

The two roads from passion to sport performance and psychological well-being: The mediating role of need satisfaction, deliberate practice, and achievement goals



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ABSTRACT

Objectives: Research on passion has demonstrated the existence of two roads toward sports performance through the effects of deliberate practice (Vallerand et al., 2007, 2008). The first emanates from harmonious passion (HP) and contributes to both performance and psychological well-being. The second stems from obsessive passion (OP), and performance comes at the cost of well-being. The present research proposes that need satisfaction (Deci & Ryan, 2000) mediates the relation of HP, but not OP, with both outcomes. In Study 2, achievement goals were added to the model. Mastery goals were expected to mediate the positive relation between HP and outcomes, whereas performance-avoidance goals would be associated with OP and, thus be detrimental to athletes.

Design: Two studies using correlational (Study 1) and longitudinal (Study 2) designs.

Method: Study 1 ($N = 172$) was conducted with soccer players. Study 2 was conducted with hockey players ($N = 598$). Athletes completed measures of passion, need satisfaction, life satisfaction, deliberate practice, and achievement goals (Study 2 only). Coaches assessed performance in Study 1. Study 2 used games played in competitive leagues over 15 years to measure performance.

Results: Analyses using SEM provided support for the mediating role of need satisfaction (Study 1 and 2) and achievement goals (Study 2) in the relation of HP with outcomes. In contrast, deliberate practice (Study 1 and 2) mediated the relation between OP and performance.

Conclusions: This research supported the mediating role of need satisfaction in the “two roads to performance” (Vallerand et al., 2007, 2008).

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Scientists in the field of expert performance have long identified deliberate practice as key in the attainment of high performance in sport (Ericsson & Charness, 1994; Starkes & Ericsson, 2003). Deliberate practice entails highly structured practice aimed specifically at the improvement of certain skills. Such practice is not always enjoyable, as it often involves practicing through setbacks, pain, and injuries. Passion leads athletes to actively pursue their quest to attain performance in sport, spending a great amount of time practicing in order to deliberately enhance their skills (Vallerand et al., 2007, 2008). Engaging in a sport in such an intense manner often leads to positive outcomes, such as high levels of

performance and psychological well-being. Nonetheless, the pursuit of performance can also lead to negative outcomes for athletes, especially regarding their psychological well-being. According to self-determination theory (SDT; Deci & Ryan, 2000), the satisfaction of the basic psychological needs of autonomy, competence, and relatedness is key to better understand how athletes attain high levels of performance while also maintaining their psychological well-being. The present research proposes that the two types of passion take different roads to performance and psychological well-being, through the mediating effects of the satisfaction of basic psychological needs, deliberate practice (Studies 1 and 2) and also achievement goals (Study 2). Moreover, the current research uses two distinct measures of performance to assess the predictive power of the aforementioned variables both on short term (during a tournament – Study 1) and over the course of a career (nearly 15 years – Study 2).

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1. The dualistic model of passion

The dualistic model of passion (DMP; Vallerand, 2015; Vallerand et al., 2003) defines passion as a strong inclination toward an activity that is important, liked, and in which a significant amount of time and energy is invested. This model further proposes the existence of two dimensions of passion. Important theoretical and empirical support for the differentiation of harmonious passion (HP) and obsessive passion (OP) has been gathered over the past decade. These two types of passion can be distinguished in terms of how the passionate activity is regulated and integrated with other life domains. With HP, the process of internalization of the activity in the self occurs in an autonomous fashion. Thus, individuals with HP freely accept and engage in their passionate activity without any contingency attached to it (Mageau, Carpentier, & Vallerand, 2011; Vallerand et al., 2003). The activity thus occupies a significant, but not overpowering, space in one's identity and remains under the control of the individual. Consequently, this activity is in harmony with other important life aspects.

With OP, the process of internalization of the activity in the self occurs in a controlled way, as it originates from intra- and/or interpersonal pressures. Thus, the activity becomes a part of one's identity because it brings some extrinsic benefits, such as a boost of self-esteem or a reward (Lafrenière, Vallerand, & Sedikides, 2013; Mageau et al., 2011). With OP, individuals face an uncontrollable urge to partake in the activity they love and find enjoyable, as activity engagement is beyond their control. Since everything gravitates around the activity, OP is associated with rigid persistence, even when activity engagement is detrimental to other goals or activities in the person's life (Vallerand et al., 2003). Researchers have shown that HP is generally associated with more adaptive cognitive, affective, relational and behavioral outcomes compared to OP (see Curran, Hill, Appleton, Vallerand, & Standage, 2015; Vallerand, 2010, 2015 for reviews).

1.1. Passion and the “two roads to performance” in sports

In order to reach high levels of performance, an active learning process where the goal focuses on skill improvement is necessary (Ericsson & Charness, 1994). Deliberate practice, defined as a highly structured activity motivated by the explicit aim of improvement, is thus key in order to reach high levels of performance. Interestingly, researchers have shown the existence of a positive linear relationships between accumulated team and individual deliberate practice and the skill level of international, national, and state/provincial athletes (e.g., Baker, Cote, & Abernethy, 2003; Helsen, Hodges, Van Winckel, & Starkes, 2000; Starkes & Ericsson, 2003). Passion represents a motivational force providing the necessary resources to engage in the deliberate practice activities that are essential to reach expert-level performance. Passion for sport, by being a highly important and valued activity in athletes' lives, is thus key in the process of energizing athletes, allowing them to engage in their deliberate practice activities that consequently lead to performance. Past research has supported these claims by showing the mediating role of deliberate practice in the relation between passion and performance in various domains, including sport (Bonneville-Roussy, Lavigne, & Vallerand, 2011; Vallerand et al., 2007, Studies 1 and 2, Vallerand et al., 2008, Study 2).

Moreover, these studies have demonstrated that passion can go beyond performance to facilitate other outcomes, such as psychological well-being. In what they called “the two roads to performance”, Vallerand et al. (2007, 2008) demonstrated that in addition to its positive relation with deliberate practice and subsequent performance, HP is also positively associated with indicators of psychological well-being, such as life satisfaction. Conversely, the

mentioned studies have shown that for OP, performance comes at the cost of lower levels of psychological well-being (see Bonneville-Roussy et al., 2011; Vallerand et al., 2007, Studies 1 and 2; Vallerand et al., 2008, Study 2). Researchers in several other achievement-oriented domains, such as work, music, and academia, have replicated these findings and repeatedly shown that HP was positively, but OP either negatively or non-significantly, associated with indicators of psychological well-being such as life satisfaction (see Vallerand, 2015 for a review). Life satisfaction in athletes is especially important as it represents a cognitive evaluation of athletes' global life judgement (Diener, Suh, Lucas, & Smith, 1999). Consequently, life satisfaction is a key outcome of the present research, along with performance.

