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Affect and post-traumatic growth in previously bullied students: Intrusive and deliberate rumination as mediators

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ABSTRACT

Bullying often causes profound psychological changes in people, which can have long-term impacts on mood and other related processes. This cross-sectional study aims to analyze whether associations between (negative vs. positive) affect and post-traumatic growth (PTG) are mediated by (intrusive and deliberate) rumination. Using a large sample of 1188 college students, we selected 112 participants (77 % women) who reported having experienced peer victimization before entering university. Based on correlation analysis, two serial mediation analyses were estimated using either positive or negative affect as predictors. While positive affect was directly related to PTG, negative affect was only indirectly related to thriving. Specifically, negative affect made PTG less likely through intrusive rumination, and more likely through serial mediation of intrusive and deliberate rumination. The findings suggest that deliberate rumination could be useful for designing interventions that promote thriving after experiencing bullying. It could also help reduce the risk posed by negative affect and intrusive rumination.

1. Introduction

Traumatic or highly stressful events such as bullying often cause profound psychological changes in people, which can have long-term impacts on mood and other related processes (Yang et al., 2018). Indeed, a large body of research has shown that peer victimization has long-lasting negative consequences on health and academic achievement (Guo et al., 2022; Laith & Vaillancourt, 2022; Li et al., 2022; Park et al., 2017; Troop-Gordon, 2017). However, evidence also indicates that it can lead to thriving (Andreou et al., 2021; Ravelo et al., 2022), thus demonstrating the complexity of responses to bullying. Post-traumatic growth (PTG) has been defined as those enduring positive changes as a result of struggling to face a significant life challenge (Tedeschi & Calhoun, 2004). However, it does not necessarily put an end to distress in trauma survivors (Liu et al., 2017;Taku et al., 2021; Tedeschi & Calhoun, 1995). Hence, both positive affect and negative affect may be relevant for this process.

So far, findings linking affect and PTG are inconclusive. Some studies have found that PTG is either directly or indirectly linked to positive affect and unrelated to negative affect (Kong et al., 2018; Rzeszutek, 2018; Yu et al., 2014). However, others suggest that negative affect may act as a trigger for PTG to the extent that it is an indicator of psychological struggle (Taku et al., 2021; Tedeschi & Calhoun, 1995). These inconsistencies have motivated the analysis of possible underlying cognitive mechanisms that account for the relationships between affect and PTG. In this regard, researchers have paid special attention to the role of rumination (Curci et al., 2013; Yang & Ha, 2019).

Rumination has been shown to have multiple negative consequences that facilitate the development and persistence of depression and other psychopathologies (Watkins & Roberts, 2020). It was initially defined as repetitive thinking about the causes, consequences, and symptoms of one's negative affect (Nolen-Hoeksema et al., 2008). However, research has expanded by examining different dimensions (e.g., content, triggering event, stability, relationship to other constructs), making it difficult to reach a consensus on its definition (Smith & Alloy, 2009) and on its underlying structure (Segerstrom et al., 2003; Tanner et al., 2013).

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Although rumination is generally considered a negative and maladaptive cognitive process, there is growing interest in examining whether some forms of rumination can be adaptive (García et al., 2017). This is especially the case when it comes to investigating the role of rumination in PTG (Turan et al., 2022). In this area, two main dimensions of ruminative thinking have been proposed: intrusive and deliberate rumination, (Cann et al., 2011; García et al., 2017; Triplett et al., 2012).

Intrusive rumination is considered to comprise uncontrollable and repetitive negative thoughts that contribute to maintaining distress and maladaptive outcomes after adverse events (Brown et al., 2018; Wozniak et al., 2020). Deliberate rumination is also considered to be repetitive, but still intentional, aimed at struggling with adverse events, and with the potential to lead people to thriving (Allbaugh et al., 2016; Kamijo & Yukawa, 2018; Kramer et al., 2020; Stockton et al., 2011). For instance, it seems to help people find meaning in the face of adversity (Kamijo & Yukawa, 2018; Tedeschi & Blevins, 2015).

Despite being considered an unproductive and maladaptive form of cognitive processing (Stockton et al., 2011), intrusive rumination is also a normal response immediately after adversity. This has led to some researchers to suggest that it could have a potential facilitating role in deliberative rumination (Kamijo & Yukawa, 2018). In fact, both forms of rumination seem to be positively related to each other (García et al., 2017; Liu et al., 2021; Squires et al., 2022).

