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Abstract

Many individuals are passionate for physical activity such as cycling, running, and soccer. Drawing from the dualistic model of passion, the purpose of the present study was to examine the direct and indirect relationships between passion (harmonious and obsessive) for physical activity, life satisfaction, performance, and innovativeness in organizational settings. Survey data were gathered from 272 cyclists who also occupied employment roles beyond their cycling pursuits. Data were analyzed using structural equation modelling. Results indicated a direct positive relationship between harmonious passion and both performance and innovativeness at work. Moreover, results indicated that perceived life satisfaction indirectly influenced the relationships between harmonious passion and both performance and innovativeness at work. No significant relationships were found between obsessive passion for cycling and either organizational performance outcome. In sum, these findings suggest that passion for physical activity directly and indirectly (through life satisfaction) enhance organizational performance outcomes, but only for harmonious passion.

Keywords; harmonious passion, obsessive passion, physical activity, performance, innovation, life satisfaction,

Passion permeates throughout all our lives, and for many it is what gives life meaning and makes life worth living (Vallerand, 2008; Vallerand 2015). For example, in one study of over 500 participants, 84% revealed an inherent passion for at least one of 150 activities, ranging from sport and exercise, to reading, to playing musical instruments (Vallerand et al., 2003).

Defining Passion

Vallerand et al. (2003) define passion as a strong inclination toward a self-defining activity that one likes (or even loves), finds important, and invests significant time and energy. The passion becomes part of the person's identity and how they define themselves. Passionate people do not merely engage in their chosen activity, but they embody it to the extent they are "the cyclist", "the guitar player", or "the poet" (Vallerand, 2015).

Passion is theoretically underpinned by self-determination theory (Deci & Ryan, 2000) which helps explain why passion emerges in individuals. People engage in various activities throughout life with the aim of satisfying the basic psychological needs of autonomy (a desire to feel a sense of personal initiative), competence (a desire to interact effectively with the environment), and relatedness (a desire to feel connected to significant others) (Vallerand, 2008). Outside of work and family commitments (which can be passions too), there are a vast array of leisure time activities open to most people. After experimenting in some activities that are of general interest, most people will concentrate their efforts on a few, especially those activities that provide a sense of competence and mastery, a sense of autonomy and self-direction, and a sense of relatedness and belonging. Many individuals are passionate about physical activity as it is one activity that seems to satisfy these needs (Paradis, Cooke, Martin, & Hall, 2014). A further distillation will usually take place into a passion where engagement in only the activities which are truly enjoyable, highly valued, and self-defining are maintained.

The Dualistic Model of Passion

Stemming largely from the work of Vallerand and colleagues (Vallerand, 2008, Vallerand, 2012; Vallerand, 2015; Vallerand & Houlfort, 2019; Vallerand et al., 2003), passion has been conceptualized as a duality, consisting of two related but conceptually distinct components. The DMP posits that an individual can have a strong inclination toward a self-defining activity that is loved, but engagement in that activity is comprised of both harmonious and obsessive manifestations (Vallerand, 2008; Vallerand et al., 2003). Harmonious passion is voluntarily internalized into the person's identity. Harmonious passion reflects a level of control to engage in the activity only when it is compatible with other life goals and endeavors and thus often leads to adaptive outcomes. According to Vallerand and Houlfort (2019), harmonious passion is flexible and autonomous (e.g., activity engagement can be stopped at any time). For example, a harmoniously passionate athlete would not feel compelled to persist with their plan to run an intense 10km if they were feeling unwell, recovering from an injury, or the timing clashed with an important family or work event.

In contrast, obsessive passion reflects a lack of self-control towards engaging in the activity. The same athlete would display an obsessive passion if they were consumed by a sense of having to persist with their planned 10km run no matter what else might be going on in their life (e.g., feeling ill, recovering from injury, or a family or work event), and thus often leads to maladaptive outcomes (Curran, Hill, Appleton, Vallerand, & Standage, 2015; Whelan & Clohessy, 2020). Obsessive passion emerges from a partial behavioral integration of the activity that one loves (Curran et al., 2015). This partial internalization propagates behavior reflective of force and rigid engagement is pursued in order to maintain a sense of prestige and self-worth (Ho, Wong, & Lee, 2011). Such compulsion creates conflict with other aspects of one's life (Paradis, Cooke, Martin, & Hall, 2013). Although the obsessively

passionate person still loves the activity, they feel bound to it or controlled by it and compelled to engage in the activity even when not appropriate to do so, as it goes beyond their self-control (Curran et al., 2015; Paradis et al., 2013).

It is important to note that harmonious and obsessive passion are not mutually exclusive. Within a passionate person, it is quite likely both manifestations can coexist and present themselves at different times. A harmoniously passionate worker can also embody some obsessively passionate tendencies for their job perhaps especially during busier times. Likewise obsessive passion does not represent a deeper love for the activity than harmonious passion, both are correlated but represent different forms of passion (Vallerand, 2015).

The construct of passion has been well researched and several studies do indeed demonstrate the validity of the DMP. Much of the passion literature assesses the influence of passion on both adaptive and maladaptive cognitive, behavioral, and affective outcomes.

In studies of cognitive outcomes, harmonious passion was found to facilitate higher levels of concentration and flow (a desirable state that people experience feeling in complete control) in soccer referees whereas obsessive passion does not (Phillipe, Vallerand, Andrianarisoa, & Brunel, 2009). In support of the notion that spillover effects from one context to another do occur, English soccer fans who reported being obsessively passionate about their team, were unable to concentrate fully on other life activities such as work during the day of the match, while harmoniously passionate fans reported no such ill effects (Vallerand, Ntoumanis, et al., 2008).

In studies of affect, the efficacy of the DMP in explaining variances in well-being has also been demonstrated. Previous research found harmonious passion was positively related to increased positive affect from engagement in physical activity (Mageau & Vallerand, 2007), and in sport (Vallerand, Rousseau, Grouzet, Dumais, & Grenier, 2006), and increased life satisfaction in athletes (Vallerand, Mageau et al., 2008). Whereas obsessive passion was

linked to negative affect and lower life satisfaction. A study of undergraduate students revealed that high self-esteem positively predicted harmonious passion while low self-esteem predicted obsessive passion (Lafrenière, Bélanger, Sedikides, & Vallerand, 2011).