In addition to deliberate practice, the mediating role of achievement goals in the two roads to performance has been the focus of past research (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). Defined as mental representations of an object that a person is committed to approach or to avoid (Elliot & Church, 1997), achievement goals stem from either the motive to attain success (approach goals) or to avoid failure (avoidance goals). These goals can take various forms depending on whether people strive to master the requirements of a situation (mastery goals), outperform competitors (performance-approach goals), or avoid demonstrating incompetence by not performing poorly relative to others (performance-avoidance goals). Considering that passion is conducive to an important investment in sport, athletes should pursue achievement goals. Researchers have shown that achievement goals differ as a function of the type of passion. Specifically, it has been shown that HP triggers the adaptive goal of mastering achievement-related activities, while being unrelated to either type of performance goals (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). On the other hand, OP is a more controlled and pressuring form of engagement in sport that should be related to a more conflicted regulatory process. Consequently, OP was found to relate positively to all three goals, but mostly to performance-avoidance and performance-approach goals.

So far, researchers have mainly focused on deliberate practice and achievement goals to better understand the differential relation of HP and OP with performance and psychological well-being. The present research proposes that need satisfaction, as described by the SDT, also plays a pivotal role in understanding the relation between passion, psychological well-being, deliberate practice, and performance.

2. Passion and need satisfaction in sport

SDT proposes that the satisfaction of the basic psychological needs of autonomy (a desire to feel a sense of personal initiative), competence (a desire to interact effectively with the environment), and relatedness (a desire to feel connected to significant others) is key in understanding the quality of one's adjustment, both in terms of performance and psychological well-being (Ryan & Deci, 2000). Indeed, the satisfaction of the three basic needs has been associated with a range of positive outcomes, including psychological well-being (Tay & Diener, 2011) and performance (Baard, Deci, & Ryan, 2004). A few individual difference variables are associated with whether individuals succeed in satisfying these needs or not. The passion individuals have toward an activity, such as sport, has the potential to be one of them (see Vallerand, 2015).

For passionate athletes, engaging in sport provides feelings of autonomy as it reflects one's identity. Furthermore, passionate athletes who train and play frequently come to gain skills and develop feelings of competence along the way. Finally, sport provides opportunities for athletes to have significant relationships with others involved in their sport, such as teammates and coaches.

Thus, athletes are likely to experience need satisfaction in their sport, especially when their passion is harmonious in nature. This is because HP stems from an autonomous internalization of the sport that they dearly love within the self and identity. Thus, the involvement of athletes in their favorite sport is completely in line with their core values. Athletes with HP consequently experience a greater perception of volition and personal causation (Vallerand et al., 2003), competence (Vallerand et al., 2008), and satisfaction with inter-personal relationships (Akehurst & Oliver, 2014). Past research has provided support for the positive relation between HP and need satisfaction in the sport and exercise domains (Akehurst & Oliver, 2014; Curran, Appleton, Hill, & Hall, 2013; Parastatidou, Doganis, Theodorakis, & Vlachopoulos, 2012), as well as in other life domains (Houlfort et al., 2015; Przybylski, Weinstein, Ryan, & Rigby, 2009).

However, past research has yielded mixed evidence regarding the relation between OP and need satisfaction (Curran et al., 2015). The DMP proposes that passionate individuals have opportunities to satisfy their psychological needs within the purview of their activity (Lalande et al., in press). This is the case even with OP, albeit to a lesser extent than HP (Vallerand, 2015). This is because, for passionate athletes, sport reflects part of their identity and can thus provide feelings of autonomy. Moreover, engaging regularly in sport can lead athletes to increase their skills, and subsequently, their feelings of competence. Athletes also have opportunities to experience feelings of relatedness when their sport is practiced with others, as is the case with team sports. With OP however, involvement in sport stems in part from intra and/or interpersonal pressures in order to maintain or obtain contingencies, such as feelings of self-worth and rewards (Mageau et al., 2011). Thus, with OP athletes are also likely to feel compelled to practice or play, insecure about their competence, and to experience personal relationship problems. Consequently, past research has led to equivocal conclusions regarding the relation between OP and need satisfaction. Indeed, studies have shown this relationship to be positive (Akehurst & Oliver, 2014; Lalande et al., in press; Parastatidou et al., 2012), negative (Houlfort et al., 2015; Przybylski et al., 2009), or even non-significant (Curran et al., 2013).

3. The present research

In line with the above, the purpose of the present research was to examine the mediating role of need satisfaction in the two roads to performance that stem from HP and OP (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). First, it was expected that HP would be positively related to need satisfaction. Second, given the mixed evidence of past research and the results of a recent meta-analysis (Curran et al., 2015), OP was expected to be unrelated to need satisfaction. Third, it was hypothesized that need satisfaction would be positively related to both life satisfaction and deliberate practice. Fourth, it was proposed that deliberate practice would predict athletes' performance.

Regarding the mediating effects, it was proposed that need satisfaction would mediate the positive relation of HP with life satisfaction, deliberate practice, and performance. It was also hypothesized that need satisfaction would not significantly mediate the relation between OP and these outcomes. Rather, it was hypothesized the OP would be directly and positively associated with deliberate practice that, in turn, would be positively associated with performance. It was also hypothesized that OP would be negatively and directly associated with life satisfaction.

This basic model was tested in two studies. Study 1 tested the

proposed model with soccer players using a cross-sectional design. Study 2 sought to replicate the results of Study 1 by using a longitudinal design and following hockey¹ players' objective performance over several years. In Study 2, we also sought to examine whether achievement goals mediated the relation between passion and the satisfaction of psychological needs and thus to life satisfaction, deliberate practice, and performance.

4. Study 1

The purpose of Study 1 was to assess the mediating role of need satisfaction in the relation between passion and life satisfaction, deliberate practice, and performance in a sample of soccer players. In line with the above reasoning, it was expected that HP would be positively associated with need satisfaction. Consequently, need satisfaction would be positively related to deliberate practice and life satisfaction. In contrast, OP was hypothesized to be unrelated to need satisfaction, but to be directly and positively associated with deliberate practice. In turn, deliberate practice was expected to be positively associated with performance. Moreover, it was hypothesized that OP would be directly and negatively related to life satisfaction.

5. Method

5.1. Participants and procedures

Participants were 172 soccer players (122 males, 50 females), with a mean age of 14.61 years ($SD = 1.63$ years). They were recruited just before mid-season, during an important indoor soccer tournament at the provincial level. An agreement with the tournament organizers and the coaches of each team was made prior to the tournament. Players and coaches were told that the purpose of the study was to better understand athletes' attitudes toward soccer. Participation was voluntary and both coaches and athletes signed a consent form. The questionnaires were completed in a supervised classroom, prior to the teams' first game of the tournament.

5.2. Measures

5.2.1. Passion

Athletes' passion was assessed using the Passion Scale (Marsh et al., 2013; Vallerand et al., 2003) adapted to soccer. Two 6-item subscales were used to assess harmonious (e.g., "Playing soccer is in harmony with other things that are part of me"; $\alpha = 0.81$) and obsessive (e.g., "I have difficulties controlling my urge to play soccer, $\alpha = 0.85$) passion. All items were answered using a seven-point scale ranging from 1, 'I do not agree at all' to 7, 'I strongly agree'.²

5.2.2. Need satisfaction

A short 6-item questionnaire adapted from Deci and Ryan (2000) was used to assess athletes' autonomy (e.g., "I feel free to act and think the way I want"), competence (e.g., "I feel competent") and relatedness (e.g., "I feel appreciated by others, such as my teammates and coaches"). These items were aggregated to form a single indicator of basic psychological need satisfaction ($\alpha = 0.56$). Given that the alpha of Cronbach was low, a factor analysis was conducted. Results showed that one item (i.e., "I feel pressured to act or think in certain ways" – reverse coded) did not load adequately on the need satisfaction factor and was thus removed.

