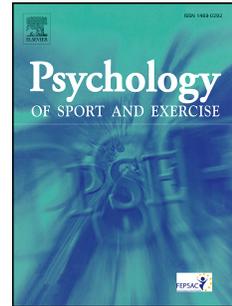


# Journal Pre-proof

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PII: S1469-0292(19)30228-6

DOI: <https://doi.org/10.1016/j.psychsport.2020.101674>

Reference: PSYSPO 101674

To appear in: *Psychology of Sport & Exercise*

Received Date: 25 March 2019

Revised Date: 16 February 2020

Accepted Date: 18 February 2020

Please cite this article as: Lopes, M., Vallerand, R.J., The role of passion, need satisfaction, and conflict in athletes' perceptions of burnout, *Psychology of Sport & Exercise* (2020), doi: <https://doi.org/10.1016/j.psychsport.2020.101674>.

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**The Role of Passion, Need Satisfaction, and Conflict  
in Athletes' Perceptions of Burnout**

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February 16th, 2020

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Declarations of interest: none

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## PASSION AND ATHLETES' PERCEPTIONS OF BURNOUT

**Abstract**

This research examined the role of harmonious and obsessive passion in athletes' perceptions of burnout. Two studies using correlational designs were carried out with different samples of athletes of varied skill levels. In Study 1, we found that obsessive passion was positively, and harmonious passion negatively, associated with burnout perceptions in athletes. Results of Study 2 replicated the findings of Study 1 and in addition used Structural Equation Modeling analyses to support the mediating role of conflict and need satisfaction in the relation between types of passion for sport and athletes' perceptions of burnout. Furthermore, it was found that harmonious passion for a second activity was associated with lower athletes' perceptions of burnout; while obsessive passion for a second activity was directly associated with it. The results have important implications for theory and research on passion as well as burnout in sport.

**Keywords:** Athlete Burnout; Harmonious Passion; Obsessive Passion; Need Satisfaction; Conflict

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Declarations of interest: none

## **The Role of Passion, Need Satisfaction, and Conflict in Athletes' Perceptions of Burnout**

Athlete burnout leads to several problems that include performance decrements as well as feeling depressed, frustrated, demotivated, and exhausted (Gustafsson, Kenttä, & Hassmén, 2011b; Lemyre, Hall, & Roberts, 2008). In the sport domain, it has been estimated that between six to eleven percent of athletes may suffer from high burnout levels (Eklund & Cresswell, 2007; Raedeke, 1997), a condition that is known to affect not only elite but also amateur athletes (Cresswell & Eklund, 2005b). It is thus a matter of great importance to provide athletes, coaches, and sport organizations with valuable knowledge that may prevent its occurrence. In this paper we address this issue of athlete burnout through the lens of the concept of passion (Vallerand, 2015; Vallerand & Verner-Filion, in press).

The concept of burnout takes its origins in occupational settings with Maslach and Pines (1977) and has been adapted to the sporting context by Raedeke (1997). It is described as a syndrome with three key dimensions: (a) emotional and physical exhaustion, which refers to a negative response to the intense demands of training and competition (b) sport devaluation, which corresponds to a loss of interest and desire to engage in one's sport, and (c) reduced sense of accomplishment, in terms of sport skills and abilities (see also Raedeke & Smith, 2009).

When athletes suffer from burnout, they typically experience chronic fatigue, poor sleep patterns, mood disturbance, and episodes of depression and helplessness (Gould & Dieffenbach, 2002; Kenttä & Hassmén, 2002). Not surprisingly, their performance and well-being are considerably impaired. Burned out athletes may necessitate several months or even years to reach full recovery. Therefore, investigation of the antecedents of burnout that may lead to its prevention is especially important. Researchers have employed several conceptual approaches to explain athlete burnout (Eklund, & DeFreese, 2015; Gustafsson, DeFreese, &

1 Madigan, 2017). The motivational perspective has been extensively used as to understand  
2 why athletes burn out (e.g., Cresswell & Eklund, 2005a; Gustafsson, Hassmén, & Hassmén,  
3 2011a; Lemyre et al., 2008; Martin & Horn, 2013). This is because to succeed in sport, being  
4 highly motivated to the extent of feeling passionate is very important. This strong  
5 motivational force toward the beloved activity may account for why athletes devote extensive  
6 time and energy training while staying motivated over time. Consequently, based on past  
7 research (Curran, Appleton, Hill, & Hall, 2011; Gustafsson et al., 2011a), we believe that the  
8 concept of passion for sport should allow us to better understand the processes leading  
9 athletes to experience burnout symptoms in sport.

### 10 **Passion in Sport**

11 The dualistic model of passion (DMP; Vallerand, 2015) defines passion as a strong  
12 inclination toward an activity that is important, that people love, value, engage in on a regular  
13 basis and is self-defining. This model further proposes the existence of two types of passion.  
14 Harmonious passion (HP) results from an autonomous internalization, that is when people  
15 have freely accepted the activity that they love as being important without any contingencies  
16 attached to it (Mageau, Carpentier, & Vallerand, 2011; Vallerand, & Houliort, 2003). The  
17 activity thus occupies a significant, but not overwhelming, space in identity and remains  
18 under the control of the individual. Hence, with HP, a runner might run out of love for the  
19 activity without any sense of obligation, allowing positive activity experience to occur, while  
20 being in harmony with other important life domains. Obsessive passion (OP) in contrast  
21 results from a controlled internalization and is associated with the experience of a loss of  
22 control with regards to the beloved activity. Thus, a runner with an OP might run because he  
23 or she loves the activity but also because of inner contingencies, such as the desire to validate  
24 or protect one's self-worth (Vallerand, 2015). With OP, individuals face an uncontrollable  
25 urge to partake in the activity that they love and find enjoyable, as activity engagement is out

1 of control. Consequently, activity engagement is not fully positive and the activity conflicts  
2 with other life activities. Much research, including sports research (for a review see Vallerand  
3 & Verner-Filion, in press), provides support for the Dualistic Model of Passion, showing that  
4 HP is generally associated with adaptive outcomes whereas OP has been associated with less  
5 adaptive outcomes, or even maladaptive ones (for reviews, see Curran, Hill, Appleton,  
6 Vallerand, & Standage, 2015; Vallerand, 2015; Vallerand & Houliort, 2019).

### 7 **Passion and Athletes' Perceptions of Burnout**

8 In light of the above reasoning, HP should allow one to remain fully involved in the  
9 passionate activity without becoming obsessive about the beloved activity and thus, there  
10 should be little burnout. Conversely, OP should lead one to go beyond the limit, to overspend  
11 one's energy, and thus to experience burnout symptoms. Much research, especially in the  
12 work domain supports this hypothesis (e.g., Vallerand, Paquet, Philippe, & Charest, 2010). In  
13 the sport context, research also supports this analysis as HP is negatively associated with  
14 burnout, whereas OP is either unrelated or positively related to burnout (e.g., Curran et al.,  
15 2011; Gustafsson et al., 2011a; Martin & Horn, 2013). Given that the two types of passion for  
16 sport may make burnout more or less likely, an important next step is to understand *why* this  
17 may be so by identifying potential mechanisms.

### 18 **The Mediating Role of Conflict and Basic Psychological Need Satisfaction**

19 The burnout model proposed by Vallerand et al. (2010) posits that a personal  
20 characteristic (HP and OP) predicts the occurrence of a contributing (conflict) and a protective  
21 (positive activity experiences) factor of burnout. To begin with OP, one likely mediator of its  
22 contributory effect on athlete burnout should be the psychological conflict experienced  
23 between sport passion and other life activities (e.g., family activities). Because with OP one  
24 experiences an uncontrollable urge to engage in the passionate activity, it becomes very  
25 difficult for the person to fully disengage from thoughts about the activity, even when such an

1 engagement is detrimental to other goals or activities in the person's life (Vallerand et al.,  
2 2003). Consequently, because the activity takes all the space in the person's life, OP has been  
3 found to lead to conflict with other activities (e.g., Caudroit, Boiché, Stephan, Le Scanff, &  
4 Trouilloud, 2011; Vallerand et al., 2003, Study 1; Vallerand et al., 2010; Young, de Jong, &  
5 Medic, 2015). Conversely, with HP, the person can physically and mentally disengage from  
6 the passionate activity, thereby allowing the person to replenish him- or herself as well as  
7 preventing the experience of conflict with other activities (or people).

