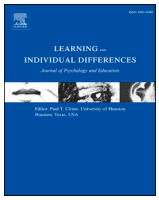
Learning and Individual Differences 107 (2023) 102360

Contents lists available at ScienceDirect

Learning and Individual Differences

journal homepage: www.elsevier.com/locate/lindif



The role of students' passion and affect in resilience following failure

Sonia Rahimi *, Virginie Paquette, Robert J. Vallerand

Research Laboratory on Social Behavior, Department of Psychology, Université du Québec à Montréal, Canada

ARTICLE INFO

Keywords:
Passion
Resilience
Failure
Positive and negative affect
Performance

ABSTRACT

A passion-affect-outcomes resilience model was proposed and tested in two studies (Study 1: $n = 320$, Study 2: $n = 236$) where students were randomly assigned to experimentally manipulated failure/success conditions. It was hypothesized that beyond the effects of failure on affect, harmonious passion would be positively associated with positive affect and negatively relate to negative affect, and obsessive passion would positively relate to negative affect and, to a lesser degree, to positive affect. In turn, positive affect was assumed to promote high global resilience within and outside the domain students were passionate about (academia), while negative affect was assumed to hinder resilience. Results supported this model showing that harmonious passion was associated with high global resilience in both studies, whereas obsessive passion was associated with low global resilience in Study 1 and no resilience in Study 2, via their respective relationships with positive and negative affect. Implications for the field of resilience and for future research are drawn.

Educational relevance and implications statement

These studies suggest that the resilience process is more complex than previously portrayed in the literature. Failure on an academic task can lead to resilience in the academic domain, but no resilience outside of school (e.g., life in general). Additionally, such findings highlight that differences in resilience following failure may be attributed to the type of passion students have (harmonious v. obsessive), and which emotions they experience following failure.

1. Introduction

1.1. The role of students' passion and affect in resilience following failure

For close to 50 years now, the concept of *resilience* has generated great attention. Resilience is defined as the ability to recover when faced with difficulties or challenges in one's life (Bonanno, 2005; Rutter, 1979) and to return to the same, or nearly the same, levels of functioning after facing adversity (Fletcher & Sarkar, 2013). Adversity can range from challenges unique to a subset of individuals (e.g., death of a loved one, divorce) to more large-scale global hardships (e.g., terrorist attacks, geological disasters). Individuals who display resilience are those who positively adjust and continue to function effectively following such difficulties, as typically indexed by psychological well-being (see Bonanno & Diminich, 2013). Few studies have examined the resilience process following a failure and discern people's positive adjustment in different life areas (Johnson et al., 2017). In addition, while studies on resilience have been conducted on a variety of different populations (e.g., children, adults), few studies have looked at the resilience process among individuals who are highly invested in their activities such as those who are passionate toward their studies. Through their engagement in their studies, passionate students may use certain mechanisms to overcome adversity in order to perform at a high level in the academic realm. One mechanism critical to the resilience process is positive affect (Fredrickson et al., 2003). Therefore, the overarching objective of the present research was to assess the resilience process following failure in a multidimensional manner with passionate students, as well as test the mediating role of affect in the relationship between passion and indicators of positive adjustment following adversity.

1.2. The nature of resilience

Research on the construct of resilience aims to understand why certain individuals can withstand stressors caused by challenging situations, whereas others are unable to endure in these contexts. Most of the studies on resilience have been conducted with at-risk children in terms of their developmental trajectories when dealing with chronically aversive circumstances (e.g., parental psychopathology, Masten et al., 1990; maltreatment, Cicchetti & Rogosch, 1997; poverty, Luthar, 1999), adults in terms of how they return to adaptive levels of functioning

* Corresponding author at: Department of Psychology, Université du Québec à Montréal, P.O. Box 8888, Station Centre-Ville, Montréal, QC H3C 3P8, Canada.
E-mail address: sonia.rahimi@mail.mcgill.ca (S. Rahimi).

https://doi.org/10.1016/j.lindif.2023.102360
Received 2 December 2022; Received in revised form 15 July 2023; Accepted 30 August 2023

following adversity (e.g., death of a loved one, Bonanno et al., 2005; terrorist attacks, Fredrickson et al., 2003; natural disasters, Carr et al., 1997), and, of particular interest for the present research, with students following academic setbacks (e.g., Brewer et al., 2019; Martin, 2013). Overall, research has revealed several factors which shield individuals from potentially negative outcomes following adverse conditions and may even promote more adaptive development. For children, these factors include personality variables such as ego-resiliency, low impulsivity, high self-control, as well as support from adults, families, and their communities (Ong et al., 2009; Ungar et al., 2013; Werner, 1995). For adults, protective factors involve variables such as personality variables, emotional regulation, and coping abilities (Bonanno et al., 2011; Bonanno & Diminich, 2013).

Much of this research has looked at resilience using a unidimensional approach by typically focusing on one outcome in each study such as psychological well-being or mental disorders (Fletcher & Sarkar, 2013). However, these types of studies have not fully encapsulated other important aspects of resilience. For example, imagine a student who fails a chemistry exam one morning, manages to perform very well on the biology exam that same afternoon, but also experiences depression and burnout at the end of that day. If, as researchers, we simply look at performance on the biology exam as an indicator of resilience, we would conclude that this student was resilient. However, if we looked at well-being as an additional marker of resilience, then the student would not be seen as completely resilient. Thus, it is important to assess resilience in a multidimensional fashion to get a more nuanced understanding of resilience. The present research was conducted using this perspective.

We also examined the *process of resilience* rather than the more traditional approach of exploring the *protective factors which bolster resilience*. In the past, most studies from the resilience literature have used the attribute and resources-based approach, investigating protective factors which buffer the influence of stress or risk (Fisher et al., 2018; Garmezy, 1993). Such factors include personal traits or attributes (Block & Block, 1980; Klohnen, 1996) or environmental resources (Cohen & Wills, 1985; Fuller-Iglesias et al., 2008; Wright et al., 2013). Our research differs from these studies as it focuses on the process of resilience, i.e., the process through which people overcome adversity and display resilience (for other studies on the resilience process see Bryden et al., 2015; Fredrickson et al., 2003; Kalia et al., 2020; Kalpidou et al., 2021). This dynamic method of focusing on the resilience process allows for an understanding of what individuals experience and do as adversity takes place (Fisher et al., 2018).

We also posit that resilience can be better understood in terms of two dimensions: (1) the *degree* of resilience achieved (i.e., from low to high levels of positive adjustment), and (2) the *locus* of resilience or where this adjustment takes place (i.e., from specific, if resilience occurs in only one life domain, to global, if resilience occurs across life in general). Thus, following adversity an individual could display high specific resilience if positive adaptation is high, but limited to one life area (e.g., academia). Alternatively, an individual could also have high global resilience if positive adaptation is high and applicable to several life areas (e.g., academia and general life). Moreover, an individual could have no resilience should there be no adaptation in any life domain.

1.3. Resilience of passionate individuals

One group of individuals who have been overlooked but could be particularly resilient in the face of adversity, are passionate individuals (e.g., Paquette, Vallerand, et al., 2023). However, in some cases, given that passionate individuals are highly involved in their favorite activities, they may also suffer psychologically following failure (Bélanger et al., 2013) and may display less resilience. Thus, passion may paradoxically lead to high or low levels of resilience. One theory that can explain this paradox is the *Dualistic Model of Passion* (DMP; Vallerand, 2010, 2015). The DMP defines passion as a strong proclivity toward an activity that one loves, values, finds important, devotes time and energy pursuing, and is part of ones' identity (Vallerand et al., 2003). This model further posits that they are two types of passion: harmonious passion and obsessive passion. Once an activity has become internalized in an autonomous fashion (out of love of the activity), this leads to the initial development of a predominant harmonious passion (HP). HP refers to a strong desire to engage in the activity that one loves, while upholding the other parts or activities in one's life. Individuals who have a predominant HP freely engage in the activity that they love and experience adaptive outcomes such as positive affect and flow (e.g., Carpentier et al., 2012; Curran et al., 2015; Paquette, Holding, et al., 2023; Paquette, Vallerand, et al., 2023; Rahimi & Vallerand, 2021). HP is also unrelated or negatively related to negative affect (e.g., Paquette, Vallerand, et al., 2023). On the other hand, when an activity that one loves is internalized through controlled ways (in part for some extrinsic reasons), this leads to the development of a predominant obsessive passion (OP). OP is characterized by an uncontrollable urge to partake in the beloved activity. Individuals with a predominant OP display a rigid persistence when they are engaged in the activity they love and have many contingencies attached to it such as self-esteem and ego-invested structures (Mageau et al., 2011). OP can lead to the experience of less adaptive, and sometimes maladaptive, outcomes such as negative affect and rumination (e.g., Carpentier et al., 2012; Curran et al., 2015; Paquette, Holding, et al., 2023; Paquette, Vallerand, et al., 2023; Rahimi & Vallerand, 2021). Moreover, OP is unrelated or slightly positively related to positive affect (e.g., Carbonneau et al., 2010; Philippe et al., 2010).