¹ Throughout the manuscript, the term "hockey" refers to ice hockey.

² The same Likert scale was used for all instruments used throughout the manuscript, unless otherwise indicated.

The Cronbach alpha was satisfactory after removing this item ($\alpha = 0.75$). Results of a Confirmatory Fit Analysis (CFA) also supported the unifactorial structure of the scale used in this study: MLR χ^2 ($df = 4$, $N = 172$) = 4.849, $p = 0.303$, CFI = 0.995, TLI = 0.987, RMSEA = 0.035 (0.000, 0.125), SRMR = 0.025.

5.2.3. Deliberate practice

Deliberate practice was assessed by asking athletes the amount of hours per week they spent training on soccer specific skills, outside of the regular training sessions. Athletes were asked to report only the number of hours they spent training individually during their free time to enhance specific abilities related to soccer. Past research has shown that this type of practice contributes greatly to performance in sports (Helsen, Starkes, & Hodges, 1998; Helsen et al., 2000). In team sports such as soccer, individual practice is proposed to be of great importance in order to differentiate athlete's level of performance. This is because players generally engage in the same number of hours in team practice per week in team sports. Moreover, since coaches assessed athletes' performance in this study, it was deemed important to ensure that coaches did not attribute higher levels of performance solely to athletes who work hard in their presence. Thus, focusing on individual deliberate practice where players independently engage in training outside the supervision of their coaches enabled for the control of this potential methodological confound. Other researchers in the field of the study of deliberate practice have used a similar methodology (Krampe & Ericsson, 1996).

5.2.4. Life satisfaction

The five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used to assess the level of satisfaction with one's global life (e.g., "The conditions of my life are excellent"; $\alpha = 0.84$).

5.2.5. Performance

Coaches were asked to evaluate the performance of their athletes on a scale ranging from 0 (very poor performance) to 100 (outstanding performance). To obtain an indicator of performance, each coach was asked to provide an overall assessment of the athletes' performance since the beginning of the season. Coaches were told to "Rate each of [their] players' performance since the beginning of the season on the following scale." Coaches were informed that 60/100 should be considered as the passing grade (see Vallerand et al., 2008, Study 1 for the use of a similar performance scale).

5.3. Data analysis

Prior to analyses, all variables included in the subsequent path analyses were examined for accuracy of data entry, missing data, and fit between their distributions and the assumptions underlying maximum likelihood procedures (Tabachnick & Fidell, 2007). Descriptive statistics and bivariate correlation are reported in

Table 1. All structural equation modeling analyses in the present study were performed on a raw data file using robust maximum likelihood estimation (MLR) procedures with MPLUS 7.3 (Muthén & Muthén, 2012) because this method is robust to potential deviations in normality. Indirect effects were tested using the bias-corrected bootstrap method (5000 samples with 95% bias-corrected confidence intervals (CIs)) using the maximum likelihood procedure (ML) because bootstrapping is unavailable using MLR estimation. The following fit indices were thus given priority in model evaluation: the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR). According to Kline (2011) and Tabachnick and Fidell (2007), the CFI and TLI should be 0.95 or higher, while the RMSEA and SRMR should be 0.06 or lower for acceptable model fit.

6. Results

As shown in Fig. 1, all predicted paths were statistically significant at the $p < 0.05$ level. Results revealed that HP positively predicted need satisfaction ($\beta = 0.51$, $p < 0.001$), and life satisfaction ($\beta = 0.42$, $p < 0.001$). OP was unrelated to need satisfaction. Instead, OP was directly and positively associated with deliberate practice ($\beta = 0.27$, $p < 0.001$). However, the OP was negatively, but non-significantly related to life satisfaction ($\beta = -0.16$, $p = 0.052$). Need satisfaction was positively related to life satisfaction ($\beta = 0.21$, $p = 0.008$) and deliberate practice ($\beta = 0.15$, $p = 0.043$). Finally, deliberate practice ($\beta = 0.14$, $p = 0.019$) and need satisfaction ($\beta = 0.16$, $p = 0.033$) were both positively related to athletes' performance, as evaluated by their coach. Overall, the proposed model had an excellent fit to the data: MLR χ^2 ($df = 5$, $N = 172$) = 4.869, $p = 0.432$, CFI = 1.000, TLI = 1.000, RMSEA = 0.000 (0.000, 0.105), SRMR = 0.029.

The second aim of this study was to assess the mediating role of need satisfaction and deliberate practice in the relation between passion and outcomes for athletes. The hypothesized model allowed for the partitioning of the total relationship between passion and outcomes into specific indirect effects. Detailed results are reported in Table 2. First, results of indirect effects provided support for the mediating role of need satisfaction in the relation between HP and performance. However, the combined indirect effects of need satisfaction and deliberate practice were not significant. Notwithstanding, these results provide support for the mediating role of need satisfaction in the relation between HP and deliberate practice. The results also provided support for the mediating role of need satisfaction in the relation between HP and life satisfaction. Finally, results of the indirect effect of deliberate practice on the relation between OP and performance failed to reach statistical significance ($p = 0.073$). Thus, although it approached significance, the mediating role of deliberate practice in the relation between OP and performance was not supported.

Table 1
Descriptive statistics and bivariate correlations – study 1.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Harmonious Passion	6.04	0.77	0.81					
2. Obsessive Passion	4.24	1.43	0.44**	0.85				
3. Need Satisfaction	5.59	1.05	0.51**	0.15*	0.75			
4. Life Satisfaction	5.82	0.85	0.45**	0.06	0.40**	0.84		
5. Deliberate Practice (Hours)	6.43	2.94	0.18*	0.30**	0.19*	0.14	–	
6. Performance (Coach)	77.77	11.78	0.18*	0.16*	0.18*	0.17*	0.18*	–

Note. * $p < 0.05$, ** $p < 0.01$. Alphas of Cronbach are on the diagonal.

