

# Obsessive Passion: A Compensatory Response to Unsatisfied Needs

Daniel Lalande,<sup>1</sup> Robert J. Vallerand,<sup>2,3</sup>  
Marc-André K. Lafrenière,<sup>2</sup> Jérémie Verner-Filion,<sup>2</sup>  
François-Albert Laurent,<sup>4</sup> Jacques Forest,<sup>4</sup> and  
Yvan Paquet<sup>5</sup>

<sup>1</sup>Université du Québec à Chicoutimi

<sup>2</sup>Laboratoire de Recherche sur le Comportement Social, Université du Québec à Montréal

<sup>3</sup>Institute of Positive Psychology and Education, Australian Catholic University

<sup>4</sup>Université du Québec à Montréal

<sup>5</sup>Université de la Réunion

## Abstract

The present research investigated the role of two sources of psychological need satisfaction (inside and outside a passionate activity) as determinants of harmonious (HP) and obsessive (OP) passion. Four studies were carried out with different samples of young and middle-aged adults (e.g., athletes, musicians; total  $N = 648$ ). Different research designs (cross-sectional, mixed, longitudinal) were also used. Results showed that only a rigid engagement in a passionate activity (OP) was predicted by low levels of need satisfaction outside the passionate activity (in an important life context or in life in general), whereas both OP and a more favorable and balanced type of passion, HP were positively predicted by need satisfaction inside the passionate activity. Further, OP led to negative outcomes, and HP predicted positive outcomes. These results suggest that OP may represent a form of compensatory striving for psychological need satisfaction. It appears important to consider two distinct sources of need satisfaction, inside and outside the passionate activity, when investigating determinants of optimal and less optimal forms of activity engagement.

People can have all kinds of passions: for sports, music, work, and a variety of other leisure activities. According to the dualistic model of passion (DMP; Vallerand, 2008; Vallerand et al., 2003), passion is defined as a strong inclination toward a self-defining activity that one loves, values, and considers important, and in which one invests considerable time and energy. While much research has explored the consequences of one's involvement in a passionate activity, much less attention has been paid to the determinants of initial engagement in a passionate activity as well as the determinants of continued engagement in an activity one has been passionate about for years. The present article focuses on the determinants of continued engagement in a passionate activity.

## The Experience of Passion

The DMP describes two specific types of passion: harmonious and obsessive. Harmonious passion (HP) is characterized by a balanced and agreeable involvement in the passionate activity. With HP, the activity that one loves occupies a significant place in the person's life but remains in harmony with other aspects of the person's life. There should be little or no conflict between

the person's passionate activity and other life domains. In fact, research shows that HP is negatively related to experiences of conflict between one's passion and other life domains (Caudroit, Boiché, Stephan, Le Scanff, & Trouilloud, 2011, Study 1; Vallerand, Paquet, Philippe, & Charest, 2010). This absence of conflict enables people to experience a number of positive outcomes both during and after task engagement. For instance, research shows that with HP, people experience high levels of concentration (Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005), flow (Philippe, Vallerand, Richer, Vallières, & Bergeron, 2009; Wang, Khoo, Liu, & Divaharan, 2008), positive emotions (Mageau & Vallerand, 2007; Vallerand et al., 2008; Vallerand et al., 2006), high-quality relationships (Lafrenière, Jowett, Vallerand, & Carbonneau, 2011; Philippe, Vallerand, Houliort, Lavigne, & Donahue, 2010), and psychological well-being (Rousseau & Vallerand, 2008). Furthermore, when prevented from engaging in their passionate activity, individuals

---

Correspondence concerning this article should be addressed to Daniel Lalande, Département des sciences de la santé, Université du Québec à Chicoutimi (UQAC), 555 Boulevard de l'Université Chicoutimi, Québec, Canada, G7H 2B1, Local V2-1250. Email: daniel.lalande@uqac.ca

with an HP are able to adapt well to the situation and focus their attention and energy elsewhere. Essentially, with HP, the person is in control of the activity and can decide when and when not to engage in it.

Obsessive passion (OP), in contrast, is characterized by an uncontrollable urge to engage in the passionate activity that one loves. OP leads the person to put aside or neglect other important activities, which often leads to conflict between one's passionate activity and other activities (Mageau & Vallerand, 2007), as well as conflict with one's partner (Séguin-Levesque, Laliberté, Pelletier, Blanchard, & Vallerand, 2003). A rigid persistence in the passionate activity at the expense of other activities may lead to increased performance in the activity (e.g., Vallerand et al., 2007, 2008), but it is also associated with negative affective, cognitive, and behavioral consequences during and after activity engagement. Research shows that with OP, people have a difficult time concentrating and do not experience much flow when engaged in the activity (Mageau et al., 2005; Vallerand et al., 2003, 2008; Wang et al., 2008). Research also shows that with OP, people experience negative emotions both during and after activity engagement (Mageau et al., 2005; Vallerand et al., 2006) and ruminate when prevented from engaging in the activity (Ratelle, Vallerand, Mageau, Rousseau, & Provencher, 2004). OP has also been found to be unrelated to positive emotions (Vallerand et al., 2003) and either negatively related (Rousseau & Vallerand, 2003) or unrelated (Vallerand & Miquelon, 2007) to satisfaction with life. In sum, while OP may lead to some benefits (e.g., improved performance in the activity; Bonneville-Roussy, Lavigne, & Vallerand, 2011; Vallerand et al., 2007, 2008), it may also incur important costs. Eventually, with OP, individuals adopt unbalanced lifestyles.

## The Development of Passion

According to the DMP, there are three important stages in the development of both types of passion (see Mageau et al., 2009; Vallerand, 2015). First, an individual selects an activity, among all available to him or her, to engage in. Second, the person must come to value the chosen activity. As will be discussed below, the extent to which an activity satisfies one's psychological needs determines in part its value. Third, the valued activity becomes internalized in one's identity in one of two ways (Deci & Ryan, 2000; Sheldon, 2002). Internalization is the most important stage, as it determines the type of passion that will be predominant for the individual. The first type of internalization is autonomous internalization. When a passionate activity is internalized in this way, the person feels free to engage in the activity when he or she wants to. There are no strings attached to one's involvement in the passionate activity. This type of internalization leads to HP (Vallerand, 2010, 2015). The second type of internalization is controlled internalization, and it leads to OP. With this type of internalization, the individual feels pressured to engage in the activity that he or she loves. Feelings of self-worth or social acceptance may be tied to one's engagement in

the passionate activity (Deci & Ryan, 1985; Vallerand, 2010). Indeed, recent research has shown that OP is associated with self-esteem contingencies, whereas HP is not (Mageau, Carpentier, & Vallerand, 2011).

## Determinants of Passion: Need Satisfaction

As mentioned above, valuation of an activity that can become a passion depends on its ability to satisfy people's basic psychological needs. The more one's needs are satisfied when engaging in the activity, the more one should value the activity (Vallerand et al., 2003). According to self-determination theory (SDT; Deci & Ryan, 1985, 2000), people need three specific psychological nutrients to thrive: feelings of autonomy, competence, and relatedness. The need for autonomy refers to feeling free to make decisions and to behave in ways that express one's true interests. The need for competence pertains to feeling that one deals effectively with the environment. Finally, the need for relatedness refers to having reciprocal, fulfilling connections with others. To the extent that one's psychological needs are satisfied, one should experience optimal levels of psychological and physical health. Research has shown that the satisfaction of the three basic needs is associated with a range of positive outcomes, including positive affect (Sheldon, Ryan, & Reis, 1996), well-being (Deci et al., 2001; Gillet, Fouquereau, Forest, Brunault, & Colombat, 2012; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Tay & Diener, 2011), vitality (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011; Ryan & Frederick, 1997), and general health (Ilardi, Leone, Kasser, & Ryan, 1993). Unsatisfied needs have been associated with negative repercussions for one's health and well-being, such as negative affect, burnout, and depression (Bartholomew et al., 2011; Ryan, Deci, Grolnick, & La Guardia, 2006). Naturally, people seek to satisfy their needs (Deci & Ryan, 2000). Whether or not individuals succeed in satisfying these needs, however, depends largely on the environment. Social contexts can provide individuals with the nutrients that allow them to feel autonomous, competent, and related to others in the course of their activity engagement (Deci & Ryan, 2000).

Because of their nature, passionate activities have the potential to satisfy people's basic psychological needs (see Deci & Ryan, 2000; Vallerand, 2010). Engaging in a passionate activity provides feelings of autonomy—when it is engaged in freely—as it reflects one's identity. Furthermore, passionate individuals who engage in their activity on a regular basis come to gain skills and develop feelings of competence along the way (Deci & Ryan, 1994). Finally, if the activity is shared with others, individuals have the opportunity to develop friendships and feel positively related to others. Over time, people may continue to engage in the passionate activity on a regular basis in order to satisfy some, or all, of their psychological needs.

Recent research provides insights into the relation between favorable environmental conditions for need satisfaction—

namely, autonomy support—and passion. For instance, Mageau et al. (2009, Study 3) conducted a study with nearly 200 high school students enrolled in a mandatory music class but who had never played music before. The purpose of the study was to discover who, among these students, would develop a passion for music at the end of the school term. Their results showed that 36% of the students had developed a passion for music. Interestingly, results also showed that among those who had developed a passion, autonomy support from parents and teachers positively predicted HP. Conversely, autonomy support negatively predicted OP. In another study (Mageau et al., 2009, Study 1), high-level musicians and athletes completed measures of need satisfaction and the Passion Scale. Results showed that participants who reported higher levels of autonomy support from teachers, coaches, and parents also had higher levels of HP. Similarly, Bonneville-Roussy, Vallerand, and Bouffard (2013, Study 2) showed that autonomy support from music teachers predicted HP, whereas teachers' controlling behavior predicted OP among music students at the collegiate level (i.e., non-beginners). Other research has similarly shown that perceived autonomy support positively predicts HP and negatively predicts OP at work (Liu, Chen, & Yao, 2011, Study 2). Taken together, these results suggest that autonomy support (a precursor to autonomy need satisfaction) is an important determinant of passion not only at the initial stage of the development of passion but also years into activity engagement.