Some studies have started to look at the relationship between passion and resilience. Such research reveals that HP positively predicts *trait* resilience, whereas OP is either negatively related or unrelated to it (Fisher et al., 2017; Vankakova et al., 2021). In a series of three studies (Paquette, Vallerand, et al., 2023), it was found that passion plays a key role in the *resilience process*. Specifically, results uncovered that HP led to positive adjustment through positive affect following a stressful situation (e.g., final exams), whereas OP led to mixed effects, sometimes facilitating positive affect and, in turn, positive adjustment, yet also consistently leading to negative affect that hindered resilience. This research was conducted with passionate students facing a stressful situation in their studies. However, Paquette et al.'s (2023) research did not examine the role of HP and OP in the resilience process *following failure* in the academic context.

1.4. The mediational role of affect in the resilience process

Studies (e.g., Fredrickson et al., 2003) have shown that positive affect plays an important role in the resilience process. Indeed, research shows that positive affect experienced during or following an adverse situation leads to subsequent adaptive outcomes and, thus, to resilience (Cohn et al., 2009; Fredrickson et al., 2003; Galatzer-Levy et al., 2013; Gloria et al., 2013; Ong et al., 2006). According to the Broaden-and-Build Theory of Positive Emotions (Fredrickson, 2013), experiencing positive emotions leads to the momentary broadening of one's thought-action repertoire and helps build durable personal resources (Fredrickson et al., 2000; Fredrickson, 2004). More specifically, when individuals experience positive emotions, these emotions lead to more flexible attention and open-minded thinking, which forecast overall psychological and physical well-being. In repeatedly having such experiences, individuals progressively store personal resources (e.g., friendships, creativity, etc.) which can be drawn upon when they face adversity.

On the other hand, negative emotions lead to the narrowing of the thought-action repertoires and are triggered when one is coping with an immediate threat. Negative emotions promote a narrow focus aimed at certain actions and are also negatively related to resilience (Cohn et al., 2009; Fredrickson & Kurtz, 2011). Negative emotions can take a substantial physiological toll on an individual (e.g., cardiovascular reactivity), but positive emotions are able to "undo" some of this strain (e.g.,

allowing an individual to return to baseline cardiovascular activation levels; Tugade & Fredrickson, 2004). Therefore, not only do positive emotions help construct a range of personal resources, they also help alleviate some of the negative effects of negative emotions. In sum, positive emotions provide important psychological and physiological benefits when individuals are under stress (see Fredrickson, 2013 for a review of research on the Broaden-and-Build Theory of Positive Emotions). Although some studies have looked at the resilience process (e.g., Fredrickson et al., 2003), there is no research to date on the role of positive emotions in the resilience process after passionate individuals have experienced failure.

1.5. The present research

The present research had three objectives assessed across two studies. In both studies, undergraduate students who were passionate about their studies were recruited and failure in this life area (or success, for control purposes) was experimentally induced to create adversity. The first objective was to examine resilience in a multidimensional fashion following failure. More specifically, we examined resilience within a domain that students were passionate about (academia) as well as in other important life areas (life in general) to better identify students' degree of resilience (low to high) and where this resilience occurs (specific to global). The second objective of the present research was to examine how students' resilience following failure would differ as a function of their HP and OP. The third and final objective of this research was to assess the mediating role of affect in the relationships between passion and various outcome variables.

The present research makes important contributions to the resilience literature. First, it offers a broader view of the resilience process by examining it in a multidimensional fashion (degree and locus of resilience). Second, this research provides a better understanding of the resilience process by integrating the DMP (Vallerand, 2010, 2015) with the Broaden-and-Build Theory of Emotions (Fredrickson, 2013) where passion should be related to affect that, in turn, should be associated with indicators of adjustment. Finally, it uses a number of variables (see below) to cover a wide range of outcomes (psychological, physical, performance) and measures (subjective and objective). Based on the literature on the DMP presented above (e.g., Curran et al., 2015; Paquette, Vallerand, et al., 2023), it was hypothesized that HP for one's studies should positively relate to positive affect, and negatively relate to negative affect. On the other hand, OP for one's studies was expected to positively relate to negative affect and, to a lesser degree, positive affect. In accordance with the Broaden-and-Build Theory (Fredrickson, 2013), it was also assumed that positive affect should be positively related to adaptive outcomes both within and outside academia. The opposite pattern of results was expected with negative affect. Of importance, such effects were hypothesized to take place over and beyond those of induced failure. As such, induced failure should be positively related to negative affect and negatively related to positive affect (Howell et al., 2018), that in turn should hinder resilience. In sum, failure was hypothesized to be associated with no resilience, HP for one's studies was expected to be associated with high global resilience (high adaptive outcomes inside and outside academia), and OP for one's studies was assumed to be associated with low global resilience (low adaptive outcomes inside and outside academia), via their respective relationships with positive and negative affect (please see Fig. 1).

1.6. Study 1

The purpose of Study 1 was to test the passion-resilience model following failure. Specifically, we examined the relationships between HP and OP for one's studies, failure (condition variable in which failure or success were experimentally induced), positive and negative affect experienced following induced failure or success in an education task, situational vitality and situational physical symptoms assessed immediately after the education task and the failure induction, and general life satisfaction. It was hypothesized that HP for one's studies should

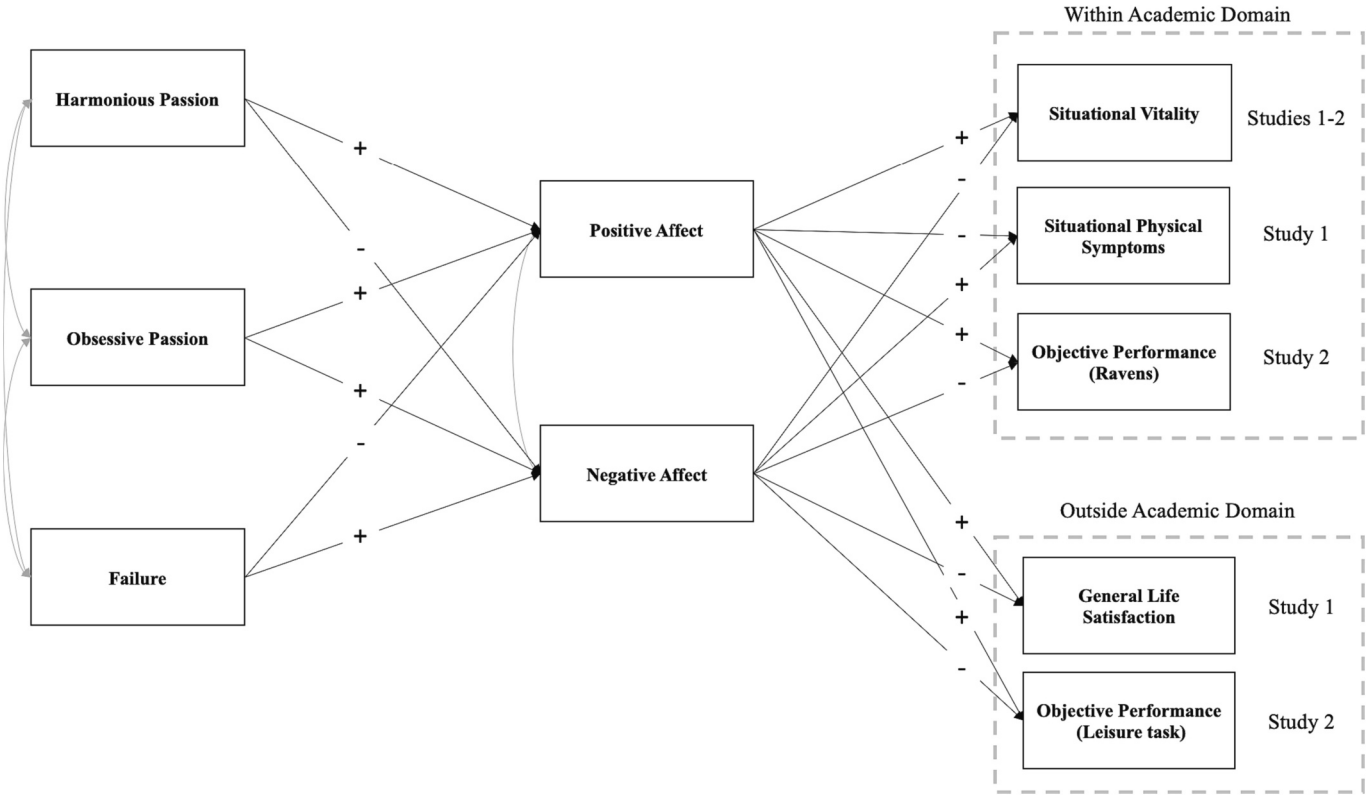


Fig. 1. Chart of hypothesized relationships among model variables.

positively relate to positive affect, and negatively relate to negative affect. Conversely, OP for one's studies was expected to positively relate to negative affect and, to a lesser degree, to positive affect. Moreover, induced failure should increase negative affect and undermine positive affect. In turn, positive affect was assumed to positively relate to adaptive outcomes within the domain students are passionate about (i.e., more situational vitality and less situational physical symptoms) and outside of it (i.e., more general life satisfaction). The opposite pattern of results was expected with negative affect. Overall, failure was hypothesized to be related to no resilience, HP for one's studies to high global resilience, and OP for one's studies to low global resilience, via their distinct mediating relationships with positive and negative affect.

