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The dark side of passion: emotional experiences and negative physical health symptoms in athletes

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ABSTRACT

Research using the Dualistic Model of Passion reveals that obsessive passion fosters negative emotions, which have been linked to various health symptoms. Harmonious passion, conversely, can promote positive emotions and may prevent negative ones. This research examined the mediating role of emotions in the relationship between passion and negative physical health symptoms among athletes. In Study 1 ($N=165$), basketball players answered a questionnaire during a tournament. Study 2 ($N=375$) aimed to replicate Study 1 with a larger and more diverse sample of athletes across various sports and competitive levels. Finally, Study 3 ($N=193$) aimed to replicate longitudinally both previous studies with elite water polo and synchronised swimming athletes over four months. Overall, across all three studies, results from structural equation modelling showed that obsessive passion was associated with both negative and positive emotions, whereas harmonious passion was linked mostly to positive emotions. Negative emotions, in turn, were positively associated with negative physical health symptoms and mediated the relationship between obsessive passion and negative physical health symptoms (Studies 1 and 2, but not in Study 3). Positive emotions were unrelated to symptoms. These findings highlight the indirect role of obsessive passion in health through the experience of negative emotions.

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Sport, as one of the most popular forms of physical activity, is widely recognised for its benefits on well-being and health (Bull et al., 2020). However, sports participation can sometimes have downsides effects. Indeed, athletes may suffer from negative physical symptoms, illness, or health problems related to their engagement in sport (Bahr, 2009; Clarsen et al., 2020). These symptoms may not solely reflect physical strain but may also be rooted in underlying psychological processes. Identifying the psychological factors that contribute to such adverse outcomes is therefore essential for understanding when sports participation becomes maladaptive.

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The dark side of passion in sport

A psychological factor that may explain both the benefits and costs of sports participation is passion, as it is a motivational force that fosters high engagement in the activity (Vallerand, 2015). The Dualistic Model of Passion (Vallerand, 2015; Vallerand et al., 2003) defines passion as a strong inclination towards an activity that one loves, finds important, is part of their identity, and in which they invest time and energy. Furthermore, the Dualistic Model of Passion distinguishes two types of passion: harmonious and obsessive. Harmonious passion arises from an autonomous internalisation into one's identity, enabling flexible engagement in the activity and life balance. In contrast, obsessive passion arises from controlled internalisation, which may result in a strong urge to engage in the beloved activity and potential conflicts with other spheres of life.

The Dualistic Model of Passion highlights that passion can have both adaptive and maladaptive consequences. Indeed, obsessive and harmonious passion coexist within a person but are often differentially associated with diverse forms of well-being and health, including psychological and physical well-being (St-Cyr & Vallerand, 2024). For instance, harmonious passion generally associated with adaptive outcomes and obsessive passion with less adaptive ones. This latter pattern with obsessive passion reflects what has been referred to as the *dark side of passion*, namely the maladaptive consequences that can arise when engagement in the valued activity becomes rigid, pressured, and difficult to regulate. In sports contexts, this dark side may manifest through risky persistence (e.g., training while injured), psychological strain, and ultimately compromised physical health (Akehurst & Oliver, 2014; St-Cyr et al., 2024).

Passion and physical health in athletes

Emerging evidence suggests that the nature of one's passion towards an activity may have a downstream effect on physical health (St-Cyr et al., 2024; St-Louis et al., 2016). Both types of passion are associated with increased engagement in the activity, which can be beneficial for physical health (e.g., Carbonneau et al., 2010). However, the quality of this engagement appears critical. Harmonious passion promotes flexible persistence in the activity (Vallerand et al., 2023), enabling athletes to better detect warning signs of injury and adopt recovery behaviours, thereby reducing the risk of injury (De Jonge et al., 2020). Conversely, due to its rigid nature (Vallerand et al., 2023), obsessive passion can result in risky behaviours such as ignoring pain, training while injured, or delaying medical care (e.g., Akehurst & Oliver, 2014; Benoit-Piau et al., 2024; Rip et al., 2006). Consistent with this perspective, obsessive passion has been linked to poorer physical health, whereas harmonious passion tends to be positively associated with health indicators (St-Cyr et al., 2024; St-Louis et al., 2016). However, the mechanisms underlying these associations remain insufficiently understood. Specifically, little research has examined how passion may contribute to negative physical health symptoms, such as fatigue, headaches, or gastrointestinal discomfort, which are prevalent among athletes and may precede more serious conditions (e.g., Bahr, 2009; Clarsen et al., 2020; Holm Moseid et al., 2018).

The mediating role of emotions

A promising mechanism linking passion to health lies in emotional processes. Emotions are well-established determinants of physical health (Pressman & Cohen, 2005; Trudel-

Fitzgerald et al., 2017). Negative emotions such as anxiety, anger, and sadness can exacerbate stress responses and contribute to the development of negative physical health symptoms, whereas positive emotions can buffer them, promote recovery, and foster resilience. Within the Dualistic Model of Passion (Vallerand, 2015; Vallerand et al., 2003), emotions are central outcomes of passionate engagement. Obsessive passion is typically positively associated with negative emotions, particularly when one is prevented from engaging in the activity one is passionate about. Although obsessive passion can also be linked to positive emotions in certain instances, these experiences tend to be less consistent. In contrast, harmonious passion is more consistently associated with positive emotions and lower levels of negative emotions, in part because it facilitates adaptive emotion regulation and a balanced integration of the activity within one's life (e.g., Lavoie et al., 2021; Paquette et al., 2023). These associations have been replicated across a variety of domains and activities, including sports (Vallerand & Verner-Filion, 2020). Moreover, these emotional experiences extend beyond the activity itself and contribute to individuals' broader affective functioning (Bouzigarene et al., 2018; Schellenberg et al., 2023). In this regard, passion is not only a source of affective experiences within a context but also an important determinant of one's broader emotional landscape.