While research has looked at the role of autonomy support in the development of passion, little research has investigated the role of need satisfaction *per se*—that is, to what extent people feel that their needs are satisfied—in the type of passionate engagement people manifest toward activities they are already passionate about. Moreover, to our knowledge, no research has yet looked at need satisfaction from two distinct sources: inside and outside the passionate activity.

Need satisfaction inside the passionate activity corresponds to the feelings of autonomy, competence, and relatedness one experiences while engaging in the passionate activity. Since, with HP, people feel free to engage in the activity, can gain skills and abilities, and can develop friendships along the way, psychological need satisfaction inside the passionate activity should represent a determinant of this type of passion. Similarly, with OP, people have the same opportunities to gain skills and develop friendships. For these reasons, psychological need satisfaction inside the passionate activity should also represent a determinant of OP.

At the same time, need satisfaction outside the passionate activity might also be a determinant of obsessive passion. This type of need satisfaction refers to feelings of autonomy, competence, and relatedness felt either in an important context (aside from the passionate activity) or in life in general. It is believed that needs that are chronically unsatisfied outside the passionate activity lead the person to compensate by becoming overly involved in the need-satisfying passionate activity (Ryan et al., 2006; Vansteenkiste & Ryan, 2013). Chronic need dissatisfaction in an important life domain might prompt people to seek

need satisfaction in another area (see Vallerand, 1997; Vallerand & Miquelon, 2008), such as in the passionate activity. However, in doing so, people may also come to display a rigid persistence toward the activity, develop an OP, and experience the negative consequences associated with it. Such should not be the case for HP, as it should not represent a compensatory form of activity involvement. With HP, people have internalized the passionate activity in an autonomous fashion and therefore do not engage in the activity out of pressure or to satisfy external contingencies, such as social acceptance (Deci & Ryan, 1985; Vallerand, 2010, 2015).

## The Present Research

The purpose of the present research is to test the hypothesis that when one's needs are unsatisfied in life in general or in an important context outside the passionate activity, the person becomes overly reliant on this activity, loses control over it, and manifests an OP. It was therefore expected that OP would result from low levels of need satisfaction outside the activity and high levels of need satisfaction inside of it, whereas HP would result only from high levels of need satisfaction inside the activity. HP was also expected to lead to more positive outcomes than OP.

We conducted four studies in which we first assessed both types of passion. In Study 1, we focused on passion for music; in Study 2, we looked at passion for a range of different activities; in Study 3, we assessed passion for basketball; and in Study 4, we tested passion for work. Then we assessed need satisfaction inside the passionate activity as well as outside the activity, such as at work (Study 1) or in life in general (Studies 2, 3, and 4). Positive and negative consequences of passionate involvement were also assessed. It was important to measure the consequences of passion in order to show that even though both types of passion may share the same determinant (need satisfaction inside the activity), they nevertheless lead to different outcomes. In line with the literature, HP was expected to lead to more adaptive outcomes than OP.

## STUDY 1

Participants in Study 1 were passionate about playing a musical instrument. Playing an instrument can represent a need-satisfying passionate activity when it allows one to feel autonomous, competent, and related to others (e.g., if one is in a band). Satisfaction with life was included as an outcome measure in the model. We expected both low levels of need satisfaction at work and high levels of need satisfaction in the context of music playing to predict OP. We expected that only high levels of need satisfaction inside the passionate activity would predict HP. HP was also expected to positively predict life satisfaction. Given the mixed results in the literature where OP is either negatively related or unrelated to life satisfaction (see Vallerand, 2010), we did not formulate a hypothesis concerning this relationship.

## Method

**Participants.** Participants were recruited using advertisements on Facebook. Advertisements targeted individuals whose Facebook page included the following keywords: *guitar*, *drums*, or *piano/keyboards*. Those who clicked on the link were redirected to an online survey after having given their consent to participate. This study and all of the following studies were submitted to appropriate ethics control boards for approval. Participants were not compensated for participating in this study or any of the following studies. Participants in this first study were 116 North American English-speaking individuals (28 women, 87 men, 1 unspecified) who played a musical instrument as a hobby. The mean age of the participants was 30.15 years ( $SD = 12.29$  years). On average, participants had been playing a musical instrument for 16.34 years ( $SD = 12.22$  years) and played on average 9.08 hours per week ( $SD = 10.30$  hours). The final sample, after exclusion of outliers (see Data Analyses below), comprised 111 individuals.

**Measures.** Unless otherwise indicated, all variables in this study and all of the following studies were measured using 7-point Likert-type scales, with higher scores indicating higher levels of the construct. Reliability coefficients were measured using Cronbach's alpha.

**Need Satisfaction Inside the Activity (in Music).** Inspired by Self-Determination Theory (Deci & Ryan, 2000), the Basic Psychological Needs Scale measures the extent to which individuals' psychological needs are met in general in one's life (see Gagné, Ryan, & Bargmann, 2003; Kashdan, Julian, Merritt, & Uswatte, 2006). Twelve items (four items for each need) were adapted to measure the extent to which individuals' needs for autonomy, competence, and relatedness are met when they play music. Adaptations to the items are italicized in the following examples: "I feel that the way I *play guitar* is definitely an expression of myself" (autonomy); "Most days, I feel a sense of accomplishment from what I do *in music*" (competence); and "I consider the *musicians* I regularly interact with to be my friends" (relatedness). All need satisfaction items were combined<sup>1</sup> to form a measure of overall need satisfaction inside the passionate activity (i.e., in music). The reliability coefficient for this variable was .74.

**Need Satisfaction Outside the Activity (at Work).** The Work-Basic Needs Scale (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010) was used to measure the degree to which participants' needs for autonomy (three items), competence (three items), and relatedness (three items) are met outside the passionate activity, namely, in the workplace. Sample items include "I feel like I can be myself at my job" (autonomy), "I feel competent at my job" (competence), and "At work I feel part of a group" (relatedness). Items were measured using a 5-point Likert-type scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). All items were combined to form a single need

satisfaction variable. The reliability coefficient for this variable was .71.

**Passion for Music.** Passion for playing a musical instrument was assessed with the Passion Scale (Vallerand et al., 2003), which is composed of two six-item subscales assessing harmonious and obsessive passion. Much research provides support for the reliability and validity of the scale (Marsh et al., 2013; Vallerand, 2010). In addition, research reveals that the scale is invariant with respect to gender, types of activities, and language (English and French). The scale is made in such a way that the words *passionate activity* can be changed for any activity in a given study. In the present study, the words *passionate activity* were replaced with *playing guitar*. Alternatively, some participants completed the survey with regard to drums or piano/keyboards. Sample items include "Playing guitar is in harmony with other things that are a part of me" (HP) and "Playing guitar is so exciting that I sometimes lose control over it" (OP). Both subscales were found to have adequate reliability coefficients: .86 and .88 for HP and OP, respectively.

**Satisfaction With Life.** The five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used to assess satisfaction with general aspects of one's life. A sample item is "In most ways my life is close to my ideal." The scale's reliability was .92.

## Results and Discussion

**Data Analyses.** In this study, and all following studies, structural equation modeling analyses (path analyses with observed variables) were performed on raw data files using the maximum likelihood estimation procedure in EQS 6.1 (Bentler, 1995). Model fit was first assessed using a chi-square test. Typically, a nonsignificant chi-square value indicates that the model is able to suitably replicate the sample covariance matrix. However, because this statistic is sensitive to the size of correlations and sample size, some researchers (e.g., Kline, 2011) have suggested reporting the normed chi-square value—the chi-square value divided by degrees of freedom. According to Bollen (1989), a normed chi-square value lower than 3.0 indicates that the model fits the data reasonably well. Model fit was also assessed using the following indices: the comparative fit index (CFI), the incremental fit index (IFI), and the root mean square error of approximation (RMSEA). According to Kline (2011) and Tabachnik and Fidell (2007), CFI and IFI values above .90 indicate acceptable model fit. Moreover, while some authors suggest the RMSEA should be .08 or lower (e.g., Kline, 2011), others question the use of a precise cut-off point for the RMSEA and suggest interpreting this value in conjunction with other indices of model fit (Chen, Curran, Bollen, Kirby, & Paxton, 2008). Finally, in order to obtain the model that best fit the data, we used Wald and Lagrange tests (Bentler, 1995). The Wald test indicates which parameters could be dropped, and the Lagrange

Multiplier test indicates which parameters could be added to increase model fit. Together, these two tests allowed us to obtain the best-fitting statistical model given the data. Robust statistics are reported for all studies.

Means, standard deviations, and correlations for all measures in Study 1 are presented in Table 1. Missing values (less than 5% missing at random) were replaced by regression-based imputation. No univariate outliers were found. Five multivariate outliers exceeded the 20.52 critical chi-square value ( $df = 5, p = .001$ ) and were deleted. As shown in Figure 1, HP was positively predicted by need satisfaction inside the passionate activity (i.e., in music), ( $\beta = .64, p < .001$ ). OP was positively predicted by need satisfaction inside the passionate activity ( $\beta = .49, p < .001$ ) and need satisfaction outside the activity (i.e., at work;  $\beta = -.38, p < .001$ ). Finally, satisfaction with life was positively predicted by HP ( $\beta = .46, p < .001$ ) and marginally negatively predicted by OP ( $\beta = -.14, p = .067$ ). The model fit was good, S-B  $\chi^2(3, N = 111) = 0.82, p = .85, \chi^2/df = 0.27, CFI = 1.0, IFI = 1.0, RMSEA = 0.0$ .

