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Passion and performance attainment in sport

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Abstract

Objectives: To test a performance-attainment model derived from the Dualistic Model of Passion [Vallerand et al. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85, 756–767] that posits that both harmonious and obsessive passions are positive predictors of deliberate practice that, in turn, is a positive predictor of performance.

Design: A prospective design was used in the present study.

Methods and results: The basic model was tested in two studies using structural equation modeling. Results from Study 1 with 184 high school basketball players indicated that both harmonious and obsessive passions were positive predictors of deliberate practice, which, in turn, was a positive predictor of objective performance. The results of Study 2, conducted with 67 synchronized swimming and water-polo athletes conceptually replicated those from Study 1. Furthermore, results differentially linked the two passions to achievement goals and subjective well-being (SWB). Specifically, harmonious passion was a positive predictor of mastery goal pursuit and SWB, whereas obsessive passion was a positive predictor of mastery, performance-approach, and performance-avoidance goal pursuit and was unrelated to SWB. Mastery goals were positive predictors of deliberate practice, which was a direct positive predictor of performance, whereas performance-avoidance goals were direct negative predictors of performance.

Conclusions: It appears that there are two paths to high-level performance attainment in sport, depending if harmonious or obsessive passion underlies sport engagement. While the path from harmonious passion is

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conducive to high levels of performance and living a happy life, that from obsessive passion is less reliably related to performance attainment and is unrelated to happiness.

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Introduction

Nothing great in the world has ever been accomplished without passion
(Hegel, 1770–1831)

Michael Jordan, the great basketball player of the National Basketball Association (NBA) Washington Wizards (and the Chicago Bulls prior to that), retired for good at the end of the 2002–2003 season. Jordan left the NBA after an outstanding 15 season career in which, among other achievements, he won the NBA Most Valuable Player (MVP) award 5 times, the NBA Finals MVP award 6 times, and was the only player to be named the NBA MVP and the defensive player of the year in the same season. In the face of such achievements, most people assume that Jordan's exploits were almost exclusively the result of remarkable natural talent. However, scientists conducting expert performance research (e.g., [Ericsson & Charness, 1994](#); [Starkes & Ericsson, 2003](#)) suggest that individuals such as Jordan have achieved high levels of performance because they have engaged for many years in highly structured practice aimed at improvement and skill refinement. Indeed, it is often forgotten that Jordan failed to make his varsity high school basketball team the first time he tried and that he credits his regimen of intense, focused, goal-oriented practice for the success he attained in his subsequent basketball career ([Jordan, 2005](#)). However, what psychological factors enabled Jordan to maintain a sustained level of intense practice over the years? [Ericsson and Charness \(1994\)](#) have noted that the nature of the motivational forces that lead individuals to engage in such sustained deliberate practice is currently unclear.

In line with the above quote from Hegel, we propose that the concept of passion represents an important source of motivational energy underlying such persistent involvement that may be conducive to performance attainment. Indeed, being passionate for one's sport leads individuals to dedicate themselves fully to their sport, thereby allowing them to persist, even in the face of obstacles, and to eventually reach excellence. The purpose of the present research was to test the Dualistic Model of Passion ([Vallerand et al., 2003](#)) as applied to performance attainment in sport in two studies.

The dualistic model of passion

[Vallerand et al. \(2003, 2006\)](#), [Vallerand and Houliort \(2003\)](#), and [Vallerand and Miquelon \(2007\)](#) have recently offered a conceptual analysis of passion toward activities. They define passion as a strong inclination toward an activity that individuals like (or even love), that they find important, and in which they invest time and energy. Another important characteristic of passion is that the activity has been internalized into one's identity. In the process of activity

involvement, some activities come to be so self-defining that they represent central features of one's identity. Following Self-Determination Theory (SDT; Deci & Ryan, 2000), this is presumed to be so because the self becomes more complex over time through the interrelation of self-constituents, as well as the internalization of elements from the environment.

Prior research has shown that values and regulations concerning *non-interesting* activities can be internalized by the person in either a controlled or an autonomous fashion (see Sheldon, 2002; Vallerand, 1997; Vallerand, Fortier, & Guay, 1997). Vallerand and colleagues propose that representations of activities that people like and engage in on a regular basis can also be incorporated into the person's identity to the extent that they are highly valued (Aron, Aron, & Smollan, 1992; Csikszentmihalyi, Rathunde, & Whalen, 1993), thereby leading to a passion toward these activities (Vallerand et al., 2003). Such a passion becomes a central feature of one's identity. Those who have a passion for playing football or for running, for instance, do not merely play football or run, they are "football players" or "runners". The passionate activity is part of the athletes' identity—of who they are.

Two types of passion are posited to develop as a result of the type of internalization process that takes place. The first one, *harmonious passion*, results from an autonomous internalization of the activity into the person's identity. An autonomous internalization takes place when the activity is perceived to be important in the absence of any contingencies attached to it. A motivational force to engage in the activity willingly follows such an internalization, and leads to a sense of personal endorsement and volition about engaging in the activity. People then freely choose to engage in the activity and do not feel a compulsion to partake in it. With harmonious passion, the passionate activity is in harmony with other aspects of the person's life. It does not hold an overpowering space in the person's identity (Vallerand et al., 2003).

Harmonious passion is hypothesized to lead to positive affect and to minimize negative affect during task engagement. This is because with harmonious passion the authentic integrating self (Deci & Ryan, 2000; Hodgins & Knee, 2002) is in operation. The authentic integrating self allows the person to fully partake in the passionate activity with an openness that is conducive to positive experiences (Hodgins, Yacko, & Gottlieb, 2006) without the presence of undesirable self-activity contingencies. Task engagement then facilitates better concentration, the experience of positive affect, absorption, as well as flow (Csikszentmihalyi, 1978; Jackson & Marsh, 1996). Furthermore, because harmonious passion facilitates control over the passionate activity, it should contribute to the experience of positive affect and minimize the experience of negative affect after task engagement. Finally, such control over the activity should lead the person to display flexible persistence, persisting in the passionate activity only if positive returns are expected. If conditions become consistently negative, involvement in the activity should no longer persist.

The second type of passion, namely *obsessive passion*, results from a controlled internalization of the activity into one's identity. Such internalization originates from intra and/or interpersonal pressure, either because certain contingencies are attached to the activity (e.g., self-worth or social acceptance) or because the sense of excitement derived from activity engagement becomes overpowering, and therefore difficult to regulate. Thus, although individuals like the activity, they also feel compelled to engage in it due to these internal contingencies that come to control them. They cannot help but to engage in the passionate activity; the passion must run its course as it controls the person. Obsessive passion entails a controlled internalization. Therefore, it should breed an internal compulsion to engage in the activity, leading to a more rigid and conflicted form

of task engagement. Such pressured engagement should prevent the person from fully focusing on the task at hand, and may interfere with the experience of positive affect, and even facilitate negative affect during task engagement (Hodgins & Knee, 2002). In addition, because with obsessive passion an internal compulsion leads the person to engage in the activity even when he or she should not, he or she may experience negative emotions once engagement in the passionate activity is terminated (e.g., guilt for having engaged in the activity when one should not have done so). Similarly, this internal pressure to engage in the passionate activity makes it very difficult for the person to fully disengage from thoughts about the activity. Thus, the person will engage in rumination about the activity and experience negative feelings of psychological dependence when prevented from engaging in the activity (Vallerand et al., 2003). Finally, because of its controlled nature, obsessive passion is expected to lead to a rigid form of persistence. Such persistence is rigid because it not only occurs in the absence of positive emotions, but it even occurs in the face of important personal costs, such as weakened relationships (Séguin-Lévesque, Laliberté, Pelletier, Blanchard, & Vallerand, 2003).