Participating in an activity that is deeply loved and is part of a person's identity, should lead to feeling good about oneself. The outcome of a study of passionate activities among the elderly confirmed such an outcome (Rousseau & Vallerand, 2003). The same study reports an important caveat in terms of psychological well-being, in that obsessive passion explained increases in ill-being and depression. Obsessive passion can also thwart basic needs and lead to burnout (Kent, Kingston, & Paradis, 2018). Similar wellness findings were reported through the passion of young adults and teenagers in a variety of domains (e.g., sports, work, dramatics arts, education) (Stenseng, Stenseng, & Phelps, 2013; Vallerand et al., 2007). In determining why passion is connected to well-being; basic needs satisfaction (Verner-Filion, Vallerand, Amiot, & Mocanu, 2017), flow experiences (Carpentier, Mageau, & Vallerand, 2012), and achievement goals (Verner-Filion et al., 2017) have all been found to play an indirect role. Passion has also been shown to influence interpersonal affective outcomes such as increased relationship quality with coaches, (Lafrenière, Jowett, Vallerand, & Carbonneau, 2011; Lafrenière, Jowett, Vallerand, Donahue, & Lorimer, 2008), teammates (Phillipe, Vallerand, Houlfort, Lavigne, & Donahue, 2010), and team cohesion (Paradis, Martin, & Carron, 2012).

In terms of behavioral outcomes, passion for activities can also go awry and lead to maladaptive behaviors, such as obligatory exercise (Paradis et al., 2013), rigidity and inflexibility (Rip, Fortin, & Vallerand, 2006), problem gambling (Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005; Morvannou, Dufour, Brunelle, Berbiche, & Roy, 2018), intrapersonal conflict, (Stenseng, Haugen, Torstveit, & Høigaard, 2015), and problematic gaming (Wang & Chu, 2007), particularly when the passion is obsessive.

Individuals can also be passionate about their occupation (Vallerand & Houlfort, 2003). Previous research has assessed the DMP in organizational settings and found harmonious passion towards work was positively related to job satisfaction and perceived belongingness (Spehar, Forest, & Stenseng, 2016), as well as good mental health, flow, vitality, and commitment, whereas obsessive passion was negatively related to good mental health (Forest, Mageau, Sarrazin, & Morin, 2010). However, if one is not passionate about their work, employees may seek fulfillment in other aspects of their life as an indirect motivator to persevere through their requirements at work.

A person's occupation occupies a substantial portion of one's overall life. However, people engage in their work in different ways. For some, work is a passion in itself (Vallerand & Houlfort, 2003), while for others, it's the means to and end (a pay cheque, a stepping stone, a societal obligation). People who are passionate about their work are likely to identify along with that role, whereas those who may not be passionate, likely would not consider their job as part of their identity (Vallerand, Paquet, Phillipe, & Charest, 2011). Regardless of whether employees are passionate about their work or not, performance and innovation are important organizational constructs that employers seek to improve. Another main concern for employers is the well-being of their workers themselves. Leisure time physical activity has been documented as one way that employees seek respite from work (Sonnentag, 2001). Additionally, exercise has been shown to lead to an increase in job satisfaction, life satisfaction, and enthusiasm for corporate employees at work (Thorgersen-Ntoumani, Fox, & Ntoumanis, 2005). Many companies have sought to create such environments that will foster and enhance their employees' well-being, which in turn will lead to more satisfied workers who would then likely perform better on the job. Physical activity is one medium that organizations have utilized both formally and informally as a means to achieve this performance objective due to the fact that many people take personal

interests in various forms of sport and physical activity (Moen, Kelly, Tranby, & Huang, 2011). Thus, understanding an employee's passion for physical activity may uncover important associations with organizational performance outcomes through their employees. For example, the concept of DMP has been explored in the workplace. According to Vallerand and Houlfort (2019) a "harmonious passion for work may emerge if employees continuously devote effort to their work tasks out of their own free will, whereas obsessive passion for work should evolve if certain internal or external pressures (e.g., social norms or organizational culture) arise over time" (p. 248). Furthermore, the authors identified that a harmonious passion for work resulted in improved cognitive capabilities such as decision-making ease, problem solving ease, and enhanced concentration.

Given its relationship with well-being, cognition, decision-making, creativity, and performance, passion is a very important organizational construct. For many workers, physical activity is their primary non-work-related interest. For example, in a recent study, most employees reported meeting (43.7%) or exceeding (42.9%) physical activity guidelines over the previous week (Hunter, Gordon, Bird, & Benson, 2018). However, we still have a limited understanding about if and how passion for non-work related activities, such as physical activity, may spillover into the workplace and influence life satisfaction, performance, and innovativeness. It is to this question we now turn.

Research Model and Hypotheses

Figure 1 depicts the research model where we hypothesize on the direct and indirect relationships between passion for physical activity, life satisfaction, and the organizational outcomes of work performance and work innovativeness.

Passion for Physical Activity and Work Performance

Vallerand (2015, p. 247) argues that "…passion for an activity is the necessary ingredient in developing high-level proficiency". To excel in any activity requires dedication

and persistence, particularly when inevitable setbacks occur. People are more likely to commit hours of engagement to their chosen craft when they love and value the activity (i.e. when they are passionate about it). Empirical studies of passion where performance is the dependent variable would support such a view. For example, in terms of musical ability, high performers were much more passionate than lower performers (Mageau et al., 2009).

Performance studies drawing from the DMP have examined how harmonious and obsessive passion influence performance. In the sports literature, deliberate practice has been identified as the mechanism linking passion to performance. In one DMP study, both harmonious and obsessive passion for basketball positively predicted deliberate practice, which in turn predicted objective performance evaluations (Vallerand, Mageau, et al., 2008). The same study also reported the significant link between obsessive passion for sport and performance avoidance goals which can be considered maladaptive. A later study of soccer players confirmed the indirect effects of deliberate practice between obsessive passion and performance in sport, and the pivotal role of needs satisfaction in the indirect relationship between harmonious passion and performance (Verner-Filion et al., 2017).