The results of Study 1 provide initial support for the hypothesis whereby OP, but not HP, is predicted by low levels of need satisfaction outside the passionate activity. In contrast, both types of passion are predicted by need satisfaction inside the passionate activity. It should be noted, however, that the association between need satisfaction in the activity and HP is stronger

than that between the same source of need satisfaction and OP. Furthermore, in line with past research, HP positively predicted life satisfaction, and although the association was only marginally significant, OP negatively predicted life satisfaction. These results provide preliminary evidence of the compensatory role of OP in which a lack of need satisfaction in an important life context may lead to a rigid engagement in a need-satisfying passionate activity. Given that it is not possible to infer causality in correlational designs, we opted for a mixed design to provide evidence that a lack of need satisfaction outside the passionate activity leads to OP.

### STUDY 2

A mixed design was used to manipulate need satisfaction outside the passionate activity, which was shown in Study 1 to differentially predict OP and HP. We hypothesized that inducing low levels of need satisfaction outside the passionate activity would lead to higher levels of OP but was not expected to influence HP. We also expected that high levels of need satisfaction inside the passionate activity would predict both types of passion. We used a different outcome variable in Study 2, namely, negative affect. Past research has shown that HP was negatively associated with negative affect and that OP was positively associated with it (Burke, Sabiston, & Vallerand, 2012; Vallerand et al., 2003). Finally, for generalizability purposes, we used a different measure of need satisfaction outside the passionate activity.

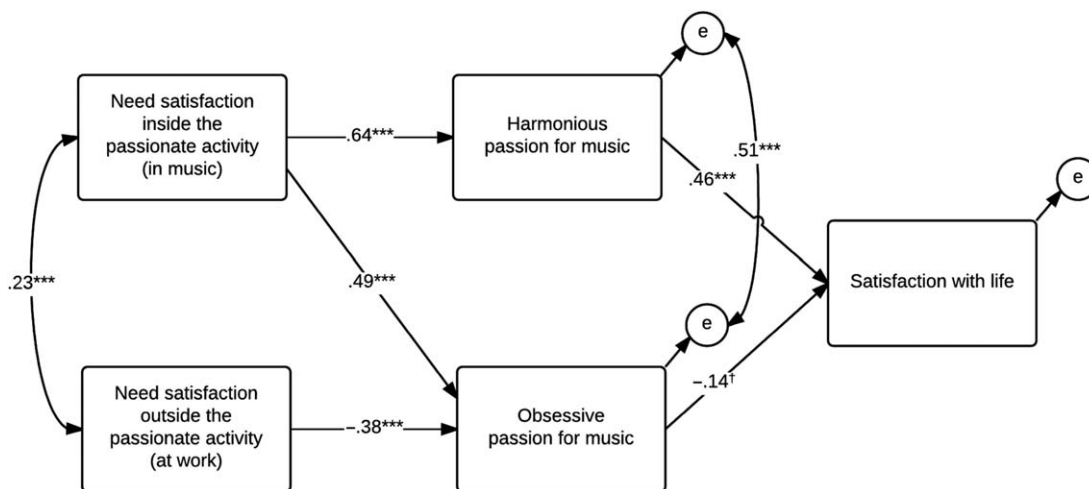
**Table 1** Study 1: Summary of Intercorrelations, Means, and Standard Deviations for All Variables

Measure	2	3	4	5	M	SD
1. Needs: music	.48**	.64**	.32**	.23*	5.46	0.81
2. Needs: work		.33**	-.13	.21*	3.57	0.59
3. Harmonious passion			.43**	.39**	5.14	1.31
4. Obsessive passion				.06	3.39	1.68
5. Satisfaction with life					4.13	1.49

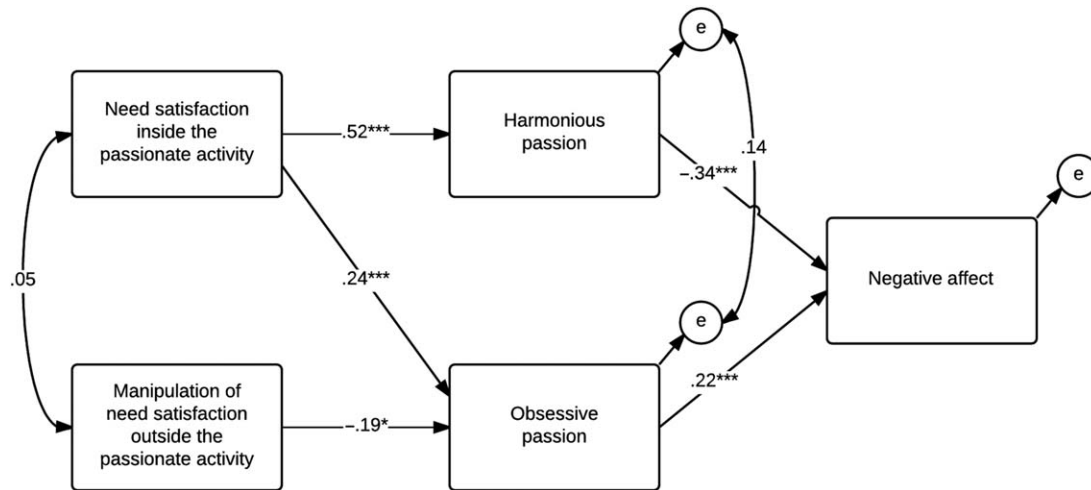
Note. \* $p < .05$ . \*\* $p < .01$ .

### Method

**Participants.** Participants were 143 American citizens (85 women, 57 men, 1 unspecified) who were recruited using the Amazon Mechanical Turk online survey program. The mean age of the participants was 31.98 years ( $SD = 14.29$  years). Participants reported being passionate about a myriad of activities,



**Figure 1** Study 1: Structural equation model results. Path coefficients are presented as standardized coefficients.  $^{\dagger}p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



**Figure 2** Study 2: Structural equation model results. Path coefficients are presented as standardized coefficients. † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

including sports and exercise ( $n = 37$ ), arts and crafts ( $n = 32$ ), reading ( $n = 26$ ), playing games ( $n = 7$ ), and other activities ( $n = 41$ ). On average, participants had been engaging in their passionate activity for 13.42 years ( $SD = 11.90$  years) and for 15.62 hours per week on average ( $SD = 13.19$  hours). The final sample, after exclusions (see Procedure and Main Analyses below), includes 132 individuals.

**Procedure.** Participants completed a survey in which they were first asked to report an activity that they loved, that they found important, and in which they invested time and energy (i.e., the *passion* definition). Participants were then given a questionnaire assessing to what extent their needs for autonomy, competence, and relatedness are satisfied in the context of their passionate activity. Afterward, participants were randomly assigned to one of two experimental conditions, inspired by the work of Bélanger, Lafrenière, Vallerand, and Kruglanski (2013). In the need satisfaction condition ( $n = 75$ ), participants were asked to “Write about a recent and important event in your life (outside of your activity) where you felt highly competent, related to others, and/or were able to freely make choices.” Participants in the need-thwarting condition ( $n = 56$ ) were assigned to a similar writing task but were instructed to “Write about a recent and important event in your life (outside of your activity) where you felt not competent, not related to others, and/or were not able to freely make choices.”

Importantly, participants in both conditions were asked to recall this event vividly and include as much detail as they could to relive the experience. Following this task, participants completed the scales on passion, need satisfaction outside the activity (manipulation check), and negative affect. Researchers then coded participants’ reported events to ensure that at least one of the basic psychological needs was satisfied or unsatisfied, depending upon the condition. Seven participants were removed from the final analyses because the events they reported did not refer to any of the three basic psychological needs.

## Measures

**Need Satisfaction Inside the Activity.** Need satisfaction inside the passionate activity was assessed using 12 items of the Basic Psychological Needs Scale based on SDT (Deci & Ryan, 2000). Adaptations to the items are italicized in the following examples: “I feel that the way I *engage in my passionate activity* is definitely an expression of myself” (autonomy); “Most days, I feel a sense of accomplishment from what I do *in my passionate activity*” (competence); and “I consider the people I regularly interact with *in the context of my passionate activity* to be my friends” (relatedness). The three needs were once again aggregated to form a global measure of need satisfaction inside the passionate activity. The reliability coefficient for this measure was .78.

**Need Satisfaction Outside the Activity.** Twelve items from the Basic Psychological Needs Scale (Deci & Ryan, 2000) were used to measure need satisfaction outside the activity (in life in general). Once again, we combined all three needs to create a global measure of need satisfaction outside the passionate activity. The reliability coefficient for this measure was .93. This measure served exclusively as a manipulation check of the experimental induction of need satisfaction outside the activity.

**Passion for an Activity.** Passion was assessed using the Passion Scale (Vallerand et al., 2003). Participants were asked to respond to the items with regard to the specific activity for which they were passionate. The two six-item subscales provided adequate reliability coefficients: .87 and .86 for HP and OP, respectively.

**Negative Affect.** The five-item Negative Affect subscale was taken from the short version of the Positive and Negative Affect Scale (PANAS; Mackinnon et al., 1999) and was used to measure the negative affect experienced in the context of the passionate activity. This instrument uses a 5-point Likert-type scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*).

