

Thriving through Adversity:**The Role of Passion and Emotions in the Resilience Process**

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Abstract

Two cross-sectional (Studies 1, $N = 283$, and 2, $N = 275$) and one prospective (Study 3, $N = 238$) studies investigated the role of passion (for academia) and emotions in the process of resilience in the education domain and in life in general. Participants were examined when facing a stressful situation related to their passion for academia (end of term exam period, a timed education task). All three studies showed that harmonious passion, through its positive relationship with positive emotions, was positively associated with high positive outcomes in the education domain (satisfaction with one's studies, subjective and objective performance in one's studies) and in life in general via the subjective evaluation of one's life and general health indicators (subjective vitality, fewer negative physical symptoms). On the other hand, obsessive passion was related to mixed effects on resilience. Specifically, obsessive passion related to low levels of functioning (Studies 1 and 3) and also hindered the positive outcomes (Studies 1 to 3) through its positive relationships with positive and negative emotions, respectively. In sum, under stress, harmonious passion facilitates high levels of resilience across life domains, whereas obsessive passion yields low levels of resilience across life or no resilience at all.

Keywords: resilience, passion, positive emotions

**Thriving through Adversity: The Role of Passion and Emotions
in the Resilience Process**

The concept of resilience, defined as the absence of persistent problems and a positive adaptation in the face of adversity (Fletcher & Sarkar, 2013), has received a lot of attention over the past 40 years (e.g., Bonanno, 2005; Masten et al., 1990; Prinzing et al., 2020). Researchers have tried to better understand how and why some individuals bounce back from adversity, whereas others experience more difficulties (e.g., Cohn et al., 2009; Prinzing et al., 2020). One population that has rarely been studied in research on resilience is that of highly invested individuals, such as passionate people (Vallerand, 2015). These individuals are of particular interest because they should be expected to display resilience and overcome adversity to develop expertise in their realm of endeavor. At the same time, they may also display less resilience when they are unable to find a balance between their passionate activity and the rest of their life. Thus, how resilient are passionate people in the face of adversity? And if they are resilient, what are the psychological processes helping them adapt positively? One mechanism at the heart of the resilience process is that of positive emotions. Studies have showed that positive emotions lead to psychological adaptation in the face of stressful events (Fredrickson et al., 2003). Thus, how do passion and the emotions experienced when engaging in the passionate activity help people adjust positively (high resilience), or conversely impair their levels of functioning (low / no resilience)? Further, can we look at resilience in a more precise multidimensional perspective instead of being simply present or absent? These are some of the issues examined in this research.

Resilience

Studies on resilience have looked at three groups of phenomena: (1) children successfully adapting, or even flourishing, despite high-risk situations, such as chronic poverty and parental bereavement (Draper & Hancock, 2011; Garnezy, 1993), (2) adults recovering from trauma such

as death of a loved one and terrorist attacks (Bonanno, 2005; Bonanno et al., 2005; Fredrickson et al., 2003), and (3) adults facing daily life stressful experiences, like work adversity and academic stress (Jackson et al., 2007; Wilks & Spivey, 2010). Overall, these three lines of research reveal that, for resilience to occur, positive adaptation has to follow adversity (Fletcher & Sarkar, 2013). Adversity has been defined in many ways ranging from major negative life events (Luthar & Cicchetti, 2000) to more ordinary disruptions of daily life (Davis et al., 2009). On the other hand, although people may struggle for a short period of time to maintain psychological equilibrium in the face of adversity (e.g., difficulty concentrating, intermittent sleeplessness; Bonanno, 2005), there is positive adaptation when individuals continue to function effectively at or near their normal levels and experience a sense of psychological well-being (e.g., life satisfaction; Cohn et al., 2009; subjective vitality; Garg & Sarkar, 2020). Furthermore, Fletcher and Sarkar (2013) underline that the indicators of resilience used to demonstrate positive adjustment following adversity must be appropriate to the adversity examined. For instance, for students, a proper indicator of adjustment under adversity should be academic performance, where high levels of performance reflect adaptive functioning, and poor performance reflects low levels of functioning, in one area of life (academia). Thus, resilience is defined as a *positive adaptation* when facing adversity and not simply as the absence of disorders (Almedom & Glandon; 2007).

Of interest, some researchers have focused on the resilience construct in a holistic fashion, where it is concluded that resilience was achieved or not. Others have been more nuanced and have investigated the degree of positive adaptation following adverse situations (e.g., Bonanno, 2005). However, individuals may be well adjusted in one life domain but not necessarily in another (Infurna & Luthar, 2017). Therefore, there is a need to assess both the degree of positive adaptation following adversity, as well as its locus, where it takes place. Hence, we propose a more refined analysis of resilience relying on two dimensions: (a) the *degree* of resilience

achieved (from low to high levels of positive adaptation after facing adversity) and (b) the *locus* of resilience (from specific, if resilience takes place only in one life domain, to global, if resilience takes place across life in general). Thus, following adversity, someone can display high (or low) global resilience if high (or low) positive adaptation is generalized across life domains, or high (or low) specific resilience if one's adaptation is high (or low) and limited to one area (e.g., education). Moreover, someone could display no resilience if there is no adaptation across life domains. The use of these two dimensions, degree and locus, provides a more comprehensive assessment of resilience following adversity.

Finally, it is important to note that resilience can be conceptualized as a trait (i.e., ego-resiliency; see Block & Block, 1980) or as a process (e.g., Fredrickson et al., 2003). The latter is the dynamic process through which individuals achieve a positive adaptation, or maintain a positive adjustment, in the face of a challenging situation (Luthar et al., 2000). In other words, it is what “individuals actually experience and do in the context of adversity” that allows them to be resilient and to overcome stress and difficulties (Fisher et al., 2018). Contrary to trait resilience, the process of resilience implies the exposure to adversity and variations in levels of positive adaptation across time and contexts (Luthar et al., 2000). We address this issue below.

Positive Emotions and the Resilience Process

Research has repeatedly demonstrated that the experience of positive emotions in the face of adversity is one of the important processes involved in resilience (e.g., Cohn et al., 2009; Fredrickson et al., 2003; Galatzer-Levy et al., 2013; Gloria et al., 2013; Ong et al., 2006, 2010; Tugade & Fredrickson, 2004). The role of positive emotions in resilience can be explained by the Broaden-and-Build Theory (BBT; Fredrickson, 1998, 2001). According to this theory, positive emotions (e.g., interest, joy, and enthusiasm) momentarily *broaden* thought-action tendencies (e.g., flexible attention; Fredrickson & Branigan, 2005), whereas it is the opposite for negative

emotions (Fredrickson, 1998). This broadened awareness helps individuals *build* enduring personal resources such as mindfulness (Catalino & Fredrickson, 2011; Fredrickson et al., 2008) and adaptive coping strategies (Fredrickson & Joiner, 2002; Reschly et al., 2008), that individuals can rely on when facing adversity. In addition, positive emotions also have an *undoing effect* (Fredrickson, 1998, 2001): they counteract the deleterious aftereffects of negative emotions and stress when facing adversity (Fredrickson et al., 2003). Indeed, a longitudinal study (Cohn et al., 2009) has shown that, over a one-month period, daily positive emotions buffered against the effect of negative emotions and were related to growth in resilience. Findings have also shown that higher levels of positive emotions and lower levels of negative emotions prior to exposure to a stressor were associated with resilience during the stressful situation (Galatzer-Levy et al., 2013). Moreover, studies have shown that positive emotions helped highly resilient individuals be more resistant to stress, recover more effectively from it, and thrive through adversity, as shown by less negative emotions the day following a stressful event (Ong et al., 2006), and fewer depressive symptoms as well as growth in psychological resources in the aftermath of a crisis (Fredrickson et al., 2003). In sum, people experiencing positive emotions were not only more resistant to stress, they bounced back stronger than before: they displayed resilience.

Resilience in Highly Invested Individuals

As mentioned previously, individuals highly invested in an activity are of particular interest for research on resilience. Indeed, the positive emotions they may experience in their activity may contribute in creating resources that can be used to positively adapt to adversity in their activity and other life domains. However, they may also suffer psychologically and display less resilience if they use all of their resources to face adversity in their passionate activity, thereby leading to imbalance with the rest of their life. Thus, a paradox exists.

