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Fostering Posttraumatic Growth: The Other Face of Trauma

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ABSTRACT

In the face of multiple traumatic events that people face, there are significant differences in their reactions and their overall capacity for posttraumatic growth. The present study analyses the role of centrality of events (CE), cognitive flexibility (CF), and creativity (C) in the evolution of posttraumatic growth (PTG), defined as the positive change that follows adversity. Moreover, it investigates three separate mediation models to determine the mediating role of each CE, CF, and C on the relationship between the perception of the traumatic impact (PTI) and PTG. The research analysed a sample of 164 individuals, aged between 18 and 62 years old, including 40 men (24.4%) and 124 women (75.6%). The hierarchical multiple regression highlights the predictive role of CE and CF in shaping PTG, while C did not reach statistical significance. The results of the mediation analyses showed that PTI influences CE, which also has an input in PTG, while the mediation models for CF and C were not statistically significant. Through this present study, efforts are being made to discover new relevant variables to PTG and their contribution to posttraumatic recovery, proposing a direction for future studies in the field of psychotraumatology.

Keywords: posttraumatic growth, centrality of events, cognitive flexibility, creativity, perception of traumatic impact

1. INTRODUCTION

Despite the multiple traumatic events that people endure, some of them seem to cope better with their consequences, with such experiences often becoming catalysts of change, paving the way towards better relationships, new possibilities, and a stronger sense of gratitude (Henson et al., 2021). When it comes to people's ability to cope, current literature tries to find the most important factors underlying posttraumatic growth that could explain this discrepancy in traumatic effects from one individual to another, and the mechanisms behind them. Some fundamental frameworks for this study are the Posttraumatic Growth Model (Calhoun et al., 2010) and The Recovery Concept (Tedeschi et al., 2018). The Posttraumatic Growth Model takes into account the variety of coping mechanisms that take place on an individual level, analysing the interconnectedness of certain elements such as the characteristics of the person, the management of emotional distress, rumination, self-disclosure, sociocultural influences, narrative revision, and wisdom (Calhoun et al., 2010). The Recovery Concept focuses on people's capacity to live fulfilling lives despite adversities, focusing on their capacity to create a new meaning (Tedeschi et al., 2018).

Posttraumatic growth

Posttraumatic growth (PTG) is defined as "the positive change that the individual experiences as a result of the struggle with a traumatic event" (Calhoun & Tedeschi, 1999, p. 11). PTG is viewed as a way of reconstructing meaning, in the wake of crisis (Neimeyer, 2006), while using the traumatic experience as a continuous opportunity for growth (Turliuc & Măirean, 2014). Calhoun and Tedeschi (1998) see trauma as a seismic event that shakes one's internal and external world uncontrollably and irreversibly, generating shifts in one's view on future, their personal coping capacity and on their role in the world. PTG implies a posttraumatic adaptation that exceeds the previous functioning levels and targets specific areas from an individual's life, such as life appreciation, personal force, level of self-confidence, perception of self, interpersonal relationships, priorities and goals, and existential concerns (O'Leary & Ickovics, 1995; Tedeschi & Calhoun, 1996; Turliuc & Măirean, 2014). Moreover, PTG requires a long-term process, spanning from days to years, during which people develop new ways of functioning (Tedeschi et al., 2018). If resilience entails a return to normality, PTG has a transformative connotation, implying significant changes in the cognitive, emotional, and behavioural levels (Tedeschi & Calhoun, 1995; Tedeschi & Calhoun, 2004). While it is similar to personal development, the main difference lies in how change unfolds, as PTG is the positive result of a major crisis, a secondary effect of survival efforts rather than a planned purpose in itself (Tedeschi et al., 2018).