8 A second set of psychological processes in the Vallerand et al. (2010) model refers to  
9 protective factors. Vallerand et al. (2010) had proposed and empirically shown that positive  
10 activity experiences such as satisfaction with the activity protect against burnout. In this  
11 regard, much research has shown that need satisfaction (Ryan & Deci, 2017) represents a  
12 major form of adaptive activity satisfaction. According to self-determination theory (SDT;  
13 Ryan & Deci, 2017) there are three basic psychological that are defined as “innate  
14 psychological nutrients that are essential for ongoing psychological growth, integrity, and  
15 well-being” (Deci & Ryan, 2000, p. 229). Autonomy is defined as the need to feel volitional  
16 and authentic in one's actions; competence reflects the need to feel effective and efficacious  
17 in challenging endeavors; relatedness refers to a feeling of being secure and connected with  
18 valued significant others (Deci & Ryan, 2000). A major implication of the needs framework is  
19 the claim that satisfying all three basic needs is necessary for people to actualize their  
20 potential, to flourish, and to be protected from ill health and maladaptive functioning (Sheldon  
21 & Niemiec, 2006). While need satisfaction has been shown to promote energy, autonomous  
22 motivation, positive emotions, well-being, and performance, its absence has been linked to the  
23 development of many forms of psychopathology and even negative physical health,  
24 motivational undermining, and decreased wellness (e.g., Baard, Deci, & Ryan, 2004; Ryan &  
25 Deci, 2017; Tay & Diener, 2011). Therefore, in the sport context, need satisfaction should

1 serve to protect athletes from high levels of burnout symptoms (Hodge, Lonsdale, & Ng,  
2 2008; Li, Wang, Pyun, & Kee, 2013; Quested, & Duda, 2011).

3 Much research supports the role of passion in need satisfaction (see Curran et al., 2015 for  
4 a meta-analysis) both in sport and exercise (e.g., Akehurst & Oliver, 2014; Curran, Appleton,  
5 Hill, & Hall, 2013; Parastatidou, Doganis, Theodorakis, & Vlachopoulos, 2012) and in other  
6 life domains (e.g., Houlfort et al., 2015; Philippe, Vallerand, Houlfort, Lavigne, & Donahue,  
7 2010; Przybylski, Weinstein, Ryan, & Rigby, 2009; Vallerand, 2015). Such research reveals  
8 that when participation in sport is fueled by HP, individuals may experience a greater sense of  
9 personal causation, perceptions of competence, and connectedness with others within the  
10 activity. OP, in contrast, does not readily facilitate the fulfillment of basic psychological  
11 needs or at least not to the same extent as HP (Lalande et al., 2017). This is because, with OP,  
12 engagement is fueled by a sense of compulsion (i.e., “I have the impression that my activity  
13 controls me”; Vallerand, & Houlfort, 2003) and a defensive ego-involved style (Lafrenière,  
14 Bélanger, Sedikides, & Vallerand, 2011; Mageau et al., 2011). Thus, although with OP  
15 athletes may experience some sense of need satisfaction while engaging in their sport (e.g.,  
16 Akehurst & Oliver, 2014; Lalande et al., 2017; Parastatidou et al., 2012; Verner-Filion,  
17 Vallerand, Amiot, & Mocanu, 2017), it should be lower than that associated with HP (see  
18 Lalande et al., 2017) and may even be negative (Houlfort et al., 2015; Przybylski et al., 2009).

19 Finally, only one study has assessed the role of passion for sport in need satisfaction and  
20 burnout. In this study, Curran et al. (2013) provided support for the mediating role of need  
21 satisfaction between passion and burnout in athletes. Specifically, they found HP to positively  
22 predict need satisfaction that in turn was negatively associated with athlete burnout. Although  
23 the path involving OP and need satisfaction was positive, it did not reach significance ( $\beta =$   
24  $.04, p > .05$ ). This study therefore provides support for the contributory nature of HP to need

1 satisfaction and its protective function in athlete burnout but leaves open the potential role of  
2 OP in this process.

### 3 **The Role of a Second Activity**

4       Research over the past 10 years or so has underscored the importance of incorporating  
5 the role of other activities in the understanding of burnout. Vallerand (1997, 2001) has long  
6 posited that we needed to take into account other life activities in order to better understand  
7 and predict motivational processes and outcomes in a given activity such as sport burnout.  
8 Indeed, athletes spend a large amount of time pursuing activities outside of their sport (e.g.,  
9 working, gaming, reading, hiking). For instance, amateur athletes often deal with a full-time  
10 job (or studies) besides their sport commitment. These other activities may play a role in  
11 burnout. For instance, workers who engage in recovery activities after work are likely to  
12 experience fewer symptoms of exhaustion than workers who do not do so (e.g., Sonnentag,  
13 2001; Sonnentag & Fritz, 2007;). Additionally, Stanton-Rich and Iso-Ahola (1998) found that  
14 engaging in satisfying leisure behaviors and self-determined activities reduced or prevented  
15 burnout among clergy. In the sports context, Kellmann et al. (2018) suggest that partaking in  
16 other activities (i.e., proactive approach to recovery) out of a high level of self-determination  
17 might act as a buffer against sport induced fatigue.

18       Of importance, research reveals that the type of passion that one has for the primary  
19 activity plays a role in engaging or not in other life activities and thereby reducing burnout.  
20 Specifically, Donahue et al. (2012) found that HP for work was positively associated with  
21 recovery experiences leading to lower levels of exhaustion at work. By contrast, OP for work  
22 led workers to disengage from recovery experiences and consequently to experience more  
23 exhaustion symptoms. Finally, other research has gone even further by empirically showing  
24 that while most people display passion for more than one activity, only those who display HP

1 for a second activity will experience psychological benefits from such engagement  
2 (Schellenberg & Bailis, 2015).

### 3 **The Present Research**

4 The purpose of the present research was to build up on past research and to test the  
5 role of passion in athletes' perceptions of burnout. This was done in two studies. In the first  
6 study, we ascertained the relationships between sport passion and athletes' perceptions of  
7 burnout within a large sample of mainly endurance athletes with varied skill levels. Based on  
8 past research (e.g., Gustafsson et al., 2011b; Martin & Horn, 2013), we argued that OP for  
9 one's sport should be positively associated with burnout perceptions whereas HP should  
10 negatively relate with it.

11 In Study 2, we proposed to test an extended version of the Vallerand et al. (2010)  
12 burnout model for sport in line with the above review. Based on this model, we propose that  
13 passion for sport plays an important role in sport burnout. Specifically, sport engagement  
14 fueled by OP will lead athletes to rigidly engage in sport at the expense of other life activities,  
15 to experience conflict between sport and other such activities and at some point to become  
16 mentally and physically stale and develop burnout. Further, with OP, athletes do not derive as  
17 much positive sport experiences such as need satisfaction (Curran et al., 2013), and do not  
18 benefit as much from their protective functions against burnout. Conversely, with HP one  
19 engages in sport more flexibly and as such can fully experience need satisfaction in sport and  
20 is also less likely to experience conflict between sport and other activities. Thus, with HP for  
21 sport, athletes are protected against burnout. But there is more. Beyond sport, passion for  
22 other life activities should be negatively associated with athletes' perceptions of burnout  
23 specifically when such passion is harmonious in nature. Athletes with a HP for a second  
24 activity will then experience need satisfaction in this other activity and thus be protected even  
25 further against burnout. Such should not be the case with OP for sport as it should prevent full

1 engagement and need satisfaction in this second activity and negate the protective role of this  
2 second activity. In sum, passion for sport and for another important life activity should play a  
3 key role in sports that may either trigger or protect athletes against burnout.

#### 4 **Study 1**

5 The purpose of Study 1 was to investigate the cross-sectional associations between  
6 sport passion and athletes' perceptions of burnout. In line with past research (Martin & Horn,  
7 2013; Schellenberg, Gaudreau, & Crocker, 2013), we posited that the type of passion that  
8 athletes have for their sport is of prime importance for sport burnout. Specifically, it was  
9 hypothesized that OP would be positively associated with athletes' perceptions of burnout  
10 whereas HP would be negatively related to it.