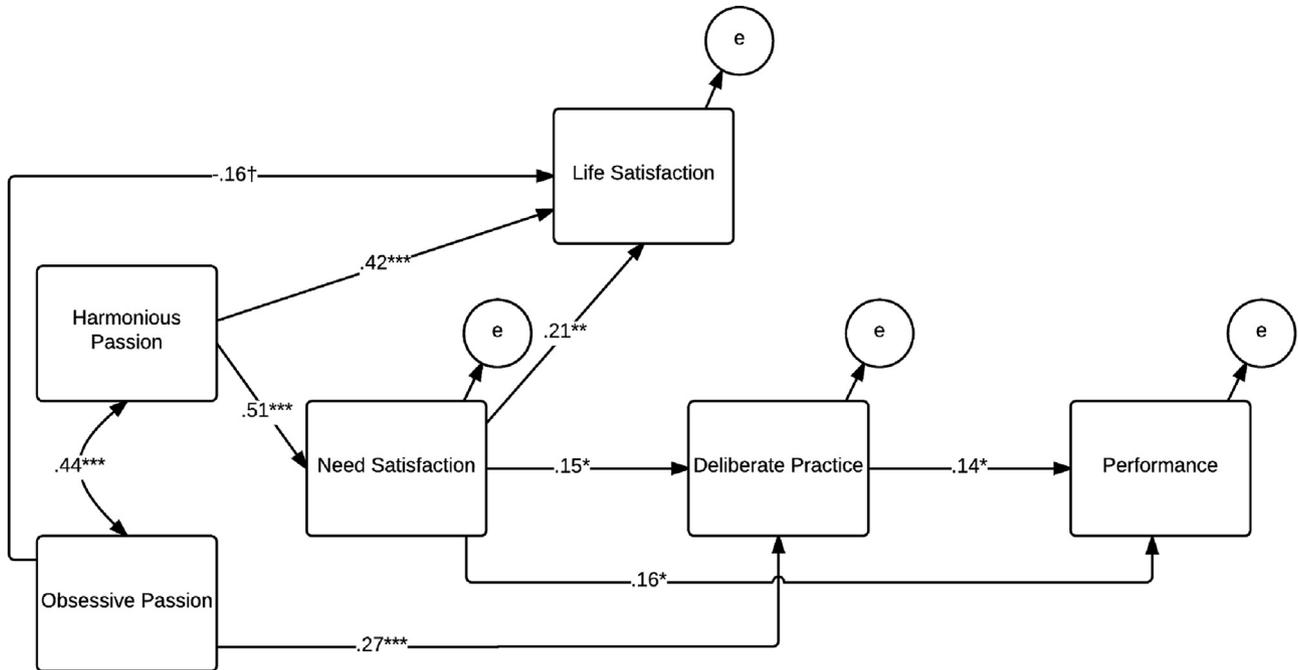


Fig. 1. Final model of the relationship involving passion, need satisfaction, life satisfaction, deliberate practice, and performance, rated by coaches. Note. †*p* < 0.06, **p* < 0.05, ***p* < 0.01, ****p* < 0.001.

Table 2

Mediation of the effects of harmonious and obsessive passion on life satisfaction, deliberate practice, and performance through need satisfaction and deliberate practice – study 1.

Harmonious Passion to Outcome		Indirect Effect	<i>p</i>	95% CI	
Mediating Variables				Lower	Upper
Life satisfaction	Need satisfaction	0.108	0.016	0.020	0.196
Deliberate practice	Need satisfaction	0.077	0.047	0.001	0.153
Performance	Need satisfaction	0.080	0.048	0.001	0.160
	Need satisfaction → Deliberate practice	0.011	0.165	–0.005	0.027
Obsessive Passion to Outcome		Indirect Effect	<i>p</i>	95% CI	
Mediating Variable				Lower	Upper
Performance	Deliberate practice	0.039	0.073	–0.004	0.082

6.1. Brief discussion

Results of Study 1 provided support for the mediating role of need satisfaction in the relation between HP and life satisfaction, deliberate practice, and performance in sport. This was evidenced by the results of Study 1 that demonstrated that need satisfaction mediated the relation between HP and performance, over and above the effects of deliberate practice. Moreover, Study 1 showed that need satisfaction did not mediate the relation between OP and life satisfaction, deliberate practice, or performance. Rather, OP was directly related to deliberate practice that in turn, predicted higher levels of performance.

Overall, the results of Study 1 offered support for the proposed hypotheses and contribute to the understanding of the relation among passion, life satisfaction, deliberate practice, and performance by showing the key role of need satisfaction as mediating variable. However, as passion leads athletes to be deeply involved in their sport, they are also likely to set achievement goals (Elliot & Church, 1997). Researchers have looked at the mediating role of achievement goals in the two roads from passion to performance (e.g., Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). Yet, no empirical attention has been attributed to the mediating role of need satisfaction in the relation of achievement goals with

deliberate practice and performance. Thus, more research was warranted to explore if need satisfaction acts as a mediator in the model proposed by past research, and if these associations also hold over a long period of time.

7. Study 2

Study 2 had two main objectives. The first aim was to examine the role of an additional mediating variable that could intervene in the relations observed in Study 1, namely achievement goals. Second, Study 2 also sought to examine if the proposed model would predict performance over several years of an athlete's career.

The theoretical associations between achievement goals and SDT have been discussed in the past (e.g., Hagger & Chatzisarantis, 2008; Hein & Hagger, 2007). Specifically, authors have proposed that mastery-approach goals are likely to foster the satisfaction of basic needs. This is because such goals lead to the desire to master skills, improve technique, and enhance competence in a self-referenced fashion. In the process, athletes are also more likely to feel more autonomous and even develop stronger bonds with others, such as teammates and coaches (i.e., higher levels of relatedness). In contrast, performance-approach goals are more likely to have a conflicted impact on athletes' need satisfaction. This is

because performance-approach goals are associated with a tendency to view success and failure in a normative fashion. Consequently, such goals are likely to bolster one's need satisfaction, especially when normative success is achieved. However, the attainment of normative standards of performance as a necessary condition for goal attainment is likely to undermine athletes' sense of autonomy, due to the pressure to outperform others. Moreover, as other athletes are likely to be perceived as threats to goal attainment, performance-approach goals are not likely to contribute to the development or maintenance of significant relationships with other athletes (i.e., lower relatedness). As for performance-avoidance goals, they are proposed to relate negatively to need satisfaction. This is because of the controlling and non-proactive nature of performance avoidance goals. Such goals put the focus on avoiding demonstrating inferiority compared to other athletes, thereby leading athletes to feel more controlled and pressured. Relatedness and competence are also likely to be thwarted by performance avoidance goals, as others are perceived as threats that have to be defeated for one's sense of competence to be fulfilled.

In sum, it was hypothesized that mastery-approach goals would be positively related to need satisfaction, while performance-avoidance goals are hypothesized to be related negatively to the satisfaction of athletes' basic psychological needs. In contrast, no specific hypothesis was proposed regarding performance-approach goals, as they are susceptible to either foster or hinder athletes' psychological needs. This is because goal attainment is instrumental to need satisfaction with performance-approach goals (Hagger & Chatzisarantis, 2008; Hein & Hagger, 2007).

In line with the above and with past research (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008), Study 2 sought to determine if achievement goals would mediate the relation between passion and need satisfaction in order to better explain its relation with performance and psychological well-being in a large sample of hockey players. In sum, the following model was tested. First, it was hypothesized that HP and OP would be positively related to mastery goals. OP was expected to be positively related to performance-approach and performance-avoidance goals, as well as to deliberate practice. In turn, mastery and performance-avoidance goals were hypothesized to be positively and negatively related to need satisfaction and life satisfaction, respectively. In contrast, it was hypothesized that performance-approach would be unrelated to need satisfaction. It was then hypothesized that need satisfaction would be positively related to life satisfaction, deliberate practice and performance. Finally, deliberate practice was hypothesized to positively predict performance.

