ongoing process of sense-making and reconstructing of one's representations of the world over a large period of time (continuous cognitive processing = higher levels of growth). Several studies confirm the positive association between deliberate rumination and growth (Hirooka et al., 2017; Stockton et al., 2011; Hill & Watkins, 2017; Palacio-González et al., 2017).

3.2 Experience sharing and social support

According to Calhoun and Tedeschi (2014), cognitive engagement and cognitive processing of traumatic events could be fostered by the sharing (or the "disclosure") of one's internal experience with others, as long as the individual's social environment is able to provide the necessary support. Indeed, the disclosure of internal cognitive processes with a supportive social environment reduces the risks of depression and/or promotes higher levels of growth (Nolen-Hoeksema & Larson, 1999; Saltzman et al., 2018). This is consistent with Ogińska-Bulik and Kobylarczyk (2015) and Dirik and Göcek-Yorulmaz's (2018) results showing that venting negative emotions is positively associated with PTG.

[INSERT FIGURE 2 HERE]

Therefore, disclosure could be considered as a mediator of the relationship between cognitive engagement and PTG. This appears to be particularly true when sharing with people who have gone through similar traumatic experiences, as it has the positive effect of normalizing the individual's situation and feelings (Palmer et al., 2016; Richardson, 2016). Additionally, Palmer et al. (2016) showed it was not simply the presence of social support that contributed to PTG, but that the "support network" needed to have an in-depth knowledge of the individual's difficulties and trauma experiences (e.g. the spouse) in order to maximize

growth. Canevello et al. (2016) add that having a partner who experiences PTG will increase people's perception of partner's PTG, which predicts actor's increased relationship quality (Lee et al., 2017) and, in turn, predicts people's decreased psychological distress. Thus, partners' PTG can benefit people's evaluations of their relationship and, ultimately, people's psychological well-being. This is supported by Weiss (2004), who shows that couples facing cancer together share not only the pain but also the potential for gain from the trauma. Additionally, Albuquerque et al. (2018) and Büchi et al. (2009) show that higher levels of stress communication by the partner and higher levels of emotional exchange between partners also promote actor's PTG. This is consistent with Canevello et al.'s (2016) longitudinal study, suggesting that the perception of the partner's responsiveness in married couples was greatly associated with PTG. Additionally, secure partner attachment seems to play an important role in the prediction of PTG (Levi-Belz & Lev-Ari, 2018; Salo et al., 2005). Furthermore, the literature suggests that parents' PTG may also affect their children's experience with growth. For example, in families who had been directly exposed to the 2004 tsunami in Thailand, parents' self-reported PTG was a significant predictor of their children's PTG (Hafstad et al., 2010). Thus, parents' functioning can affect children's positive adaptation after experiencing a disaster. This further suggests, along with the positive effect of partners' PTG, that interconnections and relatedness play a major role in the development of growth in individuals who experience trauma.

3.3 Coping strategies

As coping strategies foster a more positive perception of potentially threatening situations, influence behaviors, strengthen one's ability to adapt, and help individuals give meaning to the events they experience, they play a major role in the facilitation of growth. For instance, Prati and Pietrantoni (2009) showed in a meta-analysis of 103 studies the influence

of several coping strategies on PTG. Indeed, religious coping was strongly correlated to growth. As stated by Pargament et al. (2000), religious coping could have various positive consequences for individuals in their daily lives (e.g., giving meaning to negative events, providing a sense of control and comfort during difficult times, fostering social relations through the religious community, and helping individuals make major life changes). Furthermore, spirituality predicted moderate positive changes (Prati & Pietrantonio, 2009; Tsai & Pietrzak, 2017; Rzeszutek et al., 2017; Danhauer et al., 2013). Spirituality differs from religious coping in that it is defined as “an individual’s sense of peace, purpose, and connection to others, and beliefs about the meaning of life”; whereas *religion* is defined as a set of beliefs and practices associated with a particular religious tradition or denomination (Vallurupalli et al., 2012). According to Prati and Pietrantonio (2009), spirituality may foster PTG because it increases feelings of belonging within the religious community, ensures the presence of social support through the community, and promotes beliefs that encourage individuals to search for meaning. Thus, spirituality may only be indirectly related to growth. Indeed, meaning-making has been positively associated with PTG in several studies (Cadell et al., 2014; Dursun et al., 2016). Additionally, the positive effect of the sense of belonging on PTG is supported by Armstrong, Shakespeare-Finch, and Shochet (2014), who found that belongingness was a mediator of the relationship between coping strategies and posttraumatic growth. Indeed, the sense of belonging may encourage individuals to seek social support which, consequently, will lead to higher levels of PTG. Prati and Pietrantonio (2009) hypothesize that seeking social support could have a positive influence on the quantity and quality of social support and, therefore, also act as a mediator of PTG.