2. Method

2.1. Participants and procedures

This research (both Studies 1 and 2) was approved by the research ethics board of the researchers' institution (Comité institutionnel d'éthique de la recherche avec des êtres humains of the Université du Québec à Montréal). Participants were 320 undergraduate full-time students recruited via Amazon Mechanical Turk (MTurk). They consisted of 52.2 % females, 47.2 % males, and 0.8 % other, with ages ranging from 16 to 66 years old (M age = 26.98 years) mostly from universities in the United States. Also, they reported spending an average of 26 h on their studies per week. Participants provided consent prior to beginning the questionnaire items. They were asked to complete a set of questionnaires and some activities in the following order: a) the Passion Scale, b) engaging in an education activity (part 1, followed by failure/success feedback), c) the Positive and Negative Affect Schedule, d) engaging in another similar education activity (part 2, with no feedback), e) the Subjective Vitality Scale, f) the Physical Symptoms Scale, and g) the Life Satisfaction Scale.

2.2. Measures

2.2.1. Passion for one's studies

The Passion Scale (Marsh et al., 2013; Vallerand et al., 2003) was used to assess students' passion for their studies consisting of six items measuring HP (e.g., "My studies are in harmony with the other activities in my life," $\alpha = 0.89$), and six items measuring OP (e.g., "I have difficulties controlling my urge to do my studies," $\alpha = 0.90$). The Passion Scale has shown high levels of validity and reliability (Vallerand, 2015; Vallerand & Rahimi, 2022). Participants were asked to indicate their level of agreement with each item on a 7-point Likert scale ranging from 1 (*not agree at all*) to 7 (*very strongly agree*), while thinking of how they generally feel about their studies (e.g., attending classes, studying for exams, writing papers, etc.).

2.2.2. Education activity

Participants were asked to do a puzzle-solving task called the Raven's Progressive Matrices (RPM Set II; Raven, 1962). The RPM Set II consists of matrices which progressively become more difficult as one moves through the set. In this study, participants were asked to complete six matrices (chosen at random) each consisting of several designs with one missing piece, and they were asked to select 1 out of 8 possible designs that logically completes the series. Participants were told that these matrices are excellent predictors of academic performance and that people who do well on these matrices generally do well in their studies, while those who have difficulty on these matrices generally do not do well in their studies. Participants were told that to obtain a high score, they had to make their selection correctly and relatively quickly because they only had 45 s to do each one. Participants completed these matrices in two parts (three matrices in each set). They were told that after they completed the first three matrices, the automated program would calculate their score with reference to everyone else who has completed this task. In reality, participants were randomly assigned to one of two conditions: failure or success. All participants were given a fictional score depicting their performance alongside an image of a distribution of scores and corresponding percentiles to help them visualize where they scored in reference to others. After completing the first three matrices, participants in the failure condition were told that their integrated total score was 121 (possible scores ranging from 0 to 200) and that they had scored below the 25th percentile. They were also told that this score was not good as it meant that 75 % of other students did better than they did. In the success condition, participants were told that they scored 181 and that they had scored above the 75th percentile. They were additionally told that this score was good and that it meant that they had performed better than 75 % of other students. After the feedback, participants were asked to complete the positive and negative affect scale (described below) and then complete the final three matrices. No feedback was presented with respect to the second set of matrices.

2.2.3. Positive and negative affect

Affect was assessed using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) consisting of 20 items measuring positive (10 items, e.g., "interested", $\alpha = 0.93$) and negative affect (10 items, e.g., "distressed", $\alpha = 0.95$). Participants were asked to indicate to what extent "they presently feel each listed affect" on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*).

2.2.4. Situational vitality

Participants were asked to complete the Subjective Vitality Questionnaire (Ryan & Frederick, 1997). The scale includes six items (e.g., "I feel alive and vital", $\alpha = 0.89$). Participants were asked to respond on a 7-point scale ranging from 1 (*not agree at all*) to 7 (*very strongly agree*) corresponding to the way they felt "right now".

2.2.5. Situational physical symptoms

Situational physical symptoms were assessed using a symptom checklist of eight items (e.g., headaches, shortness of breath, sore muscles; $\alpha = 0.95$) based on Knäuper et al. (2004). Participants were asked to indicate how they felt "right now" using a 7-point scale ranging from 1 (*not agree at all*) to 7 (*very strongly agree*).

2.2.6. General satisfaction with life

General satisfaction with life was assessed using a short version of the Satisfaction with Life Scale (SWLS; Diener et al., 1985), consisting of three items (e.g., "In most ways my life is close to my ideal", $\alpha = 0.90$). Participants were asked to indicate their level of agreement with each item on a 7-point Likert scale ranging from 1 (*not agree at all*) to 7 (*very strongly agree*), while thinking of their life in general.

3. Results

All descriptive information is presented in Table 1 below. The condition variable was scored as 2 = failure, and 1 = success. Independent samples t-tests were conducted to compare positive and negative affect scores between the failure and success conditions. Results showed that there was a significant difference in positive affect scores between the failure ($M = 2.72$, $SD = 1.00$) and success conditions ($M = 3.23$, $SD = 1.02$), $t(312) = -4.528$, $p < .001$. There was also a significant difference in negative affect scores between the failure ($M = 2.02$, $SD = 0.99$) and success conditions ($M = 1.50$, $SD = 0.84$), $t(307.870) = 5.016$, $p < .001$. In addition, the links between the failure dummy coding and positive and negative affect (see Fig. 2) revealed that failure increased negative affect and decreased positive affect. Overall, these results provide evidence that the failure/success manipulation was effective as participants in the failure condition experienced less positive and more negative affect than those in the success condition. Before conducting the main analyses, we also tested the interactions between the experimental

Table 1
Psychometric properties of study variables and correlations (Study 1).

	M	*SD*	1	2	3	4	5	6	7
1. Harmonious passion	4.81	1.18	1						
2. Obsessive passion	3.20	1.59	0.37***	1					
3. Failure	1.52	0.50	0.08	0.07	1				
4. Positive affect	2.97	1.04	0.36***	0.24***	−0.25***	1			
5. Negative affect	1.77	0.95	−0.06	0.29***	0.27***	−0.10	1		
6. Situational vitality	4.54	1.40	0.46***	0.19**	0.00	0.64***	−0.14*	1	
7. Situational physical symptoms	1.80	1.30	0.00	0.34***	0.08	0.06	0.61***	−0.07	1
8. General life satisfaction	4.40	1.69	0.45***	0.26***	0.02	0.44***	−0.02	0.62***	0.01

* $p < .05$.
** $p < .01$.
*** $p < .001$.