#### 11 **Method**

##### 12 **Participants and Procedure**

13 To determine the total sample size to detect a significant effect of passion on athlete  
14 burnout within multiple regression analyses, G\*Power software was used to conduct a power  
15 analysis. Because past studies on the passion-burnout relationship (e.g., Curran et al., 2011;  
16 Curran et al., 2013) found OP to be less associated with burnout than HP, we therefore  
17 averaged the effect sizes found in the literature ( $R^2 = .04$  for OP). The analysis revealed that,  
18 for a power of .80 at an alpha of .05, 193 participants were needed. Participants in Study 1  
19 were 224 athletes (75 females, 149 men) with a mean age of 33.91 years ( $SD = 10.23$  years),  
20 including 94 French-Canadians from the Province of Quebec, 105 French, and 25 participants  
21 from other French-speaking countries. They trained on average 7.03 hours per week ( $SD =$   
22  $3.33$  hours) and had been involved in their sport for an average of 9.72 years ( $SD = 7.91$   
23 years). Athletes participated in three main sports: running ( $n = 75$ ), badminton ( $n = 75$ ), and  
24 triathlon ( $n = 43$ ), and 31 athletes practiced other sports. Athletes in this sample had different  
25 sport backgrounds, with 80% ( $n=186$ ) of athletes who still competed in their sport, 7% ( $n=15$ )

1 who no longer competed, and 13% (n=32) who had never competed. We also assessed the  
2 athlete's level of expertise with one self-report item: "What is the highest level you have  
3 reached in your sport?". Participants were situated across the performance continuum:  
4 beginners (n=72, 32%), local athletes (n = 61, 27%), regional athletes (n = 63, 28%), national  
5 athletes (n = 19, 9%), and international athletes (n = 9, 4%).

6 Participants were recruited online through three outlets. First, study information and a  
7 survey link was posted on several sports forum, for instance [www.courseapi.net](http://www.courseapi.net) was used  
8 to invite runners to take part in an online study on sport and attitude. Second, study  
9 information was posted on several sport-related Facebook groups. Finally, many individuals  
10 who viewed the study information on social media outlets shared the original post among  
11 their own networks, which led reaching a broader network of potential participants. The  
12 questionnaires took approximately 30 minutes to complete.

### 13 **Measures**

14 All scales listed below were completed on a 7-point Likert scale ranging from 1  
15 (Strongly disagree) to 7 (Strongly agree). The same Likert scale was used for all instruments  
16 used throughout the manuscript, unless otherwise indicated.

17 **Passion for sport.** Participants named their favorite sport, "that they love, in which  
18 they invest a lot of time, and that is important for them" and completed the Passion Scale  
19 while referring to this activity (Marsh et al., 2013; Vallerand, & Houliort, 2003) in reference  
20 to their sport. For this Study, a short version of the passion scale was used (Trépanier, Fernet,  
21 Austin, Forest, & Vallerand, 2014). The items assessing harmonious passion are « This  
22 activity is in harmony with the other activities in my life », « This activity is in harmony with  
23 other things that are part of me » and « My activity is well integrated in my life » ( $M = 5.64$ ,  
24  $SD = 0.92$ ,  $\alpha = .80$ ). The items assessing obsessive passion are « I have almost an obsessive  
25 feeling for this activity », « This activity is the only thing that really turns me on » and « I

1 have the feeling that my work controls me » ( $M = 3.80$ ,  $SD = 1.28$ ,  $\alpha = .70$ ). Five passion  
2 criterion items assessed whether participants were passionate or not toward their sport. Items  
3 were “I spend a lot of time doing this activity”, “I like this activity”, “This activity is  
4 important for me”, “This activity is a passion for me” and, “This activity is part of who I am”  
5 ( $M = 6.21$ ,  $SD = .68$ ,  $\alpha = .71$ ). All participants scored above the midpoint (4) on the 7-point  
6 response scale and were thus deemed passionate (Vallerand, 2015, pp. 77-78; Vallerand &  
7 Houliort, 2003). The Passion Scale (including the short version of the scale; see Lafrenière,  
8 Vallerand, Donahue, & Lavigne, 2009; Philippe, Vallerand, Bernard-Desrosiers, Guilbault, &  
9 Rajotte, 2017) has displayed high levels of validity and reliability with respect to a variety of  
10 activities and contexts (see Marsh et al., 2013; Vallerand, 2015, chapter 4).

11 **Burnout.** The French validation of the Athlete Burnout Questionnaire (ABQ; Raedeke  
12 & Smith, 2009) conducted by Isoard-Gauthier, Oger, Guillet, & Martin-Krumm, 2010) was  
13 used to assess athletes’ perceptions of burnout. The questionnaire “Questionnaire du Burnout  
14 Sportif” (QBS) is a 12-item self-report inventory that contains three subscales, namely:  
15 emotional and physical exhaustion (4 items; e.g., « I feel so tired from my training that I have  
16 trouble finding energy to do other things »), devaluation (4 items; e.g., « I don’t care as much  
17 about my sport performance as I used to »), and reduced sense of accomplishment (4 items;  
18 e.g., « I am not performing up to my ability in sport »). Items were answered on a 7-point  
19 rating scale ranging from 1 = “never” to 7 = “always”. Empirical support for the reliability  
20 and validity of the ABQ test scores has been reviewed by Raedeke and Smith (2009) and by  
21 Cresswell and Eklund (2007). In Study 1, a burnout index was computed by averaging the  
22 three burnout subscales as is often done by sport researchers (e.g., Pacewicz, Mellano, &  
23 Smith (2019). Cronbach’s alpha coefficient was .84.

24 **Results**

1 Table 1 reports the means, standard deviations, correlations, and Cronbach's alpha for  
2 all Study 1 variables. Preliminary analyses revealed that OP and weekly hours of training  
3 were moderately correlated ( $r = .32$ ), suggesting that the higher the athletes' OP, the more  
4 they devoted hours to training. The correlation with HP was not significant. Furthermore, an  
5 independent-samples t-test was conducted to compare men and women on OP and HP. Men  
6 reported significantly higher levels of HP ( $M = 5.88$ ,  $SD = .98$ ) than women ( $M = 5.52$ ,  $SD =$   
7  $.87$ );  $t(22) = 2.71$ ,  $p = .007$ . Men also reported being more obsessive ( $M = 3.92$ ,  $SD = 1.26$ )  
8 than women ( $M = 3.55$ ,  $SD = 1.30$ );  $t(222) = -2.06$ ,  $p = .041$ . These results suggested that we  
9 include both gender and weekly training hours as control variables in the subsequent analyses.

10 The main objective of Study 1 was to examine whether HP and OP would be  
11 respectively negatively and positively associated with athletes' burnout perceptions. A  
12 multiple regression analysis was conducted with age, sex, and weekly hours of training and  
13 work as control variables. These variables were all entered at Step 1 whereas HP and OP were  
14 entered at Step 2. A hierarchical regression analysis was conducted with burnout as the  
15 dependent variable (see Table 2 for detailed results). At Step 1, age was negatively associated  
16 with burnout whereas gender (female = 0; male = 1) was positively, although marginally,  
17 associated with it revealing that men reported higher levels of burnout symptoms than  
18 women. Furthermore, weekly hours of training was positively associated with burnout. All  
19 these control variables explained 5% of the variance of burnout. At Step 2, controlling for the  
20 above variables, HP was the strongest predictor of burnout ( $\beta = -.28$ ,  $p < .001$ ), whereas OP  
21 was significantly and positively associated with it ( $\beta = .23$ ,  $p < .001$ ). This second model  
22 explained an additional 13% of the variance in athlete burnout.

23 In sum, similarly to Curran et al. (2013), we found HP for sport to be negatively  
24 associated with athlete burnout over and above training load and other control variables.  
25 However, contrary to Curran et al. (2013) that found a non-significant relationship between

1 OP and athletes' perceptions of burnout, our findings revealed that OP was positively  
2 associated with burnout. Finally, these findings are also in line with other research on burnout  
3 both in the sports (e.g., Gustafsson et al., 2011a) and work domains (e.g., Carbonneau,  
4 Vallerand, Fernet, & Guay, 2008; Vallerand et al., 2010).