As mentioned above, a growing body of research indicates that emotions are closely linked to negative physical health symptoms. Negative emotions have been associated with greater frequency and intensity of symptoms, likely through physiological pathways such as heightened stress reactivity, inflammation, or muscle tension (Ferrer & Mendes, 2018). In contrast, positive emotions may act as a protective factor, mitigating the physiological effect of stress and promoting better physical recovery (Fredrickson, 2001; Pressman & Cohen, 2005; Tannouz et al., 2024). According to Fredrickson's broaden-and-built theory, recurring experiences of positive emotions can trigger upward spirals of well-being, fostering greater resilience and health-promoting behaviours over time (Fredrickson & Joiner, 2018). Importantly, although these associations have been documented across various domains and populations, relatively little research has examined these processes across diverse cultural contexts. Recent reviews have highlighted the need to extend this work to more diverse populations (Tamminen et al., 2024). Emerging evidence suggests that emotional experiences in sport are shaped by broader social and contextual factors, including cultural norms and interpersonal dynamics. These factors may influence how emotions are experienced, expressed, and regulated, thereby potentially shaping the mediational pathway linking passion to physical health. Accordingly, examining the generalizability of these processes across diverse contexts represents an important avenue for future research.

Taken together, these findings underscore the relevance of examining emotions as a key mechanism through which passion may influence physical health. Specifically, obsessive passion may contribute to greater negative physical health symptoms through heightened negative emotional experiences, whereas harmonious passion may be linked to more favourable outcomes through the promotion of positive emotions and reduced negative emotions. Despite these advances, no research to date has directly examined whether emotions explain the relationship between passion for sport and negative physical health symptoms in athletes. Addressing this gap is essential for understanding how the dark side of passion may translate into concrete health outcomes.

The present research

The present research aimed to examine the mediating role of emotions in the relationship between passion for sport and negative physical health symptoms among athletes. By doing so, it seeks to provide a more precise understanding of the psychological processes through which passion influences health. This research adopts a multi-study approach to strengthen the robustness and generalizability of the findings. Study 1 provides an initial test of the proposed model in a specific context (i.e., competitive youth basketball players), a population particularly exposed to performance pressure and early specialisation. Study 2 replicates and extends Study 1's results in a larger and more diverse sample of athletes varying in sports type, age, and competitive level, thereby addressing issues of generalizability. Finally, Study 3 offers a short-term longitudinal test of the model (4 months), allowing for preliminary examination of temporal associations among variables. Across these studies, we hypothesised that:

1. Obsessive passion would be positively associated with negative and positive emotions.
2. Harmonious passion would be positively associated with positive emotions and negatively associated with negative emotions.
3. Negative emotions would be positively associated with negative physical health symptoms.
4. Positive emotions would be negatively associated with negative physical health symptoms.
5. Passion would have an indirect effect on negative physical health symptoms via emotions.

By integrating motivational and emotional perspectives, this research advances the literature by clarifying how the dark side of passion may unfold through emotional processes to influence athletes' physical health.

Method

Overview of studies

The present research comprised three studies designed to progressively test the proposed model linking passion, emotions, and negative physical health symptoms. Study 1 provided an initial test of the model in a specific athletic context (youth competitive basketball) using a cross-sectional design. Study 2 used a similar design but aimed to replicate and extend these findings in a larger and more diverse sample of athletes across sports and competitive levels. Finally, Study 3 sought to examine these associations over time using a short longitudinal design. In all three studies, participants took part voluntarily and provided informed consent before answering the questionnaire. An a priori sample size analysis was conducted using Daniel Soper's online calculator (Soper, 2025; effect size = .25; power = .80; $p = .05$). This analysis indicated a recommended minimum sample size of 229 participants for structural equation modelling and of 112 for path analysis.

Participants and procedure

Study 1

Participants were recruited during a high school provincial basketball tournament in Canada. Because participants were minors, parental consent and participant assent were obtained. A total of 165 competitive basketball players participated in this study (mean age = 14.51 years old; $SD = .91$) and, of them, 60 identified as women and 105 as men. On average, these young basketball players had been playing their sport for 3.65 years ($SD = 1.87$). Additionally, they reported devoting an average of 8.10 h a week ($SD = 5.97$) to basketball activities, encompassing both training sessions and games.

Study 2

Participants were recruited online via Mturk. To ensure data quality, responses were screened for careless or inattentive responding (e.g., response patterns, completion time, attention checks). A total of 375 athletes participated in this study. These athletes were engaged in various sports such as football ($n = 46$), basketball ($n = 44$), soccer ($n = 41$), track and field ($n = 33$), swimming ($n = 24$), tennis ($n = 23$), martial arts ($n = 19$), and others ($n = 145$). On average, they were 29.52 years old ($SD = 9.89$) and, of them, 145 identified as women and 229 as men ($NA = 1$). These athletes indicated that they had been practicing their sport for 11.35 years ($SD = 9.25$) and engaged in it an average of 5.44 h per week ($SD = 5.49$).

Study 3

Participants were recruited in Canada at the beginning of their competitive season and completed the first questionnaire. We then contacted these participants at the end of their competitive season (around four months later) to ask them to answer a second questionnaire. A total of 193 elite water polo and synchronised swimming athletes participated in this study (mean age = 15.81 years old; $SD = 4.14$). Of them, 113 identified as women and 79 as men ($NA = 1$). On average, these athletes had been practicing their sports for 4.60 years ($SD = 4.13$). They practiced about 4.68 times per week ($SD = 1.62$), with each session lasting around 132.75 min ($SD = 106.36$ min).

Measures

Passion for sport

Across all studies, passion for sport was assessed using the Passion Scale (Marsh et al., 2013; Vallerand et al., 2003). This measure is composed of two subscales, each of six items, assessing obsessive passion (e.g., "I have the impression that [sport] controls me") and harmonious passion (e.g., "[Sport] is in harmony with the other activities in my life"). Participants were asked to rate their level of agreement with each item on a Likert scale ranging from 1 (*Do not agree at all*) to 7 (*Very strongly agree*). Previous research has confirmed the validity, reliability, and invariance of the Passion Scale across gender, age, and a range of activities, such as sports (Vallerand & Rahimi, 2022; Vallerand & Verner-Filion, 2020). McDonald's omega coefficients were used to evaluate the scales' internal consistency. We obtained omega coefficients of .81, .89, and .89 for the obsessive

passion subscale and .70, .86, and .79 for the harmonious passion subscale in all three studies respectively.

Emotions

Emotions were assessed using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). The PANAS captures broad dimensions of negative affect (e.g., “Upset”) and positive affect (e.g., “Excited”). In Studies 1 and 2, participants completed the 20-item version of the scale, whereas the 10-item short version was used in Study 3. Participants were asked to indicate the extent to which they felt each emotion when engaging in their sport on a Likert scale (*Very slightly or not at all* to *Extremely*). Although the PANAS assesses broad affective dimensions rather than discrete emotions, it is consistent with the present theoretical framework, which focuses on general negative and positive affect as proximal mechanisms linking passion to health outcomes. This approach is widely used in sport psychology, where global affective states are considered meaningful indicators of athletes’ emotional functioning. The PANAS is a widely used measure with well-established validity and reliability (Tran, 2013; Watson et al., 1988). In this research, McDonald’s omega coefficients indicated good internal consistency across studies with values of .83, .92, and .72 for negative affect and .82, .93, and .83 for positive affect, respectively.