8. Method

8.1. Participants and procedures

Participants were 835 elite male hockey players of Midget and Junior levels, with a mean age of 16.56 years ($SD = 1.41$ years).³ The athletes were recruited during the training camps of the 2000–2001 season and completed the questionnaire after a practice that was held during the selection camp of the aforementioned season. However, 237 participants were removed from our final sample since they did not complete the achievement goals scale.

³ Part of this sample was used by Amiot, Vallerand, and Blanchard (2006) for the purpose of examining the relation between passion and psychological adjustment, as well as by Gaudreau, Amiot, and Vallerand (2009) to examine trajectories of affective states. No prior publication has looked at the role of passion in performance data that was collected years later.

Thus, the final sample was composed of 598 athletes.

8.2. Measures

8.2.1. Passion

Athletes' passion toward hockey was assessed using the Passion Scale (Vallerand et al., 2003). Participants were asked to complete the items with respect to hockey. Two 7-item subscales were used to assess harmonious (e.g., "Playing hockey is in harmony with other things that are part of me"; $\alpha = 0.73$) and obsessive (e.g., "I have difficulties controlling my urge to play hockey", $\alpha = 0.87$) passion. However, results of a factor analysis revealed that one item of the HP subscales suffered from cross-loading issues with the OP subscale and was thus removed from analyses. Results of a Confirmatory Factor Analysis (CFA) supported the structure of the scale used in this study: MLR χ^2 ($df = 58$, $N = 829$) = 189.37, $p < 0.001$, CFI = 0.954, TLI = 0.938, RMSEA = 0.052 (0.044, 0.061), SRMR = 0.043.

8.2.2. Achievement goals

The 12 items Achievement Goals Scale (Elliot & Church, 1997) was used to assess mastery-approach (e.g., "I desire to master completely the task at hand", $\alpha = 0.79$), performance-approach (e.g., "It is important for me to do better than the others", $\alpha = 0.90$) and performance-avoidance (e.g., "I just want to avoid doing a performance worse than other", $\alpha = 0.72$) goals of athletes in relation with hockey.

8.2.3. Need satisfaction

The need for autonomy was assessed using the 4-item (e.g., "Hockey really fits with my choices and my tastes", $\alpha = 0.63$) version of the *Perceived Autonomy in Life Domains Scale* (Blais, Vallerand, & Lachance, 1990). A 4-item version of the *Perceived Competence in Life Domains Scale* (Losier, Vallerand, & Blais, 1993) was adapted to hockey and used in order to assess competence (e.g., "I feel effective in all aspects of my sport", $\alpha = 0.77$). Finally, relatedness was assessed using a 5-item (e.g., "I feel supported in my relationships with other players", $\alpha = 0.88$) version of the *Perceived Relatedness Scale* (Richer & Vallerand, 1998). Athletes were asked to rate the extent to which the items corresponded to their feelings in hockey. Several researchers have combined autonomy, competence, and relatedness to create a need satisfaction score (Standage, Duda, & Ntoumanis, 2005). This decision was acceptable given the moderately high inter-scale correlations in this sample and the good level of internal consistency of a global score ($\alpha = 0.83$).

8.2.4. Deliberate practice

Deliberate practice was assessed the same way as in Study 1.

8.2.5. Life satisfaction

The same scale as in Study 1 was used ($\alpha = 0.78$).

8.2.6. Performance

Performance was assessed by calculating the number of games played by each athlete in the various highly competitive hockey leagues in which they were enrolled after the 2000–2001 training camps. The data was collected through a website (www.hockeydb.com, Slate, 1998) containing statistics from all players involved in competitive hockey from the junior level after the year 1980. Thus, it was possible to identify the amount of games played by each player in professional leagues (i.e., National Hockey League, American Hockey League, Kontinental Hockey League, etc.) and other highly competitive leagues (i.e., Quebec Junior Major Hockey League, Ontario Hockey League, etc.). Operationalizing

performance in this fashion allowed us to track down athletes' performance over nearly 15 years following their completion of the questionnaire on comparable performance criteria. Indeed, although the caliber of play varies from one league to another, highly competitive leagues, such as the NHL or AHL, are also the ones with the higher number of games played per year. Thus, players that have reached the highest levels of play are also the ones with the highest numbers of games played. Overall, the players participated in an average of 81.1 competitive games (range from 0 to 968 games, *SD* = 159.4 games) from the time they were surveyed during the 2000–2001 training camp, up until September 2015.

8.3. Data analysis

The analytical procedures described in Study 1 were used again in Study 2. Descriptive statistics and bivariate correlation are reported in Table 3.

9. Results

As shown in Fig. 2, all predicted paths were statistically significant at the *p* < 0.05 level. Results revealed that HP was positively associated with mastery ($\beta = 0.39, p < 0.001$) and performance-approach goals ($\beta = 0.16, p < 0.001$). HP was also directly related to need satisfaction ($\beta = 0.38, p < 0.001$) and life satisfaction ($\beta = 0.27, p < 0.001$), as in Study 1. OP was positively related to performance-approach ($\beta = 0.17, p < 0.001$) and performance-avoidance goals ($\beta = 0.12, p = 0.002$). As in Study 1, OP was directly related to deliberate practice ($\beta = 0.14, p = 0.001$) and life satisfaction ($\beta = -0.08, p = 0.048$). Contrary with our hypothesis, OP was directly and positively associated with need satisfaction ($\beta = 0.12, p = 0.001$). In turn, mastery ($\beta = 0.19, p < 0.001$) and performance-approach ($\beta = 0.16, p < 0.001$) goals were positively, while performance-avoidance goals ($\beta = -0.19, p < 0.001$) were negatively associated with need satisfaction, respectively. Mastery goals were also positively related to life satisfaction ($\beta = 0.11, p = 0.022$) Need satisfaction was positively associated with life satisfaction ($\beta = 0.27, p < 0.001$), deliberate practice ($\beta = 0.10, p = 0.020$), and performance ($\beta = 0.14, p < 0.001$). Finally, deliberate practice was positively related to performance ($\beta = 0.15, p < 0.001$). Overall, the proposed model had a good fit to the data: MLR χ^2 (*df* = 14, *N* = 598) = 25.796, *p* = 0.028, CFI = 0.984, TLI = 0.961, RMSEA = 0.038 (0.012, 0.060), SRMR = 0.025.

The second aim of this study was to partition the total relationship between passion and outcomes into specific indirect effects using the same method as in Study 1. The indirect effects in the relation between HP and outcomes are described below and are also reported in Table 4. In the relation between HP and need satisfaction, significant positive indirect effects were found with mastery and performance-approach goals. In the positive relation

of HP with life satisfaction, four significant indirect effects were found with mastery goals, need satisfaction, as well as with the combined effects of mastery goals with need satisfaction and of performance-approach goals with need satisfaction. Regarding the positive relation between HP with deliberate practice, indirect effects were found with need satisfaction, as well as through the combination of mastery goals and need satisfaction. However, the combined indirect effects of performance-approach goals and need satisfaction were not significant. Finally, results of the indirect effects showed that the positive relation between HP and performance was mediated by need satisfaction, the combined effects of mastery goals and need satisfaction and of performance-approach goals and need satisfaction. All other indirect effects were not significant.