## 5 **Study 2**

6 In Study 2, we had two major objectives. First, we sought to replicate the findings of  
7 Study 1 with another sample of athletes. Second, Study 2 sought to test the extended  
8 Vallerand et al. (2010) model of burnout with athletes while controlling for weekly hours of  
9 training. Based on the extended burnout model, it was hypothesized that OP for sport would  
10 be positively, while HP would be negatively, related to conflict between sport and other life  
11 activities. Also, both HP and OP for sport were expected to be positively related to need  
12 satisfaction in sport, although the path from OP was expected to be lower in magnitude than  
13 those involving HP. This model also included a second passionate activity and its  
14 relationships with athlete burnout through conflict and need satisfaction in sport in this second  
15 activity. The exact same hypotheses were made for passion and need satisfaction for the  
16 second activity. Cross-activity paths were also hypothesized to unfold between passion and  
17 need satisfaction. For instance, HP for sport was expected to be positively associated with  
18 need satisfaction in the second activity and similarly for HP for the second activity and need  
19 satisfaction in sport. This is because HP is associated with flexibility and disengagement  
20 (Vallerand, 2015). Conversely, OP for both sport and the second activity were expected to be  
21 either negatively associated or unrelated to need satisfaction in the cross-activity. This is  
22 because with OP, athletes demonstrate a rigidity that is unlikely to lead to psychological  
23 benefits from engagement in another activity (see Vallerand, 2015, p. 129). Finally, conflict  
24 was expected to positively, and need satisfaction both for sport and the second activity to  
25 negatively, relate to burnout. Based on Vallerand et al. (2010) model, a full-mediation model

1 was postulated, thus, direct paths between types of passion and athlete burnout were not  
2 modeled (see Figure 1).

### 3 **Method**

#### 4 **Participants and Procedure**

5 A Monte Carlo analysis was conducted with Mplus to estimate the required sample  
6 size. A minimal power of .80 was deemed adequate. Based on past studies on the effect of  
7 passion, conflict, need satisfaction and athlete burnout (Curran et al., 2013; Li et al., 2013;  
8 Vallerand et al., 2010) standardized regression coefficients between .10 and .50 were  
9 expected. The analysis unveiled that a sample size of 310 participants would yield power  
10 between .80 and .91 to detect significant coefficients between .10 and .50 for all the  
11 hypothesized associations. A total of 342 participants were recruited.

12 In Study 2, we incorporated four attention checks items to identify and remove  
13 careless responders. We excluded participants ( $n = 11$ ) if they missed two bogus items or  
14 more (e.g. "Please respond 5 for this question"). We also excluded 15 participants who  
15 reported being less than 18 years old. After excluding those participants, we had a final  
16 sample size of 316. Participants were 129 females and 187 men with a mean age of 39.00  
17 years ( $SD = 12.37$  years), they were 165 French Canadians from the Province of Quebec, 133  
18 French and 18 from other French-speaking countries. On average, athletes trained 8.68 hours  
19 per week ( $SD = 4.90$ ), and had been involved in their sport for 10.97 years ( $SD = 15.89$ ).  
20 Athletes participated in four main endurance sports: running ( $n = 122$ ), triathlon ( $n = 71$ ),  
21 cycling ( $n = 62$ ), and swimming ( $n = 45$ ) while 31 athletes reported to practice other sports.  
22 As in Study 1, athletes in this sample had different backgrounds, 58% ( $n=183$ ) of athletes  
23 reported to compete in their sport, 11% ( $n=36$ ) no longer competed, and 31% ( $n=97$ ) who had  
24 never competed. We also assessed the athlete's level of expertise with one self-report item:  
25 "What is the highest level you have reached in your sport?". Participants were beginner

1 (n=12, 4%), local athletes (n = 65, 21%), regional athletes (n = 211, 66%), national athletes  
2 (n = 22, 7%), and international athletes (n = 6, 2%). So, participants in Study were basically  
3 amateur athletes.

4 As Study 1, participants were recruited online through sports forum and Facebook.  
5 They were invited to take part in an online study on sport and attitude that took 20 minutes to  
6 complete on average. They completed measures of passion, conflict, need satisfaction, and  
7 burnout. They were also asked to indicate a second activity that they loved, that was important  
8 to them, and in which they invest a significant amount of time on a regular basis. With respect  
9 to this second passionate activity, descriptive analysis revealed that 25% reported to engage in  
10 other sports (e.g., ski, hockey, snowboarding), 24% spent time in creative, cultural or  
11 cognitive activities (e.g., reading, gaming, watching TV, listening to music, photography),  
12 20% reported being passionate for their job or their studies, 17% engaged in social activities  
13 (e.g., dancing, family time, friends time, travelling), 9% in domestic activities (e.g., cooking ,  
14 taking care of my children, tinkering), 5% in physical activities that weren't sport (e.g. yoga  
15 or walking). Finally, 2% engaged in spiritual activities such as meditation or volunteering.

## 16 **Measures**

17 **Passion for one's sport.** In Study 2 we used the full Passion Scale (Vallerand et al.,  
18 2003) which consists of six HP items (e.g., « Running is in harmony with the other activities  
19 in my life »;  $M = 5.87$ ,  $SD = 0.75$ ,  $\alpha = .73$ ) and six OP items (e.g., « I have almost an  
20 obsessive feeling for running »;  $M = 3.34$ ,  $SD = 1.31$ ,  $\alpha = .83$ ). To make the items more  
21 specific, the words “my activity” were replaced with the athlete specified sport. As in Study 1,  
22 all participants scored above the midpoint (4) on the 7-point responses scale on the passion  
23 criterion index ( $M = 5.91$ ,  $SD = .86$ ,  $\alpha = .80$ ), and were thus deemed to be passionate for their  
24 sport.

1           **Passion for a second activity.** Participants were then told to “name another activity  
2 that you love, that is important to you, and in which you invest a significant amount of time  
3 on a regular basis,” (the definition of passion). The full Passion Scale was used to assess  
4 passion for the second activity which also consisted of six HP items (e.g., « This second  
5 activity is in harmony with the other activities in my life »;  $M = 5.74$ ,  $SD = .94$ ,  $\alpha = .82$ ) and  
6 six OP items (e.g., « This second activity is the only thing that really turns me on »;  $M = 2.80$ ,  
7  $SD = 1.39$ ,  $\alpha = .84$ ). The passion criterion index for this second activity ( $M = 5.64$ ,  $SD = .94$ ,  
8  $\alpha = .71$ ), revealed that 5 participants had scores just below the midpoint (4), specifically  
9 between 3.6 and 4 on the 7-point Likert scale. These participants were kept in the analyses  
10 given that the results did not change when they were removed.

11           **Need satisfaction in sport.** Nine items were used to assess the three basic  
12 psychological needs. Three autonomy items (e.g. “In running, I usually feel free to make my  
13 own decisions”) were adapted from the Perceived Autonomy in Life Domains Scale (Blais,  
14 Vallerand, & Lachance, 1990). Competence (e.g. “Overall, I believe I’m a competent runner”)  
15 was assessed using three items from the Perceived Competence in Life Domains Scale  
16 (Losier, Vallerand, & Blais, 1993). Finally, we used the Basic Psychological Needs Scale in  
17 Sports (Gillet, Rosnet, & Vallerand, 2008) to assess relatedness (e.g. “I get along with people  
18 in running”). Scales were adapted to fit the athlete’ specific sport. An index averaging all  
19 three needs in sport was therefore computed, as it is commonly done by sport researchers  
20 (e.g., Curran et al., 2013; Verner-Filion et al., 2017), and in other domains (e.g., Aelterman,  
21 Vansteenkiste, Van Keer, & Haerens, 2016; Lalande et al., 2017). Cronbach’s alpha  
22 coefficient for this index was .68.

23           **Need satisfaction in the second activity.** The same items that served to measure need  
24 satisfaction in sport were also used to measure basic need with respect to the second activity

1 (e.g. "In my second activity, I usually feel free to make my own decisions"). Alpha for this  
2 scale was .79.