Positive reappraisal coping was also associated with PTG. This coping strategy implies the individual's attempt to construe negative events in a more positive way which, consequently, may generate positive changes. This is consistent with several studies suggesting that positive reframing/reinterpretation, positive affect/attitude, and positive sense-making are positively correlated to PTG (Hamama & Sharon, 2013; Trzebiński & Zięba, 2013). Other coping strategies that promote growth include the appraisal of the event as a “challenge” (“challenge appraisal”; see Yeung et al., 2016; Goldberg et al., 2018; Wilson et al., 2014), which could be considered as a form of positive reinterpretation of the event, and “gratitude”, also known as the tendency to show appreciation for something done or received which, consequently, may result in increased use of positive reappraisal (Tsai & Pietrzak, 2017; Tsai et al., 2016). Additionally, Prati and Pietrantonio (2009) show that acceptance coping, defined as “accepting that a difficult situation is real and must be addressed” (Carver et al., 1989), had a small but significant effect on PTG. According to the authors, this supports the hypothesis that people's ability to accept whatever situation may come their way plays an important role in the growth process (Zoellner & Maercker, 2006; Rzeszutek et al., 2017).

In addition, three other coping strategies positively predict PTG: *Self-care coping* (Armstrong, Shakespeare-Finch & Shochet, 2016), *Problem-focused coping*, and *avoidance coping* (Akbar & Witruk, 2016), the last two being quite contradictory. Indeed, several studies show that problem-focused coping is positively associated with growth (Dirik & Göcek-Yorulmaz, 2018; Rodríguez-Rey et al., 2017), which supports Lazarus and Folkman's (1984) findings suggesting that individuals who use problem-based coping (vs. avoidance coping) feel they have more control over the situation and a greater ability to manage the problem. However, avoidance coping was also found to be positively related to growth (Hallam & Morris, 2014; Akbar & Witruk, 2016; Carboon et al., 2005), which is inconsistent with the literature on coping and health. Thus, how can avoidance and solution-

focused coping both be correlated to PTG? Kunz et al. (2018) show in a longitudinal study that higher levels of growth are predicted by the use of both approach- and avoidance-oriented coping, as well as by coping flexibility, that is, the use both types of coping equally. The authors hypothesize that a flexible use of approach- and avoidance-oriented coping strategies may enable individuals to process trauma at times, but also avoid thoughts and activities when such a confrontation is too overwhelming, which together could promote PTG. Avoidance coping would therefore allow distress reduction preceding engagement in cognitive processing. Thus, this suggests that a flexible use of different coping strategies according to situational demands may be most predictive of posttraumatic growth. This is consistent with Su and Chen's (2015) longitudinal study, suggesting that distractive coping style, described as "a mode of purposefully turning one's attention away from one's distress to pleasant or neutral activities" (p. 104), is an important facilitator of growth.

3.4 Personality traits

The role of the personality traits of the Big Five (Goldberg, 1992) on PTG has been examined in several studies. More specifically, Agreeableness, Extraversion, Openness (Mattson et al., 2018; Taku & Matthew, 2018) and Conscientiousness (Owens, 2016; Karanci et al., 2012) were positively correlated to growth, which doesn't come as a surprise since these Big Five personality traits are generally associated with positive health outcomes (Cheng, Weiss, & Siegel, 2015). We note that Mattson et al.'s (2018) findings suggest that Openness was the most predictive of PTG. The authors do not offer any explanation for this; however, given the personality traits associated with Openness, e.g. imagination and adventurousness, it is possible to hypothesize that individuals high in Openness may be more prone to adapt to unexpected life events (Costa & McCrae, 1992).