Negative physical health symptoms

Negative physical health symptoms were assessed using self-reported checklists inspired by the Symptoms of Illness Checklist (Stowell et al., 2009). Participants were asked to indicate how often they had experienced various physical symptoms (e.g., loss of appetite, stomachache, headaches) over the past 30 days on a Likert scale. To account for contextual constraints, slightly different versions of the measure were used across studies. Study 1 employed a 14-item checklist. Study 2 used a shorter 6-item version to reduce participants’ burden while maintaining coverage of common symptoms. Study 3 used a more comprehensive 29-item checklist to better capture variability in symptoms over time in a longitudinal design. In all cases, scores were established by calculating the average of all items. We obtained McDonald’s omega coefficients of .78, .83, and .86 in each study for the complete checklist of negative physical health symptoms, indicating good reliability.

Data analysis

Across studies, we performed preliminary analyses using R statistical software (v.4.4.1; R Core Team, 2021). First, graphs and the Hawkins test were used to observe missing data patterns (Hawkins, 1981; Jamshidian et al., 2014). Second, univariate outliers were examined using Z-scores and boxplots and multivariate outliers using Mahalanobis distances ($D^2 = 20.52$). All identified outliers were retained, as their exclusion did not meaningfully alter the results. Third, scatter plots were employed to assess data linearity. Fourth, the Mardia test was performed to evaluate multivariate normality.

Next, we carried out main analyses using Mplus (v.8.6; Muthén & Muthén, 2017). Main analyses were conceptually similar across studies, with some variations reflecting sample size and design. Studies 1 and 3 relied on a path analysis with observed variables, whereas Study 2 used structural equation modelling with latent variables (Kline, 2015; Wang &

Wang, 2019). The larger sample size in Study 2 allowed for the use of latent variable modelling, which offers more precise estimation of underlying constructs. To balance model complexity and ensure stable parameter estimation, item parcelling was applied using the item-to-construct balance approach. Across all studies, Full Information Maximum Likelihood was used to handle missing data. The analyses relied on bias-corrected bootstraps (10,000 replications; 95% confidence interval) as multivariate normality was not respected. Model fit was assessed was established using several established indices (Wang & Wang, 2019). The Comparative Fit Index (CFI) and Tucker and Lewis Index (TLI) were required to meet or exceed a threshold of .90. The Root Mean Square Error of Approximation (RMSEA) was considered acceptable at values less than or equal to .08, with its 90% confidence interval ranging from .00 to .10. Furthermore, the Standardized Root Mean Square Residual (SRMR) was deemed adequate if less than or equal to .08.

Results

Preliminary analyses

Preliminary analyses were conducted separately for each study to examine missing data, outliers, and statistical assumptions. In study 1, six participants had missing data. The non-parametric version of the Hawkins test was non-significant ($p = .18$), indicating that data was missing completely at random. There was no missing data in Study 2. In Study 3, missing data occurred exclusively at Time 2 (48.70% attrition rate). Logistic regression analyses indicated that attrition was unrelated to age, sex, harmonious passion, positive emotions, or negative emotions (all $ps > .10$). However, obsessive passion at baseline was negatively associated with attrition ($\beta = -.40, p = .013$), suggesting that participants with higher levels of obsessive passion were more likely to partake in Time 2. The nonparametric Hawkins test was non-significant ($p > .05$), indicating data were missing completely at random. Across studies, a small number of univariate (Study 1 = 3; Study 2 = 10; Study 3 = 4) and multivariate (Study 1 = 1; Study 2 = 2; Study 3 = 1) outliers were identified. All were retained, as their exclusion did not affect the results. The assumption of linearity was met in all studies. However, multivariate normality was not supported, as indicated by the p -values of the Mardia test for both skewness and kurtosis being less than .001. Variable means, standard deviations, and Pearson correlations based on scale scores are presented in Table 1.

Main analyses

Study 1

The proposed model (Figure 1) yielded an adequate fit to the data: $\chi^2 (df = 5, N = 165) = 8.43, p = .13, CFI = .97, TLI = .94, RMSEA = .06 (.00, .14), SRMR = .05$. Obsessive passion was positively associated with both negative ($\beta = .20, p = .009, SE = .08, 95\% CI = .05; .35$) and positive emotions ($\beta = .29, p = .001, SE = .09, 95\% CI = .11; .46$). Harmonious passion was only positively related to positive emotions ($\beta = .38, p < .001, SE = .07, 95\% CI = .23; .52$). In turn, negative emotions were positively associated with negative physical health symptoms ($\beta = .42, p < .001, SE = .09, 95\% CI = .24; .58$), while positive emotions showed no

Table 1. Means, Standard Deviations, and Correlations

	<i>M</i>	<i>SD</i>	1	2	3	4	5
Study 1							
1. Obsessive Passion	3.46	1.38	–	.39***	.20*	.44***	.06
2. Harmonious Passion	5.75	.70		–	–.04	.49***	–.14
3. Negative Emotions	1.96	.60			–	.10	.42***
4. Positive Emotions	3.84	.60				–	–.07
5. Negative Physical Health Symptoms	2.65	.87					–
Study 2							
1. Obsessive Passion	2.74	1.44	–	.45***	.47***	.39***	.19***
2. Harmonious Passion	4.63	1.20		–	.06	.57***	.00
3. Negative Emotions	2.07	.92			–	.08	.34***
4. Positive Emotions	5.06	1.20				–	.05
5. Negative Physical Health Symptoms	2.71	1.20					–
Study 3							
Time 1							
1. Obsessive Passion	4.17	1.36	–	.69***	.15*	.33***	.11
2. Harmonious Passion	5.53	.97		–	.03	.31***	–.03
3. Negative Emotions	1.99	.80			–	.23**	.31**
4. Positive Emotions	3.53	.92				–	.05
Time 2							
5. Negative Physical Health Symptoms	.69	.54					–

Note. Study 1 *N* = 165; Study 2 *N* = 375; Study 3 *N* = 193; *M* = mean; *SD* = standard deviation; Pearson correlations based on scale scores are reported; Obsessive and Harmonious Passion were measured on a scale of 1–7 in all Studies; Negative and Positive Emotions were measured on a scale of 1–5 in Studies 1 and 3 and on a scale of 1–7 in Study 2; Negative Physical Health Symptoms were measured on a scale of 1–7 in Studies 1 and 2 and on a scale of 0–4 in Study 3. **p* < .05; ***p* < .01; ****p* < .001.

associations with these symptoms. Indirect effects analysis revealed a significant indirect association between obsessive passion and negative physical health symptoms through negative emotions (*b* = .05, *p* = .03, *SE* = .03, 95% *CI* = .02; .12).