3 **Conflict.** Conflict between sport and other life spheres was assessed with five items  
4 measuring the extent to which athletes' sport engagement conflicted with other important  
5 activities in their life. This questionnaire was adapted from Vallerand et al. (2010), and to  
6 make the items more specific, the words "my activity" were replaced with the sport specified  
7 by the athlete. A sample item is "Running conflicts with the other activities in my life.", "I  
8 sometimes sacrifice my private life to run" or "I sometimes think that I spend too much time  
9 running and not enough in my private life." In the present study, a principal component  
10 analysis yielded one factor accounting for 60% of the variance, with factor loadings ranging  
11 from .55 to .92. The alpha coefficient in this study was .82.

12 **Burnout.** Athletes' perceptions of burnout was assessed using the same scale as in  
13 Study 1. One index score was calculated by averaging the three burnout dimensions. The  
14 Cronbach's alpha coefficient was .85.

### 15 **Data Analysis**

16 To test the proposed model, a path analysis was conducted with Mplus 8 (Muthén &  
17 Muthén, 1998-2016) with Maximum Likelihood as the method of estimation. Prior to  
18 analyses, all variables included in the subsequent path analysis were examined for accuracy of  
19 data entry, missing data, and fit between their distributions and the assumptions underlying  
20 maximum likelihood procedures (Tabachnick & Fidell, 2007). Indirect effects were tested  
21 using the bias-corrected bootstrap method (5000 samples with 95% bias-corrected confidence  
22 intervals (CIs)). Models fit was assessed using the comparative fit index (CFI), Tucker-Lewis  
23 index (TLI), root mean square error of approximation (RMSEA), and standardized root mean  
24 squared residual (SRMR). According to Tabachnick and Fidell (2007), the CFI and TLI

1 should be 0.95 or higher, while the RMSEA and SRMR should be 0.06 or lower for  
2 acceptable model fit.

### 3 **Results**

4 Table 3 reports the means, standard deviations, correlations and Cronbach's alpha  
5 among all study 2 variables. The model to be tested posited that HP would be negatively  
6 associated with athletes' perceptions of burnout through its positive and negative relationships  
7 with need satisfaction and conflict, respectively. In contrast, OP should be positively  
8 associated with athletes' perceptions of burnout through the same mediating variables. First,  
9 OP and HP for sport were positively associated with weekly hours of training ( $r=.16, p<.01$ ;  
10  $r=.12, p<.05$ ). The same relationship was found between OP and weekly hours of training in  
11 the second activity ( $r=.27, p<.001$ ). Given that training load might contribute to burnout in  
12 sport (Goodger, Gorely, Lavallee, & Harwood, 2007), we statistically controlled for this  
13 variable. Prior to testing the final model, we also tested to include control variables such as  
14 age, sex, sport, and weekly hours in 2<sup>nd</sup> activity as exogenous variables. However, model fits  
15 and betas did not significantly change when these variables were removed from the model.  
16 Hence for sake of clarity and parsimony, we removed them from the final model. Data also  
17 revealed that 10 participants reported to be more passionate toward their second activity. We  
18 therefore tested the same model controlling for the passion criterion indices for sport and for  
19 the second activity, as well as removing these 10 participants. Path coefficients and model fits  
20 did not significantly change. Therefore all participants were included in the final model.  
21 Overall, the proposed model had an excellent fit to the data. The chi-square value was non-  
22 significant,  $\chi^2$  (df = 7, N = 316) = 10.78,  $p = 0.05$ , and other fit indices were excellent:  
23 comparative fit index (CFI) = .98, Tucker-Lewis Index (TLI) = .93, root mean squared error  
24 of approximation (RMSEA) = .05 [.01, .10] and standardized root mean square (SRMR) =  
25 .02. Figure 2 shows only predicted paths that were statistically significant at the  $p < .05$  level.

1           The analysis of direct effects revealed that HP for sport was positively associated with  
2 need satisfaction in sport ( $\beta = .38, p < .001$ ) but negatively with conflict ( $\beta = -.21, p < .001$ ).  
3 As for OP for sport, it was positively associated with need satisfaction in sport ( $\beta = .19, p <$   
4  $.001$ ) and with conflict ( $\beta = .55, p < .001$ ). Turning to the second activity, HP was positively  
5 associated with need satisfaction in the second activity ( $\beta = .53, p < .001$ ). OP for a second  
6 activity was not significantly associated with the mediating variables. With regard to the  
7 cross-activity relationships, OP for sport was negatively associated with need satisfaction in  
8 the second activity ( $\beta = -.12, p < .05$ ) whereas a positive association between HP for a second  
9 activity and need satisfaction in sport was obtained ( $\beta = .18, p < .001$ ). The two other cross-  
10 over relationships involving HP for sport and need satisfaction in the second activity and OP  
11 for the second activity and need satisfaction in sport were not significant. Turning to the  
12 mediators, need satisfaction in sport ( $\beta < -.19, p < .001$ ) and in the second activity ( $\beta < -.20,$   
13  $p < .001$ ) were negatively associated with athletes' perceptions of burnout whereas conflict  
14 was positively associated with burnout ( $\beta = .19, p < .001$ ). Finally, Weekly hours of training  
15 were associated with conflict but not with athlete burnout. These findings appear in Figure 2.

16           Overall, the present results provide support for the proposed model linking OP and HP  
17 to conflict and need satisfaction as mediators of the relationship between passion and athletes'  
18 perceptions of burnout. These findings also highlight the mixed results between OP for sport  
19 that was found to be positively associated with burnout through conflict, but negatively  
20 through need satisfaction. However, the total indirect effect (see Table 4) revealed that, taken  
21 as a whole, sport OP was positively associated with burnout in athletes whereas HP was  
22 negatively associated with it through the satisfaction of psychological needs.

23           We also tested two alternative models. In the first one, we tested a model in which  
24 need satisfaction and conflict were positioned as predictors of burnout with HP's and OP's as  
25 mediating variables (Need Satisfaction/Conflict  $\rightarrow$  HP/OP  $\rightarrow$  Burnout). Results of this

1 alternative model revealed poor fit indices  $\chi^2$  (df = 5, N = 316) = 62.96,  $p < 0.001$ , RMSEA =  
2 .19. The second alternative model assessed the proposal that HP and OP predicted need  
3 satisfaction and conflict through burnout. (HP/OP  $\rightarrow$  Burnout  $\rightarrow$  Need Satisfaction/Conflict).  
4 Results of this alternative model also revealed poor fit indices  $\chi^2$  (df = 23, N = 316) = 311.26,  
5  $p < 0.001$ , RMSEA = .20. In sum, the results from these two alternative models suggest that  
6 the hypothesized model should be preferred.

## 7 **General Discussion**

8 The primary purpose of this research was to test the role of passion for sport in  
9 athletes' perceptions of burnout in two studies. A second goal of this research was to test an  
10 extended version of the passion model of burnout (Vallerand et al., 2010). This model seeks  
11 to understand the psychological processes underlying the passion-burnout relationship,  
12 including contributory factors (conflict between sport and other life activities) and protective  
13 factors (need satisfaction in sport). Furthermore, this model also posits that involvement in a  
14 second passionate activity can also affect burnout. Such effects can either reduce or  
15 exacerbate athletes' perceptions of burnout, depending on the type of passion for the activity,  
16 through the need satisfaction it provides in the second activity. Results from Study 1 provided  
17 support for the role of passion in burnout and those of Study 2 for the extended passion model  
18 of burnout. These results were obtained while statistically controlling for training volume and  
19 lead to a number of implications.

### 20 **The Role of Passion in Athletes' Perceptions of Burnout**

21 A first implication of the present findings is that passion is involved in burnout in  
22 sport. Consistent with past research (e.g., Gustafsson, 2007), these findings suggest that  
23 burnout in sport might be less a matter of training volume than a matter of quality of sport  
24 engagement. Indeed, the findings of both studies showed that statistically controlling for  
25 training load, OP for sport was found to be positively associated with athletes' perceptions of

1 burnout whereas HP was negatively associated with it. Thus, the type of engagement  
2 (harmonious vs obsessive) that individuals display while engaging in sport matters greatly  
3 with respect to athlete burnout.