It is also important to note that because they both entail a passion for the activity, harmonious and obsessive passions are hypothesized to be moderately and positively correlated. However, as posited above, each type of passion entails a specific type of activity engagement, which is expected to lead to different experiences and effects, with harmonious passion leading to adaptive outcomes, and obsessive passion predominantly leading to less adaptive and at times maladaptive effects.

Research has provided support for the Passion Model. For example, Vallerand et al. (2003, Study 1) reported that the results of exploratory and confirmatory factor analyses supported the validity and reliability of the two-factor Passion Scale. These findings were replicated in sport research (Vallerand et al., 2006, Study 1). In addition, Vallerand et al. (2003, Study 1) reported that both types of passion correlated equally and positively with measures of activity valuation and of perceptions of the task as being a passionate activity. Both types of passion also correlated positively with a measure of activity inclusion in the self (e.g., Aron et al., 1992), although more so for obsessive passion as would be predicted. Finally, as expected, only obsessive passion was found to be associated with a measure of conflict with other life activities.

Other research has focused on distinguishing the outcomes derived from the two types of passion. Such research reveals the existence of a positive relation between harmonious passion and measures of positive affect (Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005; Vallerand et al., 2003, Study 1) and flow experienced during task engagement (Vallerand et al., 2003, Study 1), while obsessive passion is associated with negative affect (e.g., shame) and cognition (e.g., rumination) after activity engagement and when prevented from engaging in the passionate activity (Ratelle, Vallerand, Mageau, Rousseau, & Provencher, 2004; Vallerand et al., 2003, Study 1). Harmonious passion is also positively associated with general positive affect, while obsessive passion is associated with general negative affect (Vallerand et al., 2003, Study 2; Vallerand et al., 2006, 2007, Studies 1 and 2). Obsessive passion also predicts highly persistent behavior in activities that may be ill-advised for the person, such as winter cycling over icy roads in Quebec (Vallerand et al., 2003, Study 3), dancing while injured leading to chronic injuries (Rip, Fortin, & Vallerand, 2006), and sustained involvement in gambling leading to pathological gambling (Philippe & Vallerand, in press; Ratelle et al., 2004; Vallerand et al., 2003, Study 4). Harmonious passion is typically unrelated to such negative outcomes.

In sum, emerging research conducted with many different activities provides strong support for several elements of the Dualistic Model of Passion. However, the research conducted on passion to date has mainly focused on cognitive and affective outcomes. The present research was designed to address the issue of passion and performance attainment in sport.

Passion and performance: the present research

Expert performance research (e.g., Ericsson & Charness, 1994; Starkes & Ericsson, 2003) suggests that an active learning process, wherein the goal is to improve one's skills, is necessary to reach high levels of performance. Ericsson, Krampe, and Tesh-Römer (1993) have proposed that deliberate practice, defined as a highly structured activity motivated by the explicit aim of improvement, plays an important role in reaching such high levels of performance. Because it affords immediate feedback and knowledge of results relevant to performance, deliberate practice provides optimal opportunities for skill acquisition. Research has supported the importance of deliberate practice for attaining high-level performance. For instance, in music, Ericsson et al. (1993) have shown that by the age of 20, experts had practiced 8000 h *more* than amateurs of the same age. Charness, Tuffiash, Krampe, Reingold, and Vasyukova (2005) have also shown that deliberate practice conducted alone accounted for roughly about 40% of the variance in skill level acquisition in expert chess players. Research supports the link between deliberate practice and performance in areas as diverse as science (Holmes, 1996), art (Winner, 1996), and games (Charness, Krampe, & Mayr, 1996). Similar findings have been obtained in a variety of sports (see Baker, Horton, Robertson-Wilson, & Wall, 2003; Starkes, Deakin, Allard, Hodges, & Hayes, 1996; Starkes & Ericsson, 2003). For instance, Helsen, Hodges, Winckel, and Starkes (2000) showed the existence of a positive linear relationships between accumulated team and individual deliberate practice and the skill level of international, national, and provincial soccer players. Similar findings were obtained with netball, basketball, and field hockey athletes (Baker, Côté, & Abernathy, 2003) and with triathletes (Hodges, Kerr, Starkes, & Weir, 2004).

It should be noted that deliberate practice could differ from actual play or performing conditions in that it can be repetitive and not always enjoyable. At the same time, external or monetary rewards are rarely present. For instance, Michael Jordan would have received his salary even if he had not regularly stayed an extra 45 min after team practice to repeatedly work on his fade-away jump shot. The present position is that passion represents a major motivational force that leads one to engage in deliberate practice. Specifically, we suggest that passion provides people with the energy to engage in and persist in demanding practice activities that are essential to reach expert-level performance. This hypothesis is in line with past research that has shown that both harmonious and obsessive passions have been associated with sustained involvement in various dimensions of their activities (Vallerand et al., 2003, Study 1) that should be conducive to performance attainment. Thus, the basic model guiding the present research reflects this perspective: Both harmonious and obsessive passions are hypothesized to lead to deliberate practice, which, in turn, leads to performance attainment. It should be noted that such a model makes clear that passion is not hypothesized to influence performance directly. Rather, passion sets things in motion by providing people with the energy and goals to engage in deliberate practice, and it is deliberate practice that is hypothesized to have a direct influence on

performance. Fig. 1 illustrates this basic model. Recent research by Vallerand et al. (2007, Study 1) yielded support for this model with dramatic arts students: Both harmonious and obsessive passion positively predicted deliberate practice that led to performance as assessed by dramatic arts teachers. The main purpose of Study 1 was to test this model in the realm of sports with basketball players.