One theory that can shed light on this paradox is the Dualistic Model of Passion (DMP; Vallerand et al., 2003; Vallerand, 2010, 2015). This model focuses on people highly invested in a passionate activity. The DMP defines passion as a strong inclination toward an activity that people love, find important and meaningful and to which they invest a lot of time and energy. Furthermore, this activity is part of their identity. There are two types of passion: harmonious and obsessive. Harmonious passion (HP) refers to a strong desire to freely engage in the beloved activity while maintaining a balance between this activity and the other aspects of life. People with a predominant HP engage in the passionate activity in a flexible manner, i.e. they can stop focusing on their passionate activity to fully focus on another task if needed (Vallerand, 2015). They invest time and energy inside and outside their passionate activity. HP is related to a non-defensive and mindful engagement (St-Louis et al., 2018; Vallerand, 2015). On the other hand, obsessive passion (OP) refers to an uncontrollable urge to partake in the beloved activity. OP is related to a rigid persistence in the favorite activity that may lead to conflicts with other spheres of life (Vallerand, 2015). With OP, self-esteem is contingent to performance in the activity (Mageau et al., 2011) and the engagement is more self-defensive (Lafrenière et al., 2011).

Research has shown that HP is positively related to adaptive processes such as openness to experience (Dalpé et al., 2019), adaptive emotion regulation strategies (St-Louis et al., 2020), challenge appraisals (Lavoie et al., 2021), approach-oriented coping strategies (Verner-Filion et al., 2014), and mastery goals (Vallerand et al., 2007; 2008). On the other hand, OP is generally positively related to less adaptive processes such as maladaptive emotion regulation strategies (St-Louis et al., 2020), threat appraisals (Lavoie et al., 2021), avoidance coping strategies (Verner-Filion et al., 2014), and avoidance goals (and slightly to the more adaptive mastery goals; Vallerand et al., 2007; 2008). Studies have shown that HP is positively related to positive emotions and is unrelated or negatively related to negative emotions, whereas OP is positively

associated with negative emotions and is unrelated or slightly positively related to positive emotions (e.g., Carboneau et al., 2010; Philippe et al., 2010; Rice & Fredrickson, 2017).

Based on the above, it has been suggested that HP, more so than OP, should facilitate resilience (Curran et al., 2013). Two studies conducted with entrepreneurs (Fisher et al., 2018) and athletes (Vankakova et al., 2021) have provided support for this assertion. Specifically, HP was positively related to trait resilience, whereas OP was not. However, no study so far has tested the role of passion in the *resilience process*, when actually facing stress or adversity.

The Present Research

There were three major purposes to this research. First, we sought to propose a more nuanced perspective on resilience. We used a more refined two-dimensional approach where resilience is assessed as a function of both the *degree* of resilience (from low to high resilience) and the *locus* where it takes place (from specific to global resilience). Secondly, we went beyond the prediction of trait resilience and focused on the process of resilience. So far, no study has examined what passionate people “actually experience and do” when they face adversity during the resilience process (Fisher et al., 2018). In line with past research (e.g., Fredrickson et al., 2003), we propose that experiencing positive emotions and few negative emotions under adversity (during the resilience process) is what facilitates high levels of global resilience. Finally, a third goal was to test a novel resilience process model integrating the DMP (Vallerand, 2015) and the BBT (Fredrickson, 1998, 2001) where passion leads to emotions that, in turn, lead to adjustment in the face of adversity. These are three novel contributions that were tested in three studies.

In Study 1, resilience was examined during stressful end of term university exams using a cross-sectional design. In Study 2, we investigated resilience in an online study using an education task. We assessed both objective and subjective performance in one’s studies and general health outcomes at the situational (state) level. Finally, in Study 3, we used a prospective

design looking at both educational and well-being *changes* in outcomes over a stressful event (final exams). The directionality of the relationships in our models is supported by the results of previous longitudinal, experimental, and cross-lagged studies (e.g., Bélanger et al., 2021, Study 3; Carbonneau et al., 2010; Philippe et al., 2010) showing that HP and OP lead to emotions (and not the opposite). Specifically, a longitudinal study conducted by Carbonneau et al. (2010, Study 2) has shown that HP at Time 1 led to increases in positive emotions and decreases in negative emotions over a three-month period (Time 2), while OP at Time 1 led to increases in negative emotions at Time 2. Thus, it was expected that, in the face of adversity, HP should be positively and negatively related to positive and negative emotions, respectively, whereas OP should be strongly related to negative emotions and slightly related or unrelated to positive emotions.

Research using longitudinal (Cohn et al., 2009; Galatzer-Levy et al., 2013) and experimental (Fredrickson et al., 2008) designs reveals that, when facing adversity, positive emotions lead to adaptive outcomes, and negative emotions to less adaptive outcomes. Thus, we expected that, in turn, positive emotions should be positively related to positive outcomes inside the passionate activity and in life in general (global resilience), whereas negative emotions should hinder the outcomes inside and outside one's passionate activity (no resilience). In sum, because HP has been found to facilitate positive emotions, and to protect against negative emotions, it should facilitate high global resilience (high adjustment both in the activity and in life in general) under stress. On the other hand, because OP is conducive to mostly a negative affective tone (high levels of negative emotions and low levels of positive emotions), it should lead to either no resilience at all or to some low levels of global resilience *at best*.

Study 1

The overall purpose of Study 1 was to investigate the level of resilience of passionate individuals when facing adversity and the processes through which it takes place. Prior to end of

term exams, students completed scales assessing their passion for their studies, positive and negative emotions experienced in their studies, educational outcomes (satisfaction with one's studies, perceived academic performance), and consequences in their life in general (perceptions of a successful life). It was hypothesized that HP should lead to high levels of global resilience through its positive link with positive emotions and its protective effect against negative emotions. On the other hand, OP should lead to low levels of global resilience through its positive relationships with negative emotions and some limited positive relationships with positive emotions.

Method

Participants and Procedures. Participants were 283 undergraduate students (212 women, 59 men, and 12 unspecified; M age = 24.02 years old, SD age = 5.01 years) recruited in a large French-Canadian university in Montreal. Participants of this study, as well as those of Studies 2 and 3, were taken from different programs that have a traditionally higher female enrollment (e.g., psychology, sexology, gerontology) which explains the predominance of women in our samples. They spent on average 21.67 hours per week ($SD = 12.94$ hours) in their studies and had been enrolled in their academic program for 1.89 years on average ($SD = 0.93$ years).

Because we wanted to examine participants' reactions in the face of a stressful situation, they were recruited in undergraduate courses during the end of the semester, i.e., one or two weeks just before their final exams. The study was presented as a research on students' attitudes towards their university studies. In some courses, participants had the time to answer a paper and pencil survey in classroom, and in other courses, they did not and, thus, were invited to complete the online version of the survey. There was no difference between the two methods (in class vs. online), Wilk's $\Lambda = .96$, $F(7, 264) = 1.64$, $p = .125$, $\eta^2 = .04$. Their participation was voluntary and not compensated. Informed consent was obtained from all participants.

Measures.

For all scales, except the PANAS, participants responded on a 7-point Likert scale (1 = *do not agree at all* to 7 = *very strongly agree*). For the PANAS, a 5-point Likert scale (1 = *very slightly or not at all*, 5 = *extremely*) was used. A mean score was calculated for each scale.

Demographic Questions. Participants answered questions about their age, gender, and university studies (e.g., “How many hours per week do you spend on your studies?”).

Passion for University Studies. Passion for university studies was assessed using the Passion Scale (Vallerand et al., 2003). This scale consists of two subscales assessing HP (6-item subscale; e.g., “My university studies are in harmony with the other activities in my life”; $\alpha = .76$) and OP (6-item subscale; e.g., “I have almost an obsessive feeling for my university studies”; $\alpha = .70$). The Passion Scale has shown high levels of validity and reliability (Cronbach alphas of .75 and above; Vallerand, 2015). The scale is also largely invariant for gender, language, and type of activities (Marsh et al., 2013; Vallerand et al., 2003).

Positive and Negative Affect. Participants’ emotions “when engaging in activities related to their studies” were evaluated using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). In this study, the French-Canadian version of the short PANAS scale (Gillet et al., 2013) was used, with five items assessing positive emotions (e.g., “I feel interested”; $\alpha = .70$) and five items assessing negative emotions (e.g., “I feel upset”; $\alpha = .81$).