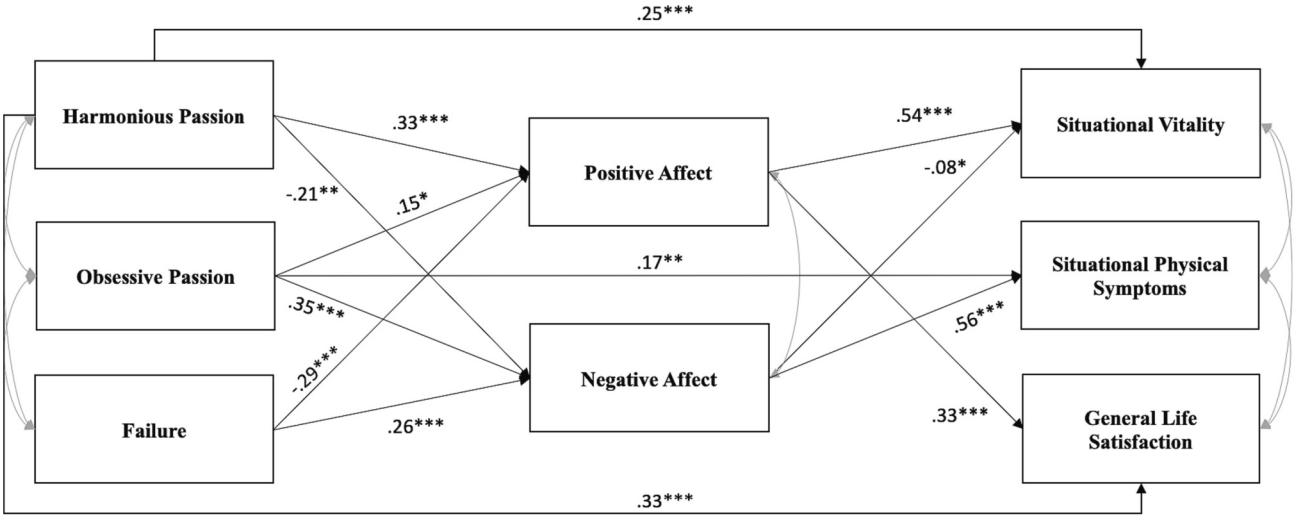


Fig. 2. Results of the path analysis: Study 1.
Note. *$p < .05$. **$p < .01$. ***$p < .001$.

condition and passion (HP and OP) on all outcome variables using separate linear regression for each outcome. None of the interaction terms (condition*HP and condition*OP) were statistically significant, revealing that the resilience process was the same irrespective of the experimental condition. Thus, we did not include any interaction terms in our model.

To test the proposed model (see Fig. 1 and the hypotheses presented above), a path analysis was conducted using the *Mplus 8* software (version 8; Muthén & Muthén, 1998–2017) with the maximum likelihood estimation with robust standard errors (MLR) to account for non-normality in the data and all effects were assessed using bootstrapping[1] (5000 samples, with 95 % bias-corrected confidence intervals [CI]). Acceptable fit was not found for the hypothesized full mediation model. With the goal of arriving at a final model, the model was re-specified based on theoretical and statistical rationales (Kline, 2016; Vallerand, 2015), and thus non-significant paths were removed and modification indices were used parsimoniously in line with recommended procedures (McCoach, 2003). Results of the modified path analysis revealed an adequate fit to the data, $\chi 2$ ($df = 8$) = 21.906, CFI = 0.975, TLI = 0.922, SRMR = 0.037, and RMSEA = 0.074 [0.038; 0.113].

Standardized results (Fig. 2) showed that HP for one's studies was positively related to positive affect ($\beta = 0.33$, $p < .001$), and negatively related to negative affect ($\beta = -0.21$, $p < .01$). On the other hand, OP for one's studies was positively related to both positive ($\beta = 0.15$, $p < .05$) and negative affect ($\beta = 0.35$, $p < .001$), while failure was negatively related to positive affect ($\beta = -0.29$, $p < .001$) and positively related to negative affect ($\beta = 0.26$, $p < .001$). These underscore the effectiveness of the success/failure experimental manipulation. In turn, positive affect was positively related to situational vitality ($\beta = 0.54$, $p < .001$) and general life satisfaction ($\beta = 0.33$, $p < .001$), while negative affect was negatively related to situational vitality ($\beta = -0.08$, $p < .05$) and positively to physical symptoms ($\beta = 0.56$, $p < .001$). Direct significant paths were also found between HP and vitality ($\beta = 0.25$, $p < .001$), HP and general life satisfaction ($\beta = 0.33$, $p < .001$), and OP and physical symptoms ($\beta = 0.17$, $p < .01$). Indirect effects (Table 2) were all significant or approaching significance and none of the bias-corrected 95 % bootstrapped confidence intervals passed through zero. Thus, standardized results showed that the paths from both types of passion to the outcome variables were mediated by both positive and negative affect.

These findings underscore the importance of looking at the role of passion and affect in the resilience process following failure from a multidimensional perspective. Specifically, when statistically controlling for the effects of experimentally induced failure, HP for one's studies was positively related to positive affect and negatively to negative affect. In turn, due to the more positive affective tone, students with high levels of HP obtained more beneficial outcomes both inside the academic domain and in their life in general, thereby reflecting high global resilience. Conversely, OP for one's studies was positively related to the experience of some positive affect, but mostly to a negative tone that undermined adaptive outcomes and was positively related to negative health outcomes, thereby reflecting low global resilience. Of significance, the effects of HP and OP were obtained over and beyond

[1] The main analyses were run using MLR, but maximum likelihood was used to get access to the bootstrapping of the indirect effects in the Mplus software.

Table 2
Bootstrap estimates of the indirect effects and their associated bias-corrected 95 % confidence intervals (Study 1).

Independent variable	Mediator	Outcome	β	95 % CI	*p*-Values
HP	Positive affect	Situational vitality	0.18	[0.12, 0.25]	$p <$ .001
HP	Negative affect	Situational vitality	0.02	[0.00, 0.04]	$p =$ .061
OP	Positive affect	Situational vitality	0.08	[0.02, 0.15]	$p <$ .05
OP	Negative affect	Situational vitality	−0.03	[−0.06, −0.00]	$p <$ .05
Failure	Positive affect	Situational vitality	−0.16	[−0.22, −0.11]	$p <$ .001
Failure	Negative affect	Situational vitality	−0.02	[−0.05, −0.00]	$p <$ .05
HP	Negative affect	Situational physical symptoms	−0.12	[−0.19, −0.05]	$p <$ .01
OP	Negative affect	Situational physical symptoms	0.19	[0.13, 0.27]	$p <$ .001
Failure	Negative affect	Situational physical symptoms	0.15	[0.09, 0.21]	$p <$ .001
HP	Positive affect	General life satisfaction	0.11	[0.07, 0.17]	$p <$ .001
OP	Positive affect	General life satisfaction	0.05	[0.01, 0.10]	$p <$ .05
Failure	Positive affect	General life satisfaction	−0.10	[−0.14, −0.06]	$p <$ .001

Note. HP = Harmonious passion, OP = Obsessive passion.

those of objective failure. As such, failure was related to no resilience via its positive relationship with negative affect and its negative relationship with positive affect.

4. Study 2

The goal of Study 2 was to replicate and extend the passion-resilience model following failure that was supported in Study 1, while additionally assessing *objective* performance. We hypothesized that the same pattern of results obtained in Study 1 would emerge again. As in Study 1, HP for one's studies was expected to positively relate to positive affect and negatively relate to negative affect, while OP for one's studies should mostly positively relate to negative affect and, to a lesser degree, to positive affect. Moreover, induced failure should promote negative affect and undermine positive affect. In turn, positive affect was assumed to relate positively to outcomes within the domain that students are passionate about (i.e., more situational vitality and higher objective performance scores on the education activity) and outside of it (i.e., higher leisure activity scores). The opposite pattern of results was expected with negative affect. Thus, controlling for the effects of induced failure, HP for one's studies was assumed to be associated with high global resilience, whereas OP for one's studies was expected to be associated with low global resilience (please see Fig. 1).

5. Method

5.1. Participants and procedure

Participants were 236 undergraduate full-time students recruited via MTurk. They consisted of 69.9 % males, 29.7 % females, and 0.4 % other, with ages ranging from 20 to 63 years (*M* age = 29.47 years). They were from universities in the United States and Canada. Participants were asked to complete a set of questionnaires, followed by some activities, including a two-part education activity and one leisure activity. The order in which participants completed the questionnaires and activities was as follows: a) the Passion Scale, b) engaging in the education activity (part 1, followed by a failure/success feedback), c) the PANAS, d) engaging in the education activity (part 2, with no feedback), f) the Subjective Vitality Scale, and g) engaging in the leisure activity.

5.2. Measures

5.2.1. Passion for one's studies

The same scale (Passion Scale; Vallerand et al., 2003) that was used in Study 1 was used again to assess students' passion for their studies (HP, α = 84; OP, α = 90).

5.2.2. Education activity

Participants were once again asked to complete the Raven's Progressive Matrices (RPM Set II, Raven, 1962). In contrast to Study 1 where the matrices were chosen at random, in Study 2 the matrices were chosen deliberately. Ten matrices were chosen for this study (five administered before the failure/success feedback and five after the feedback). Each set of five matrices got progressively more difficult. Thus, participants completed relatively similar questions (with respect to difficulty) in each set which allowed us to compare their performance before and following the feedback. Once again, participants were told that these matrices are excellent predictors of academic performance and given the same instructions as were presented in Study 1. After the feedback (the same as presented in Study 1), participants were asked to complete the PANAS and then complete the final five matrices. Once again, they did not receive feedback after completing the last set of matrices.