The indirect effects in the relation between OP and outcomes were as follow (see Table 5). In the relation between OP and need satisfaction, indirect effects of performance-avoidance and performance-approach goals were significant (negatively and positively, respectively). Positive indirect effects of the relation of OP with life satisfaction were also found with need satisfaction as well as through the combined effects of performance-approach goals with need satisfaction. However, results also showed the negative combined indirect effects of performance-avoidance goals and need satisfaction. Regarding the relation between OP and deliberate practice, all indirect effects failed to reach statistical significance. Only the direct effects of OP and deliberate practice remained significant. Finally, indirect effects showed that the positive relation between OP and performance was mediated by need satisfaction, deliberate practice, as well as with the combined effects of performance-approach goals and need satisfaction. Moreover, the combined effects of performance-avoidance goals and need satisfaction were significantly negative in the relation between OP and performance. All other indirect effects were not significant.

9.1. Brief discussion

Overall, the results of Study 2 provided further support for the pivotal role of need satisfaction in the understanding of the two roads to performance. Moreover, Study 2 builds upon the findings of Study 1 in two significant ways. First, Study 2 is more closely in line with the initial findings of Vallerand et al. (2007, Study 2; Vallerand et al., 2008, Study 2), as it integrated achievement goals as a mediating variable in the model proposed in Study 1. Overall, the results of Study 2 show that HP was associated with both types of approach goals (i.e., mastery and performance) that, consequently, lead to the satisfaction of athletes' basic psychological needs and, ultimately, to higher levels of life satisfaction, deliberate practice and performance over the span of 15 years. In contrast, OP was associated with both types of performance goals (i.e., approach and avoidance). This joint association with performance-approach

Table 3
Descriptive statistics and bivariate correlations – study 2.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Harmonious Passion	5.46	0.89	0.73								
2. Obsessive Passion	4.78	1.27	0.46**	0.87							
3. Mastery Goals	5.99	0.95	0.44**	0.23**	0.79						
4. Performance-Approach Goals	5.78	1.21	0.25**	0.24***	0.38**	0.90					
5. Performance-Avoidance Goals	4.78	1.33	0.12**	0.09*	0.29**	0.38**	0.72				
6. Need Satisfaction	5.63	0.68	0.55**	0.40**	0.43**	0.28**	-0.02	0.83			
7. Life Satisfaction	5.06	0.71	0.42**	0.14**	0.29**	0.17**	0.03	0.41**	0.78		
8. Deliberate Practice (Hours)	11.23	5.36	0.12**	0.17**	0.05	0.06	-0.08*	0.18**	0.03	-	
9. Performance (Games)	81.10	159.36	0.13**	0.17**	0.08	0.12**	-0.05	0.20**	0.15**	0.11**	-

Note. **p* < 0.05, ***p* < 0.01. Alphas of Cronbach are on the diagonal.

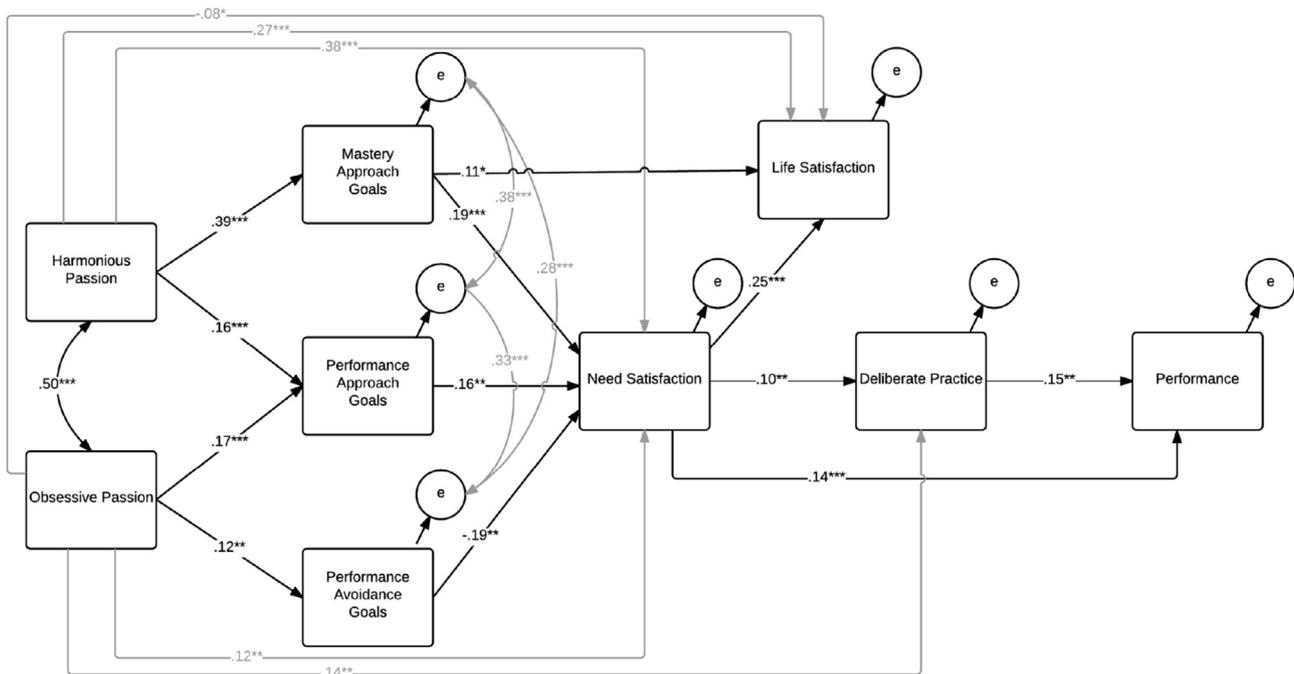


Fig. 2. Final model of the relationship involving passion, achievement goals, need satisfaction, life satisfaction, deliberate practice, and performance, indicated by the number of games athletes played in competitive leagues. Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4
Mediation of the effects of harmonious passion on need satisfaction, life satisfaction, deliberate practice and performance, through achievement goals, need satisfaction and deliberate practice – Study 2.

