

Passion for an Activity and Quality of Interpersonal Relationships: The Mediating Role of Emotions

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Our purpose in this research was to investigate the role of passion (Vallerand et al., 2003) for a given activity in the quality of interpersonal relationships experienced within the context of that activity in 4 studies. Study 1 demonstrated that a harmonious passion was positively associated with the quality of interpersonal relationships within the context of the passionate activity, whereas an obsessive passion was unrelated to it. Furthermore, in line with the broaden-and-build theory (Fredrickson, 2001), results also showed that positive emotions experienced at work fully mediated the relation between harmonious passion and quality of interpersonal relationships. Obsessive passion was not associated with positive emotions. Study 2 replicated the results from Study 1 while controlling for trait extraversion. Also, in Study 2, we examined the negative mediating role of negative emotions between obsessive passion and quality of interpersonal relationships. Finally, Studies 3 and 4 replicated the results of Study 2 with prospective designs and with objective ratings of interpersonal relationships quality. Implications for the dualistic model of passion and the broaden-and-build theory are discussed.

Keywords: passion, interpersonal relationships, emotion, broaden-and-build theory

People who are passionate for an activity are often depicted as being energetic and magnetic by others. The intense focus on the activity, the energy, and the strong positive emotions that such people experience and display often attract and inspire others to connect with them. Thus, unsurprisingly, people highly involved in an activity are usually seen as very popular and come to develop positive relationships with the people with whom they partake in the activity. At the same time, people who are passionate for an activity are also described as putting so much emphasis on the activity that they come to experience stress and negative emotions. When displayed, such emotions are likely to be a major turn off for other participants, thereby undermining the quality of relationships developed within the purview of the activity. Thus, two possibilities are left: Does passion for an activity benefit or deteriorate one's quality of interpersonal relationships in that activity? Furthermore, do emotions play a mediating role in the quality of interpersonal relationships that passionate individuals come to develop in that activity? Our purpose in this article was to examine these issues, thus extending knowledge on passion, relationships, and the social functions of emotions.

A Dualistic Model of Passion

If passion has been an important concept in philosophy throughout centuries (see Rony, 1990, for a review), it has received very little attention in psychology until very recently (see Vallerand et al., 2003; Vallerand et al., 2007, on this issue). It is only in the last few years that Vallerand and his colleagues (Vallerand, 2008; Vallerand et al., 2003; Vallerand & Houlfort, 2003) have formulated a dualistic model in which passion is defined as a strong inclination or desire toward a self-defining activity that one likes (or even loves), that one finds important (high valuation), and in which one invests time and energy. Passion is conceptualized as a moderate-level construct that is positioned at the contextual level, between global (trait) and situational (state) levels (see Vallerand, 1997, for a theoretical account of the different levels of a three-level hierarchy). A given construct at the contextual level refers to a relatively stable person–activity relationship that reflects how a person typically behaves with respect to a specific activity (and not necessarily with respect to all activities).¹

In this theoretical model, it is proposed that there exist two types of passion. The first type of passion is harmonious passion. A harmonious passion refers to a strong desire to engage in the activity that remains under the person's control. This type of passion results from an autonomous internalization of the activity into the person's identity (Vallerand et al., 2003; Vallerand, Rous-

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¹ See Vallerand (2008) and Amiot, Vallerand, and Blanchard (2006) for a comprehensive differentiation between the dualistic model of passion and other related constructs. Also, see Philippe, Vallerand, and Lavigne (2009) for a differentiation between obsessive passion and addiction.

seau, Grouzet, Dumais, & Grenier, 2006). An autonomous internalization occurs when individuals have freely accepted the activity as important for them without any contingencies attached to it (Sheldon, 2002; Vallerand, 1997). The activity is thus part of an integrated self-structure (Hodgins & Knee, 2002). In such a case, the activity occupies a significant but not overpowering space in the person's identity and is in harmony with other aspects of the person's life. With harmonious passion, the person is in control of the activity and can freely decide when to engage or not engage in the activity and even when to stop activity engagement. The activity is engaged in because of the pleasure that is drawn from it and not from other extrinsic sources. An example of such a type of passion would be a student with a passion for basketball who has to study for an important exam the next day. Because this student is characterized by a harmonious passion for basketball, if his friends call to propose a basketball scrimmage, he will be able to turn down the invitation in order to study for his exam without experiencing much conflict.

The second type of passion identified by Vallerand and colleagues (Vallerand et al., 2003) is obsessive passion. This type of passion entails a strong desire to engage in the activity, which is not under the person's control. It is as if the activity controlled the person. Obsessive passion results from a controlled internalization of the activity into one's identity (Vallerand et al., 2003; Vallerand et al., 2006). Such internalization originates from intra- and/or interpersonal pressure because certain contingencies are attached to the mental representations of the activity, such as feelings of social acceptance or self-esteem. Thus, individuals like the activity so much that they cannot help but to engage in it, due to a lack of control over internal contingencies that come to control the person and preclude the experience of volition in activity engagement. To go back to the above example, if the student has an obsessive passion for basketball and his friends call to propose a basketball scrimmage, he will probably accept the invitation and go play basketball, while feeling guilty for not studying. This conflicted form of activity engagement should lead to a narrow range of experiences that can reduce the positive affective outcomes that would be normally experienced and can even increase negative emotional experiences (e.g., guilt, anxiety).

Research has provided empirical support for the concept of passion. Results from exploratory and confirmatory factor analyses supported the two-factor structure of the Passion Scale, an instrument developed to measure harmonious passion and obsessive passion (e.g., Vallerand et al., 2003, Study 1; Vallerand et al., 2006, Study 1). The Passion Scale was also shown to have high levels of internal consistency as well as predictive, discriminant, construct, and external validity. Results on this scale revealed that both harmonious passion and obsessive passion were positively associated with measures of activity valuation, perceptions of the activity as a passion, time and energy investment in the activity, and inclusion of the activity in the self (Vallerand et al., 2003, Study 1). Both types of passion were also found to be positively associated with activity perseverance and performance (Vallerand et al., 2008, Study 1; Vallerand et al., 2007, Study 1).

However, each type of passion has also been found to be differently associated with a variety of outcomes. Indeed, harmonious passion has been found to be positively correlated with positive experiences such as flow and positive emotions (Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005; Vallerand et

al., 2003, Study 1; Vallerand et al., 2006, Studies 2 and 3), reduced negative emotions (Mageau et al., 2005; Vallerand et al., 2003, Study 1), and higher levels of concentration during task engagement (Mageau et al., 2005; Vallerand et al., 2003, Study 1). Harmonious passion has also been found to be positively associated with psychological adjustment indices (Rousseau & Vallerand, 2003, 2008; Vallerand et al., 2008, Study 2; Vallerand et al., 2007, Studies 1 and 2). Conversely, obsessive passion has been found to be positively associated with negative emotions during task engagement (Vallerand et al., 2003, Study 1), anxiety (Rousseau & Vallerand, 2003), and rumination when the person is prevented from engaging in his or her passionate activity (Ratelle et al., 2004; Vallerand et al., 2003, Study 1). In addition, obsessive passion has been shown to negatively predict psychological adjustment indices (Rousseau & Vallerand, 2003, 2008; Vallerand et al., 2007, Study 2; Vallerand et al., 2008, Study 2).

As can be seen from the above, several studies have provided support for the dualistic model of passion as pertains to a variety of intrapersonal outcomes. However, very little research has been conducted at the interpersonal level. In fact, only in one study, to our knowledge, have researchers looked at the role of passion in interpersonal relationships. In this particular study, Séguin-Lévesque, Laliberté, Pelletier, Blanchard, and Vallerand (2003) found that a harmonious passion for the Internet was associated with better dyadic adjustment in romantic couples, whereas an obsessive passion for the Internet was positively correlated with interpersonal conflict in the couple. However, this study focused on passion for the Internet and its consequences on couple adjustment and not on the quality of interpersonal relationships with the people with whom the activity is engaged in. Thus, the results from Seguin-Lévesque and colleagues' study only provide indirect support with respect to the role of passion in the quality of interpersonal relationships experienced within the purview of the passionate activity.

It is hypothesized that the two types of passion should lead to different levels of quality of interpersonal relationships in the activity. As described above, harmonious passion derives from an autonomous internalization of the activity. The individual with harmonious passion is thus capable of a flexible engagement in the activity that is conducive to a willingness to experience what is occurring at the present moment (Hodgins & Knee, 2002). This process should thus lead the person to more fully experience positive emotions during task engagement (Hodgins & Knee, 2002). Past research has indeed found harmonious passion to be positively related to positive emotions during task engagement (Mageau et al., 2005; Vallerand et al., 2003, Study 1). In parallel to this, Fredrickson (2001) has proposed through the broaden-and-build theory that positive emotions have the virtue of broadening people's thought-action repertoires and self, leading to the inclusion of other people in one's self and, thus, to increased closeness and relationship satisfaction with these other people (Aron et al., 2000; Fredrickson, 2001; Waugh & Fredrickson, 2006). Research has shown that positive emotions experienced in a given context facilitate the broadening of thought-action repertoires and self (Fredrickson & Branigan, 2005; Waugh & Fredrickson, 2006), leading to an increase in perceived similarities with others (Dovidio, Gaertner, Isen, & Lowrance, 1995; Johnson & Fredrickson, 2005) and in positive interpersonal relationships (Waugh & Fredrickson, 2006). It is thus posited that the experience of posi-

tive emotions triggered by harmonious passion should promote the quality of interpersonal relationships (Cappella, 1997; Shiota, Campos, Keltner, & Hertenstein, 2003; Walter & Bruch, 2008).