5.2.3. Positive and negative affect

A shortened version of the PANAS (Watson et al., 1988) was used to assess students' affect (5 positive affect items, α = 0.77; 5 negative affect items, α = 0.91). Participants were asked to indicate to what extent they felt each listed affect on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*).

5.2.4. Situational vitality

The same Subjective Vitality scale (Ryan & Frederick, 1997) that was used in Study 1 was used again to assess participants' vitality at the very moment following the feedback (6 items, α = 0.70).

5.2.5. Leisure activity

The leisure activity was composed of 7 riddles taken from the Common Word Game. This task was presented as a leisure activity that people generally do during their leisure time. Participants were asked to use the two words that were provided to them to find the missing common word (e.g., Switzerland + Chip [answer has 9 letters] = Chocolate).

6. Results

All descriptive statistics are presented in Table 3. Condition was coded 2 = failure and 1 = success. Independent samples *t*-tests were once again conducted to compare positive and negative affect scores between the failure and success conditions. Results showed that positive affect was significantly lower in the failure ($M = 3.37$, $SD = 0.86$) than in the success conditions ($M = 3.85$, $SD = 0.72$), $t(217.724) = -4.541$, $p <$ .001. Moreover, there was also a significant difference in negative affect scores between the failure ($M = 2.82$, $SD = 1.23$) and success conditions ($M = 3.18$, $SD = 1.19$), $t(225) = -2.238$, $p < .05$, but this difference was not as expected. We return to this issue in the General discussion section. In addition, the link between the failure dummy coding and positive affect (see Fig. 3) revealed that failure decreased positive affect. Overall, these results provide some evidence that our manipulation was effective given that participants in the failure condition reported an overall emotional tone that was less positive than in the success condition.

Table 3
Psychometric properties of study variables and correlations (Study 2).

	M	*SD*	1	2	3	4	5	6	7
1. Harmonious passion	5.19	1.11	1						
2. Obsessive passion	4.78	1.46	0.65***	1					
3. Failure	1.51	0.50	−0.18**	−0.24***	1				
4. Positive affect	3.61	0.83	0.67***	0.51***	−0.29***	1			
5. Negative affect	3.00	1.22	0.39***	0.72***	−0.15*	0.38***	1		
6. Situational vitality	4.83	1.01	0.63***	0.38***	−0.22**	0.62***	0.22**	1	
7. Performance (Ravens)	–	–	0.10	−0.04	−0.13*	0.08	−0.09	0.02	1
8. Performance (leisure activity)	0.28	0.72	−0.19**	−0.36***	0.05	−0.17*	−0.41***	−0.19**	0.23***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

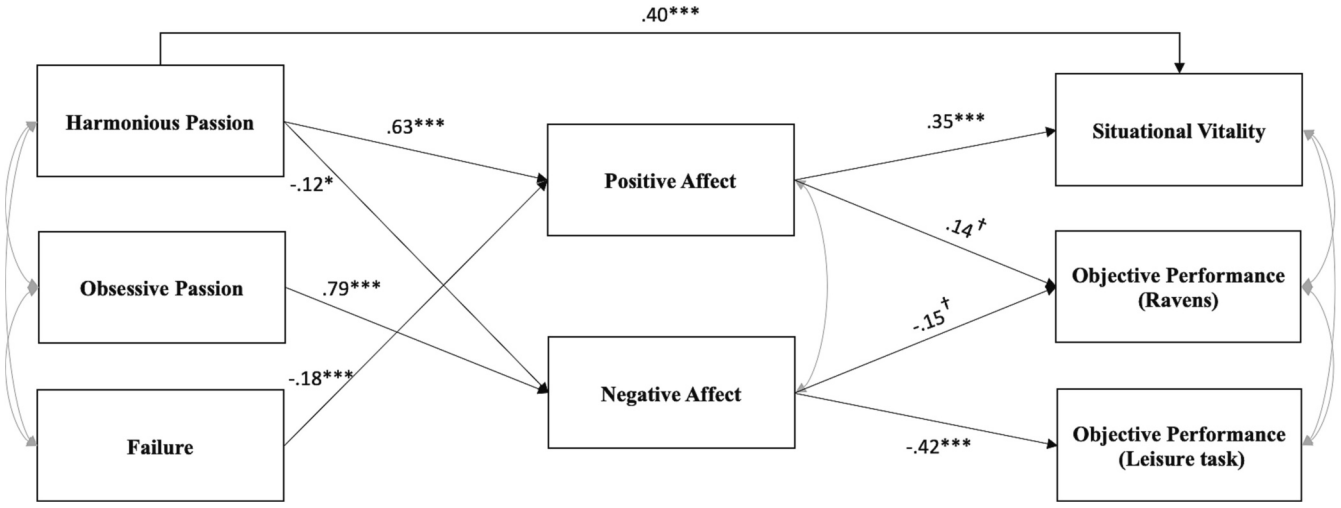


Fig. 3. Results of the path analysis: Study 2.
Note. †$p < .08$. *$p < .05$. **$p < .01$. ***$p < .001$.

All correct answers on the matrices were given one point and two total scores were created depicting how many correct answers participants had on each set of five matrices (performance score 1 = total of the correct answers to the first five matrices; performance score 2 = total of the correct answers to the last five matrices). A residual change score was obtained through regression analyses using these performance scores. This new residual score was used as an indicator of objective academic performance. Also, all correct responses on the leisure activity were given one point and summed together to create the total leisure score.

As in Study 1, the proposed model hypothesized that HP for one's studies should positively relate to positive affect and negatively to negative affect. On the other hand, OP for one's studies should positively relate to positive and negative affect. Moreover, induced failure should promote negative affect and undermine positive affect. In turn, positive affect was assumed to be positively associated with situational vitality, objective performance on the Ravens, and objective performance on the leisure activity. The opposite pattern of results was expected with negative affect. As was done in Study 1, the interactions between condition and passion (HP and OP) on all outcome variables were assessed. Once again, the interaction terms (condition*HP and condition*OP) were not significantly related to any outcomes, thus no interaction terms were added to our model.

The path analysis was conducted in the same fashion as Study 1. Acceptable fit was not found for the hypothesized full mediation model. As was done in Study 1, the model was re-specified by removing non-significant paths and modification indices were used parsimoniously in line with recommended procedures (Kline, 2016; McCoach, 2003). Thus, following Kline's (2016) recommendations, the paths between OP and positive affect and between failure and negative affect were removed.

Results of the modified model (Fig. 3) had excellent fit to the data, $\chi 2$ ($df = 12$) = 13.681, CFI = 0.996, TLI = 0.991, SRMR = 0.031, and RMSEA = 0.025 [0.000; 0.084]. Standardized results showed that HP was positively related to positive affect ($\beta = 0.63$, $p < .001$) and negatively related to negative affect ($\beta = -0.12$, $p < .05$), OP was positively related to negative affect ($\beta = 0.79$, $p < .001$), and failure was negatively related to positive affect ($\beta = -0.18$, $p < .001$). In turn, positive affect was positively related to situational vitality ($\beta = 0.35$, $p < .001$) and objective performance on the Ravens ($\beta = 0.14$, $p = .077$), and negative affect was negatively related to objective performance on the Ravens ($\beta = -0.15$, $p = .053$) and the leisure activity ($\beta = -0.42$, $p < .001$). A direct significant path was also found between HP and situational vitality ($\beta = 0.40$, $p < .001$). Most of the indirect effects (Table 4) were significant or approaching significance, but a few of the bias-corrected confidence intervals passed through zero. Thus, the indirect effects of HP on objective performance (Ravens) via negative affect, as well as the indirect effects of failure on objective performance (Ravens) via positive affect were not significant.

In sum, the results of Study 2 generally replicated results found in Study 1 and supported our hypotheses regarding the mediational role of affect in the interplay between passion and indicators of positive adjustment (resilience) following failure. More specifically, results showed that HP for one's studies was positively related to positive affect and negatively to negative affect, OP for ones' studies was only positively related to negative affect, and failure was negatively related to positive affect. In turn, positive affect was positively related to well-being outcomes and objective performance on the educational

Table 4
Bootstrap estimates of the indirect effects and their associated bias-corrected 95 % confidence intervals (Study 2).