Although rumination has been found to be related to PTG in the face of different types of adversity (Henson et al., 2021), it it is not clear how these mechanisms relate to each other to make thriving more likely. In this regard, the current study aims to analyze whether the associations between (negative and positive) affect and PTG are mediated by (intrusive and deliberate) rumination among students who have experienced bullying before entering university. Based on the literature reviewed above, the specific hypotheses examined are as follows.

Positive affect is positively related to PTG (Hypothesis 1).

Negative affect is positively related to intrusive rumination (Hypothesis 2a), which, in turn, makes PTG less likely (Hypothesis 2b).

Intrusive rumination is positively related to deliberate rumination (Hypothesis 3a), which, in turn, makes PTG more likely (Hypothesis 3b).

2. Method

2.1. Participants

Using a large sample of 1188 college students, we selected 112 participants (77 % women) who reported having experienced peer victimization before entering university. Participants were studying various degrees at the authors' university. Their mean age was 21.0 years old ($SD = 5.6$). The average time elapsed since the last remembered bullying experience was 5.6 years ($SD = 3.5$).

2.2. Design and procedure

The study was approved by the Institutional Review Board of the authors' university. The participants received information about the procedure and objective of the investigation, and they signed a consent before participating in the study. Participation was totally voluntary. Anonymity and confidentiality of data were ensured at all times.

They received a link to the first questionnaire. Participants read a definition of bullying by Olweus (1993) before being asked whether or not they had suffered that experience before entering university. They were also asked about the time elapsed since the last episode of bullying they remembered. Once those students who had experienced peer victimization were identified and having agreed to continue participating in the study, they received a second questionnaire with the rest of the measurement items.

2.3. Measures

The instrument was designed to collect general information on age, gender, degree and adversities suffered in their lives, as well as several scales that are described below.

2.3.1. Posttraumatic growth

Post-traumatic growth was measured using the shortened 9-item scale from the Resilience Portfolio Measurement Packet (Hamby et al., 2015) (e.g., "I changed my priorities about what is important in life"; "now, I know that I can handle hard times"). This scale was used due to the availability of its Spanish translation, which has demonstrated its psychometric adequacy and predictive capacity (Author citation). Response options ranged from 1 (*not true*) to 4 (*mostly true*). Internal consistency was computed using Cronbach's alpha ($\alpha = 0.85$).

2.3.2. Positive and negative affect

The 20-item Positive and Negative Affect Schedule (PANAS, Watson et al., 1988) was used to assess (10) positive and (10) negative affects over the past few weeks. Specifically, we used the Spanish adaptation of Moral (2011). This instrument has been demonstrated to be reliable and valid to assess mood states. Students were asked to indicate the extent to which they had experienced each affect (e.g., "nervous"; "scared"; "proud"; "enthusiastic"). Responses ranged from 1 (*very slightly or not at all*) to 5 (*extremely*). Cronbach's alphas were 0.81 for negative affect and 0.87 for positive affect.

2.3.3. Rumination inventory

Ruminative thinking was assessed using the Event-Related Rumination Inventory (Cann et al., 2011), which shows adequate psychometric properties, as well as convergent and predictive validity. This 20-item scale measures two dimensions, each of which consists of 10 items: intrusive rumination (e.g., "I could not keep images or thoughts about the event from entering my mind"; "thoughts about the event came to mind and I could not stop thinking about them") and deliberate rumination (e.g., "I thought about whether I have learned anything as a result of my experience"; "I thought about what the experience might mean for my future"). Response options ranged from 0 (*not at all*) to 3 (*always*). Cronbach's alphas were 0.94 and 0.88, respectively.

2.4. Data analysis

To ensure comparable scale metrics for all variables, scale scores were previously standardized by converting them to z scores. Descriptive analyses and Pearson correlations were conducted using IBM SPSS25. The mediation analysis was tested using the SPSS25 macro program PROCESS 4.2 (Hayes, 2022a). This mathematical tool does not allow causal inferences to be made from cross-sectional data. However, it does help identify the variables of interest for subsequent longitudinal or experimental studies. In Hayes' words, mediation analysis is useful "to discern order in apparent chaos, or signals of processes that may be at work amid random background noise" (Hayes, 2022b, p.17).