A sample item is “When I engage in my passionate activity, I feel nervous.” The reliability coefficient for this measure was .86.

## Results and Discussion

### Data Analyses

**Manipulation Check.** An analysis of variance (ANOVA) with need satisfaction outside the activity as the dependent measure was conducted. The main effect of experimental condition was significant,  $F(1, 123) = 4.74, p = .03, \eta^2 = .04$ ; self-reported need satisfaction outside the activity was higher in the satisfaction condition ( $M = 5.21, SD = 1.11$ ) than in the thwarting condition ( $M = 4.75, SD = 1.19$ ). In addition, those in the thwarting condition ( $M = 3.50, SD = 1.52$ ) reported higher levels of OP than those in the satisfaction condition ( $M = 2.96, SD = 1.47$ ),  $F(1, 123) = 3.95, p = .049, \eta^2 = .03$ . The need satisfaction induction was thus effective. No differences between conditions were found regarding levels of HP ( $p > .05$ ).

**Main Analyses.** We dummy-coded need satisfaction outside the passionate activity as 1 and need thwarting outside the activity as 0. Means, standard deviations, and correlations for all measures are presented in Table 2. Missing values (less than 5% missing at random) were replaced by regression-based imputation. No univariate or multivariate outliers were found. Finally, IP addresses were checked to detect potential duplicate responders. Four duplicates were identified and were thus removed from the analyses. As shown in Figure 2, results revealed that HP was positively predicted only by need satisfaction inside the activity ( $\beta = .52, p < .001$ ), whereas OP was positively predicted by need satisfaction inside the passionate activity ( $\beta = .24, p < .001$ ) and negatively predicted by need satisfaction outside the activity ( $\beta = -.19, p = .018$ ). Furthermore, negative affect was negatively predicted by HP ( $\beta = -.34, p < .001$ ) and positively predicted by OP ( $\beta = .22, p < .001$ ). The model fit the data adequately, S-B  $\chi^2(df = 3, N = 132) = 4.96, p = .17, \chi^2/df = 1.65, CFI = 0.97, IFI = 0.98, RMSEA = .07$ .

Once more, only OP resulted from a lack of need satisfaction outside the passionate activity. Interestingly, results show that a manipulated lack of need satisfaction outside the passionate activity increased OP. Once again, both HP and OP resulted from high levels of need satisfaction inside the passionate activity. As in Study 1, the association between need satisfaction inside the passionate activity and passion was stronger for HP than for OP. Moreover, the results of this study extended Study 1 by including a negative consequence (i.e., negative affect) in the model. As past research has demonstrated, OP was positively associated with negative affect, whereas HP was negatively associated with it.

## STUDY 3

In Study 3, participants were passionate about basketball. Basketball has the potential to satisfy one’s basic needs for

**Table 2** Study 2: Summary of Intercorrelations, Means, and Standard Deviations for All Variables

Measure	2	3	4	5	M	SD
1. Needs: in	.05	.52**	.23**	-.27**	5.27	0.87
2. Needs: out (manipulation) <sup>a</sup>		.06	-.18*	-.08	—	—
3. Harmonious passion			.19*	-.30**	5.31	1.20
4. Obsessive passion				.16*	3.11	1.53
5. Negative affect					1.61	0.88

Note. <sup>a</sup>0 = need-thwarting condition, 1 = need satisfaction condition. \* $p < .05$ . \*\* $p < .01$ .

autonomy (deciding how one plays), competence (making progress and acquiring skills), and relatedness (feeling close to one’s teammates). As in Study 2, we chose to assess need satisfaction outside of basketball in life in general. This time, however, two outcome variables were assessed. In addition to life satisfaction, we also assessed burnout, a negative outcome often reported by athletes (Lemyre, Roberts, & Stray-Gundersen, 2007). Past research has shown that OP represents a significant predictor of burnout (Carbonneau, Vallerand, Fernet, & Guay, 2008; Stenseng, Rise, & Kraft, 2011; Vallerand et al., 2010). We expected low levels of need satisfaction in life in general to predict only OP. High levels of need satisfaction in basketball were expected to predict both HP and OP. HP was also expected to positively predict life satisfaction, whereas OP was hypothesized to positively predict burnout. Finally, since global need satisfaction has been shown to predict indicators of psychological well-being in past research (e.g., Tay & Diener, 2011), we expected that it would positively predict life satisfaction and negatively predict burnout.

## Method

**Participants.** Participants were recruited via Facebook. Individuals whose Facebook page included keywords related to basketball were solicited. In total, 197 North American English-speaking individuals who played basketball as a hobby (55 women, 134 men, 8 unspecified) completed an online survey. The mean age of the participants was 16.78 years ( $SD = 2.77$  years). On average, they had been playing basketball for 6.19 years ( $SD = 3.83$  years) and played on average 11.99 hours per week ( $SD = 11.22$  hours). The final sample, after exclusions (see Data Analyses below) consists of 193 individuals.

### Measures

**Need Satisfaction Inside the Activity (in Basketball).** To assess need satisfaction inside the passionate activity, we used the Basic Psychological Needs in Exercise Scale (BPNES) developed by Vlachopoulos and Michailidou (2006). This 12-item scale assesses the extent to which one’s basic needs are met in exercise. For the purpose of the present study, we rephrased the items to assess need satisfaction in basketball rather than in exercise. Sample items include “I feel very strongly that the way I *play basketball* fits perfectly the way I

prefer to play” (autonomy); “I feel that *basketball* is an activity in which I do very well” (competence); and “I feel very much at ease with the other *basketball players*” (relatedness). All items were combined to create a single satisfaction variable. The reliability coefficient for this measure was .90.

**Need Satisfaction Outside the Activity (in Life in General).** To assess a broader range of feelings of need satisfaction, 18 items (six for each need) from the Basic Psychological Needs Scale (Deci & Ryan, 2000) were used to measure the extent to which individuals’ needs are met outside the passionate activity. Items were combined to create a global satisfaction variable. The reliability coefficient for this measure was .89.

**Passion for Basketball.** Passion for basketball was assessed using the Passion Scale (Vallerand et al., 2003), which was adapted for this study to refer to basketball as one’s passionate activity. Reliability coefficients were .85 and .86 for HP and OP, respectively.

**Satisfaction With Life.** The five-item Satisfaction With Life Scale (Diener et al., 1985) was used to measure how satisfied people feel regarding general aspects of their lives. The reliability coefficient was .89.

**Burnout.** Due to space constraints in the survey, only the five-item Emotional/Physical Exhaustion subscale of the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001) was used to measure the extent to which participants feel exhausted by their involvement in basketball. Sample items include “I feel overly tired from my participation in *basketball*” and “I am exhausted by the mental and physical demands of *basketball*.” This instrument uses a 5-point Likert-type frequency scale ranging from 1 (*almost never*) to 5 (*almost always*). The reliability coefficient was .90.

## Results and Discussion

**Data Analyses.** Means, standard deviations, and correlations for all measures are presented in Table 3. Missing values (less than 5% missing at random) were replaced by regression-based imputation. No univariate outliers were found. Four multivariate outliers exceeded the 22.46 critical chi-square value ( $df = 6$ ,  $p = .001$ ) and were deleted. As shown in Figure 3, HP was positively predicted by need satisfaction inside the activity (i.e., basketball;  $\beta = .73$ ,  $p < .001$ ). OP was positively predicted by need satisfaction inside the passionate activity ( $\beta = .51$ ,  $p < .001$ ) and negatively predicted by need satisfaction outside the activity (i.e., in life in general;  $\beta = -.32$ ,  $p < .001$ ). In addition, satisfaction with life was positively predicted by HP ( $\beta = .21$ ,  $p = .003$ ) and general need satisfaction ( $\beta = .50$ ,  $p < .001$ ). Finally, burnout was positively predicted by OP ( $\beta = .22$ ,  $p = .001$ ) and negatively predicted by general need satisfaction ( $\beta = -.31$ ,  $p < .001$ ). The model fit the data adequately, S-B

**Table 3** Study 3: Summary of Intercorrelations, Means, and Standard Deviations for All Variables

Measure	2	3	4	5	6	M	SD
1. Needs: basketball	.41**	.73**	.38**	.46**	-.09	5.70	0.94
2. Needs: general		.30*	-.11	.57**	-.33**	5.26	0.80
3. Harmonious passion			.53**	.36**	-.02	5.57	1.09
4. Obsessive passion				.09	.25**	4.19	1.57
5. Satisfaction with life					-.17*	4.32	1.53
6. Burnout						2.59	1.02

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

$\chi^2(6, N = 193) = 8.08$ ,  $p = .19$ ,  $\chi^2/df = 1.35$ , CFI = .99, IFI = .99, RMSEA = .04.

The results of Study 3 replicated the same associations seen thus far in Studies 1 and 2. Once again, only OP resulted from a lack of need satisfaction outside the passionate activity (in life in general). Both HP and OP were predicted by need satisfaction inside the passionate activity, and once again the association was stronger for HP. Furthermore, in line with the results of Study 1, HP positively predicted life satisfaction. Also, in line with Study 2 and past research (Rousseau & Vallerand, 2008; Vallerand et al., 2010), OP positively predicted a negative outcome, namely, burnout. It is also noteworthy that HP predicted life satisfaction over and above the influence of general need satisfaction. This finding suggests that one’s passion, when harmonious, contributes positively to psychological well-being through some other processes, possibly positive emotions (see Rousseau & Vallerand, 2008). Finally, in line with SDT, results also showed that global need satisfaction positively predicted life satisfaction and negatively predicted burnout. In other words, the more people’s needs are satisfied in life in general, the more they experience positive consequences and the less they experience negative ones.