Conversely, because it originates from a controlled internalization of the activity, obsessive passion should result in a rigid and conflicted impersonal functioning and in emotional defensiveness (Hodgins & Knee, 2002). Such a rigid and defensive style should lead to self-closure from intrapersonal and interpersonal experiences (Aron, Aron, & Smolan, 1992), to a poor integrative experience during task engagement (Hodgins & Knee, 2002), and, thus, to a negative emotional experience, while reducing the positive affective outcomes that would have been normally experienced (Hodgins & Knee, 2002). Past research has indeed shown that obsessive passion is either negatively related or unrelated to positive emotions but is positively associated with negative emotions during task engagement (Mageau et al., 2005; Vallerand et al., 2003, Study 1; Vallerand et al., 2006, Studies 2 and 3). In line with Fredrickson's (2001) broaden-and-build theory, negative emotions are posited to lead to a narrowing of the thought-action repertoires and self (Fredrickson & Branigan, 2005) and thus to poor interpersonal relationships (Levenson & Gottman, 1983; Waugh & Fredrickson, 2006). Therefore, the different emotional consequences of each type of passion might mediate the quality of interpersonal relationships experienced within the purview of the passionate activity.

The Present Research

Emotions are often considered to serve important social functions (Frijda, 2006; Keltner & Haidt, 2001). Indeed, research has shown that positive emotions represent critical ingredients that facilitate positive interpersonal relationships (e.g., Algoe, Haidt, & Gable, 2008; Walter & Bruch, 2008; Waugh & Fredrickson, 2006). However, research is lacking on the personal factors that trigger these positive emotions. As shown above, recent research on passionate activities has gathered much evidence demonstrating that having a passion for an activity in one's life may lead to a host of affective outcomes within the purview of the activity. In line with the broaden-and-build theory (Fredrickson, 2001), it can be expected that these affective outcomes may, in turn, influence the quality of interpersonal relationships with the people with whom the activity is engaged in. However, such a passion-emotions-interpersonal relationships sequence has remained unexplored. Our purpose in the present research was to examine this sequence. Four studies were thus conducted. In Study 1, we investigated whether an association existed between passion and quality of interpersonal relationships, with a sample of middle-age workers involved in challenging and interesting positions that people can be passionate about. We also aimed to test the mediating role of positive emotions in the relation between passion and quality of interpersonal relationships. Our purpose in Study 2 was to replicate the results of Study 1 and to examine the mediating role of negative emotions, while controlling for trait extraversion. Finally, in Studies 3 and 4 we used prospective designs to replicate the results of Study 2 with a wider range of emotional and interpersonal measures, including objective interpersonal relationships ratings.

Study 1

Study 1 had two purposes. First, we aimed to investigate whether a link existed between passion and quality of interpersonal relationships experienced in the course of a passionate activity. As an initial investigation of this association, work has been selected as an activity that people can be passionate about and that involves interpersonal relationships. Second, we sought to determine the nature of the psychological processes involved in the relation between passion and interpersonal relationships. In line with past research with both the dualistic model of passion and the broaden-and-build theory, it was hypothesized that harmonious passion for an activity (in this case the person's work) should lead to the experience of positive emotions within the context of that activity, which in turn were expected to be conducive to the quality of interpersonal relationships with work colleagues. Conversely, in line with past research, it was hypothesized that obsessive passion should be negatively associated with or unrelated to positive emotions and, therefore, should not be conducive to the quality of interpersonal relationships.

Method

Participants. Participants were 195 (97 females, 96 males, and 2 missing values) employees from the Greater Montreal, Canada, area working in challenging positions in education as teachers or in administration as managers. These work positions were selected, as they were very likely to be in a passionate profession. Participants were 42 years old on average ($SD = 9.68$ years). They had occupied their position for an average of 11.41 years ($SD = 8.78$ years) and were working, on average, 32.87 hr per week ($SD = 8.44$ hr).

Measures.

Passion. The Passion Scale (Vallerand et al., 2003) was administered to assess the type of passion that characterizes participants' work. The Passion Scale is composed of two subscales of six items, each assessing a precise type of passion: harmonious passion and obsessive passion. Each item is responded to on a 7-point Likert scale ranging from 1 (*do not agree at all*) to 7 (*completely agree*). Sample items for obsessive passion are "I have difficulties controlling my urge to do my work" or "I have almost an obsessive feeling for my work," whereas sample items for harmonious passion are "The new things that I discover in my work allow me to appreciate it even more" or "My activity is in harmony with other things that are part of me." Alphas in this study were .79 for each of the two subscales.²

Positive emotions. Two items from the Work Affective and Cognitive Consequences Scale (WACCS; Blais & Vallerand, 1991) were used to measure positive emotions experienced at work (happy and in a good mood). Participants were asked to rate the

² Participants also indicated on an item ranging from 1 (*do not agree at all*) to 7 (*completely agree*) the extent to which their work was a passion for them. In this study, 61% of the participants reported being passionate about their work (a rating of 4 and up according to Vallerand and colleagues' (Vallerand et al., 2003) passion criterion. In addition, results were exactly the same with and without the participants who indicated being less than moderately passionate for their work. Thus, all participants were kept in the analyses.

extent to which they experienced each emotion on a 7-point Likert scale (1 = *do not agree at all*, 7 = *very strongly agree*), according to the stem "In general, when I do my work I realize that I am—" Alpha was .70.

The Quality of Interpersonal Relationships Scale (QIRS; Sénécal, Vallerand, & Vallières, 1992) is composed of four items responded to on a 5-point Likert scale (0 = *not at all*, 4 = *extremely*). Participants were asked to indicate to what extent the relationships they have with the people at work are enriching, are satisfying, are harmonious, and inspire trust. Adequate validity and reliability indices have been reported for this scale (see Sénécal et al., 1992). Alpha in this study was .91.

Procedure. Workers were reached through internal mail at their workplace. A written letter asked them whether they would be interested in completing a short questionnaire. Participants were told that the purpose of the questionnaire was to learn more about what is satisfying and what is not satisfying at work. They were informed that they were free to participate or not and that their answers would remain anonymous and would never be sent to their supervisor or to anyone in their company or institution. All questionnaires were returned in a preaddressed and stamped envelope.

Results and Discussion

Table 1 shows the means, standard deviations, and correlations of all study variables. To assess the relation between passion and quality of interpersonal relationships experienced during activity engagement (work), a multiple regression analysis was conducted. The quality of interpersonal relationships served as the dependent variable in the regression analysis, and the two types of passion served as predictor variables. Finally, because a higher number of hours worked weekly may lead to better interpersonal relationships, this variable was controlled for in the analysis. Results of the regression yielded a significant model, $F(3, 191) = 6.82, p < .000, R^2 = .10$. Results also uncovered that harmonious passion was a significant predictor of quality of interpersonal relationships ($\beta = .28, p < .001$). Obsessive passion was not associated with quality of interpersonal relationships ($\beta = -.02, ns$). The number of hours worked weekly was also significant ($\beta = .16, p < .05$).

The second hypothesis stated that positive emotions should mediate the relation between harmonious passion and quality of interpersonal relationships. To test this model, a path analysis was conducted with LISREL 8.54 (Jöreskog & Sörborm, 2003). The covariance matrix served as the database for the path analysis and the method of estimation was maximum likelihood. All the path analyses conducted in the present research were performed with

this software and this method. The present model was composed of three exogenous variables (harmonious passion, obsessive passion, and number of hours worked weekly) and two endogenous variables (positive emotions and quality of interpersonal relationships). The paths were drawn according to the hypotheses presented above. In addition, because the time spent at work may lead to better interpersonal relationships with work colleagues, a positive path between number of hours worked weekly and quality of interpersonal relationships was added.