Vallerand et al. (2007, Study 2) also sought to examine whether achievement goals (Elliot & Harackiewicz, 1996) represent the psychological processes through which passion contributes to deliberate practice. They hypothesized that the achievement process is quite different depending on whether harmonious or obsessive passion is involved. Harmonious passion is expected to lead to a coherent and focused achievement process characterized by the adaptive goal of mastering achievement-related activities. On the other hand, obsessive passion is hypothesized to lead to a conflicted achievement process where the adaptive goal of mastering the activity may coexist with the maladaptive goal of trying to avoid failure and of trying to beat others (Elliot, 1997). In other words, Vallerand et al. hypothesized that harmonious passion would predict the use of mastery goals, while obsessive passion would lead to the adoption of all three types of goals (mastery and performance-approach and performance-avoidance goals). In turn, because there is a close fit between mastery goals and mastering the activity through deliberate practice, only mastery goals were expected to lead to deliberate practice that, in turn, predicted performance. Results from Vallerand et al. (2007, Study 2) confirmed the model. The main purpose of Study 2 was to

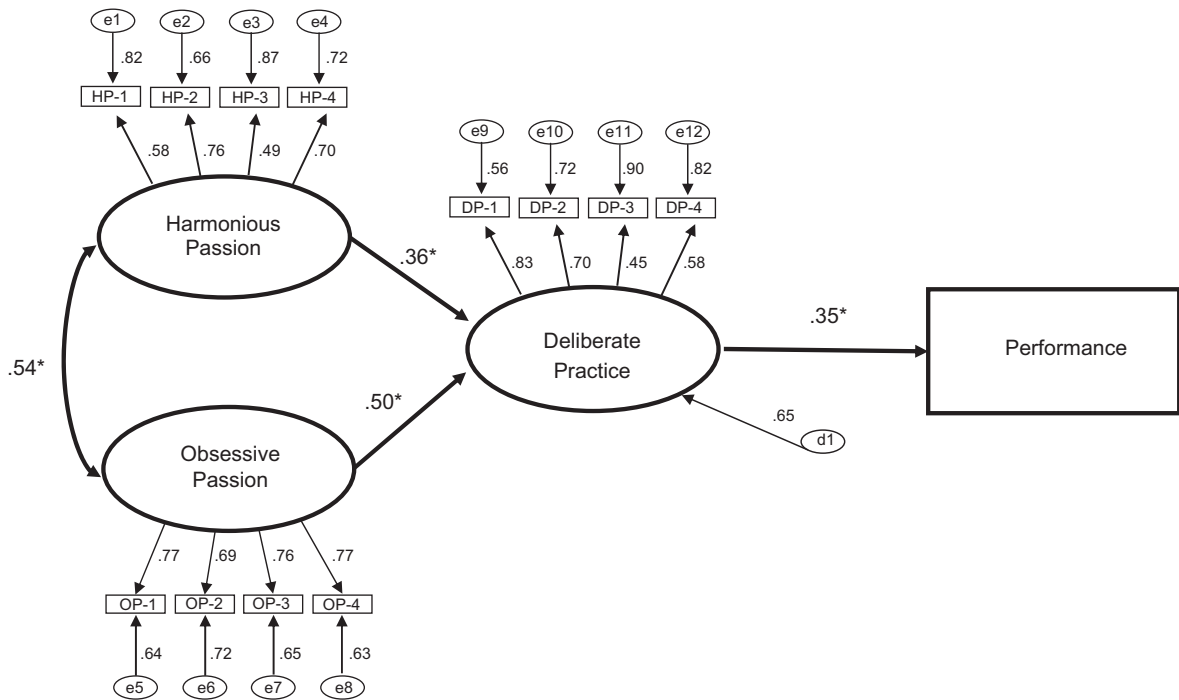


Fig. 1. Results of the Structural Equation Modeling. All coefficients were standardized to facilitate interpretability and were significant ($p < .05$).

replicate these findings within the realm of sports, with water-polo and synchronized swimming athletes.

In addition, Study 2 tested an important postulate of the Dualistic Model of Passion regarding SWB. Heavy activity involvement may be positively associated with SWB or not, depending on the type of passion underlying such involvement. Indeed, the above research of Vallerand et al. (2007, Studies 1 and 2) supported this hypothesis. Harmonious passion for either dramatic arts (Study 1) or specialized studies in psychology was found to positively predict SWB while obsessive passion was either unrelated (Study 1) or negatively related to it (Study 2). In line with these findings, it was expected that in the present Study 2, harmonious passion would be positively associated with SWB, and that obsessive passion would either be unrelated or negatively related to SWB.

Study 1

The purpose of Study 1 was to test the model in Fig. 1 in the basketball domain. Basketball players completed a questionnaire measuring both types of passion and deliberate practice, and their coaches were asked to assess the athletes' performance. It was predicted that both types of passion would positively predict deliberate practice, which, in turn, would positively predict performance.

Method

Participants

Participants were 184 (108 male, 76 female) basketball players representing high schools from various regions of the Province of Quebec. The mean age of participants was 16 years (S.D. = .98). These athletes participated in the highest level of high school basketball in the Province of Quebec. At the time of this study, athletes had been playing organized basketball for a mean of 45.38 months (S.D. = 25.73 months). Participants indicated that they typically engage in their activity 4.46 times per week (S.D. = 1.95) each time for an average of 149.73 min (S.D. = 56.73 min). Participants were not remunerated for their participation; all participants were volunteers.

Measures

Passion. The Passion Scale (Vallerand et al., 2003) is composed of two 7-item subscales: harmonious passion (e.g., "Basketball is in harmony with other activities in my life") and obsessive passion (e.g., "I cannot imagine my life without basketball"). Participants indicated their responses on a 1 (*Do not agree at all*) to 7 (*Very strongly agree*) scale. The Passion Scale has demonstrated high levels of validity and reliability (see Vallerand et al., 2006). Because the testing took place during a tournament, we used a brief version of the Passion Scale comprised of 4 items per subscale. The psychometric properties of the brief version are highly similar to those obtained for the full measure (e.g., in the present study the proposed two-factor solution fit the data well [$\chi^2(19) = 23.27, p = .23, CFI = .99, RMSEA = .04$] and all factor loadings exceeded .49 and were significant). Both subscales demonstrated acceptable internal consistency: $\alpha = .73$ and $.84$ for

harmonious and obsessive passion, respectively. Additional analyses based on data with the full Passion scale used in Study 2 of this paper, revealed that these 4-item subscales correlated very highly with the original 7-item subscales, $r = .96$ for obsessive passion, and $r = .97$ for harmonious passion. Thus, the 4-item subscales are basically equivalent to the 7-item versions.

Deliberate practice. In order to develop an assessment of athletes' deliberate practice, we asked coaches and elite players (different from those participating in the present study) to make a list of the activities that they engage in during their free time when they are seeking to improve their performance. This procedure is in line with that proposed by Ericsson and Charness (1994) and Vallerand et al. (2007, Study 1). Furthermore, we focused on individual practice performed during one's free time (and not team practice) as such practice alone has been found to contribute greatly to performance in a variety of activities such as music and chess (Charness et al., 2005; Ericsson et al., 1993), as well as in sports (Helsen et al., 2000; Helsen, Starkes, & Hodges, 1998). Indeed, if team-sport athletes such as the basketball players of this study all engage in roughly the same number of hours in team practice, it may very well be that individual practice is a key variable that distinguishes the most from the least successful performers. Finally, because performance in this study was assessed through coaches' assessment, focusing on individual deliberate practice where athletes engaged in activities independent of the supervision of their coaches allowed us to control for a potential methodological confound—namely that coaches may attribute a higher level of performance to individuals who display hard work in their presence. From the sampling of activities that were reported, we selected the four most frequent items; all of these items pertained to offense. This is line with the observation that almost all activities performed during individual practice pertain to offense. The scale started with the stem “During my leisure time, ...” and was followed by the items describing deliberate practice (e.g., “I work hard to improve techniques that I find difficult”). Participants indicated their responses on a 1 (*Do not agree at all*) to 7 (*Very strongly agree*) scale ($\alpha = .72$). Results from the present study with respect to the measurement model (see Fig. 1) and an independent confirmatory factor analysis $\chi^2(1) = 1.76$, $p = .19$, CFI = .995, RMSEA = .064], confirmed the unidimensionality of the deliberate practice measure.