Independent variable	Mediator	Outcome	β	95 % CI	*p*-Values
HP	Positive affect	Situational vitality	0.22	[0.10, 0.35]	$p <$ .01
Failure	Positive affect	Situational vitality	−0.06	[−0.13, −0.02]	$p <$ .05
HP	Positive affect	Objective performance (Ravens)	0.09	[−0.01, 0.18]	$p =$ .079
HP	Negative affect	Objective performance (Ravens)	0.02	[0.00, 0.06]	$p =$ .211
OP	Negative affect	Objective performance (Ravens)	−0.12	[−0.23, 0.00]	$p =$ .064
Failure	Positive affect	Objective performance (Ravens)	−0.03	[−0.07, −0.00]	$p =$ .130
HP	Negative affect	Objective performance (leisure activity)	0.05	[0.00, 0.10]	$p <$ .05
OP	Negative affect	Objective performance (leisure activity)	−0.33	[−0.42, −0.24]	$p <$ .001

Note. HP = Harmonious passion, OP = Obsessive passion.

activity, while negative affect was negatively related to both types of objective performance, inside and outside academia. Thus, the results of Study 2 showed that HP for one's studies was associated with high global resilience via its overall positive affective tone (high positive affect and low negative affect), whereas OP was related to no resilience through an overall negative affective tone. Finally, as expected, failure was associated with no resilience via its relative negative affective tone (undermining of positive affect). As in Study 1, the effects of HP and OP were obtained beyond those of experimental failure.

7. General discussion

The overarching purpose of the present research was to examine the resilience process among passionate students following failure across two studies. Three main objectives were pursued. The first objective was to examine resilience in a multidimensional fashion by examining resilience following failure within a domain that students were passionate about (academia) as well as in their life in general to discern their degree of resilience (from low to high levels of positive adjustment) and the locus where the resilience took place (from specific to global). The second objective sought in this research was to assess how students' positive adjustment (resilience) following failure would differ as a function of students' HP and OP. Third, we looked at the resilience process by bridging together the DMP with the Broaden-and-Build Theory. More specifically, we examined the mediating role of positive and negative affect in the resilience process following failure.

The present results revealed that HP for one's studies was associated with high global resilience as demonstrated by its positive relationship with positive affect, which in turn positively related to positive outcomes within the domain students were passionate about, such as situational vitality (Studies 1 and 2) and objective performance on an educational activity (marginally significant, Study 2), as well as outcomes outside of this area such as general life satisfaction (Study 1) and objective performance on a leisure activity (Study 2). HP was also negatively related to negative affect and their negative consequences within the domain that students care about, such as less situational vitality (Study 1), and more situational physical symptoms (Study 1), as well as outside of this area such as lower objective performance on a leisure activity (Study 2). On the other hand, OP was associated with low global resilience due to its positive relationships with both positive and negative affect and their corresponding consequences in academia and in life in general (Study 1) and to no resilience in Study 2 as it was only related to negative affect and their negative consequences (lower objective performance in both the education [marginally significant] and leisure activities). Moreover, failure was associated with no resilience in both studies through its positive relationship with negative affect (Study 1) and negative relationship with positive affect (Studies 1 and 2). These results yield several implications as outlined below.

7.1. Revisiting resilience

The first implication of the present research is that the resilience process is more complex than previously portrayed in the literature. In line with past findings on resilience when facing stressful situations (Paquette, Vallerand, et al., 2023), the present research has found that resilience can be seen as lying on two continua, depending on the degree of adaptation displayed (from low to high) and the area where it was displayed (from specific to global). Much of past research has focused on the presence versus absence of resilience. By examining students' levels of functioning inside and outside academia (the domain in which the failure occurred), the present findings suggest that a better description of the degree and the locus of resilience is necessary, especially if one focuses on the resilience process. We further discuss on this matter in the next sections by presenting the role of passion and affect in the resilience process within and outside the academic domain.

In both studies, the condition variable represented experimentally induced adversity within the domain that students were passionate about (academia). The students in the failure condition experienced more negative (Study 1) and less positive affect than those in the success condition (Studies 1 and 2). Only in Study 2 was negative affect not higher in the failure than in the success condition. However, we did not measure participants' affect at baseline. Thus, students in the success condition might already experience more negative affect at baseline than in the failure condition. Nonetheless, based on the results of the path model, the overall affective tone was less positive in the failure than in the success condition. Students appeared to be greatly affected during their involvement in the academic task.

7.2. The role of passion in the resilience process

A second implication is that the present results show for the first time that the type of passion matters greatly when it comes to the positive adjustment (resilience) of passionate students after failure. Indeed, our findings showed that HP for one's studies was associated with high global resilience (in both studies), as it was related to high functioning both within the academic domain (high vitality and objective performance, low physical symptoms) and outside of it (high life satisfaction and objective performance). Conversely, OP for one's studies was associated with low global resilience inside and outside the academic domain (Study 1) or even no resilience at all (Study 2). Our findings contribute greatly to the DMP (Vallerand, 2010, 2015) and are in line with previous research showing the more adaptive role of HP in stressful times (e.g., more life satisfaction and meaning in life, adaptive cardiovascular responses; Paquette, Holding, et al., 2023; Vallerand et al., 2022) as compared to OP. Of importance, the present findings reveal that the role of passion took place over and beyond that of objective failure, showing that the effects of passion remained even in the face of objective failure.

7.3. The role of positive and negative affect in the resilience process

The third implication of the present findings is that positive and negative affect are important mediators in the resilience process. The present research found that positive and negative affect mediated the relationships between HP, OP, failure, and the outcome variables. HP for one's studies was found to be related to high global resilience through its

positive relationship with positive affect and its negative link with negative affect. Conversely, OP for one's studies was related to low global or no resilience through its positive relationships with both positive (Study 1) and, mostly, negative affect (Studies 1 and 2). These findings fully replicate those obtained in previous research showing HP to positively relate to positive affect and negatively to negative affect, while OP positively relates to negative affect and, sometimes, to a lesser degree to positive affect (e.g., Paquette, Holding, et al., 2023; Paquette, Vallerand, et al., 2023; Philippe et al., 2010; Rahimi & Vallerand, 2021). These results also align with previous research (Lavoie et al., 2021) showing that after a defeat, people with HP appraise the situation as challenging and want to perform better the next time, which is related to positive affect, while those with OP feel threatened which is related to negative affect. Moreover, our findings are also in line with previous studies demonstrating that individuals who display resilience continue to function effectively in the face of adversity using psychological processes such as positive affect (Bonanno et al., 2011; Bonanno & Diminich, 2013; Fredrickson et al., 2003; Paquette, Vallerand, et al., 2023). Thus, in accordance with the Broaden-and-Build Theory (Fredrickson, 2004), positive affect was related to positive outcomes within (more vitality and higher objective academic performance) and outside the passionate activity (more life satisfaction), while negative affect was related to adverse outcomes for students (lower vitality and performance, more physical symptoms). Overall, these findings show that a HP for one's studies is beneficial for undergraduate students after failure because of its positive affective tone, while OP is more maladaptive due to its more negative affective tone.

8. Limitations and future directions

The present research had some limitations. The first limitation refers to the use of a correlational design which limits causality inferences. Although failure and success were experimentally induced, future research could also manipulate passion in order to identify its causal effects in the resilience process (for more details on the induction of passion mindsets, see Vallerand, 2015, pp. 82–84). Second, although we did use some objective measures of performance (in Study 2), the other measures were assessed through self-report scales. Thus, future research in which other objective assessments are used is encouraged. A third limitation of the present research is the lack of pre-test assessments for all study variables. Having these additional measures would have allowed us to assess more precisely the actual impact of failure on students' academic outcomes and life in general. Fourth, a limited set of variables were examined. For instance, affect was only assessed with the PANAS. Future research should make use of more comprehensive affect scales (e.g., Achievement Emotions Questionnaire, Pekrun et al., 2011; Core Affect, Russell, 2003). Furthermore, future research should also take into consideration a larger set of variables in order to rule out alternative mechanisms that could have influenced the resilience process (e.g., interest in the task, performance vs mastery goal orientations, students' major). A final limitation is the use of MTurk participants. Although they may differ from the general population on some variables (e.g., they are younger, more educated, and have lower incomes; Burnham et al., 2018; Hargittai & Shaw, 2020; Merz et al., 2020), research shows that using approved MTurk participants, as we did, leads to similar results as classical research in psychology (Hauser et al., 2022). Nevertheless, future research should replicate this research using other samples for generalization purposes.

9. Practical implications and conclusion

The present results have practical implications. They highlight how HP relates to a more adaptive approach to fostering resilience after failure than OP. Educators who wish to promote adaptive approaches to addressing failure should encourage HP in their students as it is positively associated with positive affect which, in turn, is positively related to high global resilience. They can do so by adopting an autonomy-supportive approach as research has shown that such teaching style promotes the development of HP (e.g., Mageau et al., 2009). For instance, educators could give adequate feedback, provide opportunities for decision-making, value self-initiation in students, use non-pressuring informational language, and provide explanatory rationales (for more details on how to adopt an autonomy-supportive teaching style, see Reeve, 2016).