Results of the path analysis revealed a satisfactory fit to the data, $\chi^2(3, N = 195) = 1.56, p = .67$, normed fit index (NFI) = 1.00, non-normed fit index (NNFI) = 1.00, comparative fit index (CFI) = 1.00, root-mean-square error of approximation (RMSEA) = .00 [.00; .094], goodness-of-fit index (GFI) = 1.00, standardized root-mean-square residual (SRMR) = .022. As shown in Figure 1, all estimated paths were significant at least at $p < .05$, except for the path between obsessive passion and positive emotions that was nonsignificant ($\beta = -.05, ns$). Inspection of the correlation residuals revealed that all were nonsignificant, indicating that additional paths would not be significant and would not improve the model fits (Kline, 2005). In addition, direct paths from harmonious passion and obsessive passion to quality of interpersonal relationships were not significant, and their inclusion in the model did not affect the fit indices, $\Delta\chi^2(2) = 1.26, ns$, or the coefficients of the hypothesized paths, thus suggesting mediation. Bias-corrected bootstrapped 95% confidence interval estimates of the indirect effect (see Preacher & Hayes, 2008; Shrout & Bolger, 2002) were then conducted to confirm the significance of this mediation of positive emotions between harmonious passion and quality of interpersonal relationships. Bootstrapping is a statistical method that randomly takes a sample size of n cases from an original sample to estimate the indirect effect and replaces these cases into the original sample. This process is repeated 5,000 times, yielding 5,000 estimates of the indirect effect of X on Y . These 5,000 estimates thus create a sampling distribution of the indirect effect, and a 95% confidence interval can be extracted from it. Bootstrapped confidence intervals provide a more accurate estimate of the indirect effect with small-to-moderate samples size, compared with the Sobel tests (see Shrout & Bolger, 2002). The indirect effect is significant at $p < .05$ if the 95% confidence intervals do not include the value of zero. As seen in Table 2, this test confirmed that the mediation effect was significant.

An alternative model tested whether the quality of interpersonal relationships mediated the relation between harmonious passion and emotions (passion \rightarrow quality of interpersonal relationships \rightarrow

Table 1
Means, Standard Deviations, and Correlations: Study 1

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Harmonious passion	4.69	1.14	—				
2. Obsessive passion	3.14	1.28	.45***	—			
3. Quality of interpersonal relationships	2.46	0.72	.27***	.08	—		
4. Positive emotions	5.32	1.12	.55***	.20**	.36***	—	
5. Hours of weekly involvement	32.87	8.44	-.07	.06	.14*	-.04	—

Note. $N = 195$.

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

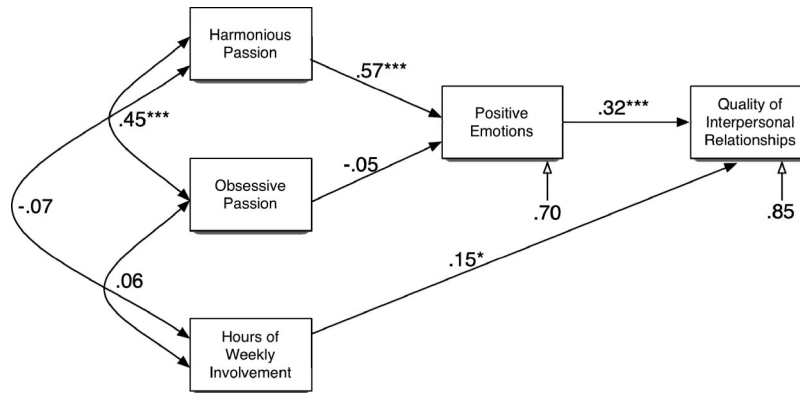


Figure 1. Study 1 path analytic model of the relations among passion, positive emotions, and quality of interpersonal relationships, controlling for hours of weekly involvement. Standardized path coefficients are presented. Nonsignificant direct effect paths are not shown for the sake of clarity. However, the values of the path coefficients are those of the full mediating model, including the direct effects of the independent variables to the outcome variables. * $p < .05$. *** $p < .001$.

positive emotions). Results revealed that the fit indices of this alternative model were very poor compared with those of the hypothesized model, $\chi^2(3, N = 195) = 50.89, p > .000$, RMSEA = .288 [0.22; 0.36], CFI = .60, NFI = .61, SRMR = .13. In addition, modification indices suggested the inclusion of a path from harmonious passion to positive emotions. These are clear evidence that the hypothesized model should be preferred. The model with positive emotions predicting both passion and interpersonal relationships would represent an equivalent model (equal fit indices) and inverting the whole original path (interpersonal relationships \rightarrow positive emotions \rightarrow passion) would also appear plausible. Past research, however, has consistently shown that passion is a predictor of the consequences of passionate activity engagement and is not an outcome per se (for a review see Vallerand, 2008; see also Carbonneau, Vallerand, Fernet, & Guay, 2008, for a cross-lagged panel study that provides empirical support for the present position).

In sum, as predicted, harmonious passion was positively related to positive emotions that were in turn associated with positive quality of interpersonal relationships at work. Conversely, obsessive passion was not associated with either positive emotions or quality of interpersonal relationships at work. Thus, overall, the present findings provide preliminary support for positive emotions as the psychological process responsible for the positive relation between harmonious passion and quality of interpersonal relationships.

Study 2

Study 2 had three purposes. First, to determine more clearly whether the results obtained in Study 1 were indeed due to passion for an activity and not to the mere result of a positive interpersonal orientation, we replicated Study 1, this time controlling for trait extraversion. Controlling for extraversion was deemed important because extraversion has been shown to be associated with both positive emotional experiences and positive interpersonal relationships (Costa & McCrae, 1980; Watson & Clark, 1997). In line with Study 1, it was first hypothesized that harmonious passion would

positively predict the quality of interpersonal relationships, even when controlling for trait extraversion, whereas obsessive passion would be unrelated to the quality of interpersonal relationships.

Study 1 had only two items with which to assess positive emotions, and those items did not clearly distinguish emotions from mood. Thus, a second purpose in Study 2 was to replicate the findings of Study 1 with a more standard measure of positive emotions (Positive and Negative Affect Schedule [PANAS] MacKinnon et al., 1999). A third goal was to assess negative emotions, to disentangle the role of both positive emotions and negative emotions in interpersonal relationships. In line with Study 1, it was proposed that harmonious passion for an activity should lead to the experience of positive emotions within the context of that activity. These positive emotions were expected, in turn, to be conducive to quality of interpersonal relationships. Furthermore, in line with past passion research (see Vallerand, 2008), it was predicted that harmonious passion should be negatively associated with negative emotions. On the other hand, in line with Study 1, it was hypothesized that obsessive passion for an activity should be unrelated to positive emotions and to the quality of interpersonal relationships. In addition, it was also predicted that obsessive passion should be positively associated with negative emotions (e.g., Mageau et al., 2005; Vallerand et al., 2003, Study 1), which in turn should be negatively related to the quality of interpersonal relationships (Vaughn & Fredrickson, 2006). Finally, it was further predicted that these mediation effects should not be altered by trait extraversion.

Method

Participants. Participants were 266 (174 females, 92 males) French-Canadian undergraduate students from a university in Quebec, Canada. Because we were interested in the quality of interpersonal relationships within the context of a passionate activity, participants who reported engaging in their activity alone were removed from this analysis ($n = 77$). A total of 12 participants were also dropped from the analysis because of several missing data. The final sample was composed of 177 participants ($M =$

Table 2
Bias-Corrected Bootstrapped Estimates of the Mediations of Studies 1–4

Model	Bias-corrected bootstrapped 95% CI estimates
Study 1	
HP → PE → Positive QIR	[.178, .259]*
Study 2	
HP → PE → Positive QIR	[.059, .124]*
HP → NE → Positive QIR	[.004, .053]*
OP → NE → Positive QIR	[-.023, -.008]*
Study 3	
HP → PE → Athletes' positive ratings	[.149, .265]*
HP → PE → Coaches' positive ratings	[.064, .273]*
HP → NE → Athletes' positive ratings	[.026, .079]*
HP → NE → Coaches' positive ratings	[-.002, .142]
OP → NE → Athletes' positive ratings	[-.230, -.088]*
OP → NE → Coaches' positive ratings	[-.593, .007]
Study 4	
HP → PE → Connectedness	[.117, .166]*
HP → PE → Seclusion	[-.091, -.055]*
HP → PE → Teammates' positive ratings	[.440, .565]*
HP → PE → Teammates' negative ratings	—
HP → NE → Connectedness	[-.004, .098]
HP → NE → Seclusion	[-.098, .004]
HP → NE → Teammates' positive ratings	—
HP → NE → Teammates' negative ratings	[-.09, .004]
OP → NE → Connectedness	[-.158, -.011]*
OP → NE → Seclusion	[.013, .159]*
OP → NE → Teammates' positive ratings	—
OP → NE → Teammates' negative ratings	[.001, .014]*

Note. Dashes indicate that in these cases, the beta path (i.e., the association between the mediator and the outcome) was not significant. CI = confidence interval; HP = harmonious passion; OP = obsessive passion; PE = positive emotions; NE = negative emotions; QIR = quality of interpersonal relationships.

* $p < .05$.

26.0 years, $SD = 7.43$ years) who engaged in their passionate activity for 8.21 hr per week ($SD = 10.62$ hr per week) on average and who had been engaging in it for 57.48 months ($SD = 74.50$ months) on average.

Measures.