Personality traits also have an indirect effect on growth through the use of either adaptive or maladaptive coping strategies (Mattson et al., 2018). On the one hand, Extraversion, Agreeableness, and Openness significantly predicted adaptive coping in a sample of 271 OIF and OEF veterans, and in turn promoted growth. We note that Optimism, which isn't one of the Big Five personality traits, also predicted PTG through the use of adaptive coping in Mattson et al.'s study (2018). On the other hand, Neuroticism significantly predicted maladaptive coping, which impeded the development of growth (Mattson et al., 2018). Nevertheless, while we expect neurotic individuals to be less likely to develop PTG because of their lower ability to manage stress, one study found a positive association between neuroticism and PTG in motor vehicle accident perpetrators (Merecz et al., 2012). However, Merecz et al. (2012) specify that the mean value of neuroticism in their sample was rather low and insufficient to assume that those individuals were emotionally unstable. Thus, the authors come to the conclusion that low levels of neuroticism may sensitize individuals to life events (which is essential for posttraumatic growth), but has no detrimental effect on the individual's ability to cope with them.

Additionally, altruistic behavior (e.g., the tendency for an individual to act out of concern for the well-being of others, regardless of his/her own self-interest) positively predicted PTG (Tsai et al., 2016). Indeed, while altruism is not a personality trait, it is a trait that could stem from high levels of Agreeableness.

Lastly, "narcissism" (Levi & Bachar, 2019) was also reported as a predictor of PTG. Indeed, according to Levi and Bachar (2019), narcissistic individuals are more inclined to use processes of self-deception associated with the adoption of positive attributions and the exclusion of negative attributions. Therefore, despite being a "negative" trait, narcissism may be relatively useful when confronted with stressful events as it may provide an illusory sense

of control (“I have all the necessary qualities to face and overcome this situation”). Individuals who feel they have control over themselves or the situation they are facing usually feel they are more capable of managing the problem (Lazarus & Folkman, 1984). Indeed, self-control (or personal mastery) reduces the onset of PTSD symptoms (Smith et al., 2011). In addition to being a protective factor against PTSD, the sense of control may also be a factor that promotes PTG. For example, for survivors of diverse traumatic events, control was a key determinant of psychological adjustment after adversity (Dekel et al., 2011; Kaye-Tzadok and Davidson-Arad, 2016). Kaye-Tzadok and Davidson-Arad (2016) specify that both realistic control and “unrealistic” control are associated with PTG. Thus, simply being under the impression that one is in control of their environment can facilitate growth. Consistent with these findings, Shuwiekh et al. (2018) show that striving for 'standards' (high performance expectations) and 'order' promotes PTG. Furthermore, Mamon et al. (2016) show in a group of Israeli Veterans that Obsessive Compulsive Behavior (OCB), a disorder characterized by the attempt to control one’s environment, may facilitate psychological growth. Indeed, according to Mamon et al. (2016), OCB symptoms trigger an ongoing ruminative processing of the event, “initiating a more deliberate search for understanding and finding meaning in the trauma, which subsequently supports growth” (Mamon et al., 2016, p.488). However, an alternative explanation is that OCB promotes PTG due to a “cognitive bias towards exaggerated personal control” (Mamon et al., 2016, p.489). Indeed, “individuals with OC symptoms tend to use compulsive rituals as a way to compensate and instill an illusory sense of control” (p.489). However, in a paradoxical way, belief in social complexity (or the belief that the world is nearly impossible to control) also appears to be positively associated with PTG (Nalipay et al., 2016). Indeed, Nalipay et al. (2016) show that generalized beliefs about how the world functions, specifically social complexity, may be one of the factors that could provide a framework for individuals to understand and make sense of stressful events. More

specifically, they argue that individuals who believe in social complexity may be more likely to engage in cognitive processes that will allow them to view a traumatic experience from various perspectives which, ultimately, will promote flexible coping strategies, positive cognitive restructuring, and acceptance of what happened (Nalipay et al., 2016).