## STUDY 4

Study 4 used a prospective design over a 6-month period to investigate the role of need satisfaction inside and outside the passionate activity in predicting changes in passion and the role of passion in predicting outcomes. Participants in Study 4 were passionate about their work. Many people derive much enjoyment from their work and even become passionate about it (Forest, Mageau, Sarrazin, & Morin, 2011). In this study, we used a different outcome variable, namely, vitality (Ryan & Frederick, 1997). Past research has shown that HP positively predicted vitality, whereas OP was unrelated to it (Rousseau & Vallerand, 2003). Overall, we expected a lack of need satisfaction outside the passionate activity (i.e., in life in general) to predict increases only in OP. We also expected high levels of need satisfaction inside the passionate activity (at work) to predict increases in both HP and OP over time. In turn, we expected HP to positively predict vitality at Time 2 over and above the contribution of vitality at Time 1. In line with past research, we expected OP to be unrelated to vitality (see Vallerand, 2010).



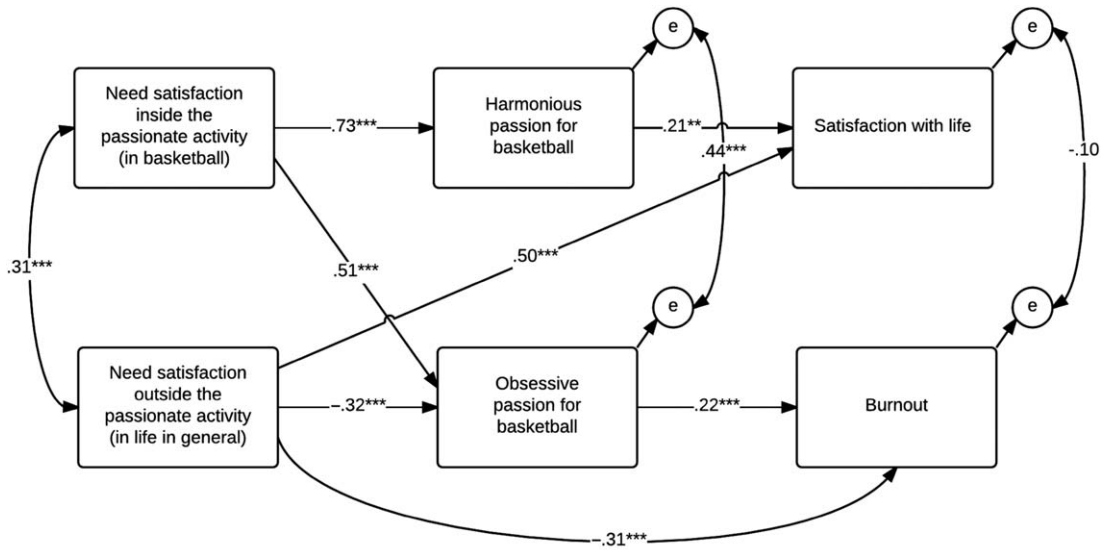


Figure 3 Study 3: Structural equation model results. Path coefficients are presented as standardized coefficients. † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Method**

**Participants.** Participants<sup>2</sup> were 251 French-speaking residents of the province of Quebec (122 women, 129 men) working as professionals for the provincial government (e.g., research agents, computer scientists, biologists, and statisticians). They were recruited from their union’s website and were asked to complete two questionnaires online. They completed the second survey 6 months after the first. The mean age of the participants was 44.74 years ( $SD = 9.46$  years). On average, they had been working at their job for 10.36 years ( $SD = 8.32$  years) and worked on average 35.08 hours per week ( $SD = 3.57$  hours). The final sample, after exclusions (see Data Analyses below), includes 248 individuals.

**Measures**

**Need Satisfaction Inside the Activity (at Work).** Six items (two items for each need) from Morin and Dassa (2006) were used to measure the extent to which one’s basic psychological needs are met at work (the passionate activity). Sample items include “My job allows me to make decisions” (autonomy), “My job corresponds to my skills” (competence), and “My job allows me to have good relationships with others” (relatedness). Items were measured on a 6-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Items were combined into a single variable with a reliability coefficient of .83.

**Need Satisfaction Outside the Activity (in Life in General).** Six items (two items for each need) from Massé et al. (1998) were used to measure the extent to which one’s basic psychological needs have been met in general in one’s life (outside the passionate activity) during the past month. Sample items include “I have integrity and am natural in all circumstances” (autonomy), “I feel useful” (competence), and “I am on

good terms with those close to me” (relatedness). Items were measured on a 5-point Likert-type frequency scale ranging from 1 (*never*) to 5 (*almost always*). All items were combined to form a single need satisfaction variable with a reliability coefficient of .82.

**Passion for Work.** Passion was assessed with the Passion Scale (Vallerand et al., 2003), which was adapted for this study to reflect passion for work. Participants completed this scale twice—6 months apart. Reliability coefficients for both subscales were .89 and .76 for HP and OP at Time 1 and .88 and .79 at Time 2.

**Vitality.** The Subjective Vitality Scale (Ryan & Frederick, 1997) was used to measure participants’ feelings of vitality in life in general. Five items were used. Sample items include “I feel alive and vital” and “I look forward to each new day.” The five-item version used in this study showed adequate reliability at both Time 1 ( $\alpha = .92$ ) and Time 2 ( $\alpha = .93$ ). Further, confirmatory factor analysis results showed good model fit for the five-item factor at Time 1 (i.e., factor loadings between .80 and .92),  $S-B \chi^2(4, N = 248) = 10.15, p = .04, \chi^2/df = 2.54, CFI = .99, IFI = .99, RMSEA = .08$ , and at Time 2 (i.e., factor loadings between .79 and .89),  $S-B \chi^2(4, N = 248) = 9.77, p = .04, \chi^2/df = 2.44, CFI = .99, IFI = .99, RMSEA = .08$ . The items not assessed were “I don’t feel very energetic” and “Sometimes I feel so alive I just want to burst.”

**Results and Discussion**

**Data Analyses.** Means, standard deviations, and correlations for all measures in Study 4 are presented in Table 4. Missing values were replaced by regression-based imputation. No univariate outliers were found. Six multivariate outliers exceeded the

**Table 4** Study 4: Summary of Intercorrelations, Means, and Standard Deviations for All Variables

Measure	2	3	4	5	6	7	8	M	SD
1. T1 Needs: work	.44**	.59**	.03	.53**	.56**	-.01	.39**	5.21	0.68
2. T1 Needs: general		.46**	-.16**	.63**	.42**	-.29**	.53**	5.76	0.61
3. T1 Harmonious passion			.01	.57**	.75**	.02	.45**	4.65	1.19
4. T1 Obsessive passion				.06	.01	.64**	-.07	1.98	0.69
5. T1 Vitality					.51**	.02	.69**	4.49	1.25
6. T2 Harmonious passion						.08	.57**	4.70	1.08
7. T2 Obsessive passion							-.09	1.85	0.71
8. T2 Vitality								4.68	1.24

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

**Table 5** Summary of Intercorrelations, Means, and Standard Deviations for Main Variables in All Studies Combined

Measure	2	3	4	M	SD
1. Needs: in	.23**	.63**	.34**	5.46	0.81
2. Needs: out		.16**	-.25**	3.57	0.59
3. Harmonious passion			.42**	5.14	1.31
4. Obsessive passion				3.39	1.68

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

26.13 critical chi-square value ( $df = 8$ ,  $p = .001$ ) and were deleted. As shown in Figure 4, results revealed that HP at Time 2 was positively predicted by need satisfaction inside the passionate activity at Time 1 (i.e., at work;  $\beta = .17$ ,  $p < .01$ ) and by HP at Time 1 ( $\beta = .59$ ,  $p < .001$ ). OP at Time 2 was positively predicted by need satisfaction inside the passionate activity at Time 1 ( $\beta = .10$ ,  $p = .027$ ), by a lack of need satisfaction outside the passionate activity (in life in general) at Time 1 ( $\beta = -.29$ ,  $p < .001$ ), and by OP at Time 1 ( $\beta = .59$ ,  $p < .001$ ). Finally, vitality at Time 2 was positively predicted by HP at Time 2 ( $\beta = .31$ ,  $p < .001$ ), negatively predicted by OP at Time 2 ( $\beta = -.12$ ,  $p = .017$ ), and positively predicted by vitality at Time 1 ( $\beta = .53$ ,  $p < .001$ ). Overall, the model fit the data well, S-B  $\chi^2(9, N = 248) = 18.45$ ,  $p = .03$ ,  $\chi^2/df = 2.05$ , CFI = .99, IFI = .99, RMSEA = .07.

Once again, a pattern emerged where need satisfaction inside the passionate activity predicted both types of passion but where a lack of need satisfaction outside the passionate activity predicted only one type of passion: OP. An important feature of this study was that these findings pertained to increases in both types of passion that took place over a 6-month period. The findings from this prospective design provide additional evidence for the role of OP as a compensatory response to unsatisfied needs outside the passionate activity. Finally, HP (but not OP) was found to predict vitality over and above the contribution of the initial vitality level.