The Passion Scale. The Passion Scale was again administered in order to assess the type of passion that characterizes a highly valued activity engaged in by the participants. Participants were asked to list an activity that they love and value and in which spend a considerable amount of time and energy (e.g., basketball, acting, playing pool). They were then asked to complete the scale while referring to this activity (e.g., "I have difficulties controlling my urge to do my activity" or "I have almost an obsessive feeling for my activity"). Alphas for the sample of this study were .80 and .85, respectively, for the harmonious passion and the obsessive passion subscales. Similarly to the Vallerand et al. (2003, Study 1) activity classification, listed activities in this study included team sports (e.g., playing basketball, hockey, football: 58%), leisure (e.g., listening to music, gardening, playing pool: 20%), active arts (e.g., painting, photography, theater: 12%), education and/or work (e.g., part-time work, teaching: 5%), and interpersonal activities (e.g., being with friends or family: 5%).³

PANAS. A short, 10-item version (MacKinnon et al., 1999) of the PANAS (Watson, Clark, & Tellegen, 1988) was used to assess

participants' emotions while engaging in the activity. Five items pertained to positive emotions (e.g., enthusiastic, determined) and five items pertained to negative emotions (e.g., nervous, upset). All emotion items were responded to on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). A factorial analysis with the selected 10 emotions, with a varimax rotation, yielded two factors accounting for 61% of the variance, thus preserving the orthogonal structure of the original full-scale version (see MacKinnon et al., 1999, for further evidence of validity and reliability for this short scale). Alphas for this brief version were .80 for the positive emotions subscale and .84 for the negative emotions subscale.

The Quality of Interpersonal Relationships Scale. The *Quality of Interpersonal Relationships Scale* (Sénécal et al., 1992) was also used in the present study ($\alpha = .92$).

Extraversion. A short version (12 items) of the extraversion subscale of the NEO Personality Inventory—Revised (Costa & McCrae, 1992) was also completed by participants on a 5-point Likert scale (1 = *strongly disagree*, and 5 = *strongly agree*). Sample items are "I like to have a lot of people around me" and "I laugh easily." Alpha in this study was .82.

Procedure. Participants were told that the purpose of the study was to find out more about participants' favorite activity. It was also mentioned that participation was voluntary and anonymous and that responses would remain confidential. Participants were first asked to complete the Passion Scale and to mention the number of hours per week they were engaging in their activity and whether they were practicing it alone or with other people. If they were practicing it with other people, participants reported with how many people they were typically engaging in their activity. Participants then completed the emotions inventory and the Quality of Interpersonal Relationships Scale. All items for both scales were referring to the chosen passionate activity. Finally, participants completed the extraversion scale.

Results and Discussion

Table 3 reports the means, standard deviations, and correlations of all study variables. To assess the relation between passion and quality of interpersonal relationships experienced during activity engagement, we conducted a multiple regression analysis. The quality of interpersonal relationships served as the dependent variable, and the two types of passion served as predictor variables, controlling for number of hours of weekly involvement in the passionate activity and for extraversion. Results of the regression yielded a significant model, $F(4, 261) = 7.95, p < .000, R^2 = .16$. Results revealed that harmonious passion was a significant

³ Results showed that there were no differences among types of activity and all study variables, except on positive emotions, $F(4, 172) = 4.23, p < .01$. Participants passionate for a team sports activity reported higher levels of positive emotions compared with those passionate for a leisure activity, $t(137) = 3.45, p < .05$. However, team sports and leisure did not differ from any other category. Therefore, no further analyses were conducted with respect to activity categories. Correlations between the number of people with whom the activity was engaged in and the passion and the quality of interpersonal relationships were not significant, but it was positively associated with positive emotions ($r = .17, p < .05$). Controlling for number of people did not affect the results of this study.

Table 3
Means, Standard Deviations, and Correlations: Study 2

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Harmonious passion	5.50	1.00	—						
2. Obsessive passion	2.29	1.22	.14*	—					
3. Quality of interpersonal relationships	3.23	0.69	.25***	-.06	—				
4. Positive emotions	3.99	0.83	.60***	.15*	.34***	—			
5. Negative emotions	1.77	0.83	-.13*	.19**	-.15*	.05	—		
6. Extraversion	3.76	0.57	.22**	-.06	.33***	.33***	-.11	—	
7. Hours of weekly involvement ^a	8.21	10.62	.13*	.26**	.06	.06	.16*	-.09	—

Note. *N* = 177.

^a Nontransformed means and standard deviations are presented.

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

predictor of quality of interpersonal relationships ($\beta = .19$, $p < .05$). Obsessive passion was not associated with quality of interpersonal relationships ($\beta = -.09$, *ns*), nor was the number of minutes of weekly involvement ($\beta = .09$, *ns*). These results replicate the findings of Study 1, this time with trait extraversion controlled for ($\beta = .29$, $p < .01$).

Our second hypothesis was that positive emotions experienced during the activity would mediate the relation between harmonious passion and quality of interpersonal relationships, whereas negative emotions would mediate the relations between obsessive passion and quality of interpersonal relationships. Given past research (e.g., Vallerand et al., 2003, Study 1) and the results of Study 1, obsessive passion was not expected to be associated with positive emotions, but harmonious passion was hypothesized to be negatively associated with negative emotions. To test this model, we conducted a path analysis. Trait extraversion and the number of

minutes of weekly involvement were added to the model as exogenous variables, to serve as control variables. Paths were also drawn from extraversion to positive emotions and from extraversion to quality of interpersonal relationships because research has shown that extraversion is usually associated with both of these variables (Costa & McCrae, 1980; Watson & Clark, 1997). Positive and negative emotions and quality of interpersonal relationships served as endogenous variables, and a covariance was estimated between positive emotions and negative emotions.

Results of the path analysis revealed a satisfactory fit of the model to the data, $\chi^2(6, N = 177) = 7.26$, $p = .30$, *NFI* = .96, *NNFI* = .97, *CFI* = .99, *RMSEA* = .035 [.00; .109], *GFI* = .99, *SRMR* = .033. As shown in Figure 2, all estimated paths were significant at least at $p < .05$, except for the path between number of hours involved weekly and quality of interpersonal relationships, which was not significant ($\beta = .09$, *ns*). Inspection of the

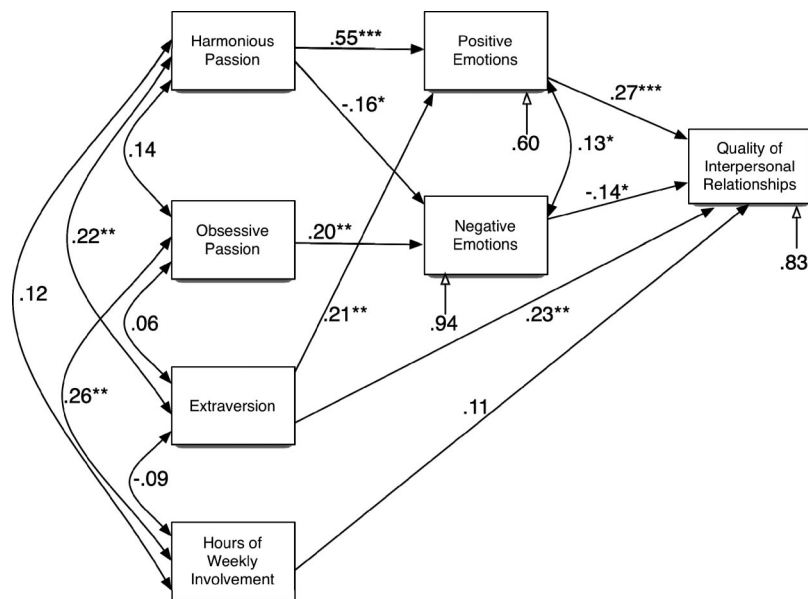


Figure 2. Study 2 path analytic model of relations among passion, positive and negative emotions, and quality of interpersonal relationships, controlling for extraversion and hours of weekly involvement. Standardized path coefficients are presented. Nonsignificant direct effect paths are not shown for the sake of clarity. However, the values of the path coefficients are those of the full mediating model, including the direct effects of the independent variables to the outcome variables. * $p < .05$. ** $p < .01$. *** $p < .001$.

correlation residuals revealed that all were nonsignificant, thus indicating that no additional path was significant (Kline, 2005). In addition, direct paths from harmonious passion and obsessive passion to quality of interpersonal relationships were not significant, and their inclusion in the model did not affect the fit indices, $\Delta\chi^2(2) = 1.66$, *ns*, or the coefficients of the hypothesized paths, thus suggesting mediation. Bias-corrected bootstrapped 95% confidence interval estimates confirmed the significance of the mediation of positive emotions between harmonious passion and quality of interpersonal relationships and of negative emotions between both obsessive passion and harmonious passion and quality of interpersonal relationships (see Table 2).

An alternative model tested whether the quality of interpersonal relationships mediated the relation between harmonious passion and emotions (passion \rightarrow quality of interpersonal relationships \rightarrow emotions). Results revealed that the fit indices of this alternative model were very poor compared with those of the hypothesized model, $\chi^2(7, N = 177) = 66.15$, $p > .000$, RMSEA = .22 [0.17; 0.27], CFI = .58, NFI = .59, SRMR = .12.