The sense of coherence (SOC), defined as “the extent to which one has a pervasive, enduring though dynamic, feeling of confidence that one’s environment is predictable and that things will work out as well as can reasonably be expected” (Antonovsky, 1979), also appears to be a potential enhancer of PTG. Indeed, Xiu et al. (2018) and López et al. (2015) demonstrate that high levels of SOC are positively associated with growth. In other words, SOC could be described as a form of “optimism” and personal belief that one’s environment is “controllable” (controllability), which are both known to enhance psychological growth. SOC, in contrast to the Big Five personality traits, is a trait that individuals develop through various life events. Thus, while biological personality characteristics (such as Extraversion) play a major role in the experience of PTG, socio-cognitive characteristics (such as the sense of control or the sense of coherence) can also be harnessed for positive psychological change. Therefore, promoting SOC in individuals who are low on Extraversion or Openness may help them experience post-traumatic growth.

In addition to the sense of control and coherence, the sense of purpose also appears as a potential facilitator of PTG. According to Reker (2000), the sense of purpose can be defined as having the ability to find meaning in non-materialistic aspects of life, having goals, a sense of direction, a sense of self-worth, a reason for existence (e.g. having children, enjoying the “little things”, etc.). Reker states that the sense of purpose is “an important construct in the prevention of illness, the promotion of wellness and successful adaptation to life’s changing circumstances” (Reker, 2000, p. 39). Indeed, it was found that having a sense of purpose promoted PTG in samples of U.S. Veterans, Traumatic brain injury survivors, adults living

with chronic illness, and hurricane survivors (Tsai & Pietrzak, 2017; Powell et al., 2012; Zeligman et al., 2018; Lowe et al., 2013). Similar to purpose, “hope” also seems to play a significant role in reaching PTG (Yuen et al., 2014). Like purpose, the hope construct represents a focus on significant future aims, and can be defined as “a belief that one knows how to reach one’s goals and a belief that one has the motivation to use those pathways to reach one’s goals” (Cotton Bronk et al., 2009, p.501).

3.6 Event centrality

According to Berntsen and Rubin (2006), “highly accessible and vivid personal memories help to give meaning and structure to our life narratives and help to anchor and stabilize our conceptions of ourselves” (p. 219). More specifically, the extent to which an individual feels a particular event has become central in the organization of his/her identity is called “Event Centrality” (EC). Indeed, Berntsen (2001) hypothesized that a traumatic event accompanied by significant consequences and repercussions in one’s life may be more likely to be centralized or viewed as an important part of one’s life story (Wright, 2015). It has been reported that high EC is associated with high levels of PTSD (Berntsen & Rubin, 2006; Bohn, 2010; Rubin, Boals, & Hoyle, 2014) and emotional distress (Zaragoza, Salgado, Shao, & Berntsen, 2014). Indeed, high EC may cause individuals to overestimate or emphasize the negative effects of the endured trauma which, in turn, will foster post-traumatic stress. However, EC may also be associated with posttraumatic growth in survivors of different traumatic events (Barton et al., 2013; Roland et al., 2014; Boals & Schuettler, 2011; Allbaugh et al., 2016; Staugaard et al., 2015; Schuettler & Boals, 2011). This positive link could be explained by the fact that construing a traumatic experience as central to one’s identity may result in more posttraumatic cognitions (deliberate and intrusive rumination) which, as demonstrated previously, is highly associated with PTG. Thus, the centrality given to trauma

appears to serve as a “double-edged sword”, in that this construct might foster both PTSD and PTG. However, Blix et al. (2015) showed in a longitudinal study that the positive association between EC and PTG attenuated over time. Thus, it is possible to hypothesize that high EC may only be beneficial soon after the traumatic event occurred, as it may help trigger cognitive processes related to growth outcomes (e.g. intrusive and deliberate rumination, see Taku et al., 2009).

3.7 Resilience

Resilience can be defined as a process characterized by the ability to successfully cope with a crisis and to return to pre-crisis status quickly (de Terte & Stephens, 2014). More specifically, resilience is the “ability to go on with life after hardship and adversity” and “to remain psychologically healthy despite very difficult circumstances” (Tedeschi & Calhoun, 2004, p.4). Therefore, Resilience differs from posttraumatic growth in that it is characterized by a return of the individual to its initial state (pre-crisis state), whereas PTG is characterized by the « gain » of positive psychological benefits. Indeed, according to Tedeschi and Calhoun (2004), “posttraumatic growth refers to a change in people that goes beyond an ability to resist and not be damaged by highly stressful circumstances [...] posttraumatic growth, then, has a quality of transformation” (Tedeschi & Calhoun, 2004, p.4).