Study 2

The model (Figure 2) yielded an adequate fit to the data: χ^2 (*df* = 164, *N* = 375) = 470.60, *p* < .001, CFI = .94, TLI = .93, RMSEA = .07 (.06, .08), SRMR = .07. Obsessive passion was positively associated with negative emotions (β = .64, *p* < .001, *SE* = .06, 95% *CI* = .15; .32) and positive emotions (β = .12, *p* = .05, *SE* = .06, 95% *CI* = .00; .22). Harmonious passion was negatively related to negative emotions (β = –.29, *p* < .001, *SE* = .06, 95% *CI* = –.18; –.08) and positively related to positive emotions (β = .58, *p* < .001, *SE* = .07, 95% *CI* = .44;

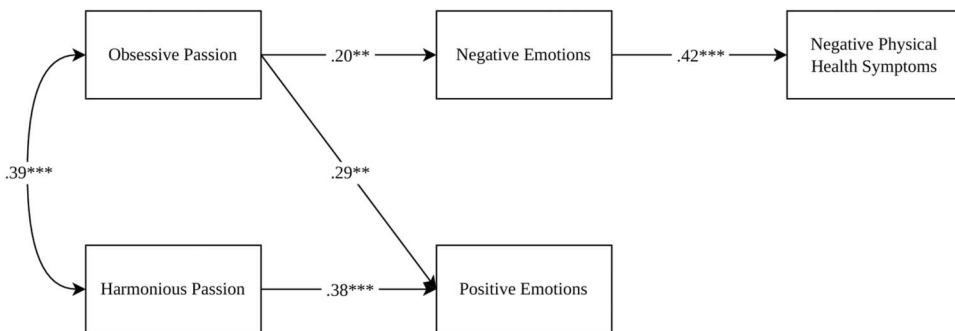


Figure 1. Path analysis – relationships between passion, emotions, and negative physical health symptoms (Study 1) **p* < .05; ***p* < .01; ****p* < .001. Note. *N* = 165. Standardised betas are presented.

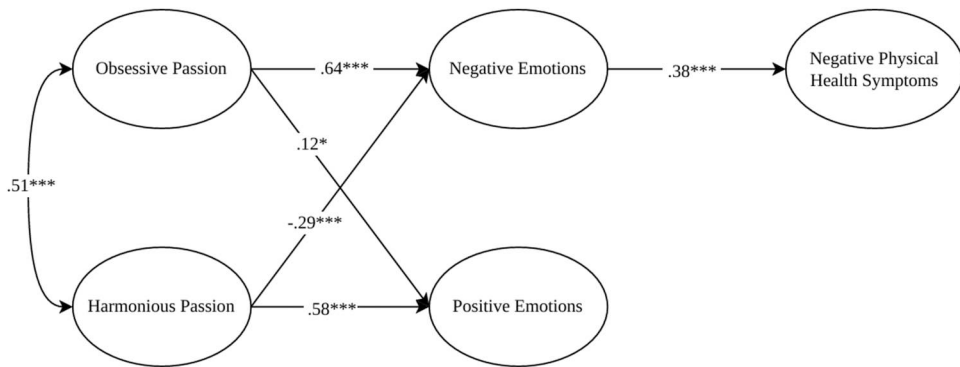


Figure 2. Structural equation modelling – relationships between passion, emotions, and negative physical health symptoms (Study 2) * $p < .05$; ** $p < .01$; *** $p < .001$. Note. $N = 375$. Standardised betas are presented.

.79). In turn, negative emotions were positively associated with negative physical health symptoms ($\beta = .38$, $p < .001$, $SE = .07$, $95\% CI = .59; .91$), while positive emotions showed no associations with the symptoms. Indirect effects analysis showed that obsessive passion was associated with negative physical health symptoms through negative emotions ($b = .21$, $p < .001$, $SE = .05$, $95\% CI = .12; .31$). A significant indirect effect was also observed for harmonious passion, such that it was associated with fewer symptoms through lower negative emotions ($b = -.11$, $p < .001$, $SE = .03$, $95\% CI = -.18; -.06$).

Study 3

The proposed model did not yield an adequate fit to the data: $\chi^2 (df = 5, N = 193) = 12.82$, $p = .03$, $CFI = .82$, $TLI = .68$, $RMSEA = .09$ (.03, .15), $SRMR = .05$. Following modification indices (Muthén & Muthén, 2017), we added a covariance between negative and positive emotions at Time 1. This model (Figure 2) yielded an adequate fit to the data: $\chi^2 (df = 4, N = 193) = 4.13$, $p = .39$, $CFI = 1.00$, $TLI = .99$, $RMSEA = .01$ (.00, .11), $SRMR = .03$. Obsessive passion at Time 1 was positively associated with negative ($\beta = .15$, $p = .04$, $SE = .07$, $95\% CI = .01; .29$) and positive emotions at Time 1 ($\beta = .20$, $p = .03$, $SE = .09$, $95\% CI = .03; .37$). Harmonious passion was only positively related to positive emotions at Time 1 ($\beta = .19$, $p < .05$, $SE = .10$, $95\% CI = -.00; .37$). In turn, negative emotions at Time 1 were positively associated with negative physical health symptoms at Time 2 ($\beta = .33$, $p < .001$, $SE = .09$, $95\% CI = .14; .50$), while positive emotions showed no associations with later symptoms. Indirect effects analysis showed no significant association between obsessive passion at Time 1 and negative physical health symptoms at Time 2 through negative emotions at Time 1 ($b = .02$, $p = .07$, $SE = .01$, $95\% CI = .00; .05$) (Figure 3).