Harmonious Passion to Outcomes		Indirect Effect	p	95% CI	
Mediating Variables				Lower	Upper
Need satisfaction	Direct	0.383	0.000	0.305	0.461
	Mastery	0.073	0.000	0.037	0.108
	Performance-approach	0.027	0.006	0.008	0.045
Life satisfaction	Direct	0.298	0.000	0.198	0.398
	Mastery	0.043	0.028	0.005	0.081
	Need satisfaction	0.104	0.000	0.062	0.146
	Mastery → Need satisfaction	0.020	0.001	0.008	0.032
Deliberate practice	Performance-approach → Need satisfaction	0.007	0.015	0.001	0.013
	Need satisfaction	0.036	0.024	0.005	0.068
	Mastery → Need satisfaction	0.007	0.044	0.000	0.014
Performance	Performance-approach → Need satisfaction	0.003	0.117	-0.001	0.006
	Need satisfaction	0.053	0.001	0.021	0.085
	Mastery → Need satisfaction	0.010	0.009	0.002	0.018
	Performance-approach → Need satisfaction	0.004	0.040	0.000	0.007
	Need satisfaction → Deliberate practice	0.005	0.062	-0.000	0.007
	Mastery → Need satisfaction → Deliberate practice	0.001	0.085	-0.000	0.002
Performance-approach → Need satisfaction → Deliberate practice		0.000	0.156	0.000	0.001

and performance-avoidance goals allows for a more detailed understanding of the ambiguous relationship OP holds with need satisfaction, life satisfaction, and performance. Indeed, while performance-approach goals mediate the positive relation between OP and all these outcomes, performance-avoidance goals also act as a mediating variable in the negative relation between these variables.

10. General discussion

The purpose of the present research was to test a model wherein the satisfaction of the basic psychological needs acts as a mediator in the two roads to performance described by Vallerand et al. (2007, 2008). Specifically, Study 1 tested this basic model with youth soccer players, using coaches' evaluations to assess performance.

Study 2 sought to replicate the findings of Study 1 with hockey players, while also using an objective indicator of performance over a 15-year period. Moreover, Study 2 tested the role of achievement goals as an additional mediator in the proposed model. Overall, it was hypothesized that HP would be positively associated with need satisfaction, that would in turn be positively related to life satisfaction, deliberate practice and performance. Thus, need satisfaction was expected to mediate the positive associations of HP with life satisfaction, deliberate practice, and performance. In contrast, it was expected that OP would be positively related to performance, through the mediating effects of deliberate practice, but not need satisfaction. Moreover, OP was expected to relate negatively to life satisfaction in athletes. In Study 2, it was expected that the adoption of mastery goals would also mediate the relation between HP and need satisfaction, psychological well-being, deliberate practice

Table 5

Mediation of the effects of obsessive passion on need satisfaction, life satisfaction, deliberate practice and performance, through achievement goals, need satisfaction and deliberate practice – Study 2.

Obsessive Passion to Outcomes		Indirect Effect	p	95% CI	
	Mediating Variables			Lower	Upper
Need satisfaction	Direct	0.121	0.001	0.045	0.196
	Performance-approach	0.027	0.004	0.009	0.045
	Performance-avoidance	-0.023	0.013	-0.041	-0.005
Life satisfaction	Direct	-0.078	0.054	-0.157	0.002
	Need satisfaction	0.033	0.005	0.010	0.056
	Performance-approach → Need satisfaction	0.007	0.012	0.002	0.013
	Performance-avoidance → Need satisfaction	-0.006	0.021	-0.012	-0.001
Deliberate practice	Direct	0.139	0.001	0.057	0.221
	Need satisfaction	0.011	0.081	-0.001	0.024
	Performance-approach → Need satisfaction	0.003	0.103	-0.001	0.006
	Performance-avoidance → Need satisfaction	-0.002	0.103	-0.005	0.000
Performance	Need satisfaction	0.017	0.024	0.002	0.031
	Deliberate practice	0.021	0.018	0.004	0.038
	Performance-approach → Need satisfaction	0.004	0.033	0.000	0.007
	Performance-avoidance → Need satisfaction	-0.003	0.048	-0.006	-0.000
	Need satisfaction → Deliberate practice	0.002	0.139	-0.001	0.004
	Performance-approach → Need satisfaction → Deliberate practice	0.000	0.150	-0.000	0.001
	Performance-avoidance → Need satisfaction → Deliberate practice	-0.000	0.139	-0.001	0.000

and performance. It was also hypothesized that all three types of achievement goals would act as mediators in the relation between OP and psychological well-being, deliberate practice, and performance. The results of the two studies provided great support for these hypotheses, with some exceptions. Contrary to our expectations, the results of Study 2 showed that OP and performance-approach goals were positively associated with need satisfaction. Moreover, OP was unrelated to mastery goals, while HP was positively related to performance-approach goals.

10.1. The role of need satisfaction in the two roads to performance

Researchers has shown the existence of two roads from passion to performance (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). The first road stems from HP and leads to high levels of both performance and psychological well-being. The present findings highlight the mediating role of need satisfaction in the relationships involving HP with well-being, deliberate practice, and performance. Results of both studies showed that HP leads athletes to engage in their sport with openness, allowing them to experience feelings of autonomy, competence and relatedness. This is because HP provides access to adaptive self-processes (Vallerand, 2015). Athletes with HP thus have a sense of personal endorsement of their involvement in sport, they feel competent in their sport and they develop strong, meaningful relationships with others involved in their sport. The present research thus builds upon previous work (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008) by showing that, in addition to deliberate practice, the satisfaction of basic psychological needs represents a key mediating variable to consider in the relation between HP and performance. In light of the present results, it thus appears that basic need satisfaction is pivotal in the understanding of how athletes succeed in attaining high levels of performance while maintaining a high degree of psychological well-being.

The second road to performance stems from OP. While it can be associated with high levels of sports performance, OP is typically not conducive to well-being. In fact, it can also be negatively associated with it. Results of both studies demonstrated that the positive relation between OP and performance was mediated by deliberate practice. In fact, the present results suggest that OP in athletes is related to a desire to work hard and to spend countless hours in order to enhance one's skills. Ultimately, the hard work and dedication that stems from OP allow athletes to reach high

levels of performance. However, the satisfaction of the basic psychological needs does not play a significant role in this relationship. In fact, the relation between OP and need satisfaction was not significant in Study 1. Moreover, while the direct relation between OP and need satisfaction was significant in Study 2, the indirect effect of need satisfaction in the relation between OP and deliberate practice remained non-significant. Consequently, the results suggest that although athletes may experience some sense of need satisfaction with OP, this is not what drives them in their quest to performance. OP in athletes is likely to lead to higher levels of deliberate practice because athletes feel in large part obligated to engage in such intensive practice in order to satisfy internal (to maintain feelings of self-worth, or for self-enhancement) or external (to attain a reward, or avoid a punishment) contingencies that are attached to their sport (Donahue, Rip, & Vallerand, 2009; Lafrenière, Bélanger, Sedikides, & Vallerand, 2011; Mageau et al., 2011; Rip, Vallerand, & Lafrenière, 2012). Moreover, while OP in athletes is associated with performance through the effects of deliberate practice, it is also either unrelated (Study 1) or negatively related (Study 2) to life satisfaction. These findings are directly in line with past research (see Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). Thus, OP in athletes is associated with a deep involvement in their quest toward performance by spending numerous hours in order to reach their goals. This devotion will ultimately lead to higher levels of performance, albeit at the cost of lower level of psychological well-being.