Results of Study 2 supported our hypotheses. First, they showed that harmonious passion was again positively associated with the quality of interpersonal relationships during activity engagement, even when controlling for trait extraversion, whereas obsessive passion was found to be unrelated to quality of interpersonal relationships. Second, results also supported the mediation hypotheses because they revealed that the association between harmonious passion and quality of interpersonal relationships was totally mediated by the experience of positive emotions during activity engagement. Such a pattern was not found for obsessive passion, as findings revealed that it was unrelated to either the experience of positive emotions during activity engagement or to the quality of interpersonal relationships. Finally, results indicated that negative emotions were a significant mediator between both obsessive passion and harmonious passion and interpersonal relationships.

Study 3

There were three purposes to Study 3. First, we aimed at replicating the results of Study 2 while using a prospective design. Specifically, in Study 3 we investigated how passionate basketball players attending a 5-day basketball summer camp developed interpersonal relationships with other people (coach, teammates, and players of the other teams) throughout the camp. One important limitation of Studies 1 and 2 was that interpersonal relationships ratings were obtained once the passionate people and their activity partners were accustomed to engaging in the activity together. Therefore, the prior quality of their relationships might have influenced passion ratings over time. The prospective design of Study 3 and the fact that basketball players did not know each other prior to the camp represent two important improvements over Studies 1 and 2 because they rule out the possibility that passion was determined by the quality of preexisting relationships. A second purpose of Study 3 was to broaden the assessment of interpersonal relationships quality. Thus, the self–other overlap (Aron et al., 1992) interpersonal measure was used with the addition of the positive quality of the relationships (as in Studies 1 and 2). In addition, all of these relationships elements were examined for each type of person engaging in the activity with the players (coach, teammates, and players of the other teams). In

Study 3 we also sought to investigate the perspective of other people with whom the passionate people engage in their activity. Therefore, head coaches of each basketball team at camp (15 teams) rated the extent to which each of his (all head coaches were male) players engaged in positive interpersonal relationships with his or her teammates, thus providing an independent and relatively objective rating of the players' relationships.

A third goal in Study 3 was to provide an improved examination of positive and negative emotions at play during passionate activity engagement by use of a more extensive assessment of positive and negative emotions.⁴ In line with Studies 1 and 2, it was hypothesized that positive emotions would positively mediate the relation between harmonious passion and all positive interpersonal dimensions, including the coaches' objective ratings. On the basis of the results of Studies 1 and 2, we further predicted that obsessive passion would be unrelated to positive emotions. Furthermore, it was hypothesized that negative emotions would mediate the relation between obsessive and harmonious passion and all positive interpersonal dimensions, including coaches' ratings.

Method

Participants. Participants were 160 (60 females, 100 males) adolescents aged between 13 years and 17 years ($M = 14.50$ years; $SD = 0.92$ year) who were taking part in a summer basketball camp. They were typically (outside of camp) playing basketball, on average, for 8.08 hr per week ($SD = 5.96$ hr per week) and had been engaging in it for 3.92 years, on average ($SD = 1.84$ years). One female participant was removed from the analysis because of incomplete data (analyzed $n = 159$). Participants in camp were members of one of 15 teams and were each assigned one coach. All of these 15 head coaches also participated in the study. Coaches were all male and were aged between 19 years and 31 years ($M = 23.67$ years; $SD = 4.39$ years) and had been coaching on average for 5.27 years ($SD = 3.63$ years).

Measures.

The Passion Scale. The Passion Scale was again administered. Alphas for the sample of this study were .66 and .83, respectively, for the harmonious passion and the obsessive passion subscales.

Positive and negative emotions. Positive emotions and negative emotions were each assessed with eight items derived from the PANAS and from Izard's differential emotional theory (Izard, 1977). All emotion items were responded to on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*).

⁴ We assessed emotions reflecting the dimensions of valence and activation, as proposed by Russell and his colleagues (J. A. Russell, 1980; Yik, Russell, & Feldman Barrett, 1999). Specifically, a total of 16 items (four per subscale) were used to measure high positive emotional activation (e.g., active), high negative emotional activation (e.g., angry), medium positive emotional activation (e.g., joyful), and medium negative emotional activation (e.g., shy). Items assessing high activation levels were taken from the PANAS, whereas the items measuring medium activation levels were derived from the Izard differential emotional theory (Izard, 1977). There was no difference in the hypothesized model as a function of the level of emotional activation. Therefore, all emotional items for each valence (positive and negative) were averaged together and no specific hypotheses were formulated with respect to activation levels.

Alphas for positive emotions and negative emotions subscales were .84 and .81, respectively.

Positive quality of interpersonal relationships. Positive quality of interpersonal relationships was measured with the Quality of Interpersonal Relationships Scale used in Studies 1 and 2. It assessed the quality of the interpersonal relationships with participants' teammates ($\alpha = .86$), coach ($\alpha = .89$), and opponent players during camp ($\alpha = .85$). These items were responded to on a 5-point Likert scale (0 = *not at all*, 4 = *extremely*).

Self-other overlap. The Inclusion of Other in Self Scale (IOS; Aron et al., 1992) is a measure of perceived relationship closeness. It is a single item designed with seven pairs of overlapping circles ranging from 1 (*no overlap*) to 7 (*almost complete overlap*). For each item, one circle represented the self (me) and the other circle represented team players, the coach, or players of the other teams. Participants were thus asked to rate the extent to which they felt close during the camp to their teammates, their coach, and the players of the other teams by selecting the appropriate pair of circles.

Coaches' ratings. The head coach of each basketball team rated the extent to which each player appeared to be close to his or her teammates during the camp using the Inclusion of Other in Self Scale for each rating. The correlation between the players' ratings and his coach's ratings was .27 for perceived interpersonal closeness with teammates.

All six positive interpersonal measures (quality and interpersonal closeness), relative to the teammates, the coach, and the other players, completed by athletes were averaged together ($\alpha = .79$) to yield one index labeled positive interpersonal relationships.⁵

Procedure. In the early part of the camp, each team composed of 10 to 15 players and the head coach were met in a classroom. Participants were told that the purpose of the study was to better understand the attitudes of basketball players and coaches toward their sport. It was also mentioned that participation was voluntary and anonymous and that their responses would remain confidential. Players were then asked to complete the Passion Scale. They were also asked to indicate how many players of their team and players of the other teams they already knew prior to the camp and to specify whether they knew their coach before the camp began.⁶ Toward the end of the camp, participants were met in a classroom. Players were asked to complete the emotions inventory and the interpersonal relationships measures. The coaches were asked to rate the extent to which each of their players appeared to be close to the other players of the team during the camp. Afterward, participants were fully debriefed and thanked for their participation.

Results and Discussion

Table 4 reports the means, standard deviations, and correlations of all study variables.⁷ To test the hypothesized model, we conducted a path analysis. The two types of passion served as exogenous variables in the model. Positive and negative emotions and positive interpersonal relationships served as endogenous variables, as well as coaches' ratings for perceived interpersonal closeness. A positive covariance was also estimated between these two interpersonal variables because they were assessing the same construct, but from a different perspective (self-evaluation vs.

observers' ratings). In addition, in line with Study 2, a covariance was drawn between positive emotions and negative emotions. Results of the path analysis revealed a satisfactory fit of the model to the data, $\chi^2(5, N = 159) = 6.12, p = .29, NFI = .96, NNFI = .98, CFI = .99, RMSEA = .038 [.00; .12], GFI = .99, SRMR = .043$. In addition, correlation residuals were all nonsignificant. Furthermore, all direct paths were not significant, and their inclusion in the model did not affect the fit indices, direct paths from harmonious passion: $\Delta\chi^2(2) = 0.96, ns$; direct paths from obsessive passion: $\Delta\chi^2(2) = 1.21, ns$, or the coefficients of the hypothesized paths. Figure 3 shows the final path analysis. As can be seen, all estimated paths were significant, except for the covariance between positive emotions and negative emotions. Bias-corrected bootstrapped 95% confidence interval estimates (see Table 2) confirmed the significance of the mediations of positive emotions between harmonious passion and athletes' and coaches' ratings as well as that for negative emotions between harmonious passion and athletes' ratings. The mediational role of negative emotions between obsessive passion and athletes' ratings was significant, but that involving harmonious passion or obsessive passion and coaches' ratings was not.

An alternative model tested whether the quality of interpersonal relationships mediated the relation between harmonious passion and emotions (passion \rightarrow quality of interpersonal relationships \rightarrow emotions). Results revealed that the fit indices of this alternative model were very poor compared with those of the hypothesized model: $\chi^2(5, N = 159) = 41.87, p > .000, RMSEA = .217 [0.16; 0.28], CFI = .71, NFI = .71, SRMR = .10$. In addition, the prospective design of Study 3 rules out equivalent models, such as positive emotions predicting both passion and interpersonal relationships (interpersonal relationships \rightarrow emotions \rightarrow passion), because passion was assessed prior to all other measures and participants did not know each other prior to the beginning of the camp.