Based on the correlation analysis, two serial mediation models (Model 6) were estimated to test the mediating role of intrusive and deliberate rumination, one with positive affect and the other with negative affect. In both cases, PTG was used as the outcome. Model 6 requires that mediators are related to each other (Hayes, 2022b), which can be provisionally assumed from the literature review. Hence, Model 6 has been used with cross-sectional data (e.g., Stromberg et al., 2021; Tang et al., 2022).

The interactions between the variables were analyzed. Statistical support for the mediation was assumed when zero was outside the confidence interval. The HC4 option was used to ensure the analyses were robust against violations of homoscedasticity. Bootstrap method was also used in mediation analysis to estimate the 95 % confidence interval with 10,000 repeated sampling.

3. Results

3.1. Pearson correlations and descriptive statistics

Table 1 shows Pearson correlations and descriptive statistics for all the variables examined. While positive affect was only positively associated with PTG, negative affect was positively associated with both intrusive rumination and deliberate rumination. Time elapsed since the last remembered peer victimization experience negatively correlated with PTG ($r = -0.19$, $p < 0.05$). Therefore, time elapsed was controlled in later analyses.

3.2. Serial mediation analyses

Using positive affect as a predictor, the first serial mediation model showed two direct significant associations with PTG: (1) a positive path from positive affect to PTG ($b = 0.29$, $SE = 0.09$, 95 %, $CI = 0.11, 0.47$); and (2) another positive path from deliberate rumination to PTG ($b = 0.30$, $SE = 0.11$, 95 %, $CI = 0.08, 0.52$). Thus, this first model supported Hypothesis 1 by indicating that positive affect makes PTG more likely. The results did not reveal any indirect path between positive affect and PTG.

Table 2 details the regression coefficients and confidence intervals of the second serial model (Fig. 1). No direct association between negative affect and PTG was observed in this model. By contrast, the results did reveal a positive direct association between negative affect and intrusive rumination, thus supporting Hypothesis 2a. Therefore, the model also supported Hypothesis 2b, as it showed a negative indirect path from negative affect to PTG through intrusive rumination.

Intrusive rumination was positively associated with deliberate rumination, which supported Hypothesis 3a. As in the previous serial model, a positive direct path from deliberate rumination to PTG was found. Finally, the results indicated that the serial mediation of intrusive and deliberate rumination increased the likelihood of thriving, thus supporting Hypothesis 3b.

As detailed in Table 3, the model revealed two significant indirect paths (1 and 3), in which zero was outside the confidence interval. Both paths indirectly associated negative affect with PTG, but the predictions were opposite. While indirect path 1 showed that intrusive rumination separately predicted a lower PTG, indirect path 3 indicated how the serial mediation of intrusive and deliberate rumination made thriving more likely.

4. Discussion

This study has analyzed the serial mediating role of intrusive and deliberate rumination between (negative vs. positive) affect and PTG in previously bullied students. Pearson correlations showed that time elapsed since the last remembered peer victimization experience was positively related to PTG. Hence, this variable was controlled in later analysis.

The first serial mediation analysis supported Hypothesis 1, thus confirming that positive affect is directly and positively related to PTG as previous research has found (Kong et al., 2018; Rzeszutek, 2018; Yu et al., 2014). In this case, none of the variables analyzed showed a mediating role between both factors, which suggests that association between positive affect and PTG becomes independent of the deliberate reinterpretation of the adverse experience. In this regard, Rzeszutek (2018) has pointed out that PTG may enhance positive affect over time. People could also consider overcoming their adverse experience as evidence of strength, without it involving rumination of past experience.

Previous research has found that negative affect makes intrusive rumination more likely (Curci et al., 2013). There is also evidence that this repetitive thought may contribute to maintaining distress and maladaptive outcomes (Brown et al., 2018; Wozniak et al., 2020). Consistent with both findings, the current study indicates that negative affect is positively related to intrusive rumination (Hypothesis 2a), which in turn makes PTG less likely (Hypothesis 2b). However, as will be seen below, our findings also point to the relevance of the association between intrusive and deliberate rumination in predicting PTG.