Satisfaction with One’s Studies. Satisfaction with university studies was assessed with the French-Canadian version of the Satisfaction with One’s Studies Scale (Vallerand & Bissonnette, 1990). This scale consists of five items (e.g., “I am satisfied with my studies”; $\alpha = .85$).

Perceived Academic Performance. Participants were asked to evaluate their own academic performance in general by completing a 4-item scale (“I adequately complete assigned duties in my university studies”, “I meet the performance requirements expected in my university studies”,

“I generally go beyond the call of duty to achieve a very high level of performance in my studies”, and “I go beyond the performance requirements expected in my university studies”; $\alpha = .83$). Higher scores indicate higher levels of performance. Correlations between the Perceived Academic Performance Scale, on one hand, and positive emotions and satisfaction with one’s studies, on the other hand, were as expected (e.g., Nauta, 2007; Ng et al., 2015) indicating good scale validity (for correlations, see Table 1 in Supplementary Materials).

Perceptions of a Successful Life. Participants were asked to evaluate how successful they perceived the different aspects of their life outside of their studies by completing a 3-item scale (“I feel effective in the different spheres in my life”, “I reach the goals that I set for myself”, and “I manage to attain the various life goals that I have”; $\alpha = .88$). Higher scores indicate higher perceptions of a successful life. A confirmatory factor analysis (CFA) was conducted on the items of the Perceptions of a Successful Life Scale and the Perceived Academic Performance Scale. As expected, results indicated they represented two distinct unidimensional scales, $\chi^2 = 17.97$, $df = 12$, $p = .117$; RMSEA = .04 [.00, .08], $p = .575$; CFI = .99; TLI = .98; SRMR = .04, with covariance between items 2 and 3 from the Perceived Academic Performance Scale.

Results and Discussion

Main Analyses. For descriptive statistics and correlations among all variables, see Table 1 in Supplementary Materials.^{1, 2} The proposed model posited that HP for one’s studies should be positively related to positive emotions and negatively related to negative emotions. On the other hand, OP was expected to be positively related to both positive and negative emotions (more strongly to negative emotions). In turn, positive emotions should be positively related to satisfaction with one’s studies, perceived academic performance, and perceptions of a successful life. By contrast, negative emotions were hypothesized to be negatively associated with all these

variables. We also added to the model the number of hours / week participants spent in their studies to control for their degree of engagement in their studies. To test the hypothesized model, a path analysis was conducted using MPlus version 8.6 (Muthén & Muthén, 1998-2017). The path analyses of Studies 2 and 3 were also conducted using the same software. The paths were drawn according to the hypotheses presented above. In line with past empirical evidence (e.g., Vallerand et al., 2007, Studies 1 to 3), a direct path from HP to satisfaction with one's studies was specified. Covariances among the exogenous variables (HP, OP, and number of hours / week spent in one's studies) and among the error terms were estimated.

Results revealed that the hypothesized model did not have an acceptable fit to the data, $\chi^2 = 18.22$, $df = 5$, $p = .003$; RMSEA = .10 [.05, .15], $p = .043$; CFI = .97; TLI = .84; SRMR = .04. Based on theoretical assumptions (Vallerand, 2015), a negative path was added from OP to perceptions of a successful life. In line with Kline's recommendation (2016), non-significant paths were removed. These paths were from negative emotions to perceived academic performance and from number of hours / week to negative emotions and perceptions of a successful life. The results showed that this modified model had good fit to the data, $\chi^2 = 11.63$, $df = 7$, $p = .114$; RMSEA = .05 [.00, .10], $p = .454$; CFI = .99; TLI = .96; SRMR = .03. The standardized solutions are presented in Figure 1. Results showed that HP was positively related to positive emotions ($\beta = .51$, $p = .000$) and negatively to negative emotions ($\beta = -.22$, $p = .001$). On the other hand, OP was positively related to both positive ($\beta = .15$, $p = .011$) and negative emotions ($\beta = .29$, $p = .000$). In turn, positive emotions were positively related to satisfaction with one's studies ($\beta = .27$, $p = .000$), perceived academic performance ($\beta = .36$, $p = .000$), and perceptions of a successful life ($\beta = .25$, $p = .000$). By contrast, negative emotions were negatively related to satisfaction with one's studies ($\beta = -.12$, $p = .013$) and perceptions of a

PASSION, EMOTIONS, AND RESILIENCE

successful life ($\beta = -.18, p = .002$). In addition, HP was positively and directly related to satisfaction with one's studies ($\beta = .34, p = .000$) and OP was negatively and directly related to perceptions of a successful life ($\beta = -.18, p = .003$). The number of hours / week individuals spent in their studies was positively associated with perceived academic performance ($\beta = .27, p = .000$) and marginally related to positive emotions ($\beta = .10, p = .074$) and satisfaction with one's studies ($\beta = .10, p = .058$).

Indirect effects were explored to further test the mediating role of emotions in the relationships between passion for one's studies and outcomes in one's studies as well as in life in general. Bias-corrected bootstrapped 95% confidence interval estimates indicated that positive emotions significantly mediated the relationships between HP and satisfaction with one's studies ($\beta = .14$; 95% CI = .07 to .22), perceived academic performance ($\beta = .18$; 95% CI = .12 to .25), and perceptions of a successful life ($\beta = .13$; 95% CI = .06 to .19). Furthermore, negative emotions mediated the relationship between HP and satisfaction with one's studies ($\beta = .03$; 95% CI = .01 to .07) and perceptions of a successful life ($\beta = .04$; 95% CI = .01 to .08). Regarding OP, positive emotions mediated the relationships between OP satisfaction with one's studies ($\beta = .04$; 95% CI = .01 to .08), perceived academic performance ($\beta = .05$; 95% CI = .01 to .10), and perceptions of a successful life ($\beta = .04$; 95% CI = .01 to .08). Negative emotions also mediated the relationship between OP and satisfaction with one's studies ($\beta = -.04$; 95% CI = -.07 to -.01), and perceptions of a successful life ($\beta = -.05$; 95% CI = -.09 to -.02).

In sum, the present findings have provided support for the differential role of HP and OP in the resilience process when facing a stressful event. Specifically, HP was related to high levels of global resilience with high positive outcomes both inside and outside the passionate activity. Furthermore, as posited such effects of HP on resilience took place through its positive link with positive emotions and through its protective role against negative emotions. Conversely, OP was

related to low levels of global resilience through its facilitative role in negative emotions and its less important positive link with positive emotions.

These findings provide support for both the DMP (Vallerand, 2015), on the differential role of HP and OP in the experience of positive and negative emotions, and the BBT (Fredrickson, 1998, 2001), on the role of such emotions in the experience of outcomes in the face of a stressful event. Specifically, positive emotions were associated with positive outcomes both inside (i.e., satisfaction with one's studies and perceived academic performance) and outside (i.e., perceptions of a successful life) academic studies. The opposite relationship was observed with negative emotions. These results showed the importance of examining resilience in a multidimensional fashion. In summary, our results supported the resilience process outlined by Fredrickson (2013) and showed that some important determinants of this process are HP and OP.

Study 2

The results of Study 1 provided support for the role of passion in resilience and the mediating role of emotions in the relationships between passion and outcomes in the passionate activity and in life in general. Study 2 aimed at replicating these results as it happens in real time using objective and situational (or state) measures of adjustment. We used an objective and a subjective measure of performance in the academic realm, as well as situational measures of general health (subjective vitality and physical symptoms). We chose to measure subjective vitality (i.e., the experience of having energy available to one's self) because it is considered as a valid situational indicator of general well-being (Ryan & Frederick, 1997). Higher subjective vitality measured following adversity should indicate higher levels of functioning and, thus, higher levels of resilience. On the other hand, we chose to measure physical symptoms because they are some of the few situational indicators of general physical health (with more symptoms indicating lower physical health). Studies have shown that such physical symptoms are

negatively related to resilience (Osofsky et al., 2018). Furthermore, in Study 1, we presumed that the end of semester was a stressful event, but we did not assess the stress actually experienced by the participants. Thus, in Study 2, participants' levels of stress were assessed before, during, and after the stressful situation to ensure that the situation was indeed stressful. Participants completed an online questionnaire assessing passion for one's studies and engaged in an online education task measuring objective performance. This education task was presented as an excellent predictor of academic ability and was timed to create a pressurized educational environment similar to the one typically found during university exams. As in Study 1, it was expected that HP should be positively and negatively related to positive and negative emotions, respectively, whereas OP should be positively related to negative emotions and less so to positive emotions. In turn, positive emotions were expected to be positively related to positive outcomes within (objective and subjective performance on the education task) and outside (situational subjective vitality) the passionate activity, and negatively related to physical symptoms (outside the passionate activity). On the other hand, the opposite patterns were expected with negative emotions. Thus, HP should lead to high global resilience and OP, to low global resilience.