In the organizational literature, employees with a harmonious passion for their work reported higher job performance (Astakhova & Porter, 2015; Burke, Astakhova, & Hang, 2015; Ho et al., 2011), and this relationship was explained by higher levels of cognitive absorption (Ho et al., 2011), and the extent to which one identifies with the organization (Astakhova & Porter, 2015). In contrast, obsessive work passion was negatively associated with cognitive absorption (Ho et al., 2011), but did not have a significant effect on work performance (Astakhova & Porter, 2015; Burke et al., 2015; Ho et al., 2011).

Although the relationship between passion and performance has been considered broadly in the DMP literature, these studies have exclusively focused on how passion for an activity relates to performance in that same activity. In the present study, we hypothesize on

the spillover effects from a passion for a non-work related activity (i.e., physical activity) to job performance. There are a number of pathways that passion for physical activity can enhance job performance. High performers at work tend to be physically fit (Pronk et al. 2004) and passion for physical activity facilitates adherence to a regular fitness routines (Stephan, Deroche, Brewer, Caudroit, & Le Scanff, 2009). Passion for physical activity can bestow energy, vigor, enthusiasm, or tension, depending on the underlying nature of the passion (Vallerand, 2015), which likely spillover into the workplace. Luth et al. (2017) report that a harmonious passion for cycling has a positive relationship with work satisfaction, while workers with an obsessive passion for cycling, are likely to take on a global prevention focus, which diminishes work satisfaction. Likewise, obsessively passionate exercisers divert their energies to their chosen activity and neglect other activities in their life (Paradis et al., 2013), such as work and family. Thus, we hypothesize;

H1: Harmonious passion for physical activity is positively associated with job performance.

H2: Obsessive passion for physical activity is negatively associated with job performance.

Passion for Physical Activity and Work Innovativeness

Work innovativeness is defined as the extent to which an individual actively generates, discovers, and promotes creative work related ideas (Gray, Iyer, & Parise, 2011). Although related to job performance, it is a distinct construct. For example, a software programmer may perform very highly by producing code that is technically flawless, but whose innovativeness could be considered low as the code lacks novelty and originality.

Empirical studies also buttress the link between innovativeness and passion. Professional artistic painters, a population whose livelihoods depend on their creativity, were found to possess high levels of both harmonious and obsessive passion (Lafrenière, St-Louis,

Vallerand, & Donahue, 2012). When creativity was measured and not just assumed, similar findings were reported in a study of design students (Luh & Lu, 2012). Whether employees who are passionate for their work are more or less innovative has also been considered in the organizational literature. When innovativeness was objectively assessed by the employee's supervisor, harmonious passion was positively related, while obsessive passion was negatively related (Shi, 2012). Similarly, creativity in the work of bank employees was supported by harmonious passion for work, but in this case, obsessive passion was unrelated (Liu, Chen, & Yao, 2011).

Scholars have theorized that a transient pleasant affective state can influence the way cognitive material is organized and thus may influence innovation behavior (Isen, Daubman, & Nowicki, 1987). Physical activity is well known to produce a pleasant affective state, such as the "runner's high". Several lab experiments have shown that physical activity may sometimes enhance creative thinking, but the evidence is still inconclusive (Colzato, Szapora, Pannekoek, & Hommel, 2013). For example, Colzato et al. (2013) found that athletes tend to perform better than non-athletes in creative tasks directly after exercise. Isen et al. (1987) however found the positive effect resulting from two minutes of moderate intensity exercise did not improve subsequent performance on a creative problem-solving task. It is possible that the association between physical activity and innovativeness takes longer to mature than can be witnessed in these unnatural controlled lab environments. The 'wandering mind' has also been proven in neuroscientific studies to be critical for creativity (Limb & Braun, 2008). Exercise provides the opportunity for the individual to switch off and let the mind wander (Colzato et al., 2013). Therefore, we speculate a harmonious passion for physical activity would be related to work innovativeness.

In contrast, obsessive passion for exercise has been found to be related to increased negative affect (Rousseau & Vallerand, 2008), and rigidity and inflexibility (Rip et al.,

2006), neither of which are conducive to innovativeness. It is also a possibility that the absence of exercise for someone who is a regular exerciser will impair innovative performance more than its presence will enhance it (Colzato et al., 2013). Obsessive passion for exercise has also been linked to all seven maladaptive symptoms of exercise dependence (Paradis et al., 2013) which include withdrawal symptoms if exercise is absent. Thus, we hypothesize;

H3: A harmonious passion for physical activity is positively associated with work innovativeness.

H4: An obsessive passion for physical activity is negatively associated with work innovativeness.

Passion for Physical Activity and Life Satisfaction

Life satisfaction in the context of the present study is defined as an overall assessment of feelings and attitudes about one's life at a particular point in time ranging from negative to positive (Diener, Emmons, Larsen, & Griffin, 1985). Many studies utilizing the DMP not only consider the direct links between the dimensions of passion and performance, but also the indirect links through variables which could also help explain how such relationships materialize. In addition to cognitive absorption (Ho et al., 2011; Shi, 2012), goal motivation (Vallerand, Mageau, et al., 2008), organizational identity (Astakhova & Porter, 2015), and life satisfaction (Lafrenière et al., 2012) have been identified as explanatory indirect influencing variables along with passion.

In an experimental setting, Lafrenière et al. (2012) found significant interaction effects between both types of passion and life satisfaction. When participants were primed to reflect upon successful outcomes, both types of passion equally led to high levels of life satisfaction. When primed for failure, obsessive passion led to a significant decrease in life satisfaction, while harmonious passion had no effect. Likewise, passion for leisure activities

has been found to influence satisfaction in other life domains, such as work and family (Stenseng et al., 2013). A review of the life satisfaction and work literature also supports our hypothesis. Summarizing this body of work, Erdogan et al. (2012) suggest life satisfaction may even be a stronger predictor of job performance when compared to job satisfaction.

In sum, the adaptive and less adaptive effects of passion for physical activity on work performance and innovativeness is dependent upon the accompanying perceptions of life satisfaction. As such, we hypothesize that workers with a harmonious passion for physical activity would be more likely to perceive higher levels of life satisfaction, which in turn will be associated with enhanced work performance and innovativeness. Additionally, it is expected those with an obsessive passion for physical activity will be more likely to report lower life satisfaction, and in turn, be lower performers in both work performance measures. Thus, we hypothesize:

H5: A harmonious passion for physical activity is indirectly positively associated with work innovativeness, via life satisfaction.