## CONGLOMERATION OF STUDIES 1–4

In order to provide a test of the consistency of the present findings across all studies, we tested a basic model consisting of four variables (i.e., need satisfaction outside the passionate activity,

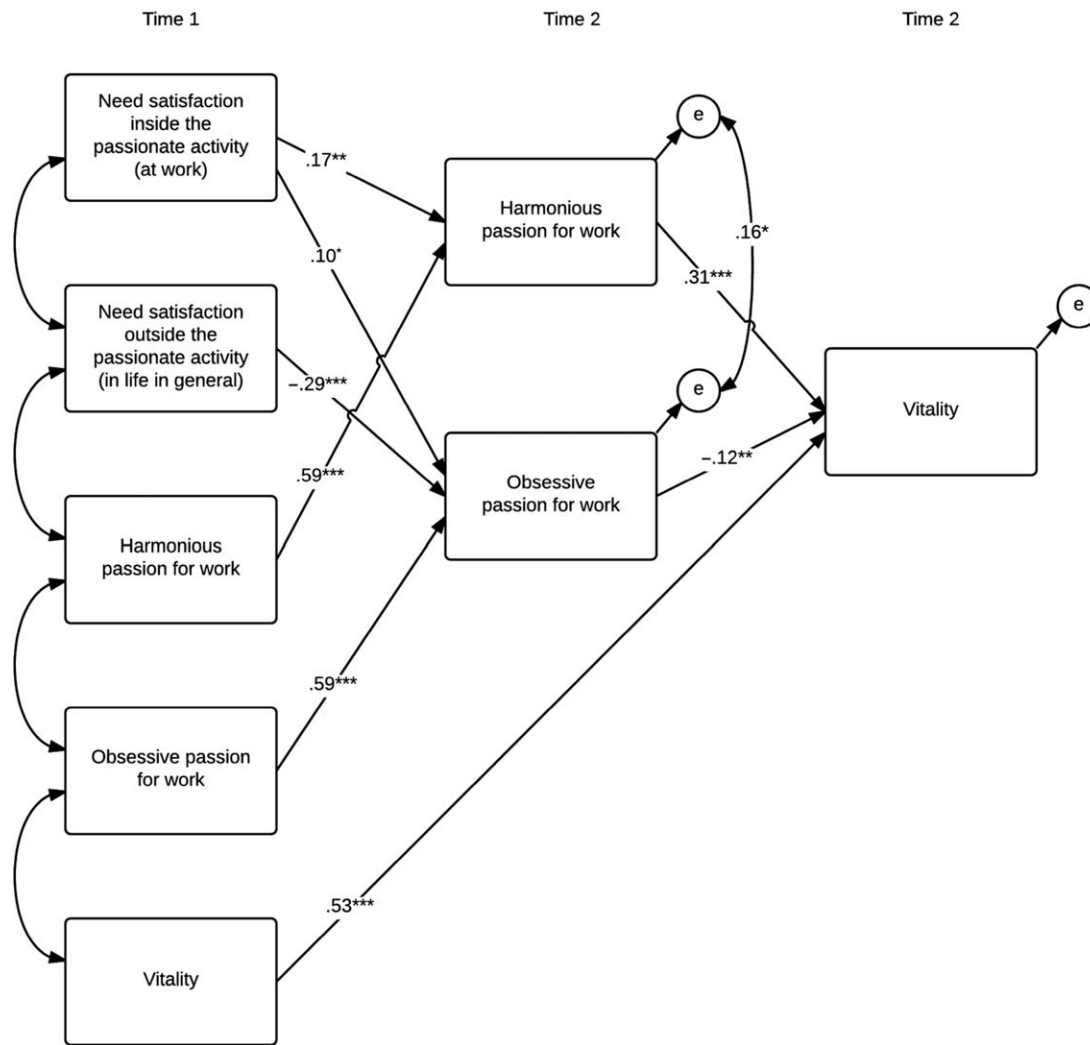
need satisfaction inside the passionate activity, HP, and OP) with data from all four studies ( $N = 648$ ). Essentially, we tested the same model as in the previous studies, but this time we focused on all common elements of the model across the four studies and tested all samples simultaneously. Means, standard deviations, and correlations for all measures in the conglomeration analysis are presented in Table 5. Outcome measures were omitted, as they differed from study to study. Since the data from Study 4 were longitudinal, we used the need satisfaction measures taken at Time 1 and the passion measures taken at Time 2. As shown in Figure 5, harmonious passion was positively predicted by need satisfaction inside the passionate activity ( $\beta = .63$ ,  $p < .001$ ). Obsessive passion was positively predicted by need satisfaction inside the passionate activity ( $\beta = .42$ ,  $p < .001$ ) and negatively predicted by need satisfaction outside the passionate activity ( $\beta = -.35$ ,  $p < .001$ ). Results showed that the model fit the data well, S-B  $\chi^2(1, N = 648) = 0.14$ ,  $p = .71$ ,  $\chi^2/df = 0.14$ , CFI = 1.0, IFI = 1.0, RMSEA = 0.0. Thus, the overall basic model was fully supported across all four studies.

## GENERAL DISCUSSION

The purpose of the present series of studies was to test the hypothesis that OP represents a compensatory response to unsatisfied psychological needs. As such, it was expected that only OP should be negatively predicted by need satisfaction outside the passionate activity, whereas both HP and OP should be positively predicted by need satisfaction inside the passionate activity. Results from four studies provided support for this hypothesis with different populations (i.e., young adults, middle-aged adults), various passionate activities (i.e., music playing, basketball, work), positive and negative outcomes (i.e., life satisfaction, negative affect, burnout, vitality), different sources of need satisfaction outside the passionate activity (i.e., work, life in general), and different methodologies that included a mixed design (Study 2) and a prospective 6-month design (Study 4). These findings lead to a number of important implications.

### Implications for the Dualistic Model of Passion

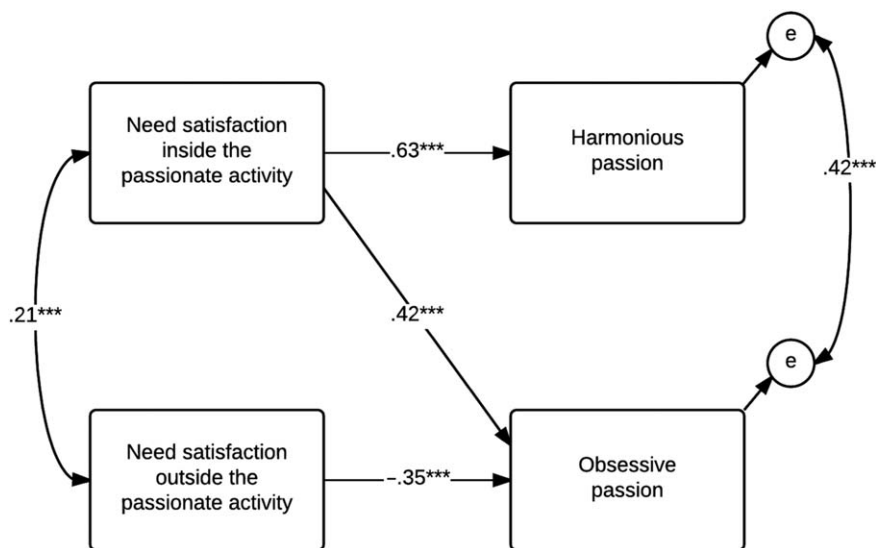
The present results have a number of implications for the Dualistic Model of Passion. A first implication is that it appears that



**Figure 4** Study 4: Structural equation model results. Path coefficients are presented as standardized coefficients. Not all covariances are shown. † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

need satisfaction is a consistent determinant of both types of passion. Specifically, the present findings suggest that need satisfaction represents a determinant of the type of passionate engagement one manifests for an activity that one is already passionate about. Of importance, two sources of need satisfaction are involved and play different roles in the two types of passion. The first source is found in the context of the passionate activity. Need satisfaction inside the passionate activity was found to positively predict both types of passion. It is also important to note that in all four studies, the association between need satisfaction inside the passionate activity and passion was stronger for HP than OP. This finding suggests that need satisfaction inside the passionate activity contributes more to the optimal type of passion (i.e., HP) than to the less optimal type (i.e., OP). Overall, this particular source of need satisfaction—inside the passionate activity—contributes to the ongoing development of one’s passion even years after initial engagement and is necessary to fuel both types of passion.

The second source of need satisfaction is found outside the passionate activity. In line with past research (see Sheldon, 2011), the results of the present studies suggest that low levels of need satisfaction outside the passionate activity could motivate people to seek need satisfaction in a different context, including in a need-satisfying passionate activity. Indeed, we found that a lack of need satisfaction at work or in life in general predicted the obsessive type of passion. Indeed, when this source of need satisfaction is expected to make up for low need satisfaction in an important life area, people may end up clinging tightly to it. Consequently, they may lose control over the activity. Need satisfaction outside the passionate activity did not play a role in HP. With HP, individuals are involved in the activity for its own sake. Past research (Bonneville-Roussy et al., 2011; Vallerand et al., 2007, 2008) has found that the only goal that characterizes activity involvement fueled by HP is the search for mastery within the activity. With HP, one’s involvement in a passionate activity provides one with an additional, optional



**Figure 5** Structural equation model results for the conglomeration analysis. Path coefficients are presented as standardized coefficients.  $^{\dagger}p < .10$ .  $*p < .05$ .  $**p < .01$ .  $***p < .001$ .

source of need satisfaction. From an interpersonal perspective, our results suggest that when confronted with OP, friends and family should perhaps encourage their obsessively passionate loved one to diversify his or her activities in order to allow the person to obtain psychological need satisfaction from different sources. Thus, in order to determine which type of passion one is likely to manifest, it becomes important to look beyond the passionate activity itself. In line with the hierarchical model of intrinsic and extrinsic motivation (Vallerand, 1997; Vallerand & Miquelon, 2008), one's psychological functioning in other important life contexts is equally important to consider to more fully understand the nature of motivational processes in another life area (or context) or for a specific activity.