It has been demonstrated that high levels of resilience reduce the onset of PTSD symptoms in firefighters (Lee et al., 2014). However, resilience may also promote growth in individuals who are confronted with various traumatic events (Kong et al., 2018; Rzeszutek et al., 2017). Additionally, Liu et al. (2018) demonstrate that high levels of family resilience are positively correlated to PTG in patients with early-stage breast cancer. Thus, individuals facing adversity seem to benefit from their own level of resilience, but also from the levels of resilience displayed by their social environment. These findings suggest that individual

resilience as well as *collective resilience* are key determinants of growth. However, some studies have found a negative correlation between resilience and PTG. Indeed, Garrido-Hernansaiz et al. (2017) and Levine et al. (2009) showed that high levels of resilience were associated with lower levels of posttraumatic growth. The authors hypothesize that resilience may decrease PTG because resilient individuals tend to struggle with adversity less than others, thus making them less likely to engage in the meaning-making behaviors that are associated with PTG. Therefore, it is argued that resilience may provide little opportunity for growth (Westphal & Bonanno, 2007).

3.8 Resource loss

As stated by Hobfoll (1989), individuals “strive to retain, protect, and build resources and [...] what is threatening to them is the potential or actual loss of these valued resources” (Hobfoll, 1989, p. 516). Thus, according to Hobfoll’s Conservation of Resource theory (COR; 1989), resource loss is known to increase traumatic stress. This assumption is verified by Cook et al.’s (2013) study, showing a negative association between resource loss and health in a sample of university students soon after Hurricane Katrina hit the Gulf coast in 2005. However, Cook et al.’s results also show the presence of a positive association between resource loss and PTG. We note that resource loss was assessed by the 18-item measure developed by Sattler et al. (2002) specifically to assess resource loss in response to a hurricane. Respondents were asked to describe the amount of loss experienced as a result of the hurricane. Resource loss was a significant positive predictor of PTG. Since resource loss increases levels of distress, it is possible to assume that resource loss fosters growth through high levels of traumatic stress. This finding is consistent with Tedeschi and Calhoun’s (2004) model suggesting that growth can only occur through high levels of distress.

3.8.1 Growth actions

Hobfoll, Hall, Canetti-Nisim, Galea, Johnson, and Palmieri (2007) show in a group of Jewish and Arab citizens of Israel highly exposed to terrorism that PTG may be beneficial when accompanied by action, not solely cognitive maneuvers. Indeed, while Calhoun and Tedeschi (2014) tend to describe the growth process as a search for meaning (e.g. cognitive engagement), Hobfoll et al. (2007) make a distinction between *growth actions* and *growth cognitions*, stating that cognitive change alone is not sufficient for growth to occur. Indeed, they show in one of their studies that PTG may only be beneficial if it includes taking action. The authors compared PTG levels between a group of settlers in Israel who took part in the resistance in the days prior to the disengagement from Gaza, and a group of settlers who did not take part in the resistance. The results show that individuals who took action by resisting the disengagement reported more PTG and were less likely to develop PTSD. Thus, this suggests that “growth actions” may play an important role in the development of posttraumatic growth and the reduction of post-traumatic stress. This hypothesis is consistent with Anderson et al.’s (2016) results, showing that volunteers in the March 2011 Disaster in Fukushima (Japan) reported significantly higher levels of PTG than non-volunteers. The authors found that volunteers were also less likely to feel guilty than non-volunteers. These findings, along with Hobfoll et al.’s (2007), indicate that actions can have lasting positive effects and convey a protective benefit.

3.9 Sociodemographic characteristics

3.9.1 Gender

According to several studies, sociodemographic characteristics such as gender, age, education, and ethnicity play an important role in post-traumatic growth. Indeed, it was often found that women reported higher levels of growth than men (Jin et al., 2014; Nakayama et

al., 2017; Sharp et al., 2018; Jeon et al., 2015; Val & Linley, 2006). A possible explanation for this is that women may be more susceptible than men to sharing their experiences with others when confronted with adversity which, in turn, facilitates cognitive processes such as deliberate rumination. This hypothesis is consistent with Wu et al.'s (2016) study, showing that women score significantly higher on the "Relating to Others" subscale of the PTGI than men.