H6: An obsessive passion for physical activity is indirectly negatively associated with work innovativeness, via life satisfaction.

Method

Participants and Procedure

Data were collected via an online self-report survey from amateur cyclists in Ireland. We chose cycling as a form of physical activity due to its popularity which has increased dramatically among Irish and UK workers, largely due to a Government tax-free incentive scheme to purchase bikes. Likewise, gathering data from cyclists enables us to build upon previous DMP studies which have also focused on the same population (Luth et al., 2017; Stenseng et al., 2015). A cross-sectional quantitative design was deemed the most appropriate in this case as we do not know in advance if the variables of interest will covary,

or what the timeframe from cause to effect would be (Spector, 2019). To recruit respondents, an invitation to participate in the survey was posted to an online forum for cyclists in Ireland.

The survey was completed by 288 people. Removing incomplete submissions (6), significantly rapid survey completion times (5), and those who were not currently employed (5), left 272 usable responses. The sample included 19% females, which is broadly representative of the amateur cycling community in Ireland[1]. The mode age bracket of participants was 40-44 (23%). All participants cycled at least 2-hours per week, with 7-hours per week the average. The average organizational tenure was 8-years with 93% of the sample employed fulltime and 7% part-time. In order to reduce the influence of alternative explanations for our results and consistent with the passion literature, we controlled for participant age, gender, and full-time job status (Vallerand et al., 2008). We also controlled for the average hours of weekly cycling training and work tenure (Luth et al., 2017).

Measures

All multi-item scales were adapted from well-established research instruments and were measured on 7-point Likert-type scales. All scale items, descriptive statistics, factor loadings, composite reliabilities (CR), Cronbach's Alpha (CA), average variance extracted (AVE) values are provided in Table 1. As all responses were self-reported, to mitigate the potential for common method bias (CMB), the order of the measurement items in the survey was randomized. An initial pilot test of the survey was also conducted with 12 cyclists and four academics, resulting in the rewording of the participant instructions to improve clarity.

Passion. Vallerand et al.'s. (2003) 14-item Passion Scale adapted to the cycling context (Luth et al., 2017; Stenseng et al., 2015) was used to measure participant's passion for cycling. Previous research demonstrated that the passion scale exhibits high construct

[1] Female membership of Cycling Ireland, the national body for cycling in Ireland, is 21% http://www.cyclingireland.ie/page/disciplines/women

validity including factor structure, reliability, convergent, and discriminant validity, across a wide variety of samples measuring passionate activities (Curran et al., 2015). The scale includes measurements for both harmonious (7-items) and obsessive (7-items) passion.

Performance and Innovation. Both work performance (3-items) and work innovativeness (4-items) were utilized from the Role Based Performance Scale (Welbourne et al., 1998). This scale assesses performance from the theoretical underpinnings of role theory and identity theory as a measure of employee performance (Welbourne et al., 1998). The scale has been widely utilized and has demonstrated evidence of reliability and validity across several employee samples (e.g., Purvanova, Bono, & Dzieweczynski, 2006; Wallace, Edwards, Arnold, Frazier, & Finch, 2009).

Life Satisfaction. Life satisfaction was measured using the Satisfaction with Life Scale (Diener et al., 1985) as a global measure of life satisfaction. This questionnaire consists of 5-items. This scale has been widely utilized across several disciplines and has demonstrated evidence of reliability and validity across several samples (Thorgersen-Ntoumani et al., 2005; Pavot & Diener, 2008).

Data Analysis

Preliminary Assessment: Data Screening and Cleaning

To analyze these data, we used the partial least squares-structural equation modeling (PLS-SEM) approach with SmartPLS software (Ringle, Wende, & Will, 2015). A number of approaches can be used to estimate the minimum sample size required for PLS-SEM analysis. For the current study, the standard “10 times rule” (Hair, Ringle, & Sarstedt, 2011) yields a minimum sample of 50, while the inverse square root method (Kock & Hadaya, 2018) returns a minimum sample of 86. Other scholars recommend 150 observations for models with three or more indicators on constructs (Anderson & Gerbing, 1984). Thus, the present sample of 272 participants more than exceeds the minimum sample size threshold.

The initial assessment focused on the potential influence of CMB. As all CMB detection techniques have limitations, we used a number of methods to assess for CMB. First, the occurrence of a variance inflation factors (VIF) greater than 3.30 is proposed as an indication that a model may be contaminated by CMB (Kock, 2015). Therefore, if all VIFs resulting from a full collinearity test are equal to or lower than 3.30, the model can be considered free of CMB. The VIF matrix confirmed all values were less than 3.30. Second, we conducted a single factor test (Harman, 1976). We conducted a principal component analysis and found no single construct accounted for a majority of the total variance. Third, the marker variable approach (Lindell & Whitney, 2001) advocates adding a theoretically unrelated marker variable to the model ('impulsiveness' in our case) and examining the correlation with latent variables. CMB may be evident if the correlation between any of the latent variable and the marker is greater than .30. The highest marker correlation in our model was .22 between impulsiveness and work performance. These tests ensure that CMB is not a major concern in the present study.

We followed the Gefen and Straub (2005) procedure to test convergent and discriminant validity (see Table 1 for item means and factor loadings). We evaluated the convergent validity by examining item loadings, CRs, and AVEs values. With regard to item loadings, Fornell and Larcker (1981) have recommended values of at least .70 to be acceptable. Based on this criterion, one item from the harmonious passion construct was removed. The CR values being above .80 and AVE values exceeding .50 further support satisfactory convergent validity. We evaluated the discriminant validity by comparing the square roots of AVE values to the inter-construct correlations (see Table 2). The square roots of the AVE values for the variables are consistently greater than the off-diagonal correlation values, suggesting satisfactory discriminant validity between the variables. We also examined the heterotrait-monotrait ratio of correlations (HTMT) to assess discriminant

validity. If the HTMT value is below .90, discriminant validity has been established between two reflective constructs (Henseler, Ringle, & Sarstedt, 2015). The highest absolute HTMT value for our measures was .76 which satisfies the most conservative threshold of .85 (Henseler et al., 2015). In sum, the model's convergent and discriminant validity could be established. Non-response bias (NRB) is also an issue researchers need to consider when applying SEM techniques (Gefen & Straub, 2005). To ensure NRB did not inhibit our findings, we compared the responses of the first and last 20 participants. Using t-tests to compare answers to questions across the same variables, we identified no significant differences. The idea behind this approach is that late respondents are more likely to resemble non-respondents than early respondents. To assess the efficacy of the model, the standard fit indices provided by the SmartPLS program were examined: the standardized root mean square residual (SRMR), the normed fit index (NFI), and the root mean squared residual covariance matrix (RMS-theta). Hu and Bentler (1998) suggest that a good model fit is achieved when the NFI values are above .90, the SRMR are below .08, and the RMS-theta is below .12