Method

Participants and Procedures. Participants were 275 undergraduate and graduate students (231 women, 39 men, 3 non-binaries, 2 unspecified; M age = 24.65 years old, SD = 5.23 years) recruited in a large French-Canadian university in Montreal. Most of them were full-time students and they spent on their studies an average of 37.84 hours per week (SD = 14.08 hours). Moreover, they had completed on average 3.22 semesters in their program (SD = 2.90 semesters).

Participants were recruited via Facebook private groups to participate to an online research about their attitudes towards their studies. These private groups were for students only and students had to answer security questions to be part of the groups. Participants gave their

informed consent and their participation was voluntary. They first filled out the Passion scale for their studies (Vallerand et al., 2003) and then, they indicated how they felt at this very moment using the short PANAS scale (Gillet et al., 2013) and a slider measuring levels of stress from 0 to 100. Then, they executed the timed education task that was presented as a valid measure of how well students do in their studies. After completing four of the six Raven's matrices from the education task (see Measures section for more details), participants were asked to indicate how they felt at this very moment during the education task using once again the short PANAS scale (Gillet et al., 2013) and the slider measuring levels of stress. They then finished the last two matrices from the education task and indicated how they felt using the short PANAS scale and the slider measuring stress. After, they filled out different scales assessing their subjective performance on the education task as well as their situational subjective vitality and physical symptoms following the task. Ten \$50 Amazon gift cards were drawn among the participants.

Measures.

The questionnaire included demographic questions, the Passion Scale (HP subscale $\alpha = .73$ and OP subscale $\alpha = .75$; Vallerand et al., 2003), and the French-Canadian version of the short PANAS scale (positive emotions $\alpha = .73$ and negative emotions $\alpha = .87$; Gillet et al., 2013), mentioned previously in Study 1. It also included the following scales and scores.

Levels of Perceived Stress. Using a slider going from 0 to 100 (0 = *not stressed at all* to 100 = *really stressed*) participants indicated how stressed they felt at that point in time. This measure was used three times: before, during, and after engaging in the education task.

Objective Performance on the Education Task. The education task consisted of six Raven's matrices (Raven et al., 1998). Participants had 45 seconds to complete each one. To solve the Raven's matrices, they had to find which image completed each series of illustrations correctly (for detailed instructions and a Raven matrix sample, see Supplementary Materials). Score on the

education task was calculated by adding one point for every matrix completed correctly. Raven's matrices were described to participants as excellent predictors of academic performance.

Subjective Performance on the Education Task. The Perceived Academic Performance scale used in Study 1 was adapted so that participants were asked to evaluate their own performance on the education task. They responded to three items ("I am satisfied with my performance on the education task.", "I felt efficient when I completed the education task." "I properly completed the education task."; $\alpha = .86$) using the same 7-point Likert scale as in Study 1. Higher scores indicate higher levels of perceived performance on the education task.

Situational Subjective Vitality. A 5-item version of the Subjective Vitality Questionnaire (Ryan & Frederick, 1997) was used to assess participants' state subjective vitality after completing the matrices (e.g., "I feel energized."; $\alpha = .90$). Participants responded on a 7-point scale (the same as in Study 1). Higher scores indicate higher subjective vitality in life in general.

Situational Negative Physical Symptoms. Physical symptoms were situational indices of ill-being and were assessed using an 8-symptom checklist (e.g., headache; $\alpha = .78$) based on Knaüper et al. (2004). Participants indicated how they felt after completing the matrices using a 7-point scale (the same as in Study 1). Higher scores indicate higher ill-being in life in general. There was a negative correlation between physical symptoms and subjective vitality, showing good validity.

To verify that all the outcome scales were unidimensional and to examine their validity, a CFA was conducted on the items of the three outcome scales (i.e., Subjective Performance on the Education Task Scale, Situational Subjective Vitality Scale, and Situational Physical Symptoms Checklist). As expected, results indicated that there were three distinct unidimensional scales, χ^2

= 157.11, $df = 97$, $p = .000$; RMSEA = .05 [.03, .06]; $p = .606$; CFI = .96; TLI = .95; SRMR = .05, with covariance between items from the same scales.

Results and Discussion

Main Analyses. For descriptive statistics and correlations, see Table 2 in Supplementary Materials.^{1, 2, 3} The proposed model postulated that HP for one's studies should be positively related to positive emotions and negatively related to negative emotions. On the other hand, OP should be positively associated with both positive and negative emotions. In turn, positive emotions should be positively related to positive outcomes in one's studies (i.e., subjective and objective performance on the education task) and general health (i.e., situational subjective vitality). Positive emotions should also be negatively related to situational physical symptoms, and thus, should protect against them. By contrast, negative emotions were hypothesized to display the opposite relationships with all these variables. As in Study 1, we controlled for the number of hours / week participants spent in their studies. To test the hypothesized model, a path analysis was conducted and paths were drawn according to the hypotheses presented above. Covariances among the exogenous variables (e.g., HP, OP, and number of hours / week spent in one's studies) and among the error terms were estimated.

Results showed that the hypothesized model did not yield acceptable fit to the data, $\chi^2 = 31.11$, $df = 8$, $p = .000$; RMSEA = .10 [.07, .14], $p = .011$; CFI = .95; TLI = .78; SRMR = .04. Based on theoretical rationale (Vallerand, 2015), we added positive paths from HP to state subjective vitality and from OP to situational physical symptoms. We also removed the following non-significant paths (Kline, 2016): paths from HP to negative emotions, from OP to positive emotions, from positive emotions to situational physical symptoms, and from number of hours / week to positive emotions as well as all the outcome variables. The results showed that this

PASSION, EMOTIONS, AND RESILIENCE

modified model had good fit to the data, $\chi^2 = 18.92$, $df = 14$, $p = .168$; RMSEA = .04 [.00, .07], $p = .694$; CFI = .99; TLI = .97; SRMR = .04. The standardized solutions are presented in Figure 2. Results showed that HP was positively related to positive emotions ($\beta = .15$, $p = .009$) that, in turn, were positively associated with both objective ($\beta = .14$, $p = .010$) and subjective ($\beta = .26$, $p = .000$) performance on the education task as well as with state subjective vitality ($\beta = .57$, $p = .000$). On the other hand, OP was positively related to negative emotions ($\beta = .21$, $p = .000$). In turn, negative emotions were negatively associated with objective ($\beta = -.30$, $p = .000$) and subjective ($\beta = -.44$, $p = .000$) performance on the education task as well as with subjective vitality ($\beta = -.11$, $p = .050$), and positively related to physical symptoms ($\beta = .40$, $p = .000$). In addition, HP was positively associated with state subjective vitality ($\beta = .19$, $p = .000$), OP was positively associated with situational physical symptoms ($\beta = .16$, $p = .006$), and number of hours / week spent in one's studies was negatively related to negative emotions ($\beta = -.19$, $p = .001$).

Indirect effects were explored to further test the mediating role of emotions in the relationships between passion for one's studies and outcomes in one's studies (i.e., objective and subjective performance on the education task) as well as in life in general (i.e., subjective vitality and physical symptoms). Results indicated that positive emotions mediated the relationships between HP and objective ($\beta = .02$, 95% CI = .00 to .05) and subjective ($\beta = .04$, 95% CI = .01 to .08) performance on the education task, and state subjective vitality ($\beta = .08$, 95% CI = .02 to .15). On the other hand, negative emotions mediated the relationships between OP and objective ($\beta = -.06$, 95% CI = -.11 to -.03) and subjective ($\beta = -.09$, 95% CI = -.15 to -.05) performance on the education task, state subjective vitality ($\beta = -.02$, 95% CI = -.05 to -.00, $p = .076$), and physical symptoms ($\beta = .09$, 95% CI = .04 to .14).