Posttraumatic growth occurs in 30% to 70% of survivors of a variety of traumatic events (Linley & Joseph, 2004), with women showing an overall higher level of growth (Vishnevsky et al., 2010). The most important predictors for PTG are: cognitive processing, sharing one's negative emotions, personality traits, centrality of events, and resilience (Henson et al., 2021; Liu et al., 2018). Michael and Cooper (2013) observed that the most important variables when losing someone close were: the age of the victim, social support, elapsed time since the moment of death, religion and active coping strategies. Regarding personality traits, openness to experience is considered the best predictor for PTG (Mattson et al., 2018). The way in which the traumatic event alters core beliefs might facilitate PTG, as the result of the cognitive effort to redefine new core beliefs and gain a new sense of meaning (Triplett et al., 2012).

Perception of traumatic impact

Perception is "the primary form of cognitive contact with the world" (Efron, 1969, p. 137). Since individuals tend to interpret reality based on previous perceptive structures (Varela et al., 1991), someone who has been through an adverse experience would show perceptive schemas based on the traumatic event, while the present is analysed in line with the traumatic climate (Ataria, 2015). Therefore, the event itself becomes a filter for the posttraumatic reality, suggesting the occurrence of a top-down perception (Ataria, 2015). Assimilating an experience into existing cognitive schemas is achieved through proper processing and engagement (Janoff-Bulman, 1992). People who are more in contact with their emotions and negative experiences may show higher levels of posttraumatic growth. This perception might be a good indicator of how much an event affected an individual, independent of its objective impact. In a study that investigated the perception of traumatic birth, it appeared that women who did not have confidence in their abilities to cope with the pain of the birth reported a higher level of traumatic perception (Türkmen et al., 2020).

Centrality of Events

Centrality of events addresses the degree to which the traumatic experience becomes a central part of one's identity, a reference point for daily life (Berntsen & Rubin, 2007). Memories of the traumatic event often mark the beginning and the end of specific life stages, being considered defining memories of the self (Conway & Pleydell-Pearce, 2000; Singer, 1995). They become important elements in one's narrative, influencing how individuals respond to future traumatic or stressful events (Barton et al., 2013; Lancaster et al., 2013). According to Neimeyer (2006), identity tends to be a narrative result, the self being organised around the stories individuals have and tell about themselves. The process of structuring, deconstructing, and restructuring personal narratives is extremely relevant in the development of posttraumatic growth (Neimeyer, 2006). Moreover, the inability of autobiographical memory to integrate

these events into one's identity may have a pathological effect (Crane et al., 2010).

It appears that a higher CE is associated with depression and PTSD symptoms (Berntsen & Rubin, 2006; Rubin et al., 2014). When the event becomes central to one's identity, its memory remains available, which might maintain its emotional impact for longer periods (Boals & Schuettler, 2011). Despite this, CE appears to be a good predictor of PTG, acting as a double-edged sword (Allbaugh et al., 2015; Boals & Schuettler, 2011; Barton et al., 2013; Staugaard et al., 2015). This phenomenon might be explained by posttraumatic cognitions, such as deliberate rumination, which is associated with PTG (Cann et al., 2011; Henson et al., 2021), suggesting that CE could be useful immediately after the traumatic event (Taku et al., 2009). Consequently, studies investigate its role as a mediator on the relationship between trauma and PTSD, but also on the relationship between trauma and PTG (Ferrajão, 2023; Tranter et al., 2021). Roland and colleagues (2014) observe that the association between CE and PTG is higher than the one with PTSD. However, it is very likely that PTSD and PTG could coexist (Groleau et al., 2013).

Cognitive flexibility

Cognitive flexibility is the capacity to adapt one's cognitive strategies, depending on the new environmental conditions (Cañas et al., 2003). The ability to acknowledge different perspectives is what represents the core of cognitive flexibility (Toraman et al., 2020). The traumatic events may generate a new life context and trigger a reconstruction of existing cognitive schemas (Tedeschi & Calhoun, 2004). Following a significant change in the environment, the individual has to interpret the new reality and restructure prior knowledge to better adapt (Cañas et al., 2006).