Results

Assessment of the Direct and Indirect Models

The present study's expected relationships were tested in two steps. The first step specified the direct paths of relationships and all study controls. The second step examined the direct and indirect paths of relationships and the significant controls. The significance of path coefficients was determined via a bootstrapping procedure by setting the number of cases equal to the sample size (as recommended by Tenenhaus et al., 2005) and the number of bootstrap samples to 5,000. Figure 2 depicts the empirical model derived from the findings of the hypothesized direct relationship paths (NFI = .65, SRMR = .17, RMS-theta =

.21). The direct model could account for 6% and 5% of the variance for work performance and work innovativeness respectfully and yielded inferior model fit.

Harmonious passion for cycling had a significant relationship path with work performance and work innovativeness, supporting *H1* and *H3* (H1: $\beta = .17$, $p < .05$; H3: $\beta = .15$, $p < .05$). As hypothesized in *H2* and *H4*, both work performance and work innovativeness would be negatively associated with obsessive passion for cycling. Although the associations were negative, neither hypothesis could be supported (H2: $\beta = -.16$, $p > .05$; H4: $\beta = -.16$, $p > .05$). No control variables (age, gender, full-time work status, cycling time, organizational tenure) had a significant effect on the dependent variables.

The second step in the assessment of the empirical model was to test for the indirect effects of life satisfaction. To test for the indirect effects of life satisfaction in the model, we followed the approach of Hair et al. (2017). This involves two main steps. First, we tested whether the indirect relationships between the independent variables and dependent variables, via life satisfaction, were significant. Next, we determined whether the direct path between the independent and dependent variables were significant. Indirect effects exist when the direct path is insignificant, but the indirect path is significant. Figure 3 depicts the indirect model derived from the findings of the hypothesized relationship paths which demonstrated acceptable model fit (NFI = .93, SRMR = .06, RMS-theta = .12). Step 1 showed that both the ‘harmonious passion – life satisfaction – work performance’ path and the ‘harmonious passion – life satisfaction – work innovativeness’ path were both significant ($p < .001$ for both). All indirect paths involving obsessive passion were insignificant. Step 2 showed that the direct path between harmonious passion and work performance became insignificant ($p = .32$), as did the direct path between harmonious passion and work innovativeness ($p = .20$), when life satisfaction was added to the indirect model. None of the control variables were significantly related to any of the dependent variables in the indirect

model. Therefore, supporting *H5,* the results indicate that the effect of harmonious passion on both work performance and work innovativeness is indirect, through life satisfaction. In terms of obsessive passion and both organizational outcomes, there is no evidence of life satisfaction providing an indirect effect. Thus, *H6* is not supported. The direct paths for life satisfaction, work performance, and work innovativeness accounted for 10%, 16%, and 12% of the variance respectively.

Although the relationship between harmonious passion and both organizational outcomes are significant in the direct model, the path coefficients were weaker ($\beta = .17$ for work performance, $\beta = .15$ for work innovativeness). In the indirect model, the path coefficients were stronger for the relationships between harmonious passion and life satisfaction ($\beta = .32$), life satisfaction and work performance ($\beta = .37$), and life satisfaction and work innovativeness ($\beta = .31$). The f^2 effect size for two dependent variables in the indirect model are .09 and .06, which indicates a substantive impact, albeit one that is in the low to moderate effect range (Hair et al., 2017). The indirect model also yielded acceptable model fit and was superior to the direct model.

To increase the reliability of our research model, we follow the advice of Stone-Romero and Rosopa (2008) and include alternative indirect variables. It is possible that passion for physical activity influences perceptions of life burnout, which in turn influences performance and innovation in the workplace. However, although harmonious passion is associated with lower life burnout ($\beta = -.17$, $p < .05$) and obsessive passion with higher life burnout ($\beta = .28$, $p < .01$), these effects do not indirectly translate to the workplace variables through life burnout. Thus, unlike life satisfaction, the variability in life burnout does not explain why passion for physical activity influences workplace outcomes.

Discussion

The primary purpose of the present study was to examine the direct and indirect relationships between passion for physical activity, and performance and innovativeness in an organizational environment. This is an important topic for organizational and performance psychologists as physical activity is often the dominant passion emanating in employees' lives (Vallerand et al., 2003), yet not all dimensions of a passion are adaptive (Vallerand, 2015), nor are the implications well understood for passion in the workplace (Perrewé, Hochwarter, Ferris, Mcallister, & Harris, 2014).

Theoretical Implications

The present study contributes to research in several ways. Firstly, this is one of the initial studies to examine the organizational performance implications of the passions held by employees for non-work related activities. Prior studies have explicitly focused on the passions held for an activity, and performance implications for that same activity (Astakhova & Porter, 2015; Burke et al., 2015; Ho et al., 2011; Vallerand, Ntoumanis, et al., 2008; Verner-Filion et al., 2017) as well as innovation (Lafrenière et al., 2012; Liu et al., 2011; Luh & Lu, 2012; Shi, 2012). Although some of these studies were conducted in organizational settings, none considered passion for non-work related activities such as physical activity.

Secondly, although a number of studies have reported on the links between engagement in physical activity and organizational performance outcomes (Burton, Hoobler, & Scheuer, 2012; Clayton et al., 2017; McDowell-Larsen, Kearney, & Campbell, 2002), the current study offers a more insightful understanding by considering physical activity as a passion, and that the differing forms of passion for physical activity, harmonious and obsessive, result in different organizational performance outcomes. In the present sample, 89% of employees reported having at least a moderate harmonious passion for cycling (i.e. average score above 4 out of 7), while 45% reported at least a moderate obsessive passion.