In sum, the present findings provided partial support for the hypothesized model and complementary analyses showed that the model was supported irrespective of the stress levels.⁴ In the face of a stressful situation that took place within an activity associated with participants' passion for their studies (i.e., an education task presented as an excellent predictor of their academic performance), HP was related to high levels of global resilience, whereas OP was related to the absence of resilience. Specifically, HP was positively related to positive emotions that, in turn, were positively associated with resilience both in one's studies (i.e., objective and subjective performance) and general health outcomes (i.e., situational subjective vitality). Conversely, through its positive relationship with negative emotions, OP hindered resilience both in the task related to participants' passion (i.e., lower objective and subjective performance on the education task) and in one's situational well-being (i.e., lower situational subjective vitality and higher physical symptoms). Of interest is the fact that the present findings were obtained with an objective measure of task performance and with additional measures of well-being. It should be underscored that while the role of HP in resilience was replicated in the present study, the resilience process only took place through the HP-Positive emotions path. There were no protective functions of HP with respect to negative affect. Also, contrary to Study 2, OP did not display resilience. Further investigations are necessary in order to understand the intricacies of these distinctions in the process and outcomes of resilience.

Study 3

Study 3 aimed to further explore the role of HP and OP in the resilience process while using a prospective design. In Studies 1 and 2, all variables were more or less assessed at the same point in time and the changes in outcomes were not examined. Thus, it was difficult to determine if the resilience process really unfolded as presented. Furthermore, it was impossible to determine if participants fared better following the stressful event than before, an important indicator of

resilience. Importantly, results of Study 2 did not support the cross-paths from HP to negative emotions and from OP to positive emotions. Thus, to address these issues, in Study 3, passion for one's studies was assessed during the end of the semester (i.e., two weeks before the final exams) and emotions and outcomes were assessed one week after the exams. This design also allowed us to look at the role of passion and emotions in *changes* in outcomes over time.

It was hypothesized that, in the face of the stressful event, HP should be positively related to positive emotions and negatively related to negative emotions. On the other hand, OP should be positively related to negative emotions and, slightly, to positive emotions. In turn, positive emotions should increase positive outcomes both inside (i.e., satisfaction with one's studies and perceived academic performance) and outside (i.e., perceptions of a successful life) the passionate activity over time, while negative emotions should lead to the opposite effects. Thus, as in Study 1, HP was hypothesized to lead to high global resilience, i.e., positive outcomes both inside and outside education, through its positive relationship with positive emotions and its protective role against negative emotions. On the other hand, OP was expected to lead to some (low) levels of global resilience because of its positive relationships with both positive and negative emotions, thus leading to limited positive adjustment inside and outside education.

Method

Participants and Procedures. Participants were 238 undergraduate students (185 women, 52 men, and 1 unspecified; M age = 26.20 years, SD = 8.19 years) recruited in a large French-Canadian university in Montreal. They spent on average 22.73 hours per week (SD = 13.63 hours) in their studies and had been enrolled in their academic program for 1.87 years on average (SD = .89 years).

Participants were recruited in undergraduate course classrooms and the study was presented as a research about their attitudes towards their university studies. Participants completed the

survey in classroom or online at home. There was no difference between the two recruitment methods, Wilk's $\Lambda = .94$, $F(7, 227) = 1.92$, $p = .068$, $\eta^2 = .06$. The survey was filled one or two weeks before participants' final exams (Time 1). One week after their final exams, participants who had provided their email address were contacted to complete a follow-up online survey (Time 2). Participants had not yet received their final exam grades. Thus, their responses at Time 2 reflected their reaction to the end-of-term and not to their grades. Their participation was voluntary and if they completed both surveys (Times 1 and 2), they were entered into a draw for a chance to win one of the thirteen \$50 Amazon gift cards.

Measures.

The questionnaire at Time 1 included demographic questions, the Passion Scale (HP subscale $\alpha = .81$ and OP subscale $\alpha = .73$; Vallerand et al., 2003), the French-Canadian version of the short PANAS scale (positive emotions $\alpha = .76$ and negative emotions $\alpha = .82$; Gillet et al., 2013), the French-Canadian version of the Satisfaction with One's Studies Scale ($\alpha = .84$; Vallerand & Bissonnette, 1990), the Perceived Academic Performance Scale ($\alpha = .85$), and the Perceptions of a Successful Life Scale ($\alpha = .92$) mentioned previously in Study 1. Time 2 questionnaire only included the outcomes (PANAS positive emotions $\alpha = .79$ and negative emotions $\alpha = .88$, Satisfaction with One's Studies Scale $\alpha = .82$, Perceived Academic Performance Scale $\alpha = .86$, and Perceptions of a Successful Life Scale $\alpha = .95$).

Once again, CFAs were conducted on the items of the Perceived Academic Performance Scale and the Perceptions of a Successful Life Scale to examine their validity. At Times 1 and 2, results indicated that these two scales were distinct and unidimensional (Time 1: $\chi^2 = 28.39$, $df = 12$, $p < .01$; RMSEA = .08 [.04, .11], $p = .108$; CFI = .98; TLI = .96; SRMR = .04, with a covariance between items 2 and 3 of the Perceived Academic Performance Scale; Time 2: $\chi^2 =$

6.06, $df = 12$, $p = .913$; RMSEA = .00 [.00, .03], $p = .991$; CFI = 1.00; TLI = 1.00; SRMR = .01, with a covariance between items 2 and 3 of the Perceived Academic Performance Scale).

Results

Main Analyses. For descriptive statistics and correlations, see Table 3 in Supplementary Materials.^{1, 2, 5, 6} To assess changes in the outcome variables, residuals were created based on the regression of the dependent variables at Time 2 on their own score at Time 1. The model proposed that HP at Time 1 should be positively and negatively related to positive and negative emotions at Time 2, respectively. In addition, OP at Time 1 should be positively associated with positive and negative emotions at Time 2. In turn, positive and negative emotions should be positively and negatively, respectively, related to residuals of satisfaction with one's studies, perceived academic performance, and perceptions of a successful life. Moreover, as in Studies 1 and 2, we controlled for the number of hours / week participants spent in their studies. Paths of the model were drawn according to the hypotheses presented above and covariances among the variables at Time 1 and among the error terms at Time 2 were estimated. This model had an acceptable fit to the data, $\chi^2 = 6.22$, $df = 6$, $p = .399$; RMSEA = .01 [.00, .09], $p = .713$; CFI = 1.00; TLI = 1.00; SRMR = .02. However, all the paths from number of hours / week to the variables at Time 2 were non-significant. Thus, they were removed (Kline, 2016). This modified model had an acceptable fit to the data, $\chi^2 = 10.20$, $df = 11$, $p = .513$; RMSEA = .00 [.00, .06], $p = .866$; CFI = 1.00; TLI = 1.00; SRMR = .02.

The standardized solutions supported the hypothesized model and are presented in Figure 3. Results showed that HP for one's studies at Time 1 was positively associated with positive emotions at Time 2 ($\beta = .34$, $p = .000$), and negatively related to negative emotions at Time 2 ($\beta = -.20$, $p = .006$). On the other hand, OP for one's studies at Time 1 was positively related to

PASSION, EMOTIONS, AND RESILIENCE

positive ($\beta = .15, p = .010$) and negative ($\beta = .20, p = .002$) emotions. In turn, positive emotions were positively related to residuals of satisfaction with one's studies ($\beta = .27, p = .000$), perceived academic performance ($\beta = .22, p = .000$), and perceptions of a successful life ($\beta = .18, p = .008$). By contrast, negative emotions were negatively associated with residuals of satisfaction with one's studies ($\beta = -.26, p = .000$), perceived academic performance ($\beta = -.18, p = .005$), and perceptions of a successful life ($\beta = -.28, p = .000$).