Cognitive flexibility is essential for evaluating the emotional dimension of PTG, as emotional regulation is significantly affected following traumatic experiences (Sattari, 2022). In order to use this cognitive flexibility, one needs to be aware of all the alternatives, have the willingness to adapt, and have a certain level of self-efficacy (Martin & Anderson, 1998). Moreover, flexibility involves other neurocognitive processes apart from attention, such as: switching from one task to another, executive function, and inhibitions, in a similar way to neuroplasticity (Ben-Zion et al., 2018; Purzycki & Sosis, 2009). Neuroplasticity is the core mechanism behind cognitive flexibility, allowing individual growth (Sattari, 2022).

Previous studies associated cognitive flexibility with resilience and positive emotions (Johnson, 2008; Sünbül, 2020), well-being (Fu & Chow, 2016), and better long-term capacity to adapt to adversities (Sattari, 2022), while others reported its mediating role on the relationship between emotional schemas and psychological stress (Mohammadkhani et al., 2022), on the relationship between PTG and resilience in the context of Covid-19 pandemic (Çinar et al., 2022), and on the relationship between PTG and death attitudes among cancer patients (Vahidi et al., 2023). Hussain and Bhushan's study (2011) reported the mediating role of some cognitive strategies on the relationship between traumatic experiences and PTG, strategies that involved: gaining new perspectives, catastrophizing, refocusing attention on positive events and planning, study that might suggest the role of cognitive flexibility in shaping these strategies.

Creativity

Gardner (1997) referred to creativity as a capacity to solve problems and generate new questions, while Robinson (2001) views it through the lens of imaginative processes that yield unique outcomes. Moreover, it can be perceived as both a force and a refuge, similar to theoretical conceptualizations of resilience (Wolin & Wolin, 1993).

Creativity fosters a safe space during difficult times and is often used in therapeutic practices, given its role in emotional well-being (Desetta & Wolin, 2000; Gibbs & Green, 2008). Art therapy, either through music, dance, or painting can lead to meaningful outcomes regarding the self and the world (Sullivan, 2005). Creativity has an important function in cultivating resilience and a sense of cohesion between different internal structures (Prescott et al., 2008). In a study analysing people suffering from chronic illness or disabilities, creativity was a positive predictor for PTG (Tolleson & Zeligman, 2019). Moreover, people affected by chronic diseases often need to learn how to create a new sense of self, and different creative interventions might enhance the sense of control, through the freedom and responsibility they create (Flach, 1988; Edgar-Bailey & Kress, 2010).

Forgeard (2013) highlights the link between adverse experiences and creative thinking, individuals being able to reassess the event, possibly making out of it a source of inspiration and motivation. However, not much is known about the role of creative behaviour in this process. Moreover, openness to experience is the best predictor among personality traits for PTG (Mattson et al., 2018). This trait takes into account imagination, aesthetics, intellectual curiosity and desire to experience new things, being the best predictor for creative thinking (Feist, 1998). This creative thinking allows alternative scenarios and positive change to take place, possibly leading towards PTG. In a study on cancer patients, Skott (2002) analysed the use of metaphors and the role of these creative expressions in personal narratives to help them depict their physical sensations. Such creative methods stimulate new perspectives, training cognitive flexibility and at the same time allowing the individuals to recognise their vulnerabilities, a process that would further help them build a stronger sense of identity.

Most studies focused on the role of resilience, cognitive processes, social support and personality traits in PTG (Henson et al., 2021). Given the paradoxical nature of certain predictors such as centrality of events or rumination (Barton et al., 2013; Cann et al., 2010), new studies are needed to better understand

the mechanisms behind them. Since traumatic events have an expansive nature, taking over different areas in one's functioning, the current framework suggests a link between centrality of events, cognitive flexibility, and creativity in PTG. These often become central in one's life and it gets fully integrated in their identity, posing both an advantage and a risk, depending on the posttraumatic cognitions. At this point, cognitive flexibility is valuable for adaptation, since it fosters exploration of multiple narratives. This process of adaptation differs from one individual to another and sometimes it can consist of engaging in a variety of creative practices.

Therefore, this study conducted a hierarchical multiple regression model to investigate predictors of posttraumatic growth, and three separate mediation models to examine the relationship between the perception of traumatic impact and posttraumatic growth, exploring the mediating role of CE, CF, and C individually.