We found that a harmonious passion for cycling is positively related to work performance and work innovativeness, whereas obsessive passion had no significant relationship to either organizational performance outcome. The fact that these results were obtained after controlling for age, gender, training time, work status, and organizational level, demonstrates that engagement in physical activity will benefit work performance and work innovativeness, but only when an employee holds a harmonious passion for the physical activity. Thus, the current study challenges recent occupational health psychology studies which conceptualize all physical activity benefitting the workplace (Sliter & Yuan, 2015; Pedersen et al., 2019).

The hypothesized negative relationships between obsessive passion and organizational performance outcomes were not supported. This could be explained by the fact that while harmonious passion embodies a purely adaptive performance outcome process, obsessive passion encompasses a more mixed performance outcome process which entails adaptive and maladaptive characteristics. Furthermore, this result was not overly surprising as many DMP studies focusing on performance came to a similar conclusion (Vallerand et al., 2007; Carbonneau, Vallerand, & Massicotte, 2010; Ho et al., 2011; Vallerand, 2012).

Thirdly, the current study determines if passion for physical activity influences organizational performance outcomes, and how harmonious passion leads to enhanced performance and innovativeness at work. In doing so, the current study helps research progress from offering general explanations of the relationship between physical activity and organizational performance outcomes, toward more detailed and specific explanations of the direct and indirect pathways involved. Specifically, the current study concludes that increases in life satisfaction can explain why harmonious passion for physical activity is positively associated with work performance and work innovativeness. Indeed, the indirect

model with life satisfaction included, was a far superior model depicting paths to work performance and work innovativeness than the direct model. Although there is a significant direct relationship between harmonious passion for physical activity and organizational performance, the relationship is weak and is better explained by the positive influence of harmonious passion on life satisfaction, which in turn, flows into organizational performance with positive results. Thus, harmonious passion for physical activity is more likely to benefit organizational performance when it also enhances the employee's satisfaction with life.

Practical Implications

The present findings have implications for both individual employees and their managers. Workers are often advised that regular physical activity will help to cope with organizational demands, whilst also providing the vigor and vitality needed to excel in one's career. The findings from the current study align with recent research which demonstrates that it is the type of passion the participant holds for that activity that matters, not mere engagement (Luth et al., 2017). Not all forms of passion are positive. A harmonious passion for physical activity is associated with enhanced life satisfaction, work performance, and work innovativeness, whereas an obsessive passion is not. To extract the positive effects of physical activity for work outcomes and general life, employees need to ensure their passion is at least moderately harmonious, and low in terms of obsession. The individual should demonstrate a level of control to engage in the activity only when it is compatible with other life goals, and not consumed by a sense of "I must, I need to" engage with the activity. In addition, studies also report that the crossover from harmonious to obsessive passion can be triggered by a number of factors, such as motivations for perfectionism, and avoiding other life problems (Paradis et al., 2013). Although physical activity is generally positive and adaptive, when motivated by such goals, it can lead to an obsession deleterious not only to organizational performance, but also to general satisfaction with life.

For managers attempting to enhance performance and innovation among employees, the present research suggests that one way to accomplish this is to look beyond the formal work environment and instead toward extra-curricular physical activity. Many organizations already have such programs in place, through free or discounted gym memberships, or by integrating fitness tracking technologies (such as the Fitbit) into employee wellness programs (Hunter et al., 2018). However, there is an important caveat. Emerging research suggests fitness tracking technologies can lead to an obsession in some users to walk so many steps, burn so many calories, or cycle so many miles (Kerner & Goodyear, 2017). The promotion of physical activity by the organization may be well intentioned, but as the present study shows, if workers gain an obsessive passion, at best there is no positive impact for the organization, and at worst, a reduction in work performance and work innovativeness will ensue. Indeed, as 45% of the current sample reported at least a moderate obsessive passion for physical activity, this suggests education on passion for non-work related activities, and specifically, the differences between the harmonious and obsessive forms, should also be included in employee wellness programs.

Limitations and Future Directions

The present study is subject to some limitations. Firstly, one limitation is the cross-sectional design that precludes from establishing the causal direction of the proposed relationships. Both longitudinal and experimental DMP studies can be conducted to test the validity of the theorized causal arrows. For example, using the experimental procedures described in Bélanger et al. (2013), researchers can induce perceptions of harmonious and obsessive passion in physical activity, and test if they relate to performance in a cognitive task. Secondly, only one variable (i.e., life satisfaction) was considered to explain the indirect association between passion for physical activity and organizational performance outcomes. Future researchers could test the indirect effects of other variables. For example,

it has been shown that physical activity helps reduce stress (Stults-Kolehmainen & Sinha, 2014), and that stress hampers work performance (Siu, 2003). Thus, both general life stress and work-related stress would be ideal indirect relationship candidates between both forms of passion for physical activity and organizational performance outcomes. Thirdly, the measures of work performance and work innovativeness relied on self-reports. Although CMB was not evident in the data, there is always a possibility such subjective self-assessments are biased in some way. Another avenue for future research is to use objective measures of work performance (such as promotions, salary, and bonuses) and work innovativeness (such as patents developed). Finally, another possible avenue for future research would be to consider the hypothesized model in reverse; is there a spillover effect from passion for work to performance in sporting endeavors? If a worker is passionate about their job, this could provide the energy and vigor needed to persist with the training load and intensity levels needed to perform in running, cycling, and triathlon events, as an example.

In summary, the present research provides new knowledge to the interplay between passion for physical activity, life satisfaction, and performance and innovativeness in the workplace. As revealed in the sample of cyclists who also occupied employment roles, passion for physical activity directly and indirectly (through life satisfaction) enhance organizational performance outcomes, but only for harmonious passion. The present study expands upon existing studies which consider how passion for physical activity transfers into the workplace (Luth et al., 2017). Thus, the findings from the current study advance the literature understanding passion and performance psychology, and can inspire future studies to investigate spillover effects of passion into other aspects of life.