A second implication of the present findings for the DMP is that they provide support for the differential role of the two types of passion in outcomes. Specifically, across the four studies in which outcomes were assessed, results showed that HP predicted higher levels of life satisfaction (Studies 1 and 3) and vitality (Study 4) but lower levels of negative affect (Study 2). Conversely, OP was found to be positively related to negative outcomes such as negative affect (Study 2) and burnout (Study 3) and either negatively related to positive outcomes (Study 1) or unrelated to them (Studies 3 and 4). These findings are in line with past research that shows that a harmoniously passionate engagement in an activity that one loves has some salutary effects, whereas such is not the case when one's passion is obsessive (see Vallerand, 2010, for a review). Of importance is that passion has an effect on meaningful outcomes over and above the effect of need satisfaction. Overall, it would appear that HP adds to one's life by producing positive global (and long-lasting) outcomes that go beyond the positive situational experiences associated with task engagement. With OP, however, the benefits derived from the passionate activity seem

mostly circumscribed to the immediate positive consequences associated with task engagement (e.g., increased performance). In fact, OP may actually take away from life satisfaction, as this and other long-lasting outcomes are sacrificed in the service of situational beneficial experiences (Vallerand, 2010). Future research would be needed to test this hypothesis.

### **Implications for Self-Determination Theory**

The present results also have some important implications for Self-Determination Theory. First, in line with SDT (Vansteenkiste & Ryan, 2013), our results suggest that a lack of need satisfaction in an important context such as work, or in one's life in general, may be associated with compensatory behaviors (OP). Of importance, while SDT posits that, with time, thwarted needs should lead to a specific type of compensatory behavior, namely, seeking to satisfy rather unfulfilling materialistic or extrinsic needs (Deci & Ryan, 2000; Ryan et al., 2006), the present findings suggest that people may also compensate by seeking satisfaction in need-satisfying activities such as passionate ones. Therefore, while the end result of this compensatory process is similar to what is proposed by SDT concerning need substitutes and need compensation (e.g., decreased well-being and less self-determined motivation), the compensatory road appears to differ. Specifically, passionate individuals may seek real, albeit incomplete, need satisfaction in a different context (on this issue, see Vallerand, 1997; Vallerand & Miquelon, 2008). Perhaps because they are only somewhat nourished by these contexts, individuals who manifest an OP engage in rigid behavior patterns and show self-control deficiencies. Future research is needed to determine the type of compensatory goals people engage in as a function of time and prevailing situations.

A second implication for SDT is that a broader perspective on the context within which need satisfaction is experienced would appear necessary in order to make sense of the effects of need satisfaction experienced during activity engagement. For instance, the observation that need satisfaction inside the passionate activity predicted both types of passion underscores the fact that need satisfaction inside the activity is not sufficient in and of itself to determine the quality of one's activity engagement. In his hierarchical model, Vallerand (1997, 2000) underscored the importance, from a motivational standpoint, of taking into consideration what happens in other areas of a person's life in order to more fully understand what is experienced in a given life context or within the context of a given activity. It is possible that seeking need satisfaction in a particular context to compensate for a lack of it elsewhere puts one in a mind-set that is less fulfilling than simply experiencing need satisfaction without seeking to fill a void. For instance, Lavigne, Vallerand, and Crevier-Braud (2011) showed that people who have a need deficit reduction orientation with respect to belongingness (those who seek to reduce the lack of belongingness or relatedness in their life) experience lower levels of psychological and social well-being than those who have a growth orientation (those who enjoy engaging in interpersonal activities). Clearly, both sources of need satisfaction—inside and outside the passionate activity—are necessary to distinguish OP from HP. Future research is needed to determine whether combinations of both sources of need satisfaction may affect other types of motivational processes and their ensuing consequences and experiences.

A third implication of the present findings as pertains to self-determination theory is that the present results provide additional support for the role of global need satisfaction in positive outcomes. As expected, global need satisfaction (in one's life in general) positively predicted life satisfaction and negatively predicted burnout in Study 3. These findings have been replicated numerous times in the literature (see Deci & Ryan, 2000) and provide support for the hypothesis that the psychological needs of autonomy, competence, and relatedness represent important nutrients for psychological well-being. What was surprising, however, was the absence of an association between global need satisfaction and negative affect (Study 2) and vitality (Study 4). Future research is needed in order to determine when global need satisfaction facilitates positive psychological outcomes and when it does not.

## LIMITATIONS

Some limitations of the present research should be mentioned. First, the design used in three of the four studies was correlational. While the results of Study 2 (where lack of outside need satisfaction was experimentally induced) supported the directional effects of lack of need satisfaction outside the passionate activity on OP, additional research is needed to replicate these findings. In addition, longitudinal research using cross-lagged designs would be useful to determine the developmental

sequence of events. More research is needed to adequately describe the dynamic patterns between need satisfaction and passion. Second, the data were based on self-reported information that may be subject to self-presentation biases. Other types of reports (e.g., informants) or observations are necessary in order to provide additional evidence of the role of need satisfaction as a determinant of passion. Third, a small number of variables were measured with only two items (i.e., autonomy, competence, and relatedness in Study 4) and thus were not suitable for the calculation of Cronbach's alpha coefficients. In some instances, low reliability as well as other potential artifacts (e.g., suppression effects, large standard errors; see Friedman & Wall, 2005) may have contributed to the inconsistency observed between some zero-order correlations and corresponding beta coefficients. Perhaps a more stringent cut-off for signs of multicollinearity would be preferable in future studies. Fourth, while we did replicate the present findings in a number of different contexts and passionate activities and with different participants, caution must be taken when generalizing the results to other participants and activities that were not part of the present research.

## CONCLUSION

The present research suggests that low levels of psychological need satisfaction in an important area of life (or in life in general) may contribute to overreliance on a need-satisfying passionate activity and to the development of OP for this activity. Thus, OP appears to play a compensatory role in the life of the individual whose needs are not sufficiently satisfied outside of the passionate activity. Consequently, two sources of need satisfaction—inside and outside the passionate activity—are necessary to distinguish HP from OP. It thus appears that considering these two sources of need satisfaction is necessary to gain a better understanding of the determinants of passionate forms of activity engagement.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Preparation of this article was supported by a Team Research Grant from the Fonds de recherche du Québec - Société et Culture to the second author.

## Notes

1. While some authors (e.g., Tian, Chen, & Huebner, 2014) prefer to test the three basic needs separately, doing so with the current data

provided no clear pattern worth mentioning. Thus, needs are considered as a whole throughout this article.

2. The sample for this study is the same as the one described in Lavigne, Forest, and Crevier-Braud (2012). However, in this study, we explored different variables, proposed different hypotheses, and conducted different analyses.

## References

- Bartholomew, K. J., Ntoumanis, N., Ryan, R. M., Bosch, J. A., & Thøgersen-Ntoumani, C. (2011). Self-determination theory and diminished functioning: The role of interpersonal control and psychological need thwarting. *Personality and Social Psychology Bulletin*, *37*, 1459–1473.
- Bélanger, J. J., Lafrenière, M.-A. K., Vallerand, R. J., & Kruglanski, A. W. (2013). When passion makes the heart grow colder: The role of passion in alternative goal suppression. *Journal of Personality and Social Psychology*, *104*, 126–147.
- Bentler, P. M. (1995). *EQS structural equations program manual*. Encino, CA: Multivariate Software.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Bonneville-Roussy, A., Lavigne, G. L., & Vallerand, R. J. (2011). When passion leads to excellence: The case of musicians. *Psychology of Music*, *39*, 123–138.
- Bonneville-Roussy, A., Vallerand, R. J., & Bouffard, T. (2013). The roles of autonomy support and harmonious and obsessive passions in educational persistence. *Learning and Individual Differences*, *24*, 22–31.
- Burke, S. M., Sabiston, C. M., & Vallerand, R. J. (2012). Passion in breast cancer survivors: Examining links to emotional well-being. *Journal of Health Psychology*, *17*, 1161–1175.
- Carbonneau, N., Vallerand, R. J., Fernet, C., & Guay, F. (2008). The role of passion for teaching in intrapersonal and interpersonal outcomes. *Journal of Educational Psychology*, *100*, 977–987.
- Caudroit, J., Boiché, J., Stephan, Y., Le Scanff, C., & Trouilloud, D. (2011). Predictors of work/family interference and leisure-time physical activity among teachers: The role of passion towards work. *European Journal of Work and Organizational Psychology*, *20*, 326–344.
- Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods & Research*, *36*, 462–494.
- Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. In P. P. Co (Ed.), *Perspectives in social psychology* (pp. XVI-372). New York: Springer US.
- Deci, E. L., & Ryan, R. M. (1994). Promoting self-determined education. *Scandinavian Journal of Educational Research*, *38*, 3–14.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry: An International Journal for the Advancement of Psychological Theory*, *11*, 227–268.
- Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, *27*, 930–942.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, *49*, 71–75.
- Forest, J., Mageau, G. A., Sarrazin, C., & Morin, E. M. (2011). “Work is my passion”: The different affective, behavioural, and cognitive consequences of harmonious and obsessive passion toward work. *Canadian Journal of Administrative Sciences*, *28*, 17–30.
- Friedman, L., & Wall, M. (2005). Graphical views of suppression and multicollinearity in multiple linear regression. *The American Statistician*, *59*, 127–136.
- Gagné, M., Ryan, R. M., & Bargmann, K. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology*, *15*, 372–390.
- Gillet, N., Fouquereau, E., Forest, J., Brunault, P., & Colombat, P. (2012). Organizational factors and psychological needs and their relations with well-being. *Journal of Business and Psychology*, *27*, 437–450.
- Ilardi, B. C., Leone, D., Kasser, T., & Ryan, R. M. (1993). Employee and supervisor ratings of motivation: Main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *Journal of Applied Social Psychology*, *23*, 1789–1805.
- Kashdan, T. B., Julian, T., Merritt, K., & Uswatte, G. (2006). Social anxiety and posttraumatic stress in combat veterans: Relations to well-being and character strengths. *Behaviour Research and Therapy*, *44*, 561–583.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.
- Lafrenière, M.-A. K., Jowett, S., Vallerand, R. J., & Carbonneau, N. (2011). Passion for coaching and the quality of the coach-athlete relationship: The mediating role of coaching behaviors. *Psychology of Sport and Exercise*, *12*, 144–152.
- Lavigne, G. L., Forest, J., & Crevier-Braud, L. (2012). Passion at work and burnout: A two-study test of the mediating role of flow experiences. *European Journal of Work and Organizational Psychology*, *21*, 518–546.
- Lavigne, G. L., Vallerand, R. J., & Crevier-Braud, L. (2011). The fundamental need to belong: On the distinction between growth and deficit-reduction orientations. *Personality and Social Psychology Bulletin*, *37*, 1185–1201.
- Lemyre, P.-N., Roberts, G. C., & Stray-Gundersen, J. (2007). Motivation, overtraining, and burnout: Can self-determined motivation predict overtraining and burnout in elite athletes? *European Journal of Sport Science*, *7*, 115–126.
- Liu, D., Chen, X.-P., & Yao, X. (2011). From autonomy to creativity: A multilevel investigation of the mediating role of harmonious passion. *Journal of Applied Psychology*, *96*, 294–309.
- Mackinnon, A., Jorm, A. F., Christensen, H., Korten, A. E., Jacomb, P. A., & Rodgers, B. (1999). A short form of the Positive and Negative Affect Schedule: Evaluation of factorial validity and