Performance. To obtain an indicator of performance attainment, we asked each coach to provide an overall assessment of the athletes' offensive performance during the first game of the tournament. Coaches were simply told to “Rate each of [their] players' offensive performance during this game on the following scale.” The assessment was made using a global 0–100 scale, with raters being informed that “60% is the passing grade.” This measure thus allowed us to assess performance at a specific and crucial point in time, namely with respect to the first game of an important Provincial Tournament.

Demographic information. On the last section of the athletes' questionnaire, they were asked to report their age, gender, and other information that allowed us to match their questionnaire with their coaches' performance assessment.

Procedure

Participants completed a questionnaire before the first game of an important Provincial Tournament held in February. This questionnaire contained assessments of harmonious and

obsessive passion, and deliberate practice. Participants were informed that the researchers were simply interested in knowing more about the attitudes of basketball players toward their sport. After the first game of the tournament, coaches were provided with questionnaires to assess each of their athletes' performance during the first game of the tournament. They were asked to return the assessment by mail in a self-addressed, stamped envelope provided with the assessment form.

Results and discussion

Preliminary analyses

Preliminary analyses yielded Kurtosis values ranging between -2 and 2 , indicating univariate normality for all variables. *t*-Tests were used to examine differences between males and females; no gender differences were found to be significant. Means, standard deviations, and correlations among the variables in this study are presented in Table 1.

Passion and performance: a structural equation model

The proposed model posited that both harmonious and obsessive passions would positively predict deliberate practice, and that deliberate practice, in turn, would positively predict performance as assessed by coaches. Harmonious and obsessive passion and deliberate practice each had four indicators. Performance was modeled as an observed variable. Both endogenous variables (the two types of passion) were free to covary. The adequacy of the model was assessed using a hybrid model, which combined a measurement model and a path model (EQS; Bentler, 1995). Results revealed that all factor loadings exceeded .45 and were significant. In addition, the model showed acceptable fit indices: $\chi^2(62, N = 184) = 91.0, p < .01$, CFI = .96, RMSEA = .05. All of the proposed links were significant. Specifically, harmonious ($\beta = .36, p < .05$) and obsessive ($\beta = .50, p < .05$) passions positively and significantly predicted deliberate practice, and deliberate practice, in turn, positively and significantly predicted performance ($\beta = .35, p < .05$). Fig. 1 summarizes the results.

The results of Study 1 were consistent with our proposed model and replicated those of Vallerand et al. (2007, Study 1). Specifically, both types of passion toward basketball were found to predict deliberate practice, which, in turn, was found to predict performance. It is important to note that the performance variable was not a subjective perception offered by the athletes, but rather an independent assessment of performance provided by their coaches. These findings provide support for the passion conceptualization (Vallerand et al., 2006) which posits that passion represents an important determinant of heavy involvement in activities that people like

Table 1
Means, standard deviations, and correlations: Study 1

	Mean	S.D.	HP	OP	DP	P
Harmonious passion (HP)	5.85	0.90	–			
Obsessive passion (OP)	4.95	1.41	.43*	–		
Deliberate practice (DP)	5.58	1.00	.51*	.56*	–	
Performance (P)	73.54	14.60	.15*	.37*	.29*	–

Note: $n = 184$, * $p < .01$.

and that they care about. It would thus appear that passion represents an important motivational force underlying engagement in deliberate practice, an important and robust predictor of performance in sports (e.g., Baker, Côté et al., 2003; Baker, Horton et al., 2003; Helsen et al., 1998; Starkes & Ericsson, 2003).

Study 2

A first purpose of Study 2 was to replicate the basic findings of Study 1, which showed that both types of passion predicted deliberate practice, which in turn predicted performance. A second purpose of Study 2 was to examine the role of achievement goals as mediators of the passion-deliberate practice relationship and as predictors of sport performance. Elliot (1997) and Elliot and Harackiewicz (1996) have proposed the existence of three types of achievement goals: mastery goals (i.e., the development of competence and task mastery), performance-approach goals (i.e., the attainment of competence relative to others), and performance-avoidance goals (i.e., avoiding incompetence relative to others). Achievement goals represent the competence-related goals that an individual seeks to achieve in a performance setting (Elliot, 1997). Passion is conducive to an important investment in an activity, and thus a strong commitment to engaging in that activity in a competent fashion. It would thus appear likely that passion would lead individuals to pursue achievement goals for their passionate activity.

The achievement goal process is expected to differ as a function of the type of passion underlying activity engagement. Harmonious passion is hypothesized to trigger the adaptive goal of mastering achievement-related activities (Duda, 2001; Dweck, 1986). This is because it reflects an autonomous form of activity engagement. Furthermore, harmonious passion was not expected to be linked to performance goals of either type because it is focused on improving oneself on the task and not on beating other performers or trying to avoid failing relative to others. Thus, harmonious passion is expected to lead to a strictly task-focused achievement goal process. On the other hand, obsessive passion is a more pressured, internally controlled form of regulation which should be conducive to a more conflicted regulatory process. Hence, it is hypothesized that when driven by obsessive passion individuals should feel compelled to endorse all forms of goals allowing one to reach success and to avoid failure at the activity. It was thus predicted that obsessive passion would positively predict mastery, performance-approach, and performance-avoidance goals.

Because they refer to the development of competence and task mastery, mastery goals were expected to lead to engagement in deliberate practice which entails striving effortfully to improve task performance (see Ericsson et al., 1993). However, with respect to performance-approach and performance-avoidance goals, their main foci are not to develop task mastery but rather to beat others and to avoid doing poorly relative to others, respectively. Thus, these goals were not expected to predict deliberate practice. Furthermore, in line with past research on achievement goals in educational settings (e.g., Elliot, 1999; Elliot, McGregor, & Gable, 1999) it was hypothesized that performance-approach and performance-avoidance goals would positively and negatively predict sport performance, respectively, in direct fashion. Results from a recent study (Vallerand et al., 2007, Study 2) with participants who experienced a passion for specialized studies in psychology yielded complete support for the proposed model. The purpose of the present research was to test the applicability of this model for sport performance.

A third purpose of Study 2 was to test whether passion toward a sport activity deemed by the individual as significant can be differentially associated with well-being as a function of the type of passion underlying activity engagement. Past research with non-sport activities has shown that harmonious passion positively predicts SWB (Vallerand et al., 2007, Studies 1 and 2), while obsessive passion is either unrelated (Vallerand et al., 2007, Study 1) or negatively related to SWB (Vallerand et al., 2007, Study 2). It remains to be seen if these findings also apply to sport. This constituted the third purpose of Study 2.