Although negative affect has been proposed as a trigger for PTG (Taku et al., 2021; Tedeschi & Calhoun, 1995), the evidence obtained so far is inconclusive (Kong et al., 2018; Rzeszutek, 2018; Yu et al., 2014). In this regard, the current study makes a potential contribution by finding that negative affect may make PTG more likely through the serial mediation of intrusive and deliberate rumination. This result is consistent with the partial findings of other studies that indicate a positive relationship between intrusive and deliberate rumination (García et al., 2017; Liu et al., 2021; Squires et al., 2022), as well as between deliberate rumination and PTG (Kamijo & Yukawa, 2018; Kramer et al., 2020; Tedeschi & Blevins, 2015). This result also seems to indicate that the potential benefits of deliberate rumination on PTG are not directly related to negative affect. However, they could be enhanced by increasing deliberate rumination once the first signs of intrusive rumination appear.

In short, deliberate rumination predicts higher PTG, whether or not it is related to negative affect and intrusive rumination. By contrast, intrusive rumination alone makes PTG less likely. As suggested by Kamijo and Yukawa (2018), intrusive rumination seems to have a different role depending on whether it is associated with deliberate rumination or not. In terms of intervention, this points to the need to promote deliberate rumination after adverse experiences.

4.1. Limitations and future directions

It is necessary to consider some limitations of the study. First, cross-sectional data do not allow causal inferences to be made from the estimated model, hence longitudinal or quasi-experimental data are necessary to confirm the results obtained. However, the model does help identify the variables of interest for subsequent studies (Hayes, 2022b; Igartua & Hayes, 2021). In Hayes' words, we should not let "the limitations of our data collection efforts constrain the tools we bring to the task of trying to understand what our data might be telling us about the processes we are studying" (Hayes, 2022b, p.18). Second, although the sample size was established after selecting students who had experienced bullying before entering university, it could reflect the characteristics of a specific university population. Hence, the need to replicate the study using other samples to guarantee the generalizability of the findings. This includes the need to expand the samples to high school students. Third, it was not assessed whether the participants had received any type of therapy after their bullying experience. Therefore, future research should examine to what extent this may have contributed to deliberative rumination.

4.2. Implications for intervention

Despite these limitations, our findings suggest that deliberate rumination could be useful for designing interventions that promote PTG in previously bullied students. The results also help understand how negative affect could contribute to thriving. Specifically, intrusive and deliberate rumination seem to follow each other to make PTG more

Table 1
Pearson correlations and descriptive statistics of the factors analyzed.

Variables	1	2	3	4	*M*	*SD*
1. Posttraumatic Growth					2.73	0.70
2. Negative affect	−0.11				3.02	0.45
3. Positive affect	0.37	−0.10			3.02	0.73
4. Intrusive Rumination	−0.08	0.47	−0.17		2.12	0.74
5. Deliberative Rumination	0.17	0.35	0.02	0.63	2.01	0.63

Note: ** $p < .01$.

Table 2
Regression coefficients and confidence intervals of chain mediation analysis.

Outcome Variable	Predictor variable	COEFF	*SE* (HC4)	*t*	LLCI	ULCI	*p*	R^2	*F* (HC4)
Intrusive rumination	Negative affect	0.45	0.09	4.90	0.27	0.64	0.000	0.22	14.66
Deliberate Rumination	Negative affect	0.06	0.09	0.72	−0.11	0.24	0.474	0.39	20.85
	Intrusive Rumination	0.58	0.09	5.99	0.38	0.77	0.000		
	Time Elapse	−0.00	0.00	−0.59	−0.01	0.00	0.553		
PTG	Negative affect	−0.11	0.09	−1.19	−0.30	0.08	0.235	0.14	4.62
	Intrusive Rumination	−0.26	0.12	−2.11	−0.51	−0.01	0.037		
	Deliberate Rumination	0.37	0.12	3.15	0.14	0.61	0.002		
	Time Elapse	−0.00	0.00	−2.8	−0.01	−0.00	0.006		

Note. PTG, post-traumatic growth; LLCI, lower level of the 95 % confidence interval; ULCI, upper level of the 95 % confidence interval; SE, Standard Error, conditional effects were calculated by PROCESS according to the 16th, 50th, and 84th percentile scores on drive; HC4 = Statistical estimator to ensure the analysis is robust against violations of homoscedasticity.