General discussion

The present research aimed to examine the emotional processes underlying the relationship between passion for sport and athletes' negative physical health symptoms across three studies. Drawing on the Dualistic Model of Passion (Vallerand, 2015; Vallerand et al., 2003), we sought to clarify how the *dark side of passion* (i.e., the maladaptive

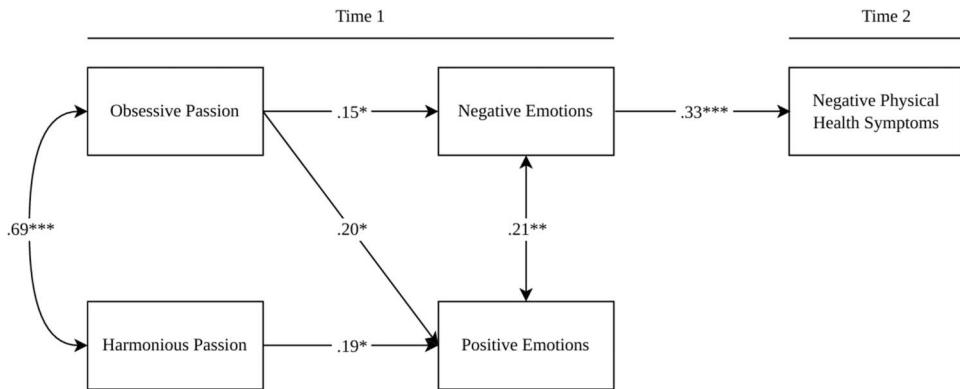


Figure 3. Path analysis – relationships between passion, emotions, and negative physical health symptoms (Study 3) $*p < .05$; $**p < .01$; $***p < .001$. Note. $N = 193$. Standardised betas are presented.

consequences associated with obsessive passion) may unfold through emotional experiences to influence athletes' physical health. By progressively testing the proposed model across distinct samples, contexts, and methodological approaches, the present multi-study research provides a robust and nuanced examination of the emotional pathways underlying the dark side of passion. Study 1 provided an initial test of the model among youth competitive basketball players. Study 2 extended these findings in a larger and more diverse sample of athletes across sports and competitive levels, strengthening the generalizability of the results. Study 3 offered a preliminary longitudinal perspective by examining the proposed relationships over a four-month period among elite athletes. In line with our hypotheses, a consistent pattern emerged: obsessive passion was associated with higher levels of negative emotions (Hypothesis 1), which, in turn, were associated with greater negative physical health symptoms (Hypothesis 3). This indirect pathway was supported in Studies 1 and 2 (Hypothesis 5) and was observed in the expected direction, although not statistically significant, in Study 3. In contrast, harmonious passion was associated with positive emotions and, in Study 2, with lower negative emotions (Hypothesis 2). An indirect effect was also observed in Study 2, such that harmonious passion was associated with fewer negative physical health symptoms through lower negative emotions (Hypothesis 5). Contrary to our Hypothesis 4, positive emotions were not associated with negative physical health symptoms. These findings provide valuable insights into the role of passion and emotions in health in sports.

Passion for sport and emotions

Firstly, the present findings provide additional support on the influence of passion on emotions in sports (Vallerand et al., 2006; Vallerand & Verner-Filion, 2020). Indeed, the type of passion one holds for a meaningful sport plays a key role in emotional experience. Across all three studies, we found that obsessive passion was positively associated with negative and positive emotions, while harmonious passion was associated with positive emotions and unrelated (Studies 1 and 3) or negatively related to negative emotions (Study 2). These findings align with past research showing that obsessive passion is

consistently linked to heightened negative emotions (Curran et al., 2015; Vallerand, 2015; Verner-Filion et al., 2018), including both during and after task engagement (e.g., in response to setbacks or to the inability to engage in the activity). This emotional cost likely stems from the ego-involvement and contingent self-worth that characterise obsessive passion, which renders individuals particularly sensitive to performance-related threats (Bélanger et al., 2013; Mageau et al., 2011). As a result, obsessively passionate athletes may experience stronger negative emotions not only during sports participation, but also when facing situations in which their self-esteem or identity feels at stake. These patterns reflect a broader emotional vulnerability associated with obsessive passion and may require greater self-regulatory effort to maintain emotional balance in sports settings.

Of interest is the significant positive link between obsessive passion and positive emotions found in all three studies. Previous research has also found this link and provided various explanations for it (Curran et al., 2015; Mageau et al., 2011; Vallerand et al., 2003, 2006). First, although obsessive in nature, obsessive passion remains a passion as the person loves the activity. It is thus not surprising that some positive emotions can be experienced through obsessive passion, although typically less so than with harmonious passion. Second, person-environment fit is important and high-level competitive contexts are more aligned with obsessive passion (Amiot et al., 2006; Gavrilu et al., 2025). In the context of competitive sports, the environment often provides validation and social approval or praise when the athletes are successful, which can temporarily generate positive emotions (even if these are contingent and fragile; Mageau et al., 2011). Third, achieving a goal, being recognised, or performing well in our passionate activity can foster the experience of positive emotions. In brief, in the short term, obsessive passion can be associated with positive emotions when the person is highly engaged and achieves the desired results immediately. Over the long-term, problems may arise if the person is unable to sustain their high level of engagement or fails to achieve the desired results (e.g., Mageau et al., 2011).

Emotions and negative physical health symptoms

Secondly, the present findings extend previous results on the role of emotions in negative physical health symptoms in athletes. Across all three studies, results showed that negative emotions were associated with greater negative physical health symptoms. These results align with theoretical and empirical work suggesting that negative emotional states can contribute to heightening physiological mechanisms (e.g., arousal, muscle tension, and inflammation), often resulting in physical discomfort (Ferrer & Mendes, 2018). In the sports context, where athletes are routinely pushing the limits of their physical capacities, these emotional-physiological links may be particularly salient. For instance, sustained experiences of anxiety, frustration, or stress may compromise recovery, disturb sleep, and accumulate as physical discomfort, even in the absence of a clear injury. Moreover, athletes may not always distinguish between emotional and physical distress, as the two are often intertwined, especially under pressure or during periods of intense training (Rogers et al., 2023). As such, these findings highlight the importance of addressing emotional well-being in efforts to prevent or manage negative physical symptoms in sport. Emotional states are not merely by-products of physical performance;

they may actively shape how athletes experience and respond to physical demands, thereby influencing health (Trudel-Fitzgerald et al., 2017).