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826

Figure 1

The research model hypothesizing the direct and indirect relationships between passion for physical activity, life satisfaction, and organizational performance outcomes

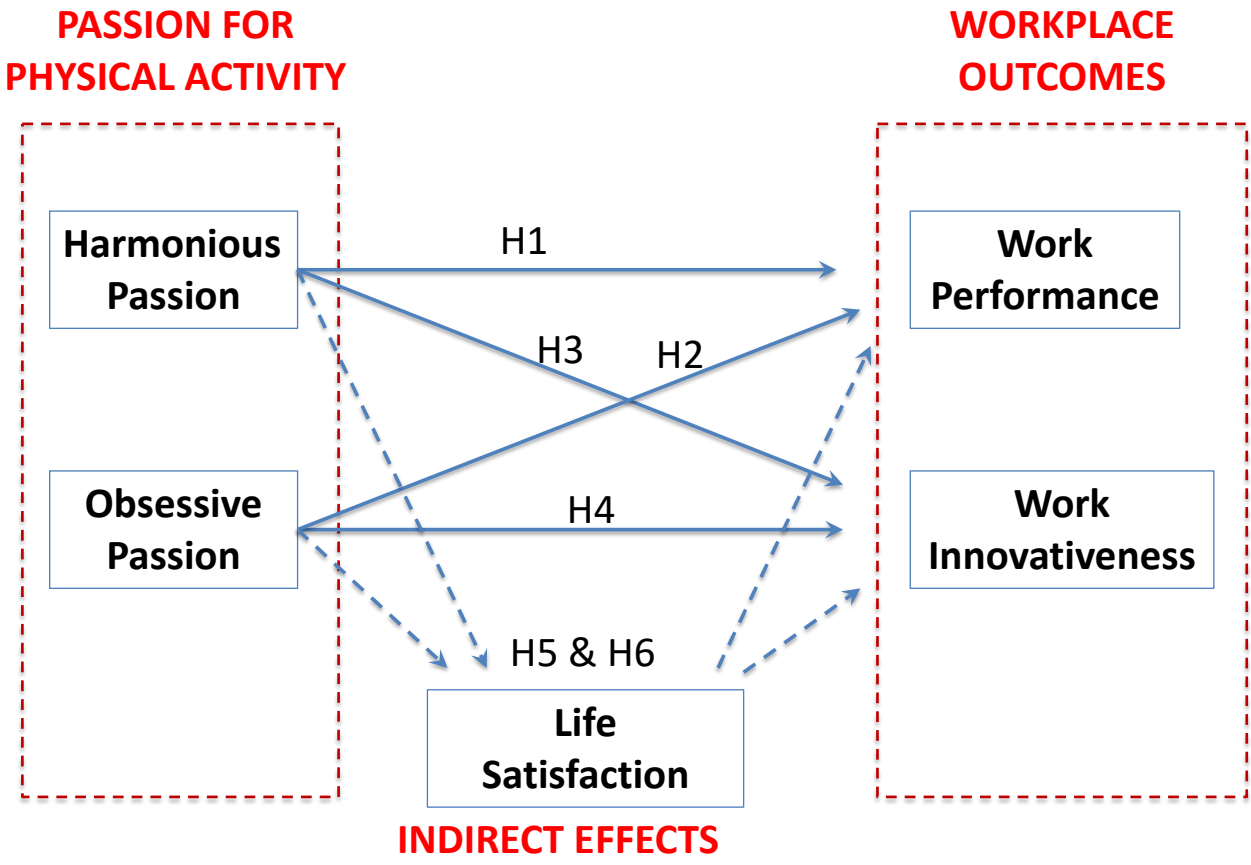
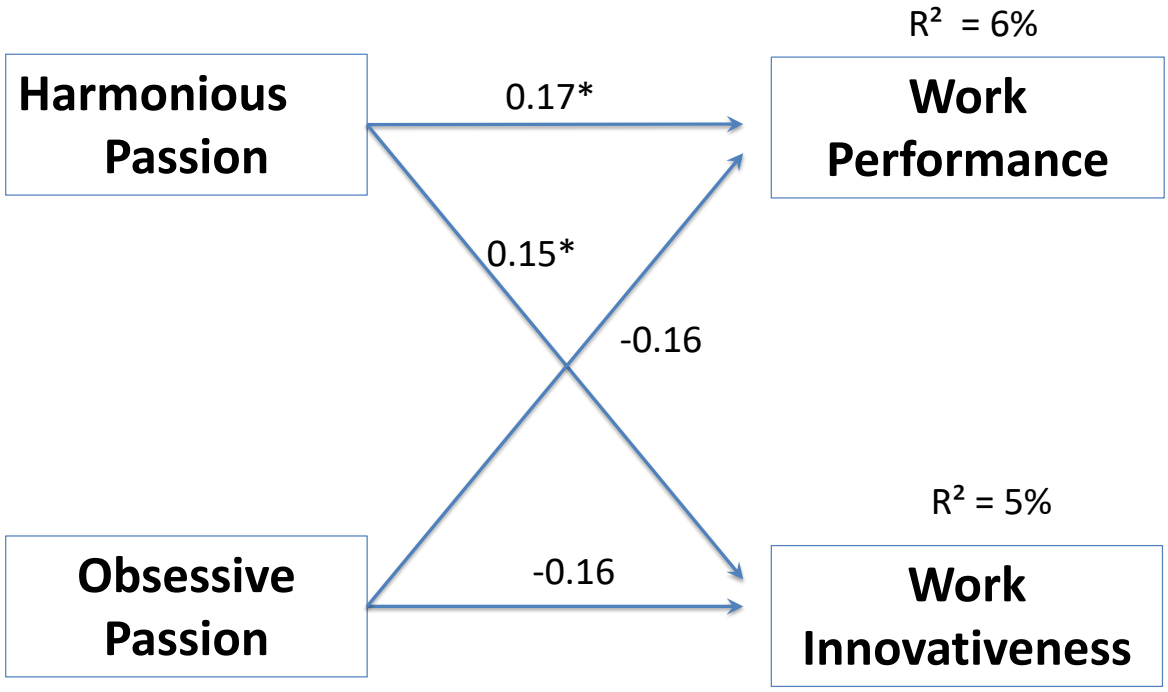