4         These findings are in line with past research on the relationship between passion and  
5 burnout in sport which demonstrates that OP may have adverse effects on athlete burnout  
6 (e.g., Gustafsson et al., 2011a) whereas HP seems to prevent its occurrence (e.g., Curran et al.,  
7 2013; Moen, Myhre, & Stiles, 2016). Furthermore, the present findings are also in accord with  
8 past research on burnout at work (e.g., Carbonneau et al., 2008; Donahue et al., 2012;  
9 Vallerand et al., 2010) that has shown the adaptive and maladaptive functions of HP and OP,  
10 respectively. Finally, these findings are coherent with those from dozens of studies on the  
11 diametrically opposed role of HP and OP in a number of adaptive and maladaptive outcomes  
12 in a number of life domains (e.g., Curran et al., 2015; Vallerand, 2010, 2015; Vallerand &  
13 Houliort, 2019), including sport (see Vallerand & Verner-Filion, in press).

#### 14 **The Mediating Role of Conflict and Basic Psychological Need Satisfaction**

15         Support for the extended passion model of burnout provides with a better  
16 understanding of the psychological processes involved in facilitating burnout or protecting  
17 against it. Thus, a second implication of the present findings is the important mediational role  
18 of need satisfaction and conflict in the passion-burnout relationship. First, as hypothesized,  
19 Study 2 demonstrated that the experience of conflict - between sport and other life domains -  
20 as well as a lack of need satisfaction in sport, was positively associated with athletes'  
21 perceptions of burnout. Specifically, we found that sport OP was positively associated with  
22 conflict. This is because athletes with OP are - to a certain degree - single-minded in their  
23 pursuit of the beloved activity. Accordingly, they may spend a lot of mental energy thinking  
24 relentlessly about their sport. The indirect path between sport OP and burnout through conflict  
25 (OP1 → Conflict → Burnout) was among the strongest indirect effect of the model.

1 Conversely, HP was negatively associated with conflict, thereby suggesting a protective  
2 function of HP in burnout. These findings are the first to replicate in sports those of Vallerand  
3 et al. (2010) on the role of conflict as a key mediator between passion and burnout at work.

4 The second mechanism that mediates the effects of passion on burnout is need  
5 satisfaction in sport. The results of Study 2 showed that although OP was positively  
6 associated with need satisfaction, the relationship was significantly lower than that of HP.  
7 Therefore, with HP athletes are more likely to be more fully involved in their sport experience  
8 (Vallerand & Verner-Filion, in press) allowing them to experience higher levels of need  
9 satisfaction in sport, thus making burnout in sport less likely. The positive relationship  
10 between sport OP and psychological need satisfaction in sport is in line with that observed in  
11 the Lalande et al. (2017) series of four studies that showed that both HP and OP were  
12 positively associated with need satisfaction in the passionate activity, although the  
13 relationship with HP was statistically more important than that involving OP.

14 The fulfillment of basic psychological needs would appear to provide athletes with  
15 positive psychological resources that are hypothesized to reduce athletes' perceptions of  
16 burnout. Findings from Study 2 supported this claim and revealed that HP for sport was  
17 positively associated with greater psychological need satisfaction that, in turn, was negatively  
18 associated with athletes' perceptions of burnout. It should be noted that OP was also  
19 positively associated with need satisfaction, although less so than HP. These findings are in  
20 line with the work from Li et al's. (2013) meta-analysis in the sport domain that showed that  
21 basic psychological need satisfaction is negatively related to athlete burnout.

22 Of additional interest, the positive role of OP in both conflict *and* need satisfaction  
23 underscores the complex nature of OP (see Vallerand, 2015), which is sometimes adaptive  
24 (through need satisfaction) and sometimes maladaptive (through conflict). Altogether,  
25 although OP may contribute to some extent to need satisfaction, its contribution was much

1 less than HP and its relationship with conflict was more important than that involving need  
2 satisfaction. As such, overall, OP seems to be more involved in the contribution of burnout  
3 than in its protection.

#### 4 **The Role of Passion for a Second Activity in Burnout**

5 A final implication of the present findings deals with the role of passion for a second  
6 activity in athletes' perceptions of burnout. The one key message here is that being passionate  
7 for a second activity does not necessarily make athletes' perceptions of burnout less likely.  
8 Rather, it depends on the *type* of passion that underlies activity engagement. Indeed, OP for a  
9 second activity was directly and positively associated with athletes' perceptions of burnout,  
10 whereas HP for a second activity was negatively associated with it. It should be noted that,  
11 based on past research (e.g., Martin & Horn, 2013; Trépanier, et al., 2014) which found a  
12 significant and positive relationship between OP and burnout and modification indices, a  
13 direct path from OP for the second activity to burnout ( $\beta = .19, p < .001$ ) was modeled a  
14 posteriori to exhibit the positive relationship between OP for the second activity and burnout.  
15 These findings are also in line with Schellenberg and Bailis (2015) who found that having OP  
16 for two activities leads to the most negative effects, whereas having a HP for two different  
17 activities is even more beneficial than having simply one HP.

18 Of importance is the finding that HP for a second activity was associated with lower  
19 athletes' burnout perceptions through the fulfillment of psychological need in sport *and* in the  
20 second activity. This new contribution provides support for the extended model on passion  
21 and burnout and adds to the present literature on passion and burnout in the sport context.  
22 Specifically, the present findings reveal that HP for a second activity may make athletes'  
23 perceptions of burnout less likely through its positive association with psychological need  
24 satisfaction both in sport and outside. In this regard, it should be noted that HP for the second  
25 activity displayed the strongest indirect effect on athlete burnout through need satisfaction in

1 the second activity (HP2 → NS2 → Burnout). This finding suggests that HP for a second  
2 activity *may* have an even stronger *protective* effect on athlete burnout through need  
3 satisfaction in the second activity than that of HP for sport through need satisfaction for sport.  
4 In other words, athlete burnout may be reduced by developing an HP for a second life  
5 activity. This is consistent with other research suggesting that burnout in sports is caused by  
6 both sport-related-stressors and stressors outside sport (e.g., Gustafsson et al., 2011a).  
7 Furthermore, although recovery was not measured in this research, this finding is in line with  
8 research from Donahue et al. (2012) who found that HP for work was positively associated  
9 with recovery experiences leading to lower levels of emotional exhaustion at work.

10 With regard to the cross-activity associations, one reason why HP for the second  
11 activity may facilitate psychological need satisfaction in sport has to do with the flexibility  
12 that HP entails (Vallerand, 2015). Contrary to OP, with HP one does not ruminate about the  
13 passionate activity when doing something else (Vallerand et al., 2003). This allows the person  
14 to fully engage in other activities and to derive psychological benefits from such engagement  
15 (Carpentier, Mageau, & Vallerand, 2012).

16 The present findings have practical implications for athletes, parents, coaches, and  
17 other sport participants regarding suggestions as to how to prevent or reduce burnout. A first  
18 one is to create a sport environment that facilitates HP. This may be done by supporting the  
19 autonomy and self-determination of athletes (Mageau et al., 2009), by focusing on mastery  
20 goals at the expense of performance approach and avoidance goals (Vallerand et al., 2007,  
21 2008), and by allowing athletes to use their strengths in the process of seeking growth  
22 (Dubreuil, Forest, & Courcy, 2014; Dubreuil et al., 2016). A second avenue to reduce burnout  
23 is to encourage athletes to engage in a second activity out of HP. Too often coaches and  
24 parents promote a tunnel vision of sports, do not support engagement in other activities, and  
25 encourage sport selection and specialization too early. To the contrary, the present findings

1 suggest that engagement in other activities is to be encouraged and promoted. Once one has  
2 engaged in sports and activities for several hours, it is time to engage in other fruitful and  
3 meaningful life activities. One will not be any worse for it, quite the contrary! Adaptive  
4 benefits may take place, especially if engagement in other activities is fueled by HP  
5 (Schellenberg & Bailis, 2015). Need satisfaction in other life pursuits should then make the  
6 sport training process more satisfying and less exhausting in the long term.