Notably, positive emotions were not significantly associated with negative physical health symptoms in either study, thereby failing to support Hypothesis 4, which posited a negative association between these variables. This result might seem to contrast with prior findings on the protective or restorative role of positive emotions on negative physical health outcomes (e.g., Fredrickson, 2001; Lyubomirsky et al., 2005; Pressman & Cohen, 2005). However, the absence of a significant association in the present research does not contradict the theoretical framework but rather suggests that this protective effect may not have been captured in the current design. There are a few possible explanations for the absence of such a relation between both variables. A first one is that the potential buffering influence of positive emotions may require longer periods of time to manifest itself or it may accumulate through repeated experiences, as proposed by the broaden-and-build theory (Fredrickson, 2001; Fredrickson & Joiner, 2018). While Study 3 employed a longitudinal design, the four-month interval between timepoints may have been insufficient to capture such accumulation effects. A second possible explanation is that in the high-demanding context of competitive sports, negative emotional experiences may exert a more immediate and salient influence on athletes' physical health than positive emotions (Rice et al., 2016). These findings underscore the need for additional research to better understand the conditions under which positive emotions may contribute to physical health in sport.

The dark side of passion: an emotional pathway to health

Thirdly, these findings offer important insights into the psychological processes linking passion, emotions, and negative physical health symptoms in athletes. Studies 1 and 2 revealed a link between obsessive passion and negative physical health symptoms via negative emotions, but this relationship was marginal ($p = .07$) and not statistically significant ($p < .05$) in Study 3. Overall, this indirect effect supports the idea that obsessive engagement in sport may heighten vulnerability to physical complaints through increased emotional distress (Curran et al., 2015; Schellenberg et al., 2013; Vallerand, 2015). Importantly, these findings contribute to a more precise understanding of the *dark side of passion* by identifying emotional experiences as a key mechanism linking obsessive passion to negative physical health symptoms. While previous research has independently documented the associations between obsessive passion and negative emotions, as well as between negative emotions and health outcomes, the present results integrate these elements within a single process model. This model highlights maladaptive emotional experiences as a central pathway through which obsessive passion may exert its detrimental effects.

Interestingly, in Study 2 only, negative emotions also negatively mediated the link between harmonious passion and negative physical health symptoms. This finding suggests that harmonious engagement in sport may help buffer athletes from negative physical health effects by reducing negative emotional experiences. This pattern was not observed in Studies 1 and 3, possibly due to sample or design differences. Moreover, although the mediating pathway between obsessive passion and negative physical health symptoms was in the hypothesised direction in Study 3, it did not reach conventional

statistical significance ($p < .07$). This lack of significance may be attributable to several factors. First, the temporal design (where both passion and emotions were assessed at Time 1) limits the ability to fully capture the dynamic unfolding of the mediational process over time. As such, Study 3 should be interpreted as providing preliminary longitudinal evidence rather than a definitive test of mediation. Second, as mentioned above, the four-month interval may have been insufficient to observe the cumulative impact of emotional experiences on negative physical health symptoms, which may develop more gradually. Therefore, the emotional costs associated with obsessive passion may not consistently translate into negative physical health symptoms over time and other factors may come into play (e.g., performance success or failure, training schedule, social support). Future research should explore these potential factors and take them into account.

Limitations

Some limitations of the present research should be acknowledged. First, the three studies relied exclusively on self-report measures, which can be subject to recall bias, social desirability, and common method variance (Kock et al., 2021; Reynolds, 1982). Future research should incorporate objective or physiological indicators of physical health (e.g., heart rate variability, inflammation markers, injury records) to provide a more comprehensive understanding of the process at play. Second, different measures of negative physical health symptoms were used across studies. Although these choices were made to balance feasibility and comprehensiveness, they limit direct comparability. Future research would benefit from the use of standardised assessment tools or even developing a comprehensive instrument specific to sports. Third, emotions were assessed using a general measure of affect (i.e., PANAS), which may not fully capture the complexity of discrete emotions. Although consistent with the present theoretical focus on general emotional experiences, future research would benefit from examining more fine-grained emotional processes to further elucidate the mechanisms underlying the passion-health relationship. Fourth, although Study 3 employed a longitudinal design, the temporal structure limits causal inference regarding mediation. Future studies should use designs that more clearly establish temporal ordering between passion, emotions, and health outcomes. Finally, it should be noted that other variables may moderate the passion – emotions – and negative physical health symptoms sequence. For instance, coping strategies, social support, or performance outcomes could influence the extent to which obsessive and harmonious passion are associated with negative emotions and negative physical health symptoms. Future research should explore these additional psychological and contextual factors to build a more nuanced model of the passion – emotions – health relationship.

Practical implications

Taken together, the present research highlighted the key role of passion in athletes' emotional experiences and physical health. From a practical standpoint, practitioners could benefit from identifying athletes' predominant type of passion. Indeed, athletes with a predominant obsessive passion are at higher risk for experiencing both negative emotional experiences and negative physical health symptoms. Interventions aimed at

managing and reducing obsessive passion as well as promoting harmonious passion (e.g., through autonomy-support, life balance, or signature strengths; Forest et al., 2012; Jang et al., 2025) may, in turn, help diminish the experience of negative emotions and negative physical health symptoms. Interventions should also directly target emotional processes. For instance, helping athletes develop emotional awareness, regulate negative emotions, and reinterpret performance-related stressors as opportunities for challenge (Lavoie et al., 2021) may reduce the likelihood that emotional distress translates into negative physical health symptoms. Such approaches may be especially important in high-performance contexts, where emotional and physical demands are closely intertwined.

Conclusion

In summary, the present research advances literature by demonstrating that the emotional experiences associated with obsessive passion represent a key pathway linking passion to negative physical health symptoms in athletes. Indeed, obsessive passion was consistently associated with heightened negative emotions, which, in turn, were associated with greater negative physical health symptoms. Such was not the case for harmonious passion. By adopting a multi-study approach across diverse samples and designs, this research provides a more comprehensive understanding of how the *dark side of passion* may unfold in sports contexts, especially through obsessive passion. Future research should build on these findings by employing more robust longitudinal designs and examining more specific emotional processes.

Authors' contribution

All authors contributed to the research conceptualisation and methodology. Data curation and analysis were performed by Jany St-Cyr. The first draft of the manuscript was written by Jany St-Cyr and reviewed by Robert J. Vallerand. Robert J. Vallerand supervised this research and provided fundings and resources. All authors read and approved the final manuscript.

Disclosure statement

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Ethics approval

This research was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Ethics Committee of the Université du Québec à Montréal (R1-061099; S-591040).

Consent

Participants gave their free and informed consent before participating in this research.

Code availability

R code for preliminary analysis and Mplus syntax for main analysis can be shared upon request with the corresponding author.