H1: *Centrality of events, cognitive flexibility and creativity predict posttraumatic growth*.

H2: *Centrality of events mediates the relationship between the perception of traumatic impact and posttraumatic growth*.

H3: *Cognitive flexibility mediates the relationship between the perception of traumatic impact and posttraumatic growth*.

H4: *Creativity mediates the relationship between the perception of traumatic impact and posttraumatic growth*.

2. METHOD

Participants and procedure

To determine the sample size, a power analysis was conducted using G*Power (Faul et al., 2007). In order to obtain a .95 power that could detect a medium effect size of .15 at the .05 error probability, 119 participants were needed. The present study analysed data from 164 people, aged between 18 and 62 years old (M = 26.9, SD = 8.84), including 124 women (75.6%) and 40 men (24.4%). Out of 167 initial responses, 164 met the inclusion criteria, which was the experience of at least one potentially traumatic event included in the LSC-R (Wolfe et al., 1997). Looking at their place of origin, 133 of them come from urban areas (81.1%), while 31 from rural areas (18.9%). As for their educational background, 1 participant (0.6%) graduated from elementary school, 76 (46.3%) finished high school, 48 of them (29.3%) completed their Bachelor's degree, 37 (22.6%) finished their Master's, and 2 of them (1.2%) completed a PhD. In terms of religion, 101 participants are Orthodox-Christians (61.6%), 8 are Catholic (4.9%), 42 are atheists or agnostics (25.6%), and 13 had other religious affiliation (7.9%).

The procedure used a non-probability, convenience sampling method, through the dissemination of a Google Forms questionnaire on different social media groups. Prior to answering the questionnaire, a note on informed consent, confidentiality and research purposes was introduced. The participants gave their consent to participate by continuing to complete the questionnaire. No data that could disclose participants' identity was collected. The research respected the ethics conditions regarding data confidentiality, processing and interpretation, with the author of this study being the only person granted access.

Instruments

Perception of traumatic impact was measured with the 30 subitems from Life Stressor Checklist-Revised (LSC-R; Wolfe et al., 1997). The instrument covers 30 types of traumatic events and they evaluate the occurrence of each one, the age at which it occurred, how frequent it happened, how dangerous it was perceived, and whether the individual experienced strong psychological reactions. To evaluate the perception of traumatic impact, each event requires an answer to the following question: "How much has this affected your life in the past year?". Answers are given on a 5-point Likert scale, ranging from 1 (not at all) to 5 (extremely). This subscale demonstrated a medium internal consistency (α= .74).

Cognitive Flexibility was assessed with the Cognitive Flexibility Scale (Martin & Rubin, 1995) which includes 12 items (e.g., "I am willing to work at creative solutions to problems.", "In any given situation, I am able to act appropriately") with answers scored on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). The instrument shows good psychometric properties in terms of internal consistency (α= .85), resembling the one obtained in other previous studies (Palm & Follette, 2011).

Centrality of Events was measured with the Centrality of Events Scale (Berntsen & Rubin, 2006) that includes 12 items (e.g., "This event tells a lot about who I am", "This event was a turning point in my life"), with responses ranging from 1 (totally disagree) to 5 (totally agree), on a 5-point Likert scale. The internal consistency obtained in this study is high (α = .95), similar to that obtained in other studies (Groleau et al., 2013; Roland et al., 2014).

Creativity was measured with the short version of the Creative Behavior Inventory (Rodriguez-Boerwinkle et al., 2021) consisting of 28 items (e.g., "Wrote poems", "Kept a sketch book"), with answers ranging from 0 (never did this) to 3 (did this more than five times), on a 4-point Likert Scale. This instrument demonstrated a good internal consistency (α = .90), similar to the one obtained in other studies (Tolleson & Zeligman, 2019).

Posttraumatic Growth was measured with the Posttraumatic Growth Inventory - Short Form (Cann et al., 2010), which includes 12 items (e.g., "I have a greater appreciation for the value of my own life", "I know better that I can handle difficulties") measured on a 6-point Likert scale from 0 (I did not experience this change as a result of my crisis) to 5 (I experienced this change to a very great degree as a result of my crisis). The internal consistency for this study is good (α = .90), similar to previous studies (Hijazi et al., 2015).