Overall, results of Study 3 supported most of our hypotheses. First, positive emotions experienced during the basketball camp

⁵ It should however be noted that the results of the path analysis were all basically the same when analyzing players' interpersonal measures with the coach, teammates, and other players, separately, as well as for each relationship dimensions (i.e., positive quality of interpersonal relationships and perceived interpersonal closeness).

⁶ Correlations and results of the path analysis were exactly the same when including the participants who reported knowing their coach and/or one or more of their teammates or players of other teams prior to camp. Thus, all participants were kept in the analyses.

⁷ As can be seen in Table 4, there was no significant correlation between harmonious passion and coaches' ratings. Although past recommendations (Baron & Kenny, 1986) suggested that for a mediation to occur the predictor needed to be positively correlated with the outcome, recent recommendations based on simulation studies proposed that this condition should be dropped (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), especially when the predictor is not measured at the same time as the outcome (Shrout & Bolger, 2002). Indeed, in these latter conditions, the direct effect tends to dilute itself over time, whereas the indirect effect becomes more preponderant. Important conditions for mediation are that the alpha path (i.e., association between the predictor and the mediator) and the beta path (i.e., association between the mediator and the outcome) are both significant (also see Preacher & Hayes, 2008).

Table 4
Means, Standard Deviations, and Correlations: Study 3

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Harmonious passion	5.74	0.71	—					
2. Obsessive passion	3.48	1.37	.38***	—				
3. Positive emotions	4.03	0.58	.46***	.18**	—			
4. Negative emotions	1.57	0.53	-.17*	.14	-.06	—		
5. Athletes' ratings of positive interpersonal relationships ^a	0.00	0.70	.24**	.06	.48***	-.20**	—	
6. Coaches' ratings of interpersonal closeness	5.24	1.27	.12	.01	.22**	-.18**	.30***	—

Note. *N* = 159.

^a The mean and standard deviation are an average of *z* scores.

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

mediated (positively) the relation between harmonious passion and athletes' assessment of positive interpersonal relationships developed throughout the week, as well as between harmonious passion and coaches' ratings of perceived relationship closeness. As in Studies 1 and 2, obsessive passion was unrelated to positive emotions. Second, there was a significant mediation for negative emotions between harmonious passion or obsessive passion and athletes' positive interpersonal relationships. As hypothesized, obsessive passion and harmonious passion, respectively, were significantly positively and negatively associated with negative emotions, which in turn were negatively and significantly associated with positive interpersonal relationships. However, negative emotions were not a significant mediator between harmonious passion or obsessive passion and coaches' positive ratings.

Study 4

There were several purposes to Study 4. The first purpose in Study 4 was aimed at replicating the results of Study 3 with a longer prospective design. Indeed, in Study 3 we examined the role of passion in the quality of interpersonal relationships in only a 5-day prospective design. Replicating Study 3 results within a longer prospective design will facilitate the interpretation of the stability of the relation between passion and development of interpersonal relationships. Specifically, in Study 4 we investigated how passion for an academic domain (management, specifically) influenced the development of interpersonal relationships over a

full semester with other work colleagues within an academic work team. A second purpose of Study 4 was to further extend the range of interpersonal relationships measures. To improve on Study 3, Study 4 extended the observers' ratings to both positive qualities and negative qualities of interpersonal relationships. In addition, in Study 4 we also looked at two other dimensions of interpersonal relationships, namely, feelings of connectedness and feelings of seclusion (inability to establish interpersonal relationships), thus assessing one positive self-reported measure and one negative self-reported measure of interpersonal relationships, respectively. Connectedness (e.g., Deci & Ryan, 2000) and seclusion (e.g., D. Russell, 1996) are believed to be important dimensions of the quality of people's interpersonal relationships.

In line with Studies 1–3, it was hypothesized that positive emotions would positively mediate the relation among harmonious passion, feelings of connectedness, and work colleagues' positive objective-interpersonal ratings. In line with past research (e.g., Barsade, 2002; Vallerand et al., 2003), it was also hypothesized that positive emotions would negatively mediate the relation among harmonious passion, feelings of seclusion, and work colleagues' negative objective-interpersonal ratings. Furthermore, in line Study 3, it was hypothesized that negative emotions would negatively mediate the relation between harmonious passion and all positive interpersonal dimensions. On the basis of the results of Studies 1–3, we also predicted that obsessive passion would be unrelated to positive emotions. In line with Studies 2 and 3, it was

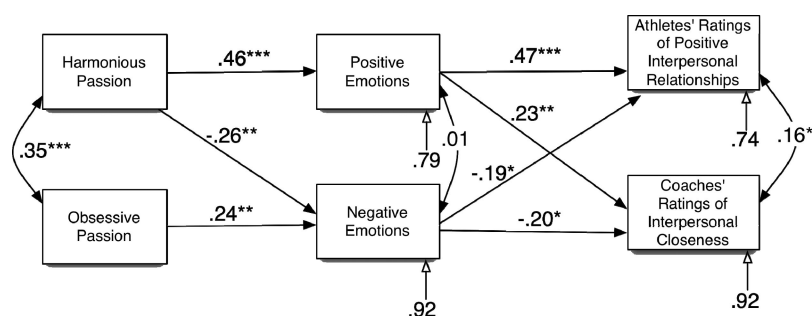


Figure 3. Study 3 path analytic model of relations among passion, positive and negative emotions, and positive and negative interpersonal relationships. Standardized path coefficients are presented. Nonsignificant direct effect paths are not shown for the sake of clarity. However, the values of the path coefficients are those of the full mediating model, including the direct effects of the independent variables to the outcome variables. * $p < .05$. ** $p < .01$. *** $p < .001$.

predicted that obsessive passion would be positively associated with negative emotions, which would be, in turn, negatively associated with the positive interpersonal relationships variables. Finally, because negative emotions have been shown to lead to interpersonal conflict (e.g., Barsade, 2002), it was hypothesized that negative emotions would positively mediate the relations among obsessive passion, feelings of seclusion, and work colleagues' negative objective-interpersonal ratings. Thus, taken together, it was expected that positive and negative emotions would mediate the relations among harmonious passion and all four interpersonal relationships variables measured in Study 4 and that negative emotions would mediate the relation among obsessive passion and all four interpersonal variables.

Method

Participants. Participants were 187 (102 females, 85 males) university students aged between 19 years and 49 years ($M = 25.50$ years, $SD = 6.72$ years) who were enrolled in a management program. One female participant was dropped from the analysis because her responses on two variables were located at more than 3 standard deviations of the distribution.

Measures.

The Passion Scale. The Passion Scale was again administered to tap passion for an academic domain. Alphas for the sample of this study were .87 and .70, respectively, for the harmonious passion and the obsessive passion subscales.

Positive and negative emotions. Positive and negative emotions experienced within the work team were each assessed with five items derived from the PANAS and from Izard's (1977) differential emotional theory, used in Study 3. These emotions were selected because of their likelihood to be experienced in an academic work team (e.g., attentive, contempt). All emotion items were responded to on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). Alphas for the positive and negative emotions subscales were .84 and .74, respectively.

Interpersonal connectedness with teammates. Participants' feelings of connectedness with their teamwork colleagues were assessed with a slightly modified three-item scale developed by Sheldon and his colleagues (Sheldon, Elliot, Kim, & Kasser, 2001). A sample item is "I felt I was close and connected with the other persons in my team." Alpha in this study was .87. All items were responded to on a 7-point Likert scale ranging from 1 (*do not agree at all*) to 7 (*completely agree*).

Interpersonal seclusion from teammates. Participants' feelings of seclusion within their work team were assessed with a four-item scale. Items assessed how much participants felt excluded and isolated within their work team ($\alpha = .65$). A sample item is "I felt that I was isolated from the members of my team work." All items were responded to on a 7-point Likert scale ranging from 1 (*do not agree at all*) to 7 (*completely agree*).

Teammates' interpersonal ratings. Participants were asked to rate their perception of each of their teammate's quality of interpersonal relationships with the other people in the work team. Ratings were made on a 7-point Likert scale ranging from 1 (*do not agree at all*) to 7 (*completely agree*). Five items assessed positive interpersonal relationships as perceived by the teammates. A sample item is "This person had a true interest for the other people in the team" ($\alpha = .84$). Five other items assessed negative interpersonal relationships as perceived by the teammates. A sample item is "This person appeared irritable" ($\alpha = .66$). Because the work teams were not composed of the same number of participants, teammates' interpersonal ratings were made by one to four colleagues. To create the positive and negative interpersonal relationships rating variables, all existing positive ratings for one participant were averaged together, and the same was done for the negative ratings. Analyses of variance revealed that these teammates' ratings as well as all other study variables did not differ as a function of the number of colleagues who evaluated them. In other words, the number of people composing the work teams did not influence the study variables, $F_s(3, 182) < 1.85$, *ns*.