Availability of data and materials

Data can be shared upon request with the corresponding author.

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References

- Akehurst, S., & Oliver, E. J. (2014). Obsessive passion: A dependency associated with injury-related risky behaviour in dancers. *Journal of Sports Sciences*, 32(3), 259–267. <https://doi.org/10.1080/02640414.2013.823223>
- Amiot, C. E., Vallerand, R. J., & Blanchard, C. M. (2006). Passion and psychological adjustment: A test of the person-environment fit hypothesis. *Personality and Social Psychology Bulletin*, 32(2), 220–229. <https://doi.org/10.1177/0146167205280250>
- Bahr, R. (2009). No injuries, but plenty of pain? On the methodology for recording overuse symptoms in sports. *British Journal of Sports Medicine*, 43(13), 966–972. <https://doi.org/10.1136/bjism.2009.066936>
- Bélanger, J. J., Lafrenière, 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, 180–195. <https://doi.org/10.1037/a0029585>
- Benoit-Piau, J., Gaudreault, N., Vallerand, R., Fortin, S., Guptill, C., & Morin, M. (2024). Passion and performance anxiety: How it affects the incidence of musculoskeletal disorders in dancers. *Psychology of Sport and Exercise*, 73, 102632. <https://doi.org/10.1016/j.psychsport.2024.102632>
- Bouizegarene, N., Bourdeau, S., Leduc, C., Gousse-Lessard, A.-S., Houlfort, N., & Vallerand, R. J. (2018). We are our passions: The role of identity processes in harmonious and obsessive passion and links to optimal functioning in society. *Self and Identity*, 17(1), 56–74. <https://doi.org/10.1080/15298868.2017.1321038>
- Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.-P., Chastin, S., Chou, R., Dempsey, P. C., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C. M., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P. T., ... Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, 54(24), 1451–1462. <https://doi.org/10.1136/bjsports-2020-102955>
- 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/10.1080/17439760.2010.534107>
- Clarsen, B., Bahr, R., Myklebust, G., Andersson, S. H., Docking, S. I., Drew, M., Finch, C. F., Fortington, L. V., Harøy, J., Khan, K. M., Moreau, B., Moore, I. S., Møller, M., Nabhan, D., Nielsen, R. O., Pasanen, K., Schweltnus, M., Soligard, T., & Verhagen, E. (2020). Improved reporting of overuse injuries and

- health problems in sport: An update of the Oslo Sport Trauma Research Center questionnaires. *British Journal of Sports Medicine*, 54(7), 390. <https://doi.org/10.1136/bjsports-2019-101337>
- 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>
- De Jonge, J., Balk, Y. A., & Taris, T. W. (2020). Mental recovery and running-related injuries in recreational runners: The moderating role of passion for running. *International Journal of Environmental Research and Public Health*, 17(3), 1044. <https://doi.org/10.3390/ijerph17031044>
- Ferrer, R. A., & Mendes, W. B. (2018). Emotion, health decision making, and health behaviour. *Psychology & Health*, 33(1), 1–16. <https://doi.org/10.1080/08870446.2017.1385787>
- Forest, J., Mageau, G. A., Crevier-Braud, L., Bergeron, É., Dubreuil, P., & Lavigne, G. L. (2012). Harmonious passion as an explanation of the relation between signature strengths' use and well-being at work: Test of an intervention program. *Human Relations*, 65(9), 1233–1252. <https://doi.org/10.1177/0018726711433134>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Fredrickson, B. L., & Joiner, T. (2018). Reflections on positive emotions and upward spirals. *Perspectives on Psychological Science*, 13(2), 194–199. <https://doi.org/10.1177/1745691617692106>
- Gavrila, A., St-Cyr, J., & Vallerand, R. J. (2025). Passion transfer in former competitive athletes: The mediating role of the social environment and personal values. *Psychology of Sport and Exercise*, 79, 102854. <https://doi.org/10.1016/j.psychsport.2025.102854>
- Hawkins, D. M. (1981). A new test for multivariate normality and homoscedasticity. *Technometrics*, 23(1), 105–110. <https://doi.org/10.1080/00401706.1981.10486244>
- Holm Moseid, C., Myklebust, G., Fagerland, M. W., Clarsen, B., & Bahr, R. (2018). The prevalence and severity of health problems in youth elite sports: A 6-month prospective cohort study of 320 athletes. *Scandinavian Journal of Medicine & Science in Sports*, 28(4), 1412–1423. <https://doi.org/10.1111/sms.13047>
- Jamshidian, M., Jalal, S., & Jansen, C. (2014). Missmech: An R package for testing homoscedasticity, multivariate normality, and missing completely at random (MCAR). *Journal of Statistical Software*, 56, 1–31. <https://doi.org/10.18637/jss.v056.i06>
- Jang, H.-R., Cheon, S. H., Reeve, J., Song, Y.-G., & Lee, Y. (2025). Two ways teachers can develop greater harmonious passion. *Physical Education and Sport Pedagogy*, 30(2), 184–199. <https://doi.org/10.1080/17408989.2023.2206832>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.
- Kock, F., Berbekova, A., & Assaf, A. G. (2021). Understanding and managing the threat of common method bias: Detection, prevention and control. *Tourism Management*, 86, 104330. <https://doi.org/10.1016/j.tourman.2021.104330>
- Lavoie, C-É, Vallerand, R. J., & Verner-Filion, J. (2021). Passion and emotions: The mediating role of cognitive appraisals. *Psychology of Sport and Exercise*, 54, 101907. <https://doi.org/10.1016/j.psychsport.2021.101907>
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin*, 131(6), 803–855. <https://doi.org/10.1037/0033-2909.131.6.803>
- Mageau, G. A., 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*, 41(6), 720–729. <https://doi.org/10.1002/ejsp.798>
- Marsh, H. W., Vallerand, R. J., Lafrenière, M.-A. K., Parker, P., Morin, A. J. S., Carbonneau, N., Jowett, S., Bureau, J. S., Fernet, C., Guay, F., Salah Abduljabbar, A., & 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(3), 796–809. <https://doi.org/10.1037/a0032573>
- Muthén, L. K., & Muthén, B. (2017). *Mplus user's guide: Statistical analysis with latent variables, user's guide*. Muthén & Muthén.