In conclusion, the present research is the first to assess the role of passion and affect in the resilience process of students when facing objective failure from a multidimensional perspective. The present findings reveal that resilience depends largely on the type of passion that one possesses. Specifically, HP is associated with high global resilience across both studies, whereas OP is associated with limited low global resilience (Study 1) or even to no resilience at all (Study 2). Such resilience largely depends on the more adaptive role of HP (relative to OP) in fostering a positive affective tone that is associated with positive outcomes. Future research is required in order to further examine the resilience process of passionate individuals in other adverse conditions.

CRediT authorship contribution statement

Sonia Rahimi: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Validation, Visualization, and Writing – Original Draft/Review & Editing.

Virginie Paquette: Formal Analysis, Methodology, Validation, and Writing – Review & Editing.

Robert J. Vallerand: Conceptualization, Funding Acquisition, Methodology, Resources, Software, Supervision, and Writing – Review & Editing.

Authors note and acknowledgements

The third author has received research grants from the Social Sciences and Humanities Research Council, the Fonds de Recherche Québécois - Sciences et Cultures and the Canada Research Chair program. The present research has received the ethics approval from the Comité institutionnel d'éthique de la recherche avec des êtres humains of the Université du Québec à Montréal (no. 551_2021). The authors declare that they have no conflict of interest. Data from this manuscript was presented at the Tenth SELF International Conference in June 2022.

References

Bélanger, J. J., Lafreniere, M. A. K., Vallerand, R. J., & Kruglanski, A. W. (2013). Driven by fear: The effect of success and failure information on passionate individuals' performance. *Journal of Personality and Social Psychology, 104*(1), 180–195. https://doi.org/10.1037/a0029585

Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Vol. 13. The Minnesota symposia on child psychology* (pp. 39–101). Hillsdale, NJ: Erlbaum.

Bonanno, G. A. (2005). Resilience in the face of potential trauma. *Current Directions in Psychological Science, 14*(3), 135–138. https://doi.org/10.1111/j.0963-7214.2005.00347.x

Bonanno, G. A., & Diminich, E. D. (2013). Annual Research Review: Positive adjustment to adversity–trajectories of minimal–impact resilience and emergent resilience. *Journal of Child Psychology and Psychiatry, 54*(4), 378–401. https://doi.org/10.1111/jcpp.12021

Bonanno, G. A., Moskowitz, J. T., Papa, A., & Folkman, S. (2005). Resilience to loss in bereaved spouses, bereaved parents, and bereaved gay men. *Journal of Personality and Social Psychology, 88*(5), 827–843. https://doi.org/10.1037/0022-3514.88.5.827

Bonanno, G. A., Westphal, M., & Mancini, A. D. (2011). Resilience to loss and potential trauma. *Annual Review of Clinical Psychology, 7*, 511–535. https://doi.org/10.1146/annurev-clinpsy-032210-104526

Brewer, M. L., Van Kessel, G., Sanderson, B., Naumann, F., Lane, M., Reubenson, A., & Carter, A. (2019). Resilience in higher education students: A scoping review. *Higher Education Research and Development, 38*(6), 1105–1120. https://doi.org/10.1080/07294360.2019.1626810

Bryden, C. I., Field, A. M., & Francis, A. J. (2015). Coping as a mediator between negative life events and eudaimonic well-being in female adolescents. *Journal of Child and Family Studies, 24*(12), 3723–3733. https://doi.org/10.1007/s10826-015-0180-0

Burnham, M. J., Le, Y. K., & Piedmont, R. L. (2018). Who is Mturk? Personal characteristics and sample consistency of these online workers. *Mental Health, Religion and Culture, 21*(9–10), 934–944. https://doi.org/10.1080/13674676.2018.1486394

Carbonneau, N., Vallerand, R. J., & Massicotte, S. (2010). Is the practice of yoga associated with positive outcomes? The role of passion. *The Journal of Positive Psychology, 5*(6), 452–465. https://doi.org/10.1080/17439 760.2010.534107

Carpentier, J., Mageau, G. A., & Vallerand, R. J. (2012). Ruminations and flow: Why do people with a more harmonious passion experience higher well-being? *Journal of Happiness Studies, 13*, 501–518. https://doi.org/10.1007/s10902-011-9276-4

Carr, V. J., Lewin, T. J., Kenardy, J. A., Webster, R. A., Hazell, P. L., Carter, G. L., & Williamson, M. (1997). Psychosocial sequelae of the 1989 Newcastle earthquake: III. Role of vulnerability factors in post-disaster morbidity. *Psychological Medicine, 27*(1), 179–190. https://doi.org/10.1017/s003329179600428x

Cicchetti, D., & Rogosch, F. A. (1997). The role of self-organization in the promotion of resilience in maltreated children. *Development and Psychopathology, 9*(4), 797–815. https://doi.org/10.1017/S0954579497001442

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Cohn, M. A., Fredrickson, B. L., Brown, S. L., Mikels, J. A., & Conway, A. M. (2009). Happiness unpacked: Positive emotions increase life satisfaction by building resilience. *Emotion, 9*, 361–368. https://doi.org/10.1037/a0015952

Curran, T., Hill, A. P., Appleton, P. R., Vallerand, R. J., & Standage, M. (2015). The psychology of passion: A meta-analytical review of a decade of research on intrapersonal outcomes. *Motivation and Emotion, 39*(5), 631–655. https://doi.org/10.1007/s11031-015-9503-0

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Fisher, R., Merlot, E., & Johnson, L. W. (2017). The obsessive and harmonious nature of entrepreneurial passion. *International Journal of Entrepreneurial Behavior & Research, 24*(1), 22–40. https://doi.org/10.1108/IJEBR-01-2017-0011

Fisher, R., Merlot, E., & Johnson, L. W. (2018). The obsessive and harmonious nature of entrepreneurial passion. *International Journal of Entrepreneurial Behavior & Research, 24*(1), 22–40. https://doi.org/10.1108/IJEBR-01-2017-0011

Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist, 18*, 12–23. https://doi.org/10.1027/1016-9040/a000124

Fredrickson, B. L. (2004). The broaden–and–build theory of positive emotions. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences, 359*(1449), 1367–1377. https://doi.org/10.1098/rstb.2004.1512

Fredrickson, B. L. (2013). Positive emotions broaden and build. In *, Vol. 47. Advances in experimental social psychology* (pp. 1–53). Academic Press. https://doi.org/10.1016/B978-0-12-407236-7.00001-2.

Fredrickson, B. L., & Kurtz, L. E. (2011). Cultivating positive emotions to enhance human flourishing. In S. I. Donaldson, M. Csikszentmihalyi, & J. Nakamura (Eds.), *Applied positive psychology: Improving everyday life, health, schools, work, and society* (pp. 35–47). Routledge/Taylor & Francis Group.

Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000). The undoing effect of positive emotions. *Motivation and Emotion, 24*(4), 237–258. https://doi.org/10.1023/A:1010796329158

Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology, 84*, 365–376. https://doi.org/10.1037/0022-3514.84.2.365

Fuller-Iglesias, H., Sellars, B., & Antonucci, T. C. (2008). Resilience in old age: Social relations as a protective factor. *Research in Human Development, 5*(3), 181–193. https://doi.org/10.1080/15427600802274043

Galatzer-Levy, I. R., Brown, A. D., Henn-Haase, C., Metzler, T. J., Neylan, T. C., & Marmar, C. R. (2013). Positive and negative emotion prospectively predict trajectories of resilience and distress among high-exposure police officers. *Emotion, 13*(3), 545–553. https://doi.org/10.1037/a0031314

Garmezy, N. (1993). Children in poverty: Resilience despite risk. *Psychiatry, 56*(1), 127–136. https://doi.org/10.1080/00332747.1993.11024627

Gloria, C. T., Faulk, K. E., & Steinhardt, M. A. (2013). Positive affectivity predicts successful and unsuccessful adaptation to stress. *Motivation and Emotion, 37*(1), 185–193. https://doi.org/10.1007/s11031-012-9291-8

Hargittai, E., & Shaw, A. (2020). Comparing Internet experiences and prosociality in Amazon Mechanical Turk and population-based survey samples. *Socius, 6*. https://doi.org/10.1177/2378023119889834

Hauser, D. J., Moss, A. J., Rosenzweig, C., Jaffe, S. N., Robinson, J., & Litman, L. (2022). Evaluating CloudResearch's Approved Group as a solution for problematic data quality on MTurk. *Behavior Research Methods, 1-12*. https://doi.org/10.3758/s13428-022-01999

Howell, J. A., Roberts, L. D., & Mancini, V. O. (2018). Learning analytics messages: Impact of grade, sender, comparative information and message style on student affect and academic resilience. *Computers in Human Behavior, 89*, 8–15. https://doi.org/10.1016/j.chb.2018.07.021

Johnson, J., Panagioti, M., Bass, J., Ramsey, L., & Harrison, R. (2017). Resilience to emotional distress in response to failure, error or mistakes: A systematic review. *Clinical Psychology Review, 52*, 19–42. https://doi.org/10.1016/j.cpr.2016.11.007

Kalia, V., Knauft, K., & Hayatbini, N. (2020). Cognitive flexibility and perceived threat from COVID-19 mediate the relationship between childhood maltreatment and state anxiety. *International Journal of Psychosocial Rehabilitation, 24*(1), 5485–5497. https://doi.org/10.1371/journal.pone.0243881

Kalpidou, M. M., Volungis, A. M., & Bates, C. (2021). Mediators between adversity and well-being of college students. *Journal of Adult Development, 28*(4), 286–298. https://doi.org/10.1007/s10804-021-09372-6

Kline, R. B. (2016). *Principles and practices of structural equation modeling* (4th ed.). New York: Guilford Publications Inc.