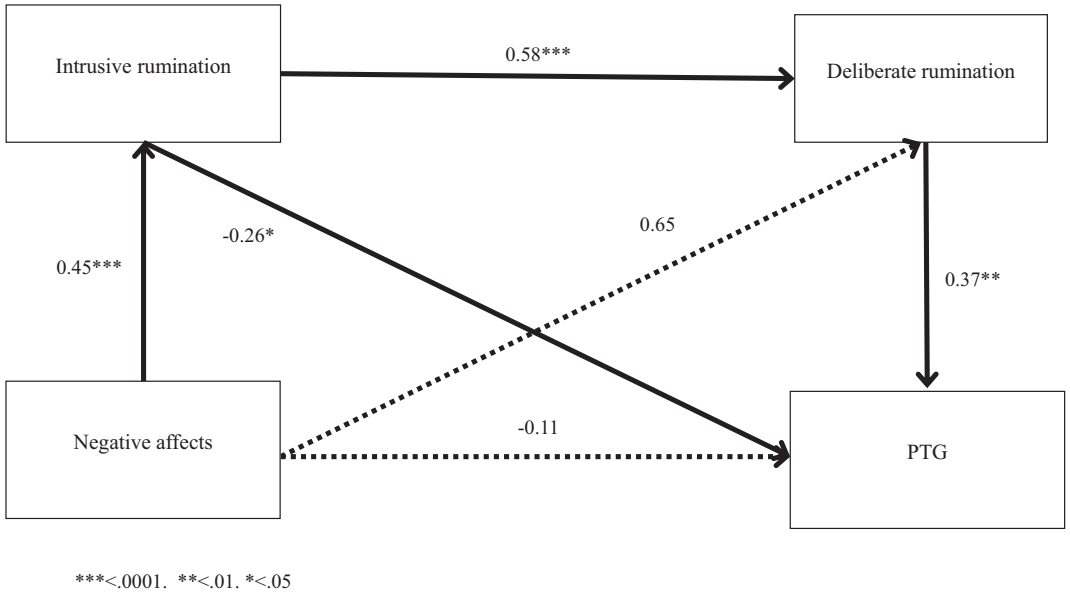

Fig. 1. Serial Mediating Role of (Intrusive and Deliberate) Rumination Between Negative Affect and PTG.

Table 3
Direct and indirect paths of serial mediation analysis.

Path	Effect	*SE* (HC4)	Boot LLCI	Boot ULCI
Total effect	−0.11	0.09		
Direct effect	−0.11	0.09		
Total indirect effect	0.02	0.05	−0.09	0.11
Indirect 1 Negative affect → Intrusive Rumination→ PTG	−0.12	0.06	−0.23	−0.00
Indirect 2 Negative affect → Deliberate Rumination→ PTG	0.02	0.03	−0.04	0.10
Indirect 3 Negative affect → Intrusive Rumination → Deliberate Rumination → PTG	0.09	0.04	0.03	0.18

Note. PTG = Post-traumatic Growth. HC4 = Statistical estimator to ensure the analysis is robust against violations of homoscedasticity.

likely. Therefore, it may be necessary to look for formulas that facilitate the transition from intrusive to deliberate rumination. For instance, a promising strategy is to help people recognize turning points that allow them to elaborate memories of positive "end affects" (Gonzalez-Mendez et al., 2022). In fact, some of them are identified during therapy. Complementary strategies could also be used to promote positive affect. For instance, training in positive rumination (i.e., repetitive thoughts centering on one's current positive affective state), using expressive writing has also been demonstrated to be a useful tool to reduce maladaptive rumination (Yang & Li, 2020). Therefore, these strategies can also serve to promote thriving.

5. Conclusions

This cross-sectional study analyzes whether (positive vs. negative) affect and PTG are mediated by (intrusive and deliberate) rumination in previously bullied university students. Although longitudinal or experimental studies are still necessary to confirm the results, the estimated model contributes to clarifying the mechanisms underlying this process. The findings support that positive affect is directly related to PTG, whereas negative affect requires the serial mediation of intrusive and deliberate rumination to make thriving more likely. The findings also point to the need to promote deliberate rumination after bullying, as well as using different strategies that can increase positive affect.

CRediT authorship contribution statement

Yennifer Ravelo: Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Hipólito Marrero:** Writing – review & editing, Writing – original draft, Resources, Project administration, Funding acquisition. **Olga M. Alegre de la Rosa:** Writing – review & editing. **Rosaura Gonzalez-Mendez:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Software,

Methodology, Formal analysis, Conceptualization.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data availability

The data file has been attached along with the manuscript

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Appendix A. Supplementary data

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