Procedure. Participants were from management classes for which an important team project had to be completed over the course of the semester. Participants completed the Passion Scale at the beginning of the semester. At that time, the work teams were not yet formed. At the end of the semester, participants completed measures of positive and negative emotions, felt connectedness and seclusion within their work team, and rated each of their teammates according to their positive and negative quality of interpersonal relationships with the other people in the work team. It was clearly stated that the confidentiality of their answers would prevail at all time.

Results

Table 5 presents the correlation matrix with means and standard deviations involving all study variables. The model was composed of two exogenous variables (i.e., harmonious passion, obsessive

Table 5
Means, Standard Deviations, and Correlations: Study 4

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Harmonious passion	4.93	1.12	—							
2. Obsessive passion	2.52	1.01	.18*	—						
3. Positive emotions	3.94	0.63	.24**	.04	—					
4. Negative emotions	1.55	0.63	-.12	.14*	-.36**	—				
5. Interpersonal connectedness	4.16	1.44	.14	-.01	.56**	-.41**	—			
6. Interpersonal seclusion	2.89	1.08	-.12	.05	-.45**	.55**	-.51**	—		
7. Teammates' positive QIR ratings	5.12	1.28	.07	-.01	.27**	-.16*	.17*	-.15*	—	
8. Teammates' negative QIR ratings	2.09	0.88	-.04	.03	-.14*	.24**	-.12	.15*	-.32**	—

Note. $N = 186$. All means and standard deviations pertain to untransformed variables. QIR = Quality of interpersonal relationships.
* $p < .05$. ** $p < .01$.

passion) and six endogenous variables (i.e., positive and negative emotions within the work team, connectedness, seclusion, and participants' positive and negative ratings of their teammates' quality of interpersonal relationships within the work team). The exogenous variables were Time 1's variables, and the endogenous variables were all Time 2's variables. Paths were specified according to the hypotheses, including paths from positive and negative emotions to all the interpersonal measures. In addition, a positive covariance was estimated between positive and negative teammates' ratings and between participant's felt connectedness and seclusion self-ratings, to account for common measurement methods (i.e., observers' ratings vs. self-report). In line with Studies 2 and 3, a covariance was also estimated between positive emotions and negative emotions. Results of this path analysis revealed a satisfactory fit of the model to the data, $\chi^2(13, N = 186) = 17.63$, $p = .17$, RMSEA = .044 [.00; .09], NFI = .95, NNFI = .97, CFI = .98, GFI = .98, and SRMR = .035.

In addition, all correlational residuals in the model were non-significant. Furthermore, all direct paths were nonsignificant, and their inclusion in the model did not affect the fit indices, direct paths from harmonious passion: $\Delta\chi^2(4) = 4.80$, *ns*; direct paths from obsessive passion: $\Delta\chi^2(4) = 9.06$, *ns*, or the coefficients of the hypothesized paths. As shown in Figure 4, harmonious passion was positively and negatively associated with positive emotions and negative emotions, respectively, whereas obsessive passion was positively associated with negative emotions and unrelated to positive emotions. Positive emotions and negative emotions were both, in turn, significantly associated with all interpersonal variables. The only nonsignificant paths were between positive emotions and teammates' negative interpersonal ratings ($\beta = -.06$, *ns*) and between negative emotions and teammates' positive interpersonal ratings ($\beta = -.07$, *ns*). Finally, it should be noted that all the above results remained virtually the same when examining only

individuals passionate for management (i.e., 84% of the sample) or when excluding from the analyses participants who reported being at least slightly familiar with one of their teammates ($n = 17$). An alternative model was used to test whether the quality of interpersonal relationships mediated the relation between harmonious passion and emotions (passion \rightarrow quality of interpersonal relationships \rightarrow emotions). Results revealed that the fit indices for this alternative model were less adequate: $\chi^2(8, N = 186) = 17.94$, $p < .02$, RMSEA = .082 [.03; .14], CFI = .97, NFI = .95, NNFI = .89, GFI = .98, SRMR = .06. In addition, the Akaike information criterion (AIC) value used to compare nonhierarchical alternative models (Kline, 2005) revealed that the hypothesized model had a lower value, $AIC_o = 63.63$, compared with the alternative model, $AIC_A = 73.94$. Therefore, the hypothesized model with the lowest AIC value should be preferred.

Table 2 provides the bias-corrected bootstrapped estimates examining the significance of each mediation. As in Studies 1, 2, and 3, positive emotions were a significant mediator between harmonious passion and interpersonal relationships variables, except for teammates' negative ratings. Negative emotions were a significant mediator between obsessive passion and both positive and negative interpersonal relationships self-report and teammates' negative ratings, but not between harmonious passion and interpersonal variables or between obsessive passion and teammates' positive ratings. Thus, positive emotions appear to be a stronger mediator of harmonious passion, compared with negative emotions, whereas obsessive passion appears to be better mediated by negative emotions than positive emotions. Finally, as mentioned above, positive emotions did not significantly predict teammates' negative interpersonal ratings, whereas negative emotions did not significantly predict teammates' positive interpersonal ratings. Therefore, no mediation tests could be computed for these paths. It should be noted, however, that for both of these relationships, their zero-

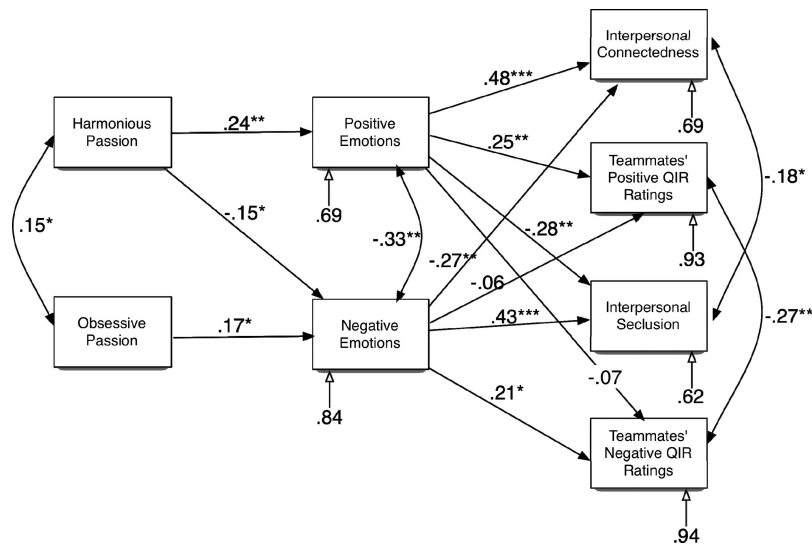


Figure 4. Study 4 path analytic model of relations among passion, positive and negative emotions, and positive and negative interpersonal relationships. Standardized path coefficients are presented. Nonsignificant direct effect paths are not shown for the sake of clarity. However, the values of the path coefficients are those of the full mediating model, including the direct effects of the independent variables to the outcome variables. QIR = quality of interpersonal relationships. * $p < .05$. ** $p < .01$. *** $p < .001$.

order correlations were significant (see Table 5). The nonsignificance of their paths in the model might be due to a number of factors, including the fact that four interpersonal variables were modeled together as competing covariates (some of these involving observers' assessments), thus reducing the strength of their associations with nonsignificant results. However, overall, the present study provided support for most of our other hypotheses.

General Discussion

The present research had two major purposes. The first one was to ascertain the role of passion for an activity in the quality of interpersonal relationships experienced within the context of that activity. The second purpose of the present research was to examine the psychological processes involved in the relation between passion and interpersonal relationships. In line with past research, it was hypothesized that the experience of positive emotions during task engagement would positively mediate the harmonious passion–interpersonal relationships relation but that obsessive passion would be positively associated with negative emotions that should positively and negatively mediate the relation between obsessive passion and negative and positive interpersonal relationships, respectively. The present results provided support for most of these hypotheses. Overall, the findings of the present research lead to a number of implications.

Passion and Interpersonal Relationships

A first implication from the present findings is that they support the application of the dualistic model of passion to interpersonal relationships. It appears that the type of passion one has for an activity matters with respect to the type of interpersonal relationships that one will develop during task engagement. Results of four studies showed that harmonious passion was indirectly positively associated with positive interpersonal relationships within the context of an activity through the effect of positive emotions (Studies 1–4), whereas obsessive passion was indirectly, negatively related to them through negative emotions experienced within the context of the activity (Studies 2–4). Overall, these findings are very robust because they were obtained with four different populations (teenage athletes, collegiate students, university students, and workers), with a variety of activities, while controlling for trait extraversion. In addition, the findings of Study 4 further showed that obsessive passion was indirectly conducive to negative interpersonal relationships through experiences of negative emotions, whereas harmonious passion was negatively associated with negative interpersonal relationships through both positive emotions and negative emotions. However, overall, the indirect effect from harmonious passion to interpersonal relationships variables was stronger through positive emotions, although it was much weaker through negative emotions. The present results are the first to show that the type of passion one holds for an activity predicts the quality of interpersonal relationships within the context of that activity. Such findings highlight the important implications that the type of engagement in a passionate activity can have on oneself and on other people. These intra- and interpersonal consequences can be important in the context of sports teams, workplaces, or social groups because they may affect other facets of an activity. For instance, poor interpersonal relationships triggered by high

levels of obsessive passion may negatively influence team unity, productivity, and performance. Future research is needed on this issue.