## 7 **Limitations**

8         Some limitations need to be considered. First, the two studies from this research used a  
9 cross-sectional design. Although past research using designs where passion was  
10 experimentally induced leads to the same findings as correlational designs (see Bélanger,  
11 Lafrenière, Vallerand, & Kruglanski, 2013; Lafrenière, Vallerand, & Sedikides, 2013), such  
12 manipulation was not used here and therefore causality cannot be inferred. Second, all data  
13 collected were self-report in nature, which increases the risk of common shared method  
14 variance among variables. To reduce the bias that such methodological practice induces,  
15 future research should use longitudinal designs as well as additional measures to complement  
16 athletes' self-report. For instance, athlete burnout may be assessed through informant reports  
17 such as the coach or the parents, or by using biological markers such as heart variability,  
18 serum or saliva cortisol (Deneva, Ianakiev, & Keskinova, 2019; Wekenborg et al., 2019).  
19 Third, the findings of Study 2 revealed that OP for a second activity was directly and  
20 positively related to athletes' perceptions of burnout. This finding suggests that it is likely that  
21 unidentified mediators were at play. Thus, future research should look at other mediating  
22 variables. One likely mediator may be the conflict (see Vallerand et al., 2003) experienced  
23 between the second passionate activity and other life domains. In addition, other research  
24 reveals that psychological need thwarting represents a predictor or certain maladaptive  
25 outcomes including burnout (Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011;

1 Warburton, Wang, Bartholomew, Tuff, & Bishop, 2019). Consequently, future research on  
2 the role of passion in burnout in sport may address this issue by examining need frustration in  
3 addition to need satisfaction. Finally, while the present research used a process model  
4 approach to the study of burnout, it should be noted that, recently, some passion researchers  
5 such as Schellenberg, et al. (2019) have begun to study how sub-types of passion relate with  
6 outcomes. Therefore, researchers are encouraged to use alternative approaches to offers  
7 complementary viewpoint and broader understanding of the passion-athlete burnout  
8 relationship.

9         Despite these limitations, the present findings suggest that OP may play a contributory  
10 role in athletes' burnout, whereas HP seems to play a protective role. Furthermore, the  
11 differential role of HP and OP in burnout seems to be mediated by psychological need  
12 satisfaction and conflict, respectively. Finally, of particular additional importance is the  
13 crucial finding that only HP for a second passionate activity may have a salutary protective  
14 effect against burnout. Indeed, OP for a second activity may even exacerbate burnout. Future  
15 research along those lines using the extended model on passion and burnout is encouraged in  
16 order to promote a better understanding and prevention of burnout in sport.

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**Table 1.** *Descriptive Statistics, Internal Reliabilities and Pearson Correlations for Variables (Study 1)*

	M	SD	1	2	3	4	5	6
1. HP	5.64	.92	(.80)					
2. OP	3.80	1.28	-.11	(.70)				
3. Total Burnout	2.68	.96	-.32**	.25**	(.85)			
4. Weekly hours of training	7.03	3.33	.04	.32**	-.02			
5. Weekly hours of work	32.52	13.91	.02	-.09	-.08	-.17*		
6. Age	33.91	10.23	.04	-.06	-.22**	.07	.33**	
7. Sex (0 = f; 1 = m)	-	-	-.18**	.14*	.12	.21**	.00	-.03

N = 224

\*  $p < .05$ , \*\*  $p < .01$ . Alphas of Cronbach are on the diagonal.

**Table 2.** Hierarchical Regression Analysis of Athlete Perceived Burnout on Age, Sex, Weekly Hours of Work and Training, and HP and OP (Study 1)

Step	Independent variables	$\beta$	$p$	t	95% CI
1	Age	-.20	< .01	-2,91	[-.032, -.006]
	Sex (0 = f; 1 = m)	.12	.07	1.82	[-.020, .517]
	Weekly hours of work	-.02	.76	-.31	[-.011, .008]
	Weekly hours of training	-.03	.63	-.48	[-.049, .029]
		$R^2 = .062$			
		$F(4, 219) = 3.59$			
2	Harmonious Passion for Sport	-.28	< .001	-4.46	[-.420, -.163]
	Obsessive Passion for Sport	.17	< .001	3.50	[.074, .267]
		$R^2 = .196$			
		$\Delta R^2 = .13$			
		$F(2, 217) = 18.09$			

N = 224.

CI = Confidence Interval.

**Table 3.** Descriptive Statistics, Internal Reliabilities and Pearson Correlations for Variables (Study 2)

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. HP for sport	5.87	.75	(.73)												
2. OP for sport	3.34	1.31	.21**	(.83)											
3. HP for 2 <sup>nd</sup> activity	5.74	.94	.40**	-.12*	(.82)										
4. OP for 2 <sup>nd</sup> activity	2.80	1.39	-.11*	.08	.17**	(.84)									
5. NS in sport	5.45	.66	.49**	.24**	.29**	-.06	(.68)								
6. NS in 2 <sup>nd</sup> activity	5.47	.85	.26**	-.17**	.58**	.08	.21**	(.79)							
7. Conflict	3.58	1.37	-.08	.52**	-.22**	.05	.05	-.21**	(.82)						
8. Total Burnout	2.77	1.00	-.29**	.12**	-.23**	.18**	-.23**	-.28**	.26**	(.85)					
12. Weekly hours of training	8.68	4.90	.12*	.16**	-.09	-.05	.10	-.14*	.22**	.14*	.24**	.06	.03	-	
13. Age	39.00	12.37	.02	-.13*	.06	-.13	.03	.11*	-.20**	-.19**	.21**	-.10	-.16**	-.05*	-
14. Sex (0 = f; 1 = m)	-	-	-.10	.04	-.07	.14*	-.01	-.04	.04	.02	.02	.01	.02	.15**	.03

N = 316.

\*  $p < .05$ , \*\*  $p < .01$ . Alphas of Cronbach are on the diagonal.

**Table 4.** *Bootstrap Estimates and 95% Confidence Intervals of the Effects of Type of Passion on Athlete Burnout through Conflict, Need Satisfaction in Sport, and Need Satisfaction in a Second Activity. (Study 2)*

Paths	$\beta$	95% CI	p
<b>HP1</b>			
Total indirect effect	-.13	[-.19, -.07]	p < .001
Specific indirect effect (HP1 → Conflict → Burnout)	-.04	[-.08, -.02]	p < .01
Specific indirect effect (HP1 → NS1 → Burnout)	-.07	[-.13, -.03]	p < .01
Specific indirect effect (HP1 → NS2 → Burnout)	-.02	[-.05, .00]	p > .05
<b>OP1</b>			
Total indirect effect	.09	[.02, .17]	p < .01
Specific indirect effect (OP1 → Conflict → Burnout)	.10	[.05, .17]	p < .001
Specific indirect effect (OP1 → NS1 → Burnout)	-.04	[-.07, -.01]	p < .05
Specific indirect effect (OP1 → NS2 → Burnout)	.03	[.01, .06]	p < .05
<b>HP2</b>			
Total indirect effect	-.14	[-.21, -.08]	p < .001
Specific indirect effect (HP2 → NS1 → Burnout)	-.03	[-.08, -.01]	p < .05
Specific indirect effect (HP2 → NS2 → Burnout)	-.11	[-.18, -.05]	p < .01
<b>OP2</b>			
Direct effect (OP2 → Burnout)	.19	[.08, .30]	p < .01
Total indirect effect	.01	[-.02, .04]	p = .54
Specific indirect effect (OP2 → NS1 → Burnout)	.01	[-.01, .04]	p = .32
Specific indirect effect (OP2 → NS2 → Burnout)	-.00	[-.03, .02]	p = .88
<b>Hours of Training</b>			
Direct effect (Hours of Training → Burnout)	.10	[-.01, .22]	p = .14
Specific indirect effect (Hours of Training → Conflict → Burnout)	.03	[.01, .06]	p < .05

Note. HP1 = Harmonious Passion for Sport; OP1 = Obsessive Passion for Sport; HP2 = Harmonious Passion for a Second Activity; OP2 = Obsessive Passion for a Second Activity; NS1 = Need Satisfaction in Sport; NS2 = Need Satisfaction in a Second Activity; CI = Confidence Interval.