Indirect effects were investigated to further test the mediating role of the emotions in the relationships between the two types of passion and resilience outcomes. Bias-corrected bootstrapped 95% confidence interval estimates indicated that positive emotions significantly mediated the relationships between HP at Time 1 and residuals of satisfaction with one's studies ($\beta = .09$; 95% CI = .05 to .16), perceived academic performance ($\beta = .08$; 95% CI = .03 to .13), and perceptions of a successful life ($\beta = .06$; 95% CI = .02 to .13). Positive emotions also mediated the relationships between OP at Time 1 and residuals of satisfaction with one's studies ($\beta = .04$; 95% CI = .01 to .08), perceived academic performance ($\beta = .03$; 95% CI = .01 to .07), and perceptions of a successful life ($\beta = .03$; 95% CI = .01 to .06). On the other hand, negative emotions mediated the relationships between HP at Time 1 and residuals of satisfaction with one's studies ($\beta = .05$; 95% CI = .01 to .12), perceived academic performance ($\beta = .04$; 95% CI = .01 to .09), and perceptions of a successful life ($\beta = .06$; 95% CI = .02 to .11). Negative emotions also mediated the relationships between OP at Time 1 and residuals of satisfaction with one's studies ($\beta = -.05$; 95% CI = -.11 to -.02), perceived academic performance ($\beta = -.04$; 95% CI = -.08 to -.01), and perceptions of a successful life ($\beta = -.06$; 95% CI = -.11 to -.02).

In sum, in line with Studies 1 and 2, HP for one's studies was associated with high levels of global resilience. Indeed, HP entailed positive emotions that increased adaptive outcomes both inside and outside the passionate activity. Moreover, HP also protected against negative emotions

and negative outcomes. In other words, individuals with a predominant HP thrived through adversity with increases in resources after the end of the semester. Such was not totally the case with OP for one's studies. Indeed, OP was related to low levels of global resilience through a mixed process of positive relationships with both positive and negative emotions that led to low levels of adaptive outcomes both inside and outside one's studies.

General Discussion

The general purpose of the present research was to assess the resilience process of passionate individuals under adversity, i.e., what passionate people “experience and do in the context of adversity” (Fisher et al., 2018). There were three specific goals to this research. First, we sought to propose a more nuanced perspective on resilience by using a new two-dimensional approach assessing resilience as a function of both the *degree* of resilience (from low to high) and the *locus* where resilience was achieved (from specific to global). Second, we aimed to study the resilience process of passionate people when facing adversity related to their passionate activity. Finally, a third goal was to test a resilience process model integrating the DMP (Vallerand, 2010, 2015) and the BBT (Fredrickson, 1998, 2001), leading to a more comprehensive analysis of the role of passion and emotions in resilience under adversity. This model posited that HP should lead to high levels of global resilience through its positive link with positive emotions and its protective effect against negative emotions and their respective links to outcomes. On the other hand, it was expected that OP should lead at best to low levels of global resilience through its positive relationships with both positive *and* negative emotions and their ensuing outcomes. To reach these goals, three studies were conducted using both cross-sectional and prospective designs as well as assessing subjective, objective, and situational measures. Overall, the results generally supported the hypotheses and showed that the model was the same irrespective of the stress levels.⁴ HP was related to positive emotions that were associated with high levels of global

resilience as displayed by positive outcomes both inside and outside one's passionate activity. HP also protected against negative emotions and their negative outcomes (in Studies 1 and 3). On the other hand, OP was related to low levels of global resilience through its mixed relationships with positive and negative emotions (Studies 1 and 3) or to no resilience through the absence of a positive relationship with positive emotions and its relationship with negative emotions that hindered and depleted outcomes (Study 2). Importantly, these findings were obtained while using both subjective and objective outcomes (Study 2) and while looking at *changes* in outcomes over time (Study 3). These findings have important implications for the field of resilience.

Passion as a Determinant of the Resilience Process

A first implication is that the type of passion that one has for a specific activity matters greatly regarding resilience. Whereas past research had looked at the relationships between passion and trait resilience (Fisher et al., 2017; Vandakova et al., 2021), the present series of studies was the first to look at the process through which passion is associated with resilience under adversity. In these three studies, HP led to high levels of global resilience under stress through its adaptive relationships with positive and negative emotions and their outcomes. Indeed, individuals with a predominant HP fared better after a stressful event than before: they thrived through adversity in Study 3. On the other hand, in Studies 1 and 3, OP led to low levels of global resilience through its positive relationships with both the positive and negative emotions (stronger link with negative emotions). However, in Study 2, OP led to an absence of resilience through its positive link with negative emotions and the lack of relationship with positive emotions. Future research should investigate why the results of the online study (Study 2) were slightly different from the other two studies and yielded no relationship between OP and positive emotions. One intriguing possibility is that with OP, the resilience process may take place over time and not right away. Thus, contrary to Study 3 where a few weeks took place

PASSION, EMOTIONS, AND RESILIENCE

between Times 1 and 2, the design of Study 2 lasted only a few minutes and may not have been long enough to allow OP to eventually leave room to cope with the stressful situation and to experience some positive emotions. Future research on this possibility would appear important.

Overall, the results showed that HP was generally more adaptive than OP due to its strong relationships with positive emotions and the protection that it provides against negative emotions. Individuals with a predominant HP also fared better after a stressful event than before (Study 3), which was not totally the case with individuals with a predominant OP. To deepen our understanding of the relationships between passion and the emotional processes involved in resilience, future studies could examine why HP better facilitates positive emotions than OP. Furthermore, future research could also examine why OP is always related to negative emotions (Curran et al., 2015; Vallerand, 2015), thereby hindering resilience while it's not the case with HP. The present series of studies has shown that the present findings held even when statistically controlling for the number of hours that people engaged in their studies. Thus, the distinction between HP and OP seems to be a matter of quality of involvement rather than intensity. Past research has shown that HP is associated with mindfulness, openness to experience, and the use of adaptive emotion regulation strategies, while it is the opposite for OP (Dalpé et al., 2019; St-Louis et al., 2018, 2020). They have also shown that HP is related to challenge appraisals while OP is related to threat appraisals (Lavoie et al., 2021). It is possible that because harmoniously passionate people are mindful, open, regulate their emotions adaptively, and appraise situations as challenges, they experience more positive emotions at the core of the resilience process. On the other hand, OP is associated with difficulties regulating one's emotions (St-Louis et al., 2020), defensiveness (Lafrenière et al., 2011), threat appraisals (Lavoie et al., 2021), and less mindfulness (St-Louis et al., 2018) that might lessen experiences of positive emotions (correlations between OP and positive emotions were lower in Studies 1 and 3 or non-existent in

Study 2). Also, OP is associated with conflict between the passionate activity and other spheres of life (Vallerand et al., 2003, Study 3). These conflicts may trigger negative emotions in the passionate activity and in life in general. Future research could look at the mediating role of these variables (i.e., emotion regulation, openness, mindfulness, conflict, appraisals) in the relationship between passion and emotions and examine how all these variables are related to resilience.

Finally, future research should also investigate why OP is sometimes positively related to positive emotions (Studies 1 and 3) and other times not (Study 2). Similarly, HP may not serve to protect one against negative emotions in the immediate stressful situation (Study 2). It would appear that the resilience process in the face of a stressor takes time before it is fully operational for both HP and OP. Thus, OP may only be related to positive emotions, and HP may only protect one against negative emotions, after some time has passed (as in Studies 1 and 3). Future naturalistic studies with diary measures are in order to test this hypothesis.

On the Role Positive and Negative Emotions in Resilience

A second implication of the present research is that emotions are central to the resilience process. Our results provided support for a resilience process model integrating the DMP (Vallerand et al., 2003) and the BBT (Fredrickson, 1998, 2001). Positive and negative emotions mediated the relationships between passion and the indicators of resilience. Specifically, positive emotions were positively related to positive outcomes, while negative emotions hindered these outcomes. These results supported the BBT (Fredrickson, 1998, 2001) positing that it is positive emotions experienced in the face of adversity that foster resilience. In addition, Study 3 also generally replicated results of Fredrickson et al. (2003). As in Fredrickson's study, over time, positive emotions increased psychological resources and, after the stressful event, individuals bounced back stronger than before. These results extended Fredrickson's findings by showing the role of passion as a facilitator of positive emotions and, particularly with HP, as a protector of

negative emotions detrimental to a positive adaptation (in Studies 1 and 3). These results also showed the effects of passion and emotions on resilience inside and outside one's passionate activity. Furthermore, they uncovered the role of negative emotions by showing that they decreased resources in all parts of one's life. These results were in line with Fredrickson's theory (1998) positing that negative emotions narrow individuals' thought-action repertoires and, thus, prevent individuals from building adaptive resources to rely on when facing stressful situations.