Study design

The current study has a non-experimental, cross-sectional, and correlational design. Statistical analyses were performed using IBM.SPSS 25 (IBM Corp, 2017) and the medmod module from Jamovi (The Jamovi project, 2024).

3. RESULTS

Descriptive statistics

Descriptive statistics including means, standard deviations, correlation coefficients, and other preliminary indicators are shown in Table 1. Skewness and kurtosis are in the range (-1, 1), with the exception of PTI where it slightly deviates from the normal distribution.

Table 1

Descriptive statistics, preliminary indicators and correlations between observed variables

	M(SD)	Skewness	Kurtosis	VIF	T	1.	2.	3.	4.	5.
1.CE	57.19 (20)	.05	-.58	1.01	.99	-				
2.CF	54 (9.1)	-.34	.26	1.11	.90	-.10	-			
3.C	25.7(15.2)	.88	.38	1.10	.91	.02	.30**	-		
4.PTG	30.96(11.26)	-.48	-.11	-	-	.32**	.28**	.18*	-	
5.PTI	14.35(11.40)	1.67	4.73	-	-	.35**	.16*	.24**	.21**	-

Note: CE= centrality of events; CF= cognitive flexibility; C= creativity; PTG= posttraumatic growth; PTI= perception of traumatic impact; T=Tolerance
*p < .05; **p < .01

Hierarchical Multiple Regression

In order to test the first hypothesis, a hierarchical multiple regression analysis was performed. The first step was to analyse whether the CE, CF and C are significantly correlated with PTG and furthermore. According to Table 1, each predictor significantly correlates with PTG. Following this, a multicollinearity diagnosis was carried out to verify the condition of orthogonality using the VIF and Tolerance indices available in Table 1.

According to Table 2, CE explains on its own around 10% of the variance in PTG, Model 1 being significant $F(1,162) = 18.5$, $R = .32$, $R^2 = .10$, $p < .001$. The second model that adds CF is also significant $F(2,161) = 20.4$, $R = .45$, $R^2 = .20$, $p < .001$. It appears that CF contributes an additional 10% over CE, a significant increment ($\Delta R2 = .10$, $p < .001$). The two variables combined explain around 20% in the variance of PTG, statistically significant results. The third block adds creativity, the overall final model being significant $F(3,160) = 14.1$, $R = .46$, $R^2 = .21$, $p < .001$. Therefore, as previously mentioned the three variables are responsible for around 21% of the variance in PTG. However, it can be noticed that creativity only brings an insignificant 1% increment in the final model ($\Delta R2 = .01$, $p = .248$).

Table 2

Hierarchical multiple regression

	b	95% CI		*SE*	*β*	*t*	R^2	ΔR^2	*F*
		LL	*UL*						
Model 1							.10***		18.5
CE	.18***	.10	.26	.04	.32***	4.31			
Model 2							.20***	.10***	20.4
CE	.20***	.12	.28	.04	.35***	4.99			
CF	.39***	.22	.57	.09	.32***	4.48			
Model 3							.21***	.01	14.1
CE	.20***	.12	.28	.04	.35***	4.94			
CF	.36***	.18	.54	.09	.29***	3.94			
C	.06	-.04	.17	.05	.09	1.16			

Note: Criterion– posttraumatic growth (PTG); ***p< .001

The mediating role of centrality of events (CE)

To test the second hypothesis, a mediation analysis was conducted. According to Table 3, the total effect is significant c= .21 (Z=2.73, p< .05), the indirect effect is significant Z=2.87, p< .05), while the direct effect is insignificant c'= .11 (Z=1.40, p> .05), data that suggests a total mediation model (c'<c). The path estimates are: a= .61, statistically significant (Z=4.78, p< .001), while b= .16 is also significant (Z=3.59, p< .001). The effect of the perception of traumatic impact on posttraumatic growth is around 47% mediated by the centrality of events.