- Paquette, V., Vallerand, R. J., Houffort, N., & Fredrickson, B. L. (2023). Thriving through adversity: The role of passion and emotions in the resilience process. *Journal of Personality, 91*(3), 789–805. <https://doi.org/10.1111/jopy.12774>
- Pressman, S. D., & Cohen, S. (2005). Does positive affect influence health? *Psychological Bulletin, 131*(6), 925–971. <https://doi.org/10.1037/0033-2909.131.6.925>
- R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of Clinical Psychology, 38*(1), 119–125. [https://doi.org/10.1002/1097-4679\(198201\)38:1%253C119::AID-JCLP2270380118%253E3.0.CO;2-I](https://doi.org/10.1002/1097-4679(198201)38:1%253C119::AID-JCLP2270380118%253E3.0.CO;2-I)
- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: A narrative systematic review. *Sports Medicine, 46*(9), 1333–1353. <https://doi.org/10.1007/s40279-016-0492-2>
- Rip, B., Fortin, S., & Vallerand, R. J. (2006). The relationship between passion and injury in dance students. *Journal of Dance Medicine & Science, 10*(1–2), 14–20.
- Rogers, D. L., Tanaka, M. J., Cosgarea, A. J., Ginsburg, R. D., & Dreher, G. M. (2023). How mental health affects injury risk and outcomes in athletes. *Sports Health, 16*(2), 222–229. <https://doi.org/10.1177/19417381231179678>
- Schellenberg, B. J. I., Gaudreau, P., & Crocker, P. R. E. (2013). Passion and coping: Relationships with changes in burnout and goal attainment in collegiate volleyball players. *Journal of Sport and Exercise Psychology, 35*(3), 270–280. <https://doi.org/10.1123/jsep.35.3.270>
- Schellenberg, B. J. I., Verner-Filion, J., Gaudreau, P., & Chichekian, T. (2023). The quadripartite approach to passion in sport: A prospective and cross-domain analysis with intercollegiate student-athletes. *International Journal of Sport and Exercise Psychology, 1*–18. <https://doi.org/10.1080/1612197X.2023.2197910>
- Soper, D. S. (2025). *A-priori sample size calculator for structural equation models* [Computer software]. <https://www.danielsoper.com/statcalc/calculator.aspx?id=89>.
- St-Cyr, J., Gavrilu, A., Tanguay-Sela, M., & Vallerand, R. J. (2024). Perfectionism, disordered eating and well-being in aesthetic sports: The mediating role of passion. *Psychology of Sport and Exercise, 73*, 102648. <https://doi.org/10.1016/j.psychsport.2024.102648>
- St-Cyr, J., & Vallerand, R. J. (2024). Pratiquer l'activité physique avec passion: Son influence sur le fonctionnement optimal en société [Engaging in physical activity with passion: Its influence on optimal functioning in society]. In C. Martin-Krumm & C. Tarquinio (Eds.), *Psychologie positive des activités physiques et sportives: Corps, santé mentale et bien-être* (pp. 31–49). Dunod.
- St-Louis, A. C., Carbonneau, N., & Vallerand, R. J. (2016). Passion for a cause: How it affects health and subjective well-being. *Journal of Personality, 84*(3), 263–276. <https://doi.org/10.1111/jopy.12157>
- Stowell, J. R., Hedges, D. W., Ghambaryan, A., Key, C., & Bloch, G. J. (2009). Validation of the Symptoms of Illness Checklist (SIC) as a tool for health psychology research. *Journal of Health Psychology, 14*(1), 68–77. <https://doi.org/10.1177/1359105308097947>
- Tamminen, K., Wolf, S. A., Dunn, R., & Bissett, J. E. (2024). A review of the interpersonal experience, expression, and regulation of emotions in sport. *International Review of Sport and Exercise Psychology, 17*(2), 1132–1169. <https://doi.org/10.1080/1750984X.2022.2132526>
- Tannouz, E., Ramirez, V., & Pressman, S. D. (2024). Positive affect and health: Past, present, and future scientific endeavors. In H. Brockmann & R. Fernandez-Urbano (Eds.), *Encyclopedia of happiness, quality of life and subjective wellbeing* (pp. 38–45). Elgar. <https://doi.org/10.4337/9781800889675.00013>.
- Tran, V. (2013). Positive Affect Negative Affect Scale (PANAS). In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of behavioral medicine* (pp. 1508–1509). Springer. https://doi.org/10.1007/978-1-4419-1005-9_978.
- Trudel-Fitzgerald, C., Qureshi, F., Appleton, A. A., & Kubzansky, L. D. (2017). A healthy mix of emotions: Underlying biological pathways linking emotions to physical health. *Current Opinion in Behavioral Sciences, Mixed Emotions, 15*, 16–21. <https://doi.org/10.1016/j.cobeha.2017.05.003>
- Vallerand, R. J. (2015). *The psychology of passion: A dualistic model*. Oxford University Press.

- Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., Gagné, M., & Marsolais, J. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85(4), 756–767. <https://doi.org/10.1037/0022-3514.85.4.756>
- Vallerand, R. J., Chichekian, T., Verner-Filion, J., & Bélanger, J. J. (2023). The two faces of persistence: How harmonious and obsessive passion shape goal pursuit. *Motivation Science*, 9(3), 175–192. <https://doi.org/10.1037/mot0000303>
- Vallerand, R. J., & Rahimi, S. (2022). On the passion scale: Theory, research, and psychometric properties. In W. Ruch, A. B. Bakker, L. Tay, & F. Gander (Eds.), *Handbook of positive psychology assessment* (pp. 248–272). Hogrefe Publishing.
- Vallerand, R. J., Rousseau, F. L., Grouzet, F. M. E., Dumais, A., Grenier, S., & Blanchard, C. M. (2006). Passion in sport: A look at determinants and affective experiences. *Journal of Sport and Exercise Psychology*, 28(4), 454–478. <https://doi.org/10.1123/jsep.28.4.454>
- Vallerand, R. J., & Verner-Filion, J. (2020). Theory and research in passion for sport and exercise. In Tenenbaum, & R. C. Eklund (Eds.), *Handbook of sport psychology* (pp. 206–229). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119568124.ch11>.
- Verner-Filion, J., Schellenberg, B. J. I., Rapaport, M., Bélanger, J. J., & Vallerand, R. J. (2018). The thrill of victory ... and the agony of defeat": Passion and emotional reactions to success and failure among recreational golfers. *Journal of Sport and Exercise Psychology*, 40(5), 280–283. <https://doi.org/10.1123/jsep.2017-0316>
- Wang, J., & Wang, X. (2019). *Structural equation modeling: Applications using Mplus*. John Wiley & Sons.
- 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(6), 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>