On a Two-Dimensional Approach to Resilience

A final implication of the present findings is that resilience should be considered in a more nuanced perspective, as being low to high depending on the degree of positive adaptation in the face of adversity, and specific to global depending on the locus of outcomes. Past research has often looked at resilience as being simply present or absent. The position taken in this paper is that we need to be more precise in our assessment of resilience to get a more nuanced and broader analysis of this process. Our results revealed that HP led to high levels of global resilience in all three studies, whereas OP led to low levels of global resilience in Studies 1 and 3, and to the absence of resilience in Study 2. Of interest, these results were obtained with various types of measurement, including subjective, objective, and situational assessments of outcomes.

The present research supports our hypothesis that engaging in an activity one is passionate about out of HP facilitates the experience of positive emotions (and prevents negative emotions) and it is those positive emotions that facilitate high levels of global resilience. In line with Fredrickson (2013), experiencing positive emotions may have help people opening up and using available repertoire and skills not only in the passionate activity, but also in other spheres of life. Thus, through the positive emotional balance that it fostered (Vallerand, 2015), HP helped people experience high levels of global resilience and thrive both in the passionate activity and in life in general. On the other hand, perhaps due to a rigid involvement in the passionate activity and

conflicts with other spheres of life (Vallerand, 2015; Vallerand et al., 2003), OP led to negative emotions in the passionate activity that appear to have ripple effects in other life spheres thereby stifling resilience. The low level of global resilience that was observed with OP was due to the small but positive relationship with positive emotions. However, overall, the emotional balance favored a more negative valence than with HP and this explained why resilience was much lower relative to HP. In sum, considering resilience as much more than absent or present can lead to a more precise analysis of the resilience process. Future research should examine the role of emotions in the resilience process of passionate individuals with other measures of adjustment both inside and outside the passionate activity (the locus of resilience).

Limitations

The present research is not without limitations. First, these three studies used a correlational design, so it is impossible to formulate causal interpretations of the relationships among the variables. Thus, although Study 3 had two time points allowing us to look at changes in outcomes, future research should use either a cross-lagged design or even a three time-point longitudinal design where passion is measured at Time 1, the mediators (emotions) at Time 2, and the outcomes at Time 3. Alternatively, an experimental design could also be used where HP and OP mindsets are experimentally induced to ascertain the causal effects of passion in emotions during the resilience process. The induction of passion mindsets has proved to be effective (e.g., Bélanger et al., 2013; Lafrenière et al., 2013; Study 2; Schellenberg et al., 2016; Vallerand, 2015, pp. 82-84 for the exact procedures). Moreover, future research could also use a control group comparing participants' reactions under a stressful vs. a non-stressful situation to examine if the processes take place differently depending on the situation. Secondly, even though the present studies assessed resilience in a multidimensional fashion, only a limited set of variables and situations were examined. Future research should extend the present research with objective real-

PASSION, EMOTIONS, AND RESILIENCE

life outcomes both within the sphere of the passionate activity and in other areas of one's life (e.g., personal relationships, contribution to society; see Vallerand, 2013). Furthermore, examining a larger set of variables could help identify other alternative mechanisms leading to resilience (e.g., cognitive appraisals, coping strategies). In addition, future research could also examine how people react, not only to adversity in their passionate activity, but also to more holistic forms of adversity in their life in general (e.g., loss of a loved one) and in the face of long lasting stressors leading to persistent resilience (Szmigin et al., 2020). Third, the stress experienced by participants was not measured explicitly in Study 1. However, we were able to calculate the combined score of the PANAS anxious and nervous items in Study 1 and compare these to those in Study 3 (at Time 1). Results revealed that there was no difference between the level of stress in Study 1 ($M = 2.80$ on a maximum score of 5) and in Study 3 ($M = 2.71$ on a maximum score of 5), $t(237) = -.88, p = .382, \eta^2 = .003$. Since participants in Study 3 reported more stress during than after the end of term exams, we can assume that it was also the case for the participants of Study 1. Finally, our samples only included undergraduate and graduate students and comprised a majority of women, limiting generalization of our findings. Future research is needed in other areas (e.g., work, sports) with more gender balanced samples.

In sum, the present research uncovered that passionate people are indeed resilient when facing stressful events. However, the type of passion matters greatly as only HP leads to high levels of global resilience, while OP leads to low levels of global resilience at best. In addition, the resilience process appears to take place through emotions with positive emotions facilitating, and negative emotions hindering, positive adjustment following a stressful event. Future research is necessary to explore more thoroughly how passion and emotions are intrinsically woven in the resilience process both within the activity people are devoted to and in the rest of their life.

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Footnotes

¹The preliminary analyses of Studies 1 to 3 showed that there were no missing values in all the data sets. Bivariate scatterplots and residual plots revealed that all variables were linearly related to each other. Variables revealed no multicollinearity ($VIF < 5$). In Study 1, box plots and Mahalanobis distances at the critical chi-square value at $p = .001$ uncovered, respectively, no univariate outlier and one multivariate outlier. This participant was kept because its presence did not influence the results. In Studies 2 and 3, the same analyses revealed no outlier. All variables were normally distributed in Studies 1 and 3, thus a Maximum Likelihood (ML) estimator was used for the path analyses. In Study 2, negative emotions and physical symptoms were slightly positively skewed, thus a Maximum Likelihood estimator with robust standard errors (MLR) was used for the path analysis and ML was used to estimate the bootstrapped confidence intervals since bootstrap is unavailable with MLR estimation.

²In each study, a multivariate analysis of variance (MANOVA) was conducted to examine gender differences on all the variables. In Study 1, the MANOVA revealed that there were gender differences on the Passion scale, Wilk's $\Lambda = .88$, $F(14, 526) = 2.46$, $p = .000$, $\eta^2 = .06$. Women ($M = 5.12$; $SD = .83$) were more harmoniously passionate than men ($M = 5.04$; $SD = .87$). Gender did not influence the results of the path analysis, thus it was not included in the model for parsimony reason. The MANOVAs of Studies 2 and 3 revealed that there were no gender differences on all the assessed variables, Wilk's $\Lambda = .91$, $F(16, 524) = 1.52$, $p = .087$, $\eta^2 = .04$, and Wilk's $\Lambda = .96$, $F(7, 227) = 1.31$, $p = .245$, $\eta^2 = .04$, for Studies 2 and 3 respectively.

³An analysis of variance with repeated measures indicated that participants were more stressed *during* the education task ($M = 49.60$) than before ($M = 44.17$) and after the task ($M = 41.92$), and that the levels of stress before and after the task were not different, Wilk's $\Lambda = .71$,

$F(2, 260)=52.16, p = .000, \eta^2 = .29$. Thus, engaging in the education task was experienced as stressful, as intended.

⁴For Study 2, we tested an alternative model where stress moderated our mediation model. Results showed that the interaction terms (OP*stress and HP*stress) did not influence the model (all p -values $> .05$). In other terms, the hypothesized model was supported irrespective of the stress levels.

⁵In Study 3, we created a combined score with the PANAS anxious and nervous items to examine if participants experienced the end of the semester as a stressful event. We compared this score at Time 1 (i.e., the end of the semester) with the score at Time 2 (after the semester). Results of a paired samples t -test indicated that, as expected, participants felt more anxious and nervous at Time 1, during end of term exams ($M= 2.71, SD=1.06$), than at Time 2, after the end of term exams ($M= 2.56, SD=1.18$), $t(237) = 2.02, p = .045, \eta^2 = .02$.

⁶In Study 3, a MANOVA uncovered that participants who only completed the Time 1 questionnaire and not that of Time 2 had lower level of Perceived academic performance ($M = 4.70; SD = 1.20$) than participants who completed both Time 1 and Time 2 ($M = 5.05; SD = 1.23$), Wilk's $\Lambda = .97, F(7, 500) = 2.33, p = .024, \eta^2 = .03$.