- invariance across demographic variables in a community sample. *Personality and Individual Differences*, **27**, 405–416.
- Mageau, G. A., Carpentier, J. E., & Vallerand, R. J. (2011). The role of self-esteem contingencies in the distinction between obsessive and harmonious passion. *European Journal of Social Psychology*, **41**, 720–729.
- Mageau, G. A., & Vallerand, R. J. (2007). The moderating effect of passion on the relation between activity engagement and positive affect. *Motivation and Emotion*, **31**, 312–321.
- Mageau, G. A., Vallerand, R. J., Charest, J., Salvy, S.-J., Lacaille, N., Bouffard, T., et al. (2009). On the development of harmonious and obsessive passion: The role of autonomy support, activity specialization, and identification with the activity. *Journal of Personality*, **77**, 601–646.
- Mageau, G. A., Vallerand, R. J., Rousseau, F. L., Ratelle, C. F., & Provencher, P. J. (2005). Passion and gambling: Investigating the divergent affective and cognitive consequences of gambling. *Journal of Applied Social Psychology*, **35**, 100–118.
- Marsh, H. W., Vallerand, R. J., Lafrenière, M.-A. K., Parker, P., Morin, A. J. S., Carbonneau, N., et al. (2013). Passion: Does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychological Assessment*, **25**, 796–809.
- Massé, R., Poulin, C., Dassa, C., Lambert, J., Bélair, S., & Battaglini, M. A. (1998). Élaboration et validation d'un outil de mesure du bien-être psychologique au Québec. *Revue Canadienne de Santé Publique*, **89**, 352–357.
- Morin, E. M., & Dassa, C. (2006). *Giving meaning to work and promoting occupational health*. Unpublished manuscript.
- Philippe, F. L., Vallerand, R. J., Houliort, N., Lavigne, G. L., & Donahue, E. G. (2010). Passion for an activity and quality of interpersonal relationships: The mediating role of emotions. *Journal of Personality and Social Psychology*, **98**, 917–932.
- Philippe, F. L., Vallerand, R. J., Richer, I., Vallières, É., & Bergeron, J. (2009). Passion for driving and aggressive driving behavior: A look at their relationship. *Journal of Applied Social Psychology*, **39**, 3020–3043.
- Raedeke, T. D., & Smith, A. L. (2001). Development and preliminary validation of an athlete burnout measure. *Journal of Sport & Exercise Psychology*, **23**, 281–306.
- Ratelle, C. F., Vallerand, R. J., Mageau, G. A., Rousseau, F. L., & Provencher, P. (2004). When passion leads to problematic outcomes: A look at gambling. *Journal of Gambling Studies*, **20**, 105–119.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, **26**, 419–435.
- Rousseau, F. L., & Vallerand, R. J. (2003). Le rôle de la passion dans le bien-être subjectif des aînés [The role of passion in subjective well-being of the elderly]. *Revue Québécoise de Psychologie*, **24**, 197–211.
- Rousseau, F. L., & Vallerand, R. J. (2008). An examination of the relationship between passion and subjective well-being in older adults. *International Journal of Aging & Human Development*, **66**, 195–211.
- Ryan, R. M., Deci, E. L., Grolnick, W. S., & La Guardia, J. G. (2006). The significance of autonomy and autonomy support in psychological development and psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol. 1. Theory and method* (pp. 795–849). New Jersey: John Wiley & Sons, Inc.
- Ryan, R. M., & Frederick, C. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality*, **65**, 529–565.
- Séguin-Levesque, C., Laliberté, M. L. N., Pelletier, L. G., Blanchard, C., & Vallerand, R. J. (2003). Harmonious and obsessive passion for the Internet: Their associations with the couple's relationship. *Journal of Applied Social Psychology*, **33**, 197–221.
- Sheldon, K. M. (2002). The self-concordance model of healthy goal striving: When personal goals correctly represent the person. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 65–86). Rochester, NY: University of Rochester Press.
- Sheldon, K. M. (2011). Integrating behavioral-motive and experiential-requirement perspectives on psychological needs: A two process model. *Psychological Review*, **118**, 552–569.
- Sheldon, K. M., Ryan, R. M., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, **22**, 1270–1279.
- Stenseng, F., Rise, J., & Kraft, P. I. (2011). The dark side of leisure: Obsessive passion and its covariates and outcomes. *Leisure Studies*, **30**, 49–62.
- Tabachnik, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston: Pearson Education.
- Tay, L., & Diener, E. (2011). Needs and subjective well-being around the world. *Journal of Personality and Social Psychology*, **101**, 354–365.
- Tian, L., Chen, H., & Huebner, E. S. (2014). The longitudinal relationships between basic psychological needs satisfaction at school and school-related subjective well-being in adolescents. *Social Indicators Research*, **119**, 353–372.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. *Advances in Experimental Social Psychology*, **29**, 271–360.
- Vallerand, R. J. (2000). Deci and Ryan's self-determination theory: A view from the hierarchical model of intrinsic and extrinsic motivation. *Psychological Inquiry*, **11**, 312–318.
- Vallerand, R. J. (2008). On the psychology of passion: In search of what makes people's lives most worth living. *Canadian Psychology/Psychologie Canadienne*, **49**, 1–13.
- Vallerand, R. J. (2010). On passion for life activities: The dualistic model of passion. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. **42**, pp. 97–193). New York: Academic Press.
- Vallerand, R. J. (2015). *The psychology of passion: A dualistic model*. New York: Oxford University Press.
- Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., et al. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, **85**, 756–767.
- Vallerand, R. J., Mageau, G. A., Elliot, A. J., Dumais, A., Demers, M.-A., & Rousseau, F. (2008). Passion and performance attainment in sport. *Psychology of Sport and Exercise*, **9**, 373–392.

- Vallerand, R. J., & Miquelon, P. (2007). Passion for sport in athletes. In D. Lavallée & S. Jowett (Eds.), *Social psychology in sport* (pp. 249–263). Champaign, IL: Human Kinetics.
- Vallerand, R. J., & Miquelon, P. (2008). Le modèle hiérarchique: Une analyse intégrative des déterminants et conséquences de la motivation intrinsèque et extrinsèque. In R.-V. Joule & P. Huguet (Eds.), *Bilans et perspectives en psychologie sociale* (pp. 163–203). Grenoble, France: University of Grenoble Press.
- Vallerand, R. J., Paquet, Y., Philippe, F. L., & Charest, J. (2010). On the role of passion for work in burnout: A process model. *Journal of Personality*, **78**, 289–312.
- Vallerand, R. J., Rousseau, F. L., Grouzet, F. M. E., Dumais, A., Grenier, S., & Blanchard, C. M. (2006). Passion in sport: A look at determinants and affective experiences. *Journal of Sport & Exercise Psychology*, **28**, 454–478.
- Vallerand, R. J., Salvy, S.-J., Mageau, G. A., Elliot, A. J., Denis, P. L., Grouzet, F. M. E., & Blanchard, C. (2007). On the role of passion in performance. *Journal of Personality*, **75**, 505–534.
- Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-Related Basic Need Satisfaction Scale. *Journal of Occupational and Organizational Psychology*, **83**, 981–1002.
- Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration*, **23**, 263–280.
- Vlachopoulos, S. P., & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The Basic Psychological Needs in Exercise Scale. *Measurement in Physical Education and Exercise Science*, **10**, 179–201.
- Wang, C. K. J., Khoo, A., Liu, W. C., & Divaharan, S. (2008). Passion and intrinsic motivation in digital gaming. *CyberPsychology & Behavior*, **11**, 39–45.