3.9.2 Age

Additionally, it was largely found that individuals of a younger age tend to report higher levels of growth than older individuals (Sharp et al., 2018; Boyle et al., 2017). Bellizzi and Blank (2006) explain this by hypothesizing that older individuals may be dealing with more comorbidities or other significant life events compared with younger survivors, such as dealing with the loss of loved ones, hearing and vision impairment, etc. However, Palgi (2016) suggests that time perspectives may also influence PTG. Indeed, Palgi found that older adults (age range 50–90) reporting younger subjective age and further distance to death reported higher levels of PTG than adults reporting older subjective age and closer distance to death. Thus, while being of a younger age promotes the chances of reaching growth, the *perception* of being young fosters PTG as well, regardless of the individual's actual age. However, several studies found a positive association between older age and PTG in samples of sexual assault victims, individuals with Acquired Brain Injury, and breast cancer survivors (Ullman, 2014; Grace et al., 2015). A possible explanation may be that older adults have acquired more life experience, which may help them deal with stressful events more easily than younger individuals. As a matter of fact, Tallman et al. (2010) report in their longitudinal study that older cancer survivors reported more enhanced spirituality on the PTGI.

3.9.3 Education/employment

Furthermore, the level of education also stood out as a factor that influences PTG, even though the results remain equivocal. On the one hand, several studies demonstrate that higher levels of education are positively associated with growth (Danahauer et al., 2013; Grace et al., 2015). Indeed, resources such as time, money, and education facilitate resistance to stress (Hobfoll, 1989): Individuals who come from an educated environment may perceive they have a wider range of possibilities and choices available to them in coping with stressful events. On the other hand, several studies also provide evidence that PTG may be associated with lower levels of education (Ullman, 2014; Tang et al., 2015). Bellizzi and Blank (2006) hypothesize that individuals with lower educational levels may have “more room to grow in their relationships” (p. 54). In other words, individuals with lower levels of education may lean on other types of resources to overcome stressful situations. Thus, whether individuals rely more on their education or on their relationships to grow from adversity remains unclear. Additionally, employment also seems to play an important role in the process of growth. Indeed, Salo et al. (2005), Bellizzi and Blank (2006), and Grace et al. (2015) show that individuals that hold high professional positions or a steady employment are more likely to experience PTG. Sattler et al. (2014) and Xu and Wu (2014) add that occupation/work satisfaction predicts PTG as well. A possible explanation could be that general life satisfaction may help promote growth. **3.9.4 Ethnicity/stigmatized minorities**

Lastly, the literature suggests that belonging to an ethnic minority may promote PTG (Hijazi et al., 2015; Ullman, 2014). Hijazi et al. (2015) hypothesize that being part of an ethnic minority is associated with increased discrimination and life adversity, which may ultimately facilitate benefit finding. This is consistent with Zeligman et al.’s (2016) study, suggesting that stigma may foster PTG in HIV-positive individuals. Thus, while it is unusual to associate discrimination with positive mental outcomes (Wei et al., 2016; Rzeszutek & Gruszczyńska, 2018), studies suggest that individuals belonging to stigmatized groups may be

more prone to developing positive changes due to their life experiences. Another hypothesis may be that stigmatized groups develop a strong sense of belonging which, ultimately, helps promote growth.

4. Conclusion

The aim of this literature review was to provide a critical analysis of different factors that may promote the development of growth among trauma-exposed individuals. Some of the factors that promote PTG include sharing negative emotions, cognitive processing or rumination, positive coping strategies (e.g. positive reappraisal), personality traits (e.g. agreeableness), experiencing multiple sources of trauma, event centrality, resilience, growth actions. Authors have also suggested that some factors may be mediators of PTG rather than direct influencers, such as seeking social support coping, social support, optimism, spirituality, and the sense of belonging. These mediators indirectly foster growth either by promoting the use of positive coping (e.g. optimism, social support), by influencing the quantity and quality of social support (e.g. seeking social support coping), by ensuring the presence of social support (e.g. spirituality), or by encouraging individuals to seek social support (e.g. sense of belonging).

Additionally, the studies suggest that PTG might be more nuanced than originally thought. Indeed, Hobfoll et al. (2007) found that post-traumatic growth was positively associated with more right-wing political attitudes, support for aggressive behaviors, and ethnocentrism in a sample of individuals who experience ongoing violence and terrorism. As suggested previously, this could mean that there are multiple ways of developing growth, and that PTG may not express itself the same way in all contexts.