Table 3

Mediation Estimates and Path Estimates for CE

			95% CI				
	b	*SE*	*LL*	*UL*	*Z*	*p*	% Mediation
Indirect	.10	.03	.03	.16	2.87	.004	47.30
Direct	.11	.08	-.04	.26	1.40	.161	52.70
Total	.21	.08	.06	.35	2.73	.006	100
PTI→ CE	.61	.13	.36	.87	4.78	< .001	
CE→PTG	.16	.04	.07	.25	3.59	< .001	
PTI→PTG	.11	.08	-.04	.26	1.40	.161	

The mediating role of cognitive flexibility (CF)

For the third hypothesis, another mediation model was performed. According to Table 4, the total effect is significant, c= .21 (Z=2.73, p< .05), the indirect effect is insignificant (Z=1.79, p> .05), and the direct effect c'= .17 is significant (Z=2.24, p< .05). The path estimates are a= .13, significant (Z=2.11, p< .05), while b= .31, also significant (Z=3.38, p< .001). As a result, the mediating role of CF on the relationship between PTI and PTG is statistically insignificant.

Table 4

Mediation Estimates and Path Estimates for CF

			95% CI				
	b	*SE*	*LL*	*UL*	*Z*	*p*	% Mediation
Indirect	.04	.02	-.003	.09	1.79	.073	19.80
Direct	.17	.07	.02	.31	2.24	.025	80.20
Total	.21	.08	.06	.35	2.73	.006	100
PTI→ CF	.13	.06	.01	.25	2.11	.034	
CF→PTG	.31	.09	.13	.50	3.38	< .001	
PTI→PTG	.17	.07	.02	.31	2.24	.025	

The mediating role of creativity (C)

For the fourth hypothesis, a final mediation model was performed. According to Table 5, the total effect is significant, c= .21 (Z=2.73, p< .05), the indirect effects is insignificant (Z=1.52, p> .05), while the direct effect is significant c'= .17 (Z=2.25, p< .05). The path estimates are a= .32, significant

(Z=3.20, p= .001) and b= .10, insignificant (Z=1.72, p> .05). Therefore, the mediating role of C on the relationship between PTI and PTG is statistically insignificant.

Table 5
Mediation Estimates and Path Estimates for C

			95% CI				
	b	*SE*	*LL*	*UL*	*Z*	*p*	% Mediation
Indirect	.03	.02	-.01	.07	1.52	.129	15.70
Direct	.17	.08	.02	.32	2.25	.024	84.30
Total	.21	.08	.06	.35	2.73	.006	100
PTI→ C	.32	.10	.13	.52	3.20	.001	
C→PTG	.10	.06	-.01	.21	1.72	.085	
PTI→PTG	.17	.08	.02	.32	2.25	.024	

4. DISCUSSIONS

Regarding our main hypothesis, the data supports the role of the current predictive model in PTG. However, the contribution of creativity in the final predictive model remains insignificant. The association between traumatic perception and PTG is in line with the theory of Tedeschi and Calhoun (2004), stating that a potential traumatic event needs to reach a specific threshold to generate PTG. The predictive role of CE is consistent with the existing literature (Barton et al., 2013; Boals & Schuettler, 2011; Groleau et al., 2013). Similar to Boals and Schuettler study (2011), the centrality of events was the most powerful predictor of posttraumatic growth, emphasising the idea that traumatic events can significantly shape an individual's life course, potentially giving it a new meaning and even contributing to a transformed identity. Cognitive flexibility also had a significant predictive role, similar to existing literature (Hijazi et al., 2015; Sattari, 2022). Since traumatic events alter core beliefs about the self and the world, the individual has to engage in a process of redefining these beliefs, in order to move forward. The new belief system is more complex, more mature and more flexible than prior to the event. Moreover, a lack of cognitive flexibility is associated with lower chances of seeing the traumatic event as a source of growth (Keith et al., 2015).