Figure 2

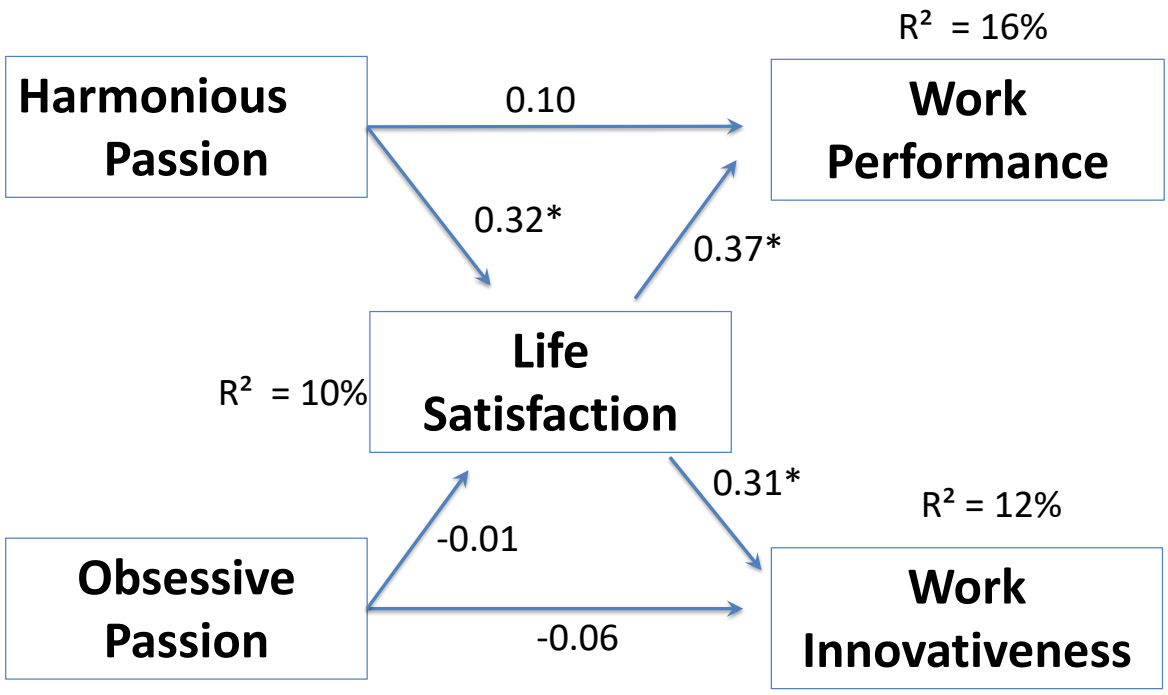
Direct model results



Note. *p < 0.05 NFI = 0.65; SRMR = 0.17; RMS-theta = 0.21

Figure 3

Indirect model results



Note. *p < 0.001 *NFI = 0.93; SRMR = 0.06; RMS-theta = 0.12*

Table 1

Item means, standard deviations (SD), and factor loadings

Construct	*Item*	*Mean*	*S.D.*	*Loading*
Harmonious Passion Vallerand et al. (2003) CR: 0.90 CA: 0.87 AVE: 0.61	HPass1: This sport allows me to live a variety of experiences.	5.62	1.24	0.87
	HPass2: The new things that I discover with this sport allow me to appreciate it even more.	5.64	1.27	0.87
	HPass3: This sport allows me to live memorable experiences.	6.01	1.12	0.83
	HPass4: This sport reflects the qualities I like about myself.	5.49	1.31	0.77
	*HPass5: This sport is in harmony with the other activities in my life.	*4.85*	*1.35*	*0.62*
	HPass6: For me it is a passion that I still manage to control.	5.33	1.33	0.75
	HPass7: I am completely taken with this activity.	5.44	1.53	0.71
	Harmonious Passion Overall	5.48	1.13	
Obsessive Passion Vallerand et al. (2003) CR: 0.95 CA: 0.94 AVE: 0.73	OPass1: I cannot live without it.	4.17	1.90	0.84
	OPass2: The urge is so strong. I can't help myself from doing this sport.	3.94	1.83	0.87
	OPass3: I have difficulty imagining my life without this activity.	4.41	1.83	0.83
	OPass4: I am emotionally dependent on this sport.	3.74	1.90	0.85
	OPass5: I have a tough time controlling my need to do this sport.	3.16	1.77	0.86
	OPass6: I have almost an obsessive feeling for this sport.	3.46	1.92	0.90
	OPass7: My mood depends on me being able to do this activity.	4.34	1.81	0.74
	Obsessive Passion Overall	3.98	1.85	
Work Performance (Welbourne et al., 1998) CR: 0.94 CA: 0.90 AVE: 0.84	WorkPerf1: Quantity of work output	5.08	1.18	0.90
	WorkPerf2: Quality of work output	5.29	1.14	0.92
	WorkPerf3: Accuracy of work	5.38	1.12	0.91
	Work Performance Overall	5.25	1.15	

Work Innovation (Welbourne et al., 1998) CR: 0.95 CA: 0.93 AVE: 0.82	WorkInnv1: Coming up with new ideas	5.04	1.27	0.89
	WorkInnv2: Working to implement new ideas	4.92	1.23	0.92
	WorkInnv3: Finding improved ways to do things	5.17	1.29	0.93
	WorkInnv4: Creating better processes and routines	5.07	1.28	0.87
	Work Innovation Overall	5.07	1.27	
Life Satisfaction (Diener et al., 1985) CR: 0.95 CA: 0.88 AVE: 0.82	LifeSat1: In most ways my life is close to my ideal.	4.55	1.28	0.84
	LifeSat2: The conditions of my life are excellent.	4.83	1.23	0.87
	LifeSat3: I am satisfied with my life.	5.02	1.25	0.91
	LifeSat4: So far, I have gotten the important things I want in life.	5.00	1.34	0.77
	LifeSat5: If I could live my life over, I would change almost nothing.	3.96	1.70	0.72
	Life Satisfaction Overall	4.76	1.36	

Note: Average Variance Extracted (AVE), Composite Reliability (CR), Cronbach's Alpha (CA)

** Items were removed due to loadings less than 0.70*

Table 2

Correlations between latent variables (square root of AVEs in the main diagonal)

	1	2	3	4	5
1. Harmonious passion	**0.77**				
2. Work innovativeness	0.17	**0.91**			
3. Work performance	0.18	0.70	**0.92**		
4. Life satisfaction	0.32	0.33	0.37	**0.83**	
5. Obsessive passion	0.43	0.02	0.06	0.14	**0.83**

Note: Average Variance Extracted (AVE)