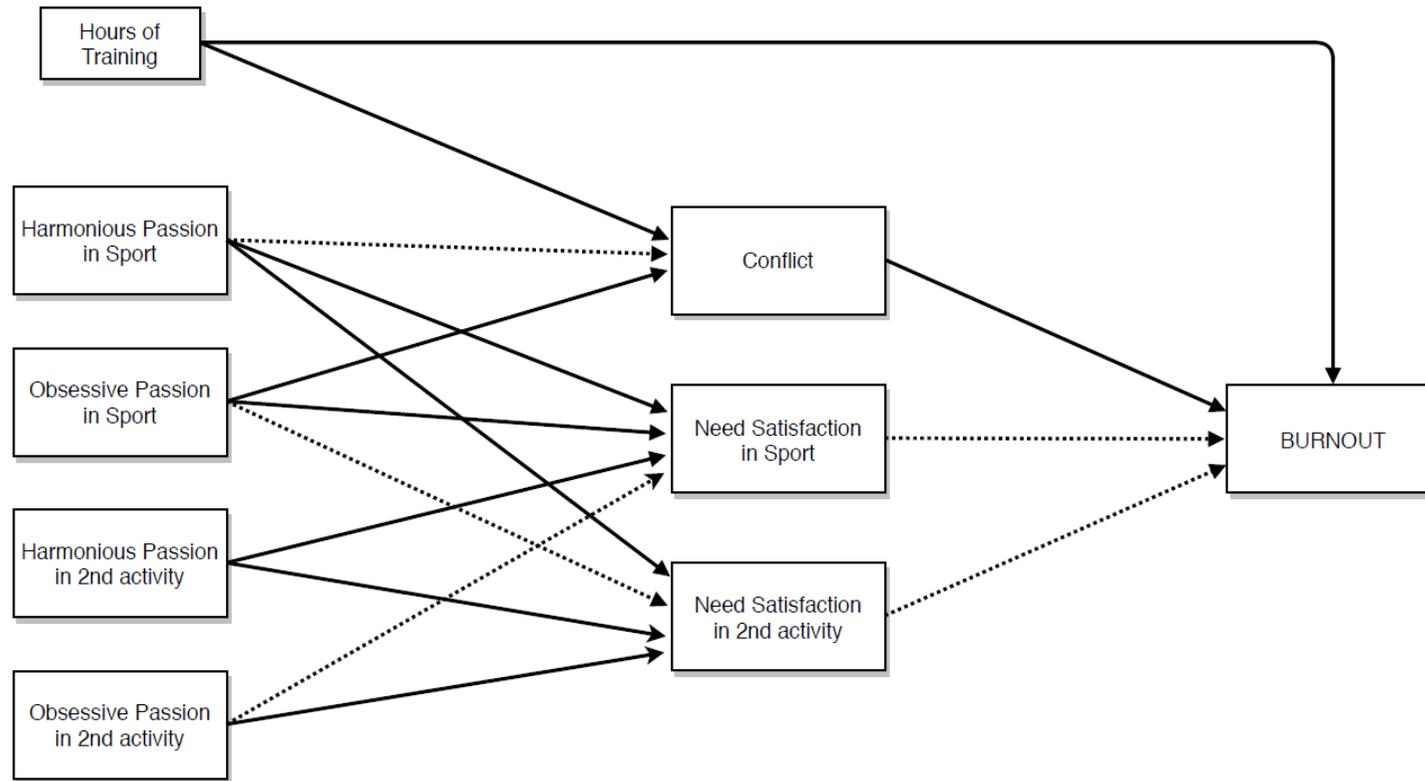


Figure 1.

Hypothesized path model of passion, basic psychological need satisfaction, conflict, and athlete burnout.

Note. dashed lines indicate a hypothesized negative relationship; the un-dashed line indicates a positive relationship.

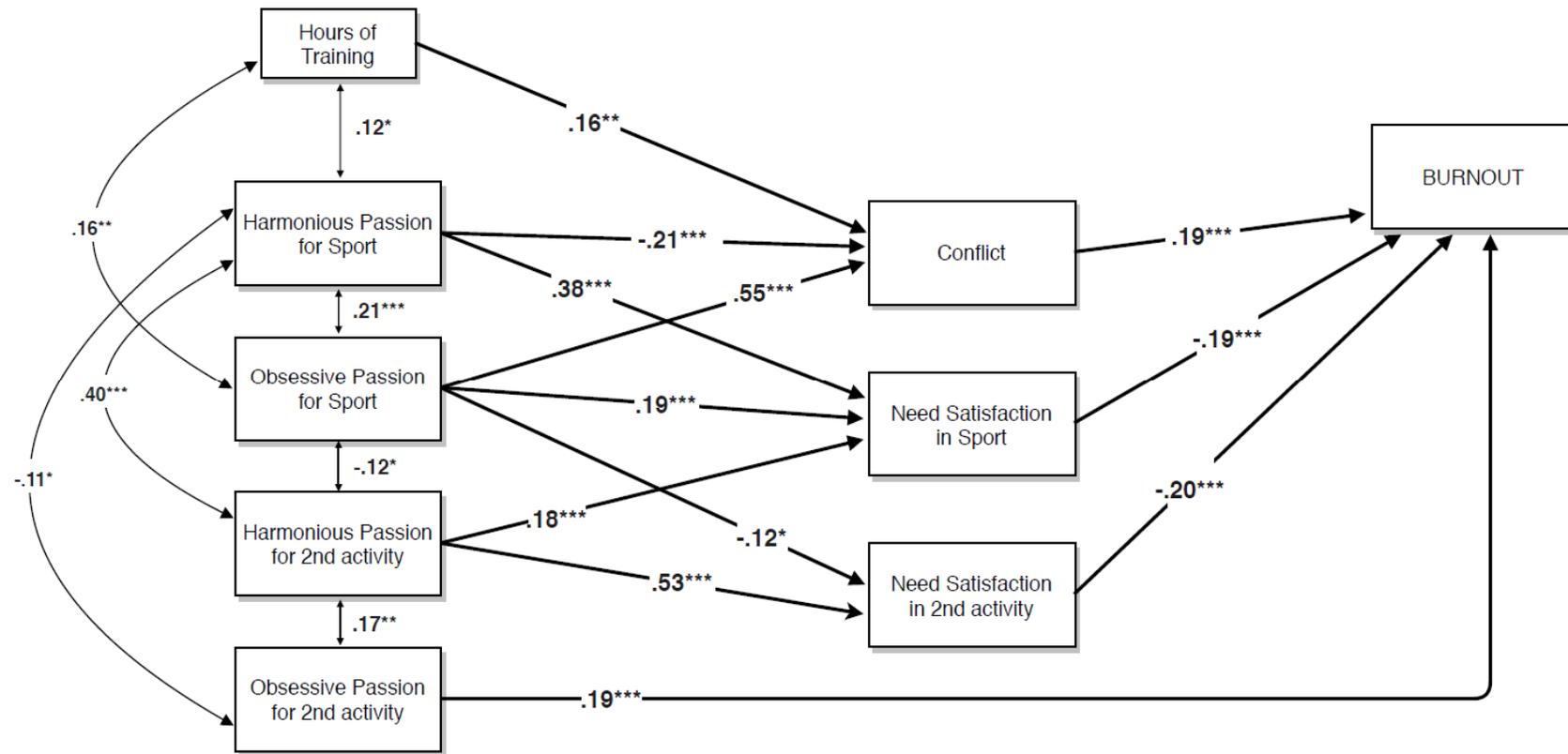


Figure 2.

Path analysis of the relationship involving weekly hours of training, passion, need satisfaction, conflict and athlete burnout (Study 2). Path coefficients are presented as standardized coefficients.

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

PASSION AND ATHLETES' PERCEPTIONS OF BURNOUT

**Highlights**

- Passion for sport and for a second activity are associated with burnout in athletes.
- Harmonious and obsessive passion have opposite effect on athlete burnout.
- Conflict positively mediates the passion-burnout relationship.
- Need satisfaction negatively mediates the passion-burnout relationship.
- The role of a second passionate activity in athlete burnout is novel finding.

## Declaration of Interest

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

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