Although creativity generates a useful theoretical framework in the therapeutic context, its role in predicting posttraumatic growth remains insignificant when analysed with other variables, as current data suggests. This might be due to the rather frequent lack of time and disposition for creative activities when faced with a trauma, since individuals might opt for preserving their few resources available, focusing more on surviving, emotional regulation, and other coping strategies.

The second hypothesis is supported by data, as the centrality of events mediates the relationship between traumatic perception and posttraumatic growth, results similar to current literature (Tranter et al., 2021). Therefore, the perception of traumatic impact influences the degree of CE, which also impacts PTG. Centrality of events appears among survivors, emphasising their tendency towards reevaluating and changing prior perceptions of the world, identity and relationships (Roland et al., 2014). Previous studies support the link between trauma and PTG (Bensimon, 2012), and also between CE and PTG (Boals & Schuettler, 2011; Groleau et al., 2013; Lancaster et al., 2013). Reiland and Clark (2017) analyse the mediating role of CE on the relationship between the type of traumatic event and PTSD, centrality of events being a double-edged construct, predicting both PTSD and PTG (Boals & Schuettler, 2011).

The third hypothesis is not supported, therefore cognitive flexibility does not mediate the relationship between perception of traumatic impact and posttraumatic growth. It is somehow expected that traumatic events might mould rigid structures that make it more difficult to interpret reality, to function, to think and to show emotion, since they tend to generate maladaptive mechanisms. Although there is no similar study analysing these three constructs in a similar manner, previous literature confirms the association between CF and PTG (Sattari, 2022; Toraman et al., 2020; Vahidi et al., 2023), the mediating role of CF on the relationship between PTG and resilience (Çınar et al., 2022), and also on the relationship between PTG and death attitudes in cancer patients (Vahidi et al., 2023).

Current data does not support the fourth hypothesis, suggesting that creativity does not act as a mediator on the relationship between PTI and PTG. This might be due to the way creativity is measured in this study, focusing specifically on creative behaviour (e.g., going to the theatre, literature writing). Future studies might cover other facets of creativity, such as creative thinking or emotional creativity. Although its role as a mediator is not supported, different studies acknowledge the role of creativity in PTG and the association between a traumatic background and using creativity as a means of expressing emotions (Forgeard, 2013; Tolleson & Zeligman, 2019; Zhai et al., 2021).

Implications

Analysing the predictive model through the lenses of the Posttraumatic Growth Model (Calhoun et al., 2010) and the

Recovery Model (Tedeschi et al., 2018), centrality of events, cognitive flexibility and creativity enhance individuals' capacity to overcome adversities, supporting internal change. Centrality of events could lead to a thorough revision of narrative schemas, aiming to reduce emotional distress and to accept the new changed world after the traumatic event occurred. Cognitive flexibility is of utmost importance when it comes to a change in attitudes, beliefs, values, that initiates the groundwork for reaching a new meaning and purpose. In this framework, creativity may help reduce emotional distress and facilitate access to more individual resources, all these efforts aspiring to an overall wellbeing and life satisfaction, as stated in the model of Calhoun and colleagues (2010). Centrality of events is the construct with the most influence on PTG, addressing almost every element from the Model of Posttraumatic Growth (Calhoun et al., 2010). Once the adverse event takes place, the individual is more prone to rumination, even to intrusive thoughts which might propel him to find new ways to cope with the distress, to reflect more and build a narrative that could be shared with others while reaching out for support. In this way, rumination on the traumatic event might be beneficial, paving the way towards acceptance, new narrative schemas, and even PTG.

Considering the predictive role of CE, it is no wonder that the assimilation of traumatic experience in one's identity is essential in a therapeutic process. This concept is associated with trauma-specific symptomatology, but it is not yet clear whether CE triggers a more intense symptomatology or whether the symptomatology itself makes the traumatic event central in one's life (Groleau et al., 2013). Given the dual character of CE, there is an immediate need for more studies that take into account the narrative behind CE, whether it has a positive or negative connotation, aspect that seems to determine the onset of PTSD or the emergence of PTG (Bernard et al., 2015; Groleau et al., 2013). Additionally, studies should look into other variables that might explain this dual character of CE.