Klohnen, E. C. (1996). Conceptual analysis and measurement of the construct of ego-resiliency. *Journal of Personality and Social Psychology, 70*(5), 1067–1079. https://doi.org/10.1037/0022-3514.70.5.1067

Knäuper, B., Rabiau, M., Cohen, O., & Patriciu, N. (2004). Compensatory health beliefs: Scale development and psychometric properties. *Psychology & Health, 19*(5), 607–624. https://doi.org/10.1080/0887044042000196737

Lavoie, C. E., Vallerand, R. J., & Verner-Filion, J. (2021). Passion and emotions: The mediating role of cognitive appraisals. *Psychology of Sport and Exercise, 54*, Article 101907. https://doi.org/10.1016/j.psychsport.2021.101907

Luthar, S. S. (1999). *Poverty and children's adjustment* (Vol. 41). Sage.

Mageau, G., Carpentier, J., & Vallerand, R. J. (2011). The role of self-esteem contingencies in the distinction between obsessive and harmonious passion. *European Journal of Social Psychology, 6*, 720–729. https://doi.org/10.1002/ejsp.798

Mageau, G. A., Vallerand, R. J., Charest, J., Salvy, S. J., Lacaille, N., Bouffard, T., & Koestner, R. (2009). On the development of harmonious and obsessive passion: The role of autonomy support, activity specialization, and identification with the activity. *Journal of Personality, 77*(3), 601–646. https://doi.org/10.1111/j.1467-6494.2009.00559.x

Marsh, H. W., Vallerand, R. J., Lafreniere, M. A. K., Parker, P., Morin, A. J. S., Carbonneau, N., … Paquet, Y. (2013). Passion: Does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychological Assessment, 25*, 796–809. https://doi.org/10.1037/a0032573

Martin, A. J. (2013). Academic buoyancy and academic resilience: Exploring 'everyday' and 'classic' resilience in the face of academic adversity. *School Psychology International, 34*(5), 488–500. https://doi.org/10.1177/0143034312472759

Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology, 2*(4), 425–444. https://doi.org/10.1017/s0954579400005812

McCoach, D. B. (2003). SEM Isn't just the Schoolwide Enrichment Model anymore: Structural Equation Modeling (SEM) in gifted education. *Journal for the Education of the Gifted, 27*(1), 36–61. https://doi.org/10.1177/016235320302700104

Merz, Z. C., Lace, J. W., & Eisenstein, A. M. (2020). Examining broad intellectual abilities obtained within an mTurk internet sample. *Current Psychology, 41*, 2241–2249. https://doi.org/10.1007/s12144-020-00741-0

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus User's Guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.

Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological resilience, positive emotions, and successful adaptation to stress in later life. *Journal of Personality and Social Psychology, 91*, 730–749. https://doi.org/10.1037/0022-3514.91.4.730

Ong, A. D., Bergeman, C. S., & Boker, S. M. (2009). Resilience comes of age: Defining features in later adulthood. *Journal of Personality, 77*(6), 1777–1804. https://doi.org/10.1111/j.1467-6494.2009.00600.x

Paquette, V., Holding, A. C., Cimon-Paquet, C., Giroux, A., Boucher, V. G., & Vallerand, R. J. (2023). Pursuing, developing, and letting go of a passionate activity when facing adversity during a pandemic: Associations with well-being and ill-being. *Personality and Individual Differences, 209*, Article 112217. https://doi.org/10.1016/j.paid.2023.112217

Paquette, V., Vallerand, R. J., Houlfort, N., & Fredrickson, B. L. (2023). Thriving through adversity: The role of passion and emotions in resilience. *Journal of Personality, 91*(3), 789–805. https://doi.org/10.1111/jopy.12774

Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The Achievement Emotions Questionnaire (AEQ). *Contemporary Educational Psychology, 36*(1), 36–48. https://doi.org/10.1016/j.cedpsych.2010.10.002

Philippe, F. L., Vallerand, R. J., Houlfort, N., Lavigne, G. L., & Donahue, E. G. (2010). Passion for an activity and quality of interpersonal relationships: The mediating role of emotions. *Journal of Personality and Social Psychology, 98*(6), 917–932. https://doi.org/10.1037/a0018017

Rahimi, S., & Vallerand, R. J. (2021). The role of passion and emotions in academic procrastination during a pandemic (COVID-19). *Personality and Individual Differences, 179*, Article 110852. https://doi.org/10.1016/j.paid.2021.110852

Raven, J. C. (1962). *Advanced progressive matrices, set II*. London, UK: H.K. Lewis.

Reeve, J. (2016). Autonomy-supportive teaching: What it is, how to do it. In W. C. Liu, J. C. K. Wang, & R. M. Ryan (Eds.), *Building autonomous learners: Perspectives from research and practice using self-determination theory* (pp. 129–152). Springer.

Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review, 110*(1), 145. https://doi.org/10.1037/0033-295X.110.1.145

Rutter, M. (1979). *Fifteen thousand hours: Secondary schools and their effects on children*. Harvard University Press.

Ryan, R. M., & Frederick, C. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality, 65*, 529–565. https://doi.org/10.1111/j.1467-6494.1997.tb00326.x

Tugade, M. M., & Fredrickson, B. L. (2004). Resilient individuals use positive emotions to bounce back from negative emotional experiences. *Journal of Personality and Social Psychology, 86*, 320–333. https://doi.org/10.1037/0022-3514.86.2.320

Ungar, M., Ghazinour, M., & Richter, J. (2013). Annual research review: What is resilience within the social ecology of human development? *Journal of Child Psychology and Psychiatry, 54*(4), 348–366. https://doi.org/10.1111/jcpp.12025

Vallerand, R. J. (2010). On passion for life activities: The dualistic model of passion. In M. P. Zanna (Ed.), *Vol. 42. Advances in experimental social psychology* (pp. 97–193). Academic Press. https://doi.org/10.1016/s0065-2601(10)42003-1.

Vallerand, R. J. (2015). *The psychology of passion: A dualistic model*. New York, NY: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199777600.001.0001

Vallerand, R. J., Blanchard, C. M., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., … Marsolais, J. (2003). Les passions de l'âme: On obsessive and harmonious passion. [the soul's passions: On obsessive and harmonious passion]. *Journal of Personality and Social Psychology, 85*, 756–767. https://doi.org/10.1037/0022-3514.85.4.756

Vallerand, R. J., Paquette, V., & Richard, C. (2022). The role of passion in psychological and cardiovascular responses: Extending the field of passion and positive psychology in new directions. *Frontiers in Psychology, 6510*. https://doi.org/10.3389/fpsyg.2021.744629

Vallerand, R. J., & Rahimi, S. (2022). On the psychometric properties of the passion scale. In A. Efklides, I. Alonso-Arbiol, T. Ortner, W. Ruch, & F. J. R. van de Vijver (Eds.), *Psychological assessment in positive psychology*. New York: Hogrefe.

Vankakova, J., Chamarro, A., & Martínez- Martí, M. L. (2021). Does passion mediate the effect of character strengths on the resilience of athletes? *Cuadernos de Psicología del Deporte, 21*(2), 32–46. https://doi.org/10.6018/cpd.418361

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063

Werner, E. E. (1995). Resilience in development. *Current Directions in Psychological Science, 4*(3), 81–84. https://doi.org/10.1111/1467-8721.ep10772327

Wright, M. O. D., Masten, A. S., & Narayan, A. J. (2013). Resilience processes in development: Four waves of research on positive adaptation in the context of adversity. In S. Goldstein, & R. B. Brooks (Eds.), *Handbook of resilience in children* (pp. 15–37). Boston, MA: Springer.