A second implication from the findings of the present research is that they highlighted the importance of emotions as a mediator of the passion–quality of interpersonal relationships relation. Specifically, harmonious passion and obsessive passion both appear to influence interpersonal relationships through different emotional pathways. A first pathway is through the positive emotions experienced during activity engagement. Findings from four studies showed that harmonious passion was positively associated with positive emotions experienced during activity engagement. In addition, as posited by Fredrickson (2001; Waugh & Fredrickson, 2006), positive emotions were found to be positively associated with positive interpersonal relationships and negatively associated with negative interpersonal relationships. Obsessive passion was consistently unrelated to positive emotions across all four studies. Finally, as hypothesized, positive emotions were found to positively mediate all relations between harmonious passion and positive interpersonal relationships and to negatively mediate the relation between harmonious passion and feelings of seclusion (Study 4).

A second emotional pathway facilitated by passion appears to be the negative emotions experienced during activity engagement. Results showed that obsessive passion was consistently and positively related to negative emotions (Studies 2–4), whereas harmonious passion was consistently, negatively associated with them. Furthermore, Studies 3 and 4 showed that negative emotions negatively mediated the relation between obsessive passion and self-reported positive aspects of interpersonal relationships (but not between obsessive passion and objective positive interpersonal relationships), whereas Study 4 showed that negative emotions positively mediated the relation between obsessive passion and negative aspects of interpersonal relationships. Harmonious passion was consistently, negatively associated with negative emotions, but negative emotions were a significant mediator between harmonious passion and interpersonal relationships variables in only two out of seven tests. Finally, positive emotions were found throughout Studies 1–4 to be a much stronger predictor of positive interpersonal relationships, whereas negative emotions seemed to better predict negative aspects of interpersonal relationships. Therefore, it appears that they are two main pathways that affect emotional experience and interpersonal relationships with the people with whom the activity is engaged in—one from the harmonious passion and another from the obsessive passion. Depending on the type of passion at play, one will experience very different types of emotional experiences and, as a consequence, interpersonal relationships.

One explanation for these mediation effects is that harmonious passion for an activity is well integrated within the self and the identity and, consequently, allows for a flexible engagement in the task (Hodgins & Knee, 2002). It thus becomes possible to experience task engagement more fully and with a willingness to experience what is occurring at the moment. Such a flexible form of activity engagement facilitates the experience of positive emotions while engaging in the activity (Vallerand et al., 2003, Study 1; Vallerand et al., 2006, Study 2; Vallerand & Houlfort, 2003). These positive emotions then sustain the broadening of the thought–action repertoires and self (Fredrickson, 2001; Waugh &

Fredrickson, 2006), leading to positive interactive behaviors such as smiling, joking, and encouraging others and to a true interest in other people (self–other overlap). Indeed, past research has shown that such positive behaviors and attitudes create conditions that are conducive to positive interpersonal relationships (Cappella, 1997; Frank, Ekman, & Friesen, 1993; Shiota et al., 2003).

Conversely, an obsessive passion for an activity fosters a rigid and conflicted form of activity engagement that is unrelated to positive emotions and may even be conducive to negative emotions (Vallerand et al., 2003, Study 2; also see Vallerand, 2008), thus leading to the narrowing of the thought–action repertoires and the self (Fredrickson, 2001; Waugh & Fredrickson, 2006) and to a closing off from others (Waugh & Fredrickson, 2006). This leaves little space for the emergence of positive emotions and for relating to others. Indeed, results from all four studies revealed that obsessive passion was not associated with positive emotions during task engagement. In fact, it was positively related to negative emotions (Studies 2–4). These negative emotional experiences appear to preclude external demonstrations of enjoyment and feelings of self–other overlap, thereby leading to poor social interaction (Waugh & Fredrickson, 2006). Indeed, negative emotions were found to be negatively associated with positive interpersonal relationships and positively associated with negative interpersonal relationships. Therefore, the findings of the present research underscore the fact that passion may lead to two types of emotional experience—depending of the type of passion at play—and that only positive emotions triggered by harmonious passion may lead to positive interpersonal relationships through a broaden-and-build process. Conversely, the negative emotions produced by obsessive passion appear to lead to negative interpersonal relationships.

Although most meditational effects were significant, some of them were marginally significant (see Table 2). In light of these results, and in order to provide clarity on these mediational effects, a meta-analysis was conducted on the present four studies to examine these meditational effects with more power. All self-report measures assessing interpersonal relationships were combined and all objective ratings were combined, holding positive and negative assessments separate for both self-report and objective ratings. Thus, the model hypothesized in Study 4 was tested on the aggregation of all four studies data (Hunter & Schmidt, 2004). Pooled correlations coefficients were calculated for all examined relationships across all four studies. These correlations were then input in a correlation matrix, which served as the database for the path analysis (Hunter & Schmidt, 2004). The median sample size among all examined relationships ($n = 345$) was used (e.g., Brown & Peterson, 1993).

Fit indices for this meta-analyzed path model were adequate, $\chi^2(13, N = 345) = 22.28, p = .051, RMSEA = .046 [0.00; .08], CFI = .98, NFI = .96, NNFI = .96, GFI = .98, SRMR = .03$. Results revealed that all hypothesized paths were significant at $p < .05$, except for the covariance between positive and negative emotions. Sobel tests were then conducted to examine the significance of each mediational effect. Results revealed that they were all significant ($z_s > 2.00$). Therefore, it would appear that some meditational effects did not reach significance in a single study because their effect size was small and the power was not large enough to detect them with a p below .05. However, when they were examined with more power, they were statistically significant. Caution is advised with respect to the meditational role of

positive and negative emotions between passion and negative quality of interpersonal relationships because these latter interpersonal measures were only used in one study (Study 4).

Passion, the Social Functions of Emotions, and the Broaden-and-Build Theory

The present findings also lead to important implications for the social functions of emotions and the broaden-and-build theory (Fredrickson, 2001). The present series of studies extended past research on these aspects in three ways. First, the present findings suggest that passion for an activity represents an important igniter of the broaden-and-build (or the narrowing) process. It appears that harmonious passion would facilitate a broadening process through the experience of positive emotions and through limiting negative emotions. Obsessive passion would, however, be conducive to a narrowing process because of the negative emotions generated by this type of passion. Therefore, passion appears to play a role in triggering the broadening and narrowing processes. A second extension of the social functions of emotions and the broaden-and-build theory is that the present findings underscore that various types of positive and negative emotions, and not only interpersonal emotions such as gratitude or compassion, experienced in the context of a highly valued activity can lead to important interpersonal consequences. Indeed, various types of positive and negative emotions were used across four studies, and each time, results showed that these emotions had an impact on interpersonal relationships. Of additional interest is that the findings of Study 3 even showed that various emotions of different arousal levels were all associated with positive interpersonal relationships. Thus, it would appear that various types of emotion might possess social functions.

Finally, the present findings showed that various self-reported emotions predicted interpersonal relationships as rated by external observers. Studies 3 and 4 showed that players' various positive emotions were positively associated with the coaches' ratings of their players' interpersonal closeness with teammates (Study 3), whereas students' positive emotions positively predicted their co-workers' ratings of positive and negative interpersonal relationships with them. Although, the present set of studies is not the first to show an association between emotion and objective interpersonal relationships ratings (e.g., Keltner & Bonano, 1997), the present findings specifically highlight a potentially important extension of the broaden-and-build theory: Other people can observe the consequences of the broadening and narrowing effects facilitated by positive emotions and negative emotions, respectively. Therefore, harmoniously passionate people, through the positive emotions they experience, might come to display overt behaviors toward others such as smiles of enjoyment, laughs, or physical closeness, which would come to be perceived by others (Frank et al., 1993). It might even be possible that observers reciprocate such positive behaviors leading to social bonding with the target (Walter & Bruch, 2008). Future research is needed to look at the positive, external interpersonal demonstrations (verbal and nonverbal) that accompany emotions and examine their consequences on the development of the quality of interpersonal relationships.

Some limitations of the present research should be underscored. First, all studies were correlational in nature. It is thus not possible to establish the causality of the relations among passion, emotion,

and interpersonal relationship. Although the prospective designs used in Studies 3 and 4 and the results of the various alternative models in Studies 1 and 2 provide additional support for the adequacy of the direction of the model passion → emotion → relationships, future research is needed in order to test the inverse model, which remains plausible. Second, emotions in the present research were all assessed with paper and pencil measures. In the future, researchers might do well in extending the present findings to include other types of assessment such as physiological measures or video recordings of interactions.

In sum, to go back to our introductory comments, it would appear that passion for an activity leads to positive interpersonal relationships within the purview of the passionate activity. However, such a positive effect takes place only if passion is harmonious. Indeed, an obsessive passion for an activity may even negatively affect interpersonal relationships. Additional research on these issues would therefore appear important.

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