Cognitive flexibility has a protective role in the process of posttraumatic recovery, with higher levels of flexibility possibly leading to a more complex reflection on the traumatic history and a better tolerance of uncertainty. Taking this into account, therapeutic interventions might target the improvement and development of cognitive flexibility from early stages, highlighting the use of ACT (Acceptance and Commitment Therapy) interventions and other practices aimed at modifying cognitive schemas (Landi et al., 2022). Although data supports the role of CF in PTG, the mechanisms through which cognitive functions adapt to trauma are not yet clear. In line with Sattari's suggestion (2022), the domain of psychotraumatology would benefit a lot from more studies addressing cognitive abilities and their relationship with PTG.

Practical implications

Looking at the importance of CE, psychotherapists should be familiarised with this concept, to be able to identify it and to elaborate intervention plans around it. Techniques that target the restructuring of personal narratives might be of value to activate personal resources and to create new directions for improvement. Self-reflection techniques and support groups that would ensure safe spaces for participants to share experiences and be exposed to new and different stories might help integrate trauma. Therefore, psychotherapists should pay close attention to the way clients integrate traumatic experiences within their identity and life story. According to Neimeyer (2006), personal narrative structures are the ones that are most affected by traumatic events, and their integration is involved in PTG, resilience and recovery.

Given that trauma has the potential to generate inflexible and maladaptive patterns and structures, regaining the capacity to adapt could stimulate the potential for PTG. To gain new perspectives, ACT and DBT use a set of techniques, such as metaphors (Killick et al., 2016). The ability to think in a flexible manner in the face of a traumatic event could foster acceptance of all the emotional states that follow.

Limitations and future directions

There are several limitations in the present study related to its methodology. First of all, the use of self-report instruments might lead to dishonest or inaccurate answers due to perception errors, affecting the accuracy of the results. Secondly, given the cross-sectional nature of the study, results cannot be generalised, and causal relationships cannot be extracted. Another limitation takes into account the sample and the data collection procedures, using a non-probability, convenience sampling method through the dissemination of an online questionnaire on different social media platforms. The sample is not representative for the general population, considering that the majority of respondents were young adults. Moreover, PTI slightly deviates from normality in the current data distribution.

Additionally, there are several limitations in the conceptualisation of the main variables. The degree of subjectivity might influence the results when measuring the perception of traumatic impact with LSC-R (Wolfe et al., 1997), where mechanisms such as denial, minimising the impact or exaggerating the impact of adverse experiences may interfere. Regarding posttraumatic growth, it is difficult to differentiate between self-perceived and objective growth, since the available instruments evaluate its self-perceived form, which may lead to overestimated or underestimated PTG scores. It is still unclear above what threshold the positive change becomes posttraumatic growth or whether any positive change could be interpreted as growth. When measuring creative behaviour, the instrument counted on participants' memory, which has an impact on its validity.

Since the presented framework of the study is relatively new, current literature is rather limited. Existent studies examined related concepts or propose isolated overviews, as opposed to the current research. In the future, a multiple mediation model would be advised, in order to see the

interconnectedness of these constructs and their overall effect on PTG, which is rather cumulative than isolated. Moreover, testing multiple hypotheses regarding mediation models increases the risk of type I error. However, the topic is highly relevant given the need to better understand the mechanisms of trauma.

Conclusions

The recovery process following a traumatic event is challenging and draining. Although traumatic experiences bring up certain difficulties in managing oneself, understanding the world and the relationships around, posttraumatic growth is possible most of the time (Tedeschi & Calhoun, 2004). The significant role of CE in this analysis could suggest that a strong perception of the traumatic impact leads to a more pronounced identification with the event, paving the road towards posttraumatic growth. Previous studies focused more on trauma and its negative effects, which diminishes our understanding of how traumatic reactions influence resilience and posttraumatic growth (Bonanno, 2004). For this reason, new theoretical models investigating predictors of posttraumatic growth and their interconnectedness would be essential to tailor more efficient methods and interventions, allowing mental health specialists to support their clients' evolution.

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