A final purpose of Study 2 was to examine the links between passion, deliberate practice, and performance in a design that enabled each of these constructs to be assessed at a separate time period. Passion and deliberate practice were assessed at the same time point in Study 1, making it difficult to determine whether passion led to deliberate practice or vice versa. We sought to address this issue in Study 2 by inserting a lengthy time interval between the passion and deliberate practice assessments. High-level athletes completed questionnaires assessing passion and achievement goals at Time 1 and deliberate practice at Time 2, 4 months later, while coaches evaluated their athletes' performance at Time 3, 1 month later. The hypothesized model posited that both types of passion would positively predict mastery goals, which themselves would positively predict deliberate practice. Deliberate practice was hypothesized to positively predict performance. Obsessive passion was also posited to predict performance-approach and performance-avoidance goals, which were expected to have a positive and negative influence on performance, respectively. Finally, it was predicted that harmonious passion would be positively associated with SWB, while obsessive passion would either be negatively related or unrelated to SWB.

Method

Participants

Participants were 67 (22 male, 45 female) competitive water-polo and synchronized swimming athletes. These athletes were high-level performers, including several members of the national team of their respective age group. The mean age of the athletes was 16.1 years (S.D. = 3.98 years) with a range from 13 to 33 years (56 of the 67 participants were aged from 13 to 17 years). All participants were volunteers. At the time of this study, they had been engaged in their sport for an average of 5.21 years (S.D. = 4.52 years). Participants engaged in their passionate activity an average of 4.73 times per week (S.D. = 1.65), each time for an average of 110.32 min (S.D. = 36.18 min).

Measures

Passion. The Passion Scale used in Study 1 was also employed in the present study except that it was the complete version (7 items per subscale; $\alpha = .84$ and $.91$ for harmonious and obsessive passion, respectively).

SWB. The Diener, Emmons, Larsen, and Griffin (1985) Satisfaction With Life Scale served as a measure of SWB. It is a 5-item scale assessing general feelings of satisfaction with one's life (e.g., "I'm satisfied with my life"). Results from factor analyses and reliability analyses have supported the unidimensionality of the scale. The French-Canadian version of the scale was used in the

present research (Blais, Vallerand, Pelletier, & Brière, 1989). This version has yielded psychometric properties similar to that of the original scale (one factor in a factor analysis, high internal reliability, and high levels of construct validity, see Blais et al., 1989). Participants indicated their responses on a 1 (*Do not agree at all*) to 7 (*Very strongly agree*) scale ($\alpha = .82$).

Achievement goals. Elliot and Church's (1997) 18-item questionnaire was used to assess participants' mastery, performance-approach, and performance-avoidance goals. Each goal measure consists of 6 items that are rated on a 1 (*Not at all true for me*) to 7 (*Very true for me*) scale. Results from factor analyses and Cronbach α 's have supported the three-factor structure of the scale and the reliability of each subscale. The questionnaire was adapted to the sports domain for the purpose of the present research. In this study, the mastery (e.g., "It is important to develop my skills as thoroughly as possible this season"), performance-approach (e.g., "I'm striving to demonstrate ability relative to others this season"), and performance-avoidance (e.g., "My goal this season is to avoid playing poorly") goal measures were all reliable ($\alpha = .83, .81, \text{ and } .82$, respectively).

Deliberate practice. Similar to the deliberate measure used in Study 1, deliberate practice in Study 2 also pertained to individual deliberate practice. The scale started with the stem "When I'm not training with the team, ..." and was followed by two items describing deliberate practice (e.g., "... I do exercises of visualization, concentration, and reflection to have better control during games"). Thus, as in Study 1, deliberate practice referred to activities that performers engaged in independent of the supervision of their coaches. Participants indicated their responses on a 1 (*Do not agree at all*) to 7 (*Very strongly agree*) scale (the Pearson Product Moment correlation between the two items was .44).

Performance. In line with Study 1, we used a 4-item performance assessment that the coaches used to rate the performance of their players relative to others. Contrary to Study 1 which assessed situational performance, in Study 2 we sought to assess the performance over the course of the whole season. The scale started with the stem "Since the beginning of the season, compared to the other athletes of his or her age, this athlete has been ..." and it was followed by four items (e.g., "... performing well under pressure"). The coaches' responses were indicated on a 1 (*Do not agree at all*) to 7 (*Very strongly agree*) scale ($\alpha = .79$).

Demographic information. In the last section of the questionnaire, athletes reported their age, gender, and other information that allowed us to match their questionnaires with their coach's performance assessment.

Procedure

Participants completed a questionnaire early in the season at Time 1 that contained assessments of harmonious and obsessive passion, achievement goals, and life satisfaction. The athletes were informed that the researchers were interested in knowing more about their attitudes toward their sport. Four months later, at Time 2, athletes completed an assessment of deliberate practice. One month later, toward the end of the season at Time 3, coaches were given a performance

questionnaire for each of their players, which they completed and returned directly to the research assistant.

Results and discussion

Preliminary analyses

t-Tests revealed no gender differences on any of the variables. Means, standard deviations, and correlations among the variables in the study are presented in Table 2.

Passion and performance: a path analytic model

The proposed model was tested through a path analysis (EQS; Bentler, 1995). In the model, the disturbances among the achievement goals were allowed to correlate (see Elliot & Church, 1997, for a similar approach). Results of a preliminary analysis revealed that performance-approach goals did not predict performance significantly. Thus, this link was removed from the final analysis. The results revealed that this model had an acceptable fit to the data, [χ^2 (15, $N = 67$) = 14.28, $p = .50$; CFI = 1.00, RMSEA = .00]. The paths indicated that at Time 1 harmonious passion positively predicted mastery goals ($\beta = .41$, $p < .05$), and that obsessive passion positively predicted mastery goals (marginally: $\beta = .22$, $p < .10$), performance-approach goals ($\beta = .36$, $p < .05$), and performance-avoidance goals ($\beta = .45$, $p < .05$). In turn, mastery goals at Time 1 positively predicted deliberate practice at Time 2 four months later ($\beta = .47$, $p < .05$), which then positively predicted performance at Time 3 ($\beta = .35$, $p < .05$). As hypothesized, performance-avoidance goals at Time 1 negatively predicted performance at Time 3 ($\beta = -.35$, $p < .05$) five months later. Finally, harmonious passion was positively associated with SWB ($\beta = .39$, $p < .05$) while obsessive passion was not ($\beta = -.04$, $p < .78$). Fig. 2 summarizes the results.

For comparison purposes, we also tested the validity of alternative models. In light of the time lag incorporated in the model, only one alternative model could be tested. This model posited that achievement goals predicted the two types of passion that in turn predicted deliberate practice. Finally, deliberate practice predicted performance. Results revealed that this model was not acceptable [χ^2 (12, $N = 67$) = 22.42, $p < .05$; CFI = .92, RMSEA = .12].