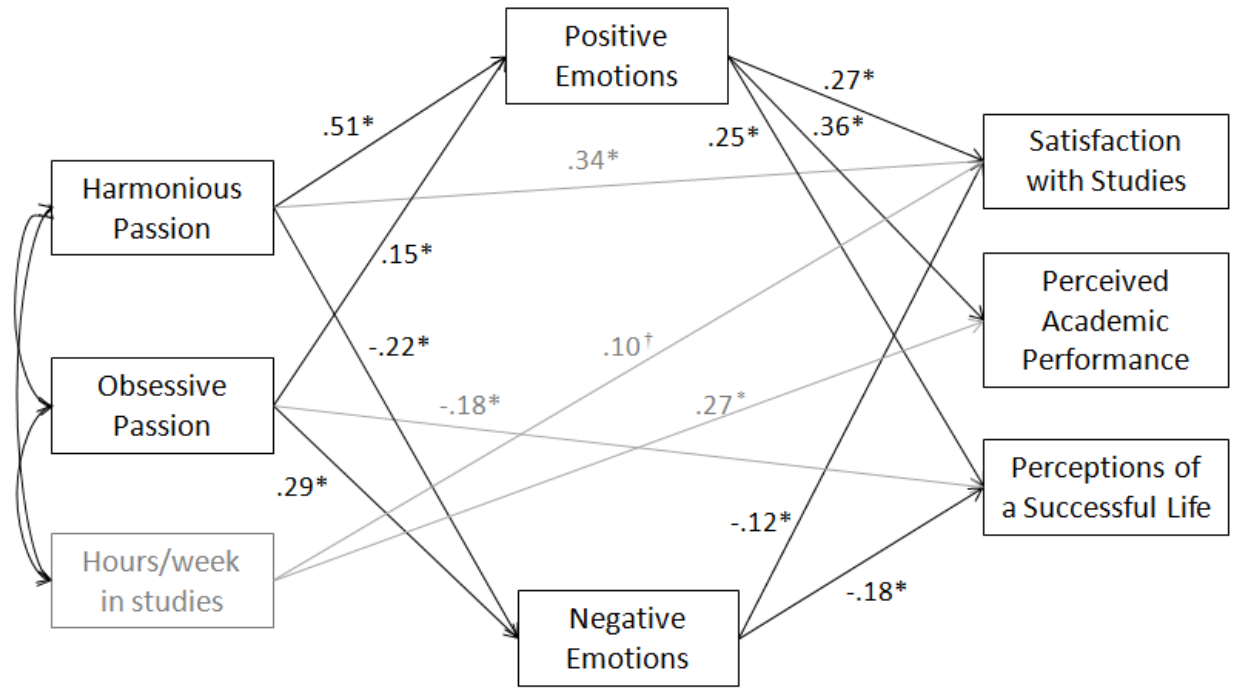


Figure 1. Results of the path analysis: Study 1. Standardized path coefficients are presented. For clarity concerns, covariances were omitted between the error terms. $N = 283$. HP = harmonious passion for one's studies; OP = obsessive passion for one's studies.

* $p < .05$ or better. † $p < .10$

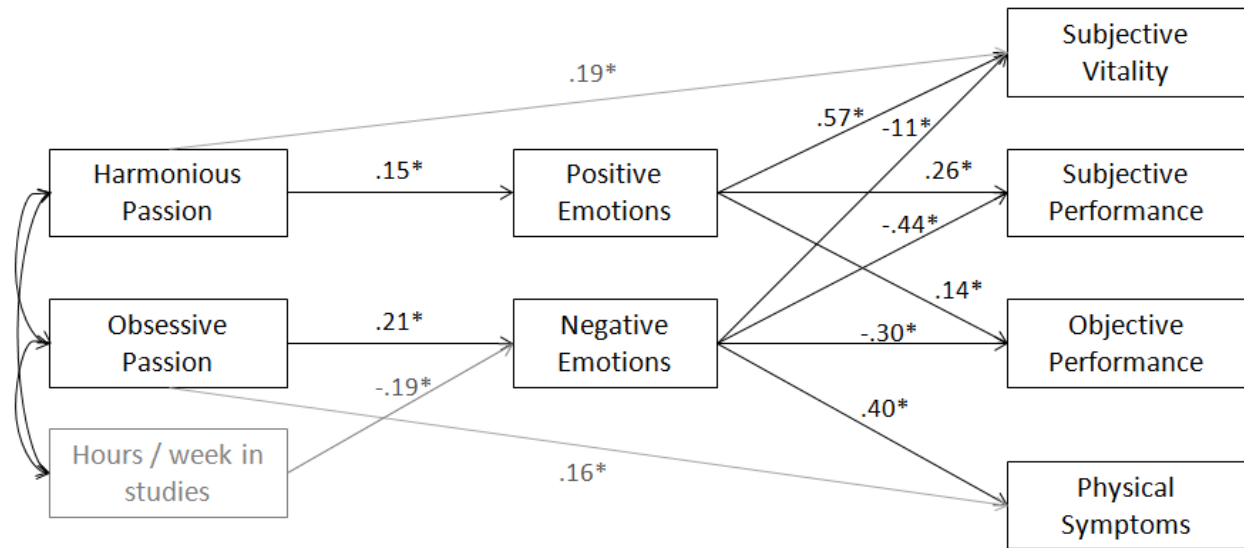


Figure 2. Results of the path analysis: Study 2. Standardized path coefficients are presented. For clarity concerns, covariances were omitted between the error terms. $N = 275$. HP = harmonious passion for one's studies; OP = obsessive passion for one's studies.

* $p < .05$ or better.

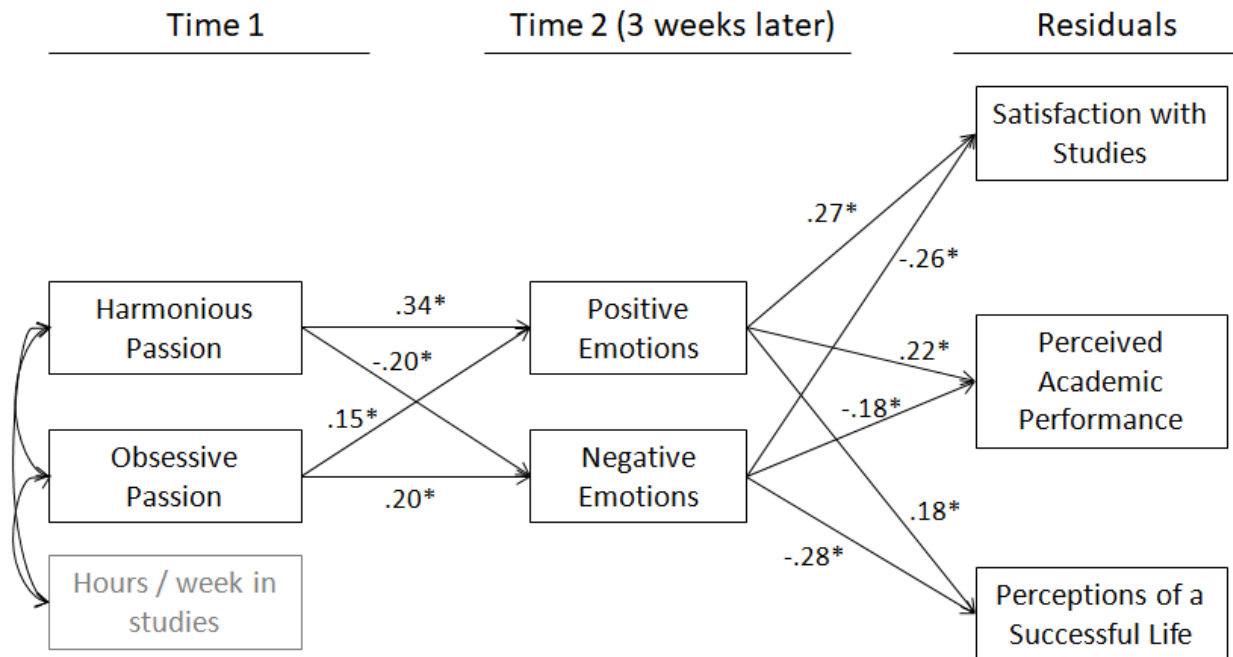


Figure 3. Results of the path analysis: Study 3. Standardized path coefficients are presented. For clarity concerns, covariances were omitted between the error terms. $N = 238$. HP = harmonious passion for one's studies; OP = obsessive passion for one's studies; Residuals = residuals from the regression of the dependent variables at Time 2 on their own score at Time 1.

* $p < .05$ or better.