10.2. The role of achievement goals in the two roads to performance

A second implication of the present research deals with the mediating role of achievement goals in the two roads to performance. This issue is especially important considering the fact that achievement goals have been identified as a mediating variable in the relation between passion and performance (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008). Thus, Study 2 sought to replicate and extend past findings by demonstrating the mediating role of achievement goals in the relation between passion and need satisfaction, life satisfaction, deliberate practice, as well as performance. A number of findings are worthy of note.

First, results of Study 2 provided additional support for past findings by showing that HP is positively associated with mastery goals. As harmoniously passionate athletes freely choose to engage in their sport, athletes are driven by a sense of improvement and

mastery, with little or no internal and/or external pressures. Thus, HP provides access to adaptive self-processes and allows athletes to set goals that are derived from a desire for mastery, in-depth learning, and self-improvement. Results of Study 2 showed that mastery goals mediate the positive relations between HP and both need satisfaction and life satisfaction. Thus, adopting mastery goals is related to the experience of feelings of autonomy, competence, and relatedness, as well as higher levels of psychological well-being. Moreover, the combined effects of mastery and need satisfaction mediated the positive relation between HP and life satisfaction, deliberate practice and performance. HP, through the combined effects of mastery goals and need satisfaction, thus allows athletes to feel satisfied toward their engagement in sport, to dedicate themselves to a great amount of deliberate practice in order to enhance their skills, and, ultimately, to reach high levels of performance even over relatively long periods of time as was shown in Study 2.

The results of Study 2 also demonstrated that HP was associated with performance-approach goals. This is contrary to past findings that have shown that HP is only related to mastery goals (see Bonneville-Roussy et al., 2011; Vallerand et al., 2007, Study 2; Vallerand et al., 2008, Study 2). The present findings also showed that performance-approach goals mediated the positive relation between HP and need satisfaction. Moreover, the combined effects of performance-approach goals and need satisfaction mediated the positive relations between HP and performance. However, performance-approach goals and need satisfaction did not significantly mediate the relation between HP and deliberate practice. Past research in the academic domain has shown that performance-approach goals are linked to surface processing, which can be seen as the opposite of deliberate practice (Elliot, McGregor, & Gable, 1999). Thus, with performance-approach goals athletes are willing to do what is necessary in order to outperform others. However, additional effort might be required when athletes try to improve their skills deliberately. This is especially relevant considering that deliberate practice often involves repeating difficult tasks, both mentally and physically, over long periods of time. Consequently, the current results show that only mastery goals (with the combined effects of need satisfaction), and not performance-approach, significantly mediated the relation between HP and deliberate practice. This is in line with past research suggesting that mastery goals are associated with a deep, purposeful, endeavor to master the task at hand. Mastery goals are thus more likely to lead to extra work in athletes in order to develop their sport-specific skills. Moreover, the results of Study 2 showed that the positive relation between HP and life satisfaction was mediated by the combined effects of performance-approach goals and need satisfaction. This finding is contrary to past research that typically shows a non-significant association between performance-approach goals and psychological well-being (Verner-Filion & Gaudreau, 2010). The current research is, to the best of our knowledge, the first to study the role of achievement goals in the relation between passion and need satisfaction. These findings await confirmation in future research.

Study 2 also showed that OP was related to both performance-approach and performance-avoidance goals. The present results demonstrate that OP in athletes is jointly associated with a strong desire to outperform others (i.e., performance-approach goals) and a fear of failing to do so (i.e., performance-avoidance goals), but not to a desire for self-improvement and mastery. Moreover, results of the indirect effects in Study 2 provided strong support for the conflicted goal pattern that stems from OP. Specifically, the positive effects of adopting performance-approach goals (i.e., higher levels of need satisfaction, life satisfaction and performance) were countered by the negative effects of also adopting performance-

avoidance goals (i.e., lower levels of need satisfaction, life satisfaction and performance). The present research thus highlights that athletes with OP are strongly focused on setting goals in a normative fashion. This is because with OP, involvement in the passionate activity serves to satisfy contingencies such as self-worth (Mageau et al., 2011). Consequently, athletes with OP might feel the need to use normative, rather the self-referenced, comparisons when setting their goals.

Overall, the results of Study 2 provided general support for the hypotheses, with some exceptions. More precisely, OP and performance-approach goals were positively associated with need satisfaction. OP was also unrelated to mastery goals, while HP was positively related to performance-approach goals. One possible explanation for these findings is the nature of the participants of Study 2 and the context in which data was collected. Specifically, Study 2 was conducted among elite hockey players during the tryout camps of highly competitive teams. At the time of data collection, athletes were thus evolving in a very strong evaluative context where they were facing fierce competition from all other athletes for securing positions on the roster. Thus, social comparison processes were highly salient, thereby facilitating achievement goals involving others at the expense of self. This might help understand why the current results are more tilted toward the normative (i.e., the OP → need satisfaction relation; the HP → performance-approach goals relation; the non-significant OP → mastery relation) compared with past research (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008).

10.3. Limitations and future research

The present research has some of limitations. First, although the results of the present studies are consistent with causal interpretation, the correlational design used prevents such an inference. The use of an experimental design would be important in future research in order to clearly show the causal relation between passion, achievement goals, and need satisfaction. For example, recently developed experimental manipulations of passion (Bélanger, Lafrenière, Vallerand, & Kruglanski, 2013; Lafrenière et al., 2013, Study 2) could be used in future research. Second, the present research relied mainly on self-report data. It would be important to replicate these studies with other types of measures, such as physiological assessment of performance (e.g., VO₂max, speed, etc.), or with indications from additional informants such as teammates and parents. Moreover, although the measures used to assess performance in this manuscript (i.e., coaches' evaluations – Study 1 – and the number of games played in highly competitive leagues over 15 years – Study 2) have merit, they also have some limitations. Specifically, coaches' evaluations remain a subjective assessment of performance. As for the measure used in Study 2, other indicators of objective performance, such as the amount of points (i.e., goals and assists) amassed over an athlete's career, could have been used. However, considering the difficulty of comparing the amount of points accumulated as a function of players' position (i.e., attacker, defender, or goalkeeper) and the league in which they played (e.g., NHL, KHL, AHL, etc.), the number of games played in competitive leagues was considered an appropriate common denominator to assess performance over such a long time span. To the best of our knowledge, Study 2 is the first to study the association between motivational variables and long-term performance (i.e., more than ten years). Future research is nevertheless warranted to replicate the present findings and further our understanding of the variables involved in the performance of athletes over long periods of time.

In sum, the present findings highlight the pivotal role of need satisfaction, achievement goals, and deliberate practice in the

relation between passion, psychological well-being, and performance in sports. Specifically, the present research helps differentiating the roads through which passion can lead to sport performance while allowing athletes to experience high levels of psychological well-being. To our knowledge, this research is the first to empirically demonstrate the impact of passion, need satisfaction, achievement goals, life satisfaction and deliberate practice on the performance of athletes over a significant period of their careers. Future research is important in order to further test the implications of these findings for other sport participants such as coaches and referees. Overall, the present findings allow for a better understanding of the “two roads to performance” by demonstrating the mediating role of need satisfaction in the initial model proposed by Vallerand et al. (2007; 2008) and further attest of the differentiated role of HP and OP in expert performance.

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