Table 2
Pearson correlations for study variables: Study 2

	Mean	S.D.	HP	OP	MG	PAppG	PAvoG	DP	P	SWB
Harmonious passion (HP)	5.74	.76	–	.68***	.56***	.25*	.27*	.30**	–.14	.36**
Obsessive passion (OP)	4.53	1.37		–	.49***	.36**	.45***	.32**	–.06	.22
Mastery goals (MG)	6.26	.80			–	.34**	.16	.47***	.02	.14
Performance-approach goals (PAppG)	4.58	1.22				–	.43***	.22	–.23	.27*
Performance-avoidance goals (PAvoG)	4.11	1.33					–	.08	–.32**	.12
Deliberate practice (DP)	4.02	1.57						–	.33**	.02
Performance (P)	4.78	1.01							–	–.24*
Subjective well-being (SWB)	5.46	1.09								–

Note: $n = 67$, * $p < .05$, ** $p < .01$, *** $p < .001$.

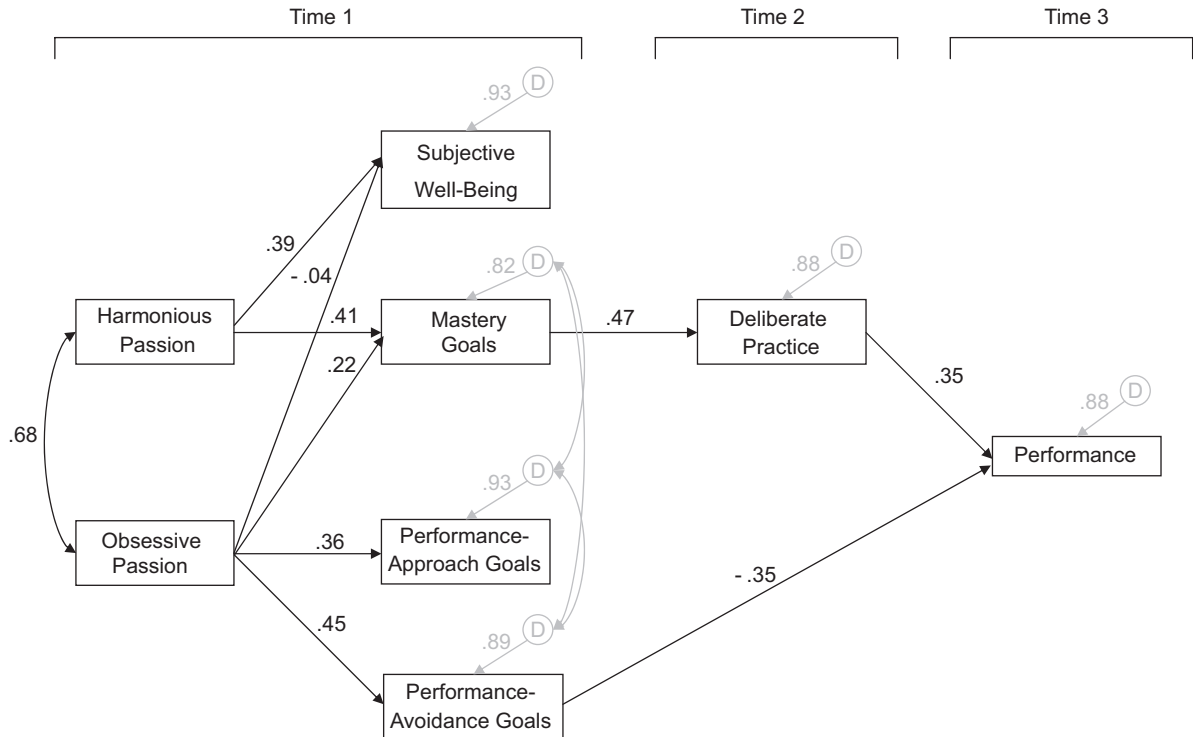


Fig. 2. Results of the path analysis of Study 2. All coefficients were standardized to facilitate interpretability. All coefficients were significant ($p < .05$), except the link between obsessive passion and subjective well-being. The correlations among the achievement goals disturbances do not appear for sake of clarity of the figure. They are available from the first author.

The results of Study 2 are highly consistent with the proposed model and basically replicated the findings of Vallerand et al. (2007, Study 2). Indeed, each of our predicted relations was confirmed with a single exception—performance-approach goals did not positively predict performance directly. The obtained results are particularly noteworthy given the clear temporal separation between the passion, deliberate practice, and performance assessments. Furthermore, the results, which revealed that the alternative model yielded poor fit values, reinforce the fact that the proposed model presented in Fig. 2 is the most adequate representation of the data.

The results from Study 2 provide strong support for the Dualistic Model of Passion. Overall, harmonious passion was found to trigger a more adaptive achievement process than obsessive passion. Harmonious passion predicted only mastery goals, while obsessive passion was found to predict all three types of goals, including performance-avoidance goals, which were found to negatively predict performance attainment. Furthermore, harmonious passion was positively associated with SWB, while obsessive passion was not. Thus, while harmonious passion produced a purely adaptive achievement process, obsessive passion engendered a more mixed achievement process characterized by some adaptive and some maladaptive features.

General discussion

The purpose of the present research was to test a model of the relation between passion and performance. In accord with the proposed model, the results of Study 1 revealed that both harmonious and obsessive passion positively contribute to performance through their link with deliberate practice. In addition, Study 2 examined the achievement goals producing the relation between passion and deliberate practice, as well as the link between passion and SWB. It was expected that harmonious passion would positively predict mastery goals, which, in turn, were hypothesized to positively predict deliberate practice. It was further hypothesized that obsessive passion would positively predict all three achievement goals. Furthermore, performance-approach goals were expected to positively and directly predict performance, whereas performance-avoidance goals were expected to have a negative direct influence on performance. Finally, harmonious passion was hypothesized to be positively associated with SWB, whereas obsessive passion was expected to be unrelated or even negatively related to SWB. The present findings provided support for all of the basic hypotheses except for one (the path between performance-approach goals and performance was not significant).

A first implication of the present findings is that they underscore the importance of the concept of passion for understanding and predicting performance attainment. Passion was found to be a catalyst, providing the energy for persistent and strategic engagement in highly demanding activities. Both harmonious and obsessive passions were found to be positive predictors of an active and organized behavioral involvement (i.e., deliberate practice) that facilitated performance. Thus, it would appear that not only harmonious passion, but also obsessive passion, represents a motivational force that can facilitate positive outcomes, particularly those that are behavioral in nature. Past research (Vallerand et al., 2003, Studies 3 and 4), on the other hand, has shown that obsessive passion also sustains persistence in self-defeating behavior such as winter cycling (in Quebec) and pathological gambling. As such, future research is needed to determine when obsessive passion leads to positive and negative forms of behavioral involvement.

A second, related, implication of the present findings is that they provide an answer to Ericsson et al.'s (1993) question regarding the nature of the motivational constructs responsible for individuals engaging in deliberate practice. One important answer appears to be harmonious and obsessive passion. Indeed, given the considerable magnitude of the relations that we observed, it seems reasonable to state that for an athlete to display sustained involvement in achievement activities over time, passion must be implicated in the process. Mastery goals also appear to be an important contributor to deliberate practice, as they were found to positively predict deliberate practice in Study 2. Future research is needed to determine if mastery goals still contribute to deliberate practice even when athletes reach a plateau and improved performance is no longer forthcoming. It is in this instance that mastery-avoidance goals (goals focused on avoiding intrapersonal incompetence; Elliot, 1999; Elliot & McGregor, 2001), a form of achievement goal regulation not examined in the present research, might become prevalent and might contribute to deliberate practice (see Conroy, Elliot, & Hofer, 2003, for a scale that assesses mastery-avoidance goals in sports).