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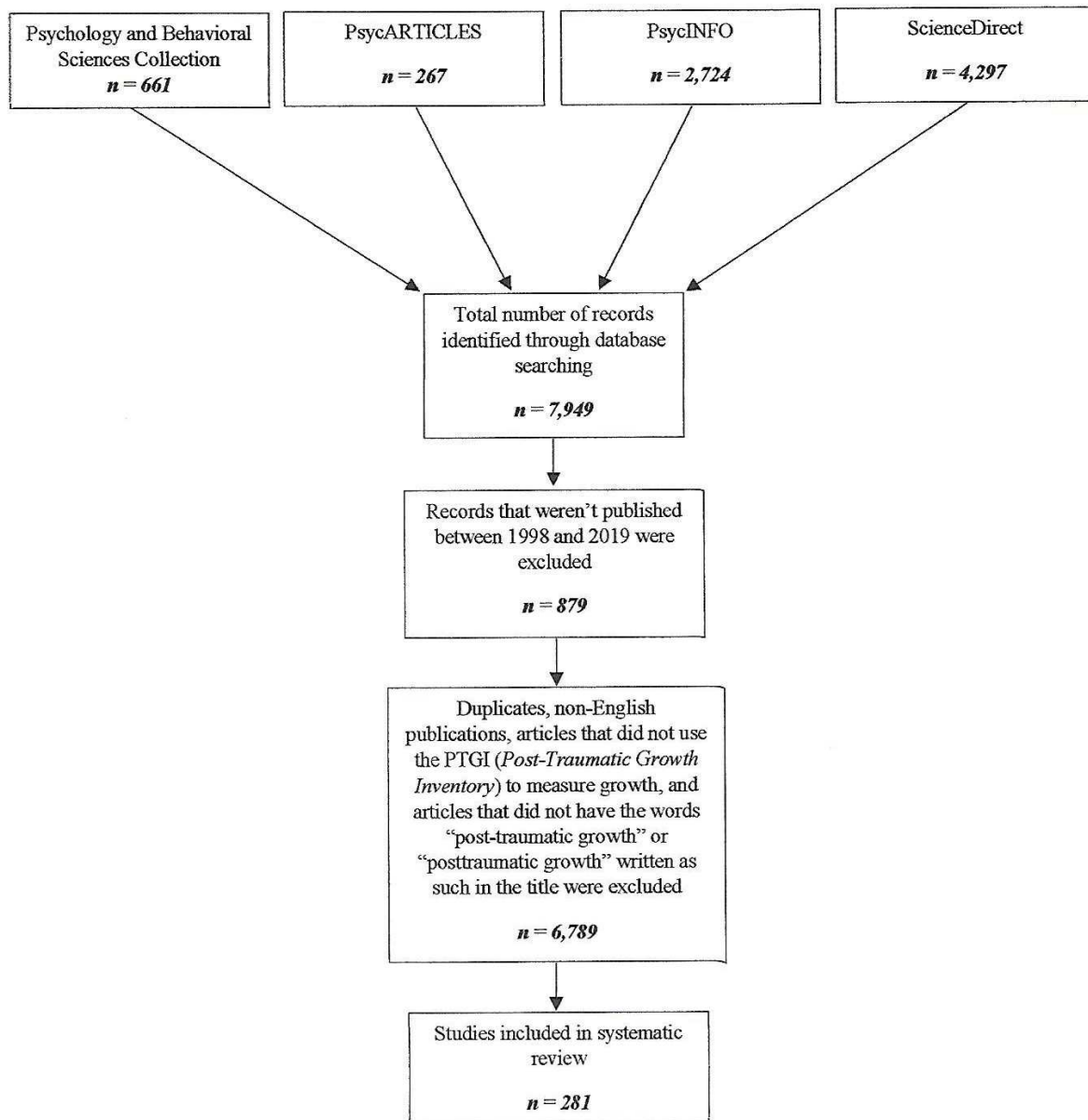


Fig.1 Schema of selected studies in systematic review of the literature.

Fig. 2. Tedeschi and Calhoun's model of post-traumatic growth (2004).