A third implication of the present findings is that they confirm the role of deliberate practice as an important predictor of performance attainment. Ericsson et al. (1993) have proposed that deliberate practice is a, if not the, central contributor to expert performance. The two studies of

the present research provide strong support for this proposition. Past research on the link between deliberate practice and performance has focused on the long-term relations between the two variables, often involving several years. For instance, research reveals that performance at the expert level in a variety of activities including chess and music (e.g., Ericsson et al., 1993; Ericsson & Lehmann, 1996), as well as sports (Baker, Côté et al., 2003; Starkes, 2001) necessitates a sustained involvement in deliberate practice for at least 10 years. The present findings extend such research by showing the usefulness of studying deliberate practice at the short-term level (i.e., over a period of a few months).

A fourth implication of the present findings concerns the achievement process triggered by the two types of passion. Harmonious passion was shown to predict mastery goals alone, while obsessive passion predicted all three types of goals. The results for harmonious passion are in line with those obtained in earlier passion research showing that harmonious passion leads to an adaptive achievement process characterized by concentration and flow during task engagement (Mageau et al., 2005; Vallerand et al., 2003, Study 1). On the other hand, the results for obsessive passion suggest that it triggers a conflicted achievement process, whereby the individual attempts to regulate achievement concerns in multiple ways, some effective and some inimical to performance. This analysis is in line with past research involving passion and achievement goals (Vallerand et al., 2007, Study 2).

In light of the above, there would appear to be two roads leading to performance attainment in sport. The first road originates from harmonious passion, and promotes an exclusive focus on trying to master the activity. This mastery focus leads the person to engage in activities specifically aimed at skill improvement, and such deliberate practice eventually leads to high levels of performance. Of interest is that this process is fully compatible with SWB. The second road leading to performance attainment emanates from obsessive passion. Such a road is more sinuous than the first, as it involves the adoption of both adaptive (mastery goals) and maladaptive (performance-avoidance) achievement goals. This second road to performance is less than optimal for the individual. Indeed, in addition to leading to mixed performance through the adoption of mastery and performance-avoidance goals, it prevents people from enjoying themselves during activity engagement (Mageau et al., 2005; Vallerand et al., 2003, Study 1) and does not facilitate SWB in their lives (Vallerand et al., 2007, Studies 1 and 2; the present research, Study 2). These two roads to performance would run contrary to the lay conception of performance attainment in sport, which suggests that high-level performance is attained by obsessively passionate athletes who focus exclusively on their sport at the expense of other life pursuits. Perhaps the encouraging message from the present research is that it is possible to reach high levels of sport performance, while at the same time experiencing high levels of enjoyment and well-being, to the extent that one's passion for sport is harmonious in nature. In other words, one can be a high-performing athlete and lead a balanced, happy life at the same time.

The finding that performance-avoidance goals negatively predict performance is in line with past results in the achievement goal literature (Elliot & Moller, 2003; Elliot, Shell, Henry, & Maier, 2005). However, the null finding for performance-approach goals is contrary to prior research with non-sport activities, including that of Vallerand et al. (2007, Study 2), which has found these goals to be consistent positive predictors of performance attainment (see Elliot & Moller, 2003). Most research that has documented the facilitative influence of performance-

approach goals has been conducted in classroom contexts with undergraduates. The fact that we did not obtain this finding in a sport context in Study 2 raises the important question of whether the positive influence of performance-approach goals generalizes beyond the classroom or, more pointedly, beyond the *college* classroom (Midgley, Kaplan, & Middleton, 2001). The normative focus inherent in performance-approach goals would actually seem a perfect match for competitive sport contexts, which makes the present null findings all the more surprising. In line with classic achievement goal theory (e.g., Dweck, 1986), it is plausible that the positive effects of performance-approach goals take place only in the presence of high perceptions of competence. Unfortunately, perceived competence was not assessed in the present study. Clearly, more empirical work is needed to systematically explore the influence of performance-approach goals on performance in sport contexts.

The present research has a number of limitations. First, the design used in both studies was correlational in nature. Definitive conclusions about causality are thus inappropriate. However, recent research using a cross-lagged panel design revealed that passion predicted changes in affective and interpersonal outcomes that took place over time, while outcomes did not predict changes in passion (Carbonneau, Vallerand, Frenette, & Guay, 2007). Nevertheless, future research should use experimental designs to examine the proposed model under more controlled conditions. A second aspect of our research to consider is that we examined a small subset of sports (basketball and water sports) and participants (adolescents and young adults). Future research should seek to generalize the present findings to other sports and age groups. Third, the subject/parameter ratio, while acceptable in Study 1 ($184/29 = 6.3$), was rather low in Study 2 ($67/22 = 3.05$). Future research should seek to replicate the present findings with a larger number of participants, thus providing increased power to the models tested. Fourth, our measures of deliberate practice and performance were developed for the explicit purposes of the present research. Future research should make use of instruments that have gone through more extensive validation procedures. In this vein, the quality and quantity dimensions of deliberate practice should be assessed, as both have been found to contribute to performance (Baker, Côté et al., 2003; Baker, Horton et al., 2003). Fifth, as indicated above, perceived competence was not assessed in the present research. Some achievement-goal theorists have posited that the negative effects of performance goals only take place when perceived competence is low (although see Cury, Elliot, Da Fonseca, & Moller, 2006, for a different perspective), and this possibility could be examined in subsequent research. Finally, our assessment of SWB was limited to life satisfaction; future research would do well to explore SWB as assessed in a more thorough fashion (see Diener, 2000).

In sum, the present findings highlight the importance of the concept of passion for understanding performance in sport. Subsequent research is needed to replicate these findings with athletes at higher levels of expertise (Olympic and professional athletes) and to more firmly establish the two roads to high-level performance in sport.

References

- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self-scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*, 596–612.

- Baker, J., Côté, J., & Abernathy, B. (2003). Sport-specific practice and the development of expert decision-making in team ball sports. *Journal of Applied Sport Psychology, 15*, 12–25.
- Baker, J., Horton, S., Robertson-Wilson, J., & Wall, M. (2003). *Journal of Sports Science and Medicine, 2*, 1–9.
- Bentler, P. M. (1995). *EQS: Structural equations program manual*. Los Angeles, CA: BMDP Statistical Software.
- Blais, M. R., Vallerand, R. J., Pelletier, L. G., & Brière, N. M. (1989). L'Échelle de satisfaction de vie: Validation canadienne-française du "Satisfaction with Life Scale" [Validation of the French-Canadian version of the Satisfaction with Life Scale]. *Canadian Journal of Behavioural Sciences, 21*, 210–223.
- Carbonneau, N., Vallerand, R. J., Frenette, C., & Guay, F. (2007). *Passion for teaching: A look at intra and interpersonal outcomes*, submitted for publication.
- Charness, N., Krampe, R., & Mayr, U. (1996). The role of practice and coaching in entrepreneurial skill domains: An international comparison of life-span chess skill acquisition. In K. A. Ericsson (Ed.), *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 51–80). Mahwah, NJ: Erlbaum.
- Charness, N., Tuffiash, M., Krampe, R., Reingold, E., & Vasyukova, E. (2005). The role of deliberate practice in chess expertise. *Applied Cognitive Psychology, 19*, 151–165.
- Conroy, D. E., Elliot, A. J., & Hofer, S. M. (2003). A 2 × 2 achievement goals questionnaire for sport. *Journal of Sport and Exercise Psychology, 25*, 456–476.
- Csikszentmihalyi, M. (1978). Intrinsic rewards and emergent motivation. In M. Lepper, & D. Greene (Eds.), *The hidden costs of reward* (pp. 205–216). Hillsdale, NJ: Erlbaum.
- Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure*. New York: Cambridge.
- Cury, F., Elliot, A. J., Da Fonseca, D., & Moller, A. (2006). The social-cognitive model of achievement motivation and the 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 90*, 666–679.
- Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268.
- Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71–76.
- Duda, J. L. (2001). Achievement goal research in sport: Pushing the boundaries and clarifying some misunderstandings. In G. Roberts (Ed.), *Advances in motivation in sport and exercise* (pp. 129–182). Champaign, IL: Human Kinetics.
- Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040–1048.
- Elliot, A. J. (1997). Integrating the "classic" and "contemporary" approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. In M. L. Maehr, & P. R. Pintrich (Eds.), *Advances in motivation and achievement*, Vol. 10 (pp. 143–179). Greenwich, CT: JAI Press.
- Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 169–189.
- Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218–232.
- Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70*, 968–980.
- Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80*, 501–519.
- Elliot, A. J., McGregor, H. A., & Gable, S. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology, 91*, 549–563.
- Elliot, A. J., & Moller, A. (2003). Performance-approach goals: Good or bad forms of regulation? *International Journal of Educational Research, 39*, 339–356.
- Elliot, A. J., Shell, M. M., Henry, K., & Maier, M. (2005). Achievement goals, performance contingencies, and performance attainment: An experimental test. *Journal of Educational Psychology, 97*, 630–640.
- Ericsson, K. A., & Charness, N. (1994). Expert performance: Its structure and acquisition. *American Psychologist, 49*, 71–76.
- Ericsson, K. A., Krampe, R. T., & Tesh-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100*, 363–406.

- Ericsson, K. A., & Lehmann, A. C. (1996). Expert and exceptional performance: Evidence of maximal adaptation to task constraints. *Annual Review of Psychology*, *47*, 273–305.
- Helsen, W. F., Hodges, N. J., Winckel, J. V., & Starkes, J. L. (2000). The role of talent, physical precocity and practice in the development of soccer expertise. *Journal of Sports Sciences*, *18*, 727–736.
- Helsen, W. F., Starkes, J. L., & Hodges, N. J. (1998). Team sports and the theory of deliberate practice. *Journal of Sport & Exercise Psychology*, *20*, 12–34.
- Hodges, N. L., Kerr, T., Starkes, J. L., & Weir, P. L. (2004). Predicting performance times from deliberate practice hours for triathletes and swimmers: What, when, and where is practice important? *Journal of Experimental Psychology: Applied*, *10*, 219–237.
- Hodgins, H. S., & Knee, R. (2002). The integrating self and conscious experience. In E. L. Deci, & R. M. Ryan (Eds.), *Handbook on self-determination research* (pp. 87–100). Rochester, NY: University of Rochester Press.
- Hodgins, H. S., Yacko, H. A., & Gottlieb, E. (2006). Autonomy and nondefensiveness. *Motivation and Emotion*, *30*, 283–293.
- Holmes, F. L. (1996). Expert performance and the history of science. In K. A. Ericsson (Ed.), *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 313–319). Mahwah, NJ: Erlbaum.
- Jackson, S. A., & Marsh, H. W. (1996). Development and validation of a scale to measure optimal experience: The Flow Scale. *Journal of Sport & Exercise Psychology*, *18*, 17–35.
- Jordan, M. (2005). *Driven from within*. New York: Atria Books.
- 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.
- Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology*, *93*, 77–86.
- Philippe, F. & Vallerand, R. J. Prevalence rates of gambling problems in Montreal, Canada: A look at old adults and the role of passion. *Journal of Gambling Studies*, in press.
- Ratelle, C., Vallerand, R. J., Mageau, G., Rousseau, F. L., & Provencher, P. J. (2004). Passion and Gambling: A look at pathological gambling. *Journal of Gambling Studies*, *20*, 105–119.
- Rip, B., Fortin, S., & Vallerand, R. J. (2006). The relationship between passion and injury in dance students. *Journal of Dance Medicine & Science*, *10*, 14–20.
- Séguin-Lévesque, C., Laliberté, M.-L., Pelletier, L. G., Blanchard, C., & Vallerand, R. J. (2003). Harmonious and obsessive passion for the Internet: Their associations with the couple's relationships. *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: The University of Rochester Press.
- Starkes, J. (2001). The road to expertise: Can we shorten the journey and lengthen the stay? In A. Papaioannou, M. Goudas, & Y. Theodorakis (Eds.), *International society of sport psychology's 10th world congress of sport psychology- In the dawn of the new millennium* (pp. 198–205). Thessaloniki, Greece: Christodoulidi Publishers.
- Starkes, J. L., Deakin, J. M., Allard, F., Hodges, N. J., & Hayes, A. (1996). Deliberate practice in sports: What is it anyway? In K. A. Ericsson (Ed.), *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 81–106). Mahwah, NJ: Erlbaum.
- Starkes, J. L., & Ericsson, K. A. (Eds.). (2003). *Expert performance in sports: Advances in research on sport expertise*. Champaign, IL: Human Kinetics.
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. *Advances in Experimental and Social Psychology*, *29*, 271–360.
- Vallerand, R. J., Blanchard, C. M., 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., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high-school dropout. *Journal of Personality and Social Psychology*, *72*, 1161–1176.

- Vallerand, R. J., & Houliort, N. (2003). Passion at work: Toward a new conceptualization. In D. Skarlicki, S. Gilliland, & D. Steiner (Eds.), *Social issues in management*, Vol. 3. Greenwich, CT: Information Age Publishing.
- Vallerand, R. J., & Miquelon, P. (2007). Passion for sport in athletes. In D. Lavallée, & S. Jowett (Eds.), *Social psychology in sport* (pp. 249–262). Champaign, IL: Human Kinetics.
- Vallerand, R. J., Rousseau, F. L., Grouzet, F. M. E., Dumais, A., Grenier, S., & Blanchard, C. B. (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., Grouzet, F. M. E., & Blanchard, C. B. (2007). On the role of passion in performance. *Journal of Personality*, *75*, 505–533.
- Winner, E. (1996). The rage to master: The decisive role of talent in visual arts. In K. A. Ericsson (Ed.), *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 271–301). Mahwah, NJ: Erlbaum.