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10 The Relationship Between Passion, Athlete Burnout and  
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1 **Abstract**

2 Athlete burnout symptoms are detrimental to athlete well-being (Cresswell & Eklund, 2005).  
3 Obsessive passion has been identified as an antecedent of athlete burnout, with basic  
4 psychological need satisfaction potentially mediating this process (Curran et al., 2011; 2013;  
5 Deci & Ryan, 2000; Vallerand et al., 2003). The aim of the current research was to extend on  
6 previous work (e.g., Curran et al., 2011; 2013; Gustafsson et al., 2011) and examine whether the  
7 relationship between passion and athlete burnout was mediated by psychological need  
8 satisfaction in a heterogeneous sample. Participants were 120 competitive athletes ( $M_{age} = 22.04$ ,  
9  $SD = 5.83$ ) from 21 different sports. Each participant completed the Passion Scale (Vallerand et  
10 al., 2003), Basic Psychological Needs in Sport Scale (Ng, Lonsdale, & Hodge, 2011), and the  
11 Athlete Burnout Questionnaire (Raedeke & Smith, 2001). Multiple regression and bootstrapping  
12 procedures (Preacher & Hayes, 2008) were used to analyze the data. Passion (harmonious and  
13 obsessive) was found to share a significant relationship with sport devaluation but shared no  
14 significant relationship with emotional and physical exhaustion and reduced sense of  
15 accomplishment. Bootstrapping results suggested that the basic psychological need of autonomy  
16 was the only significant mediating variable in the relationship between passion (harmonious and  
17 obsessive) and burnout (sport devaluation). Potential antecedents and consequences of athlete  
18 burnout, alongside applied and conceptual implications are discussed.

19 *Keywords:* passion, athlete burnout, basic psychological needs, well-being, sport  
20 performance

## **The Relationship Between Passion, Athlete Burnout and Basic Needs Satisfaction: Examining Direct and Indirect Effects**

High levels of performance and success are achieved through years of engagement and deliberate practice in a structured environment from a young age (Ericsson & Starkes, 2003). Young athletes often start out highly motivated, and after several years of competitive drive for success, sport may become a central aspect of their identity (Martin & Horn, 2013). If sport does eventually consume a disproportionate amount of the individuals' identity, this poses a risk to both well-being and performance (Gustafsson, Hassmén, & Hassmén, 2011). As such, sporting bodies (e.g., World Snooker, United States Tennis Association) have commissioned funded research to better understand the contributing factors to athlete ill-being (e.g., athlete burnout).

### **Athlete Burnout**

The intense training regimen that is common place in competition sport resulting in athlete burnout has received increasing practical and empirical attention due to the debilitating and detrimental effects on athlete well-being and performance (Eklund & DeFreese, 2015; Gustafsson, DeFreese, & Madigan, 2017). Given the growing number of elite athletes reporting chronic stress and dropping out of sports at the peak of their athletic careers (Gustafsson, Kentta, Hassmén, & Lundqvist, 2007), a greater understanding is needed surrounding the factors that may protect individuals from such maladaptive outcomes (Madigan & Nicholls, 2017).

Raedeke (1997) developed a conceptualization of athlete burnout which has been widely adopted in the sports domain (e.g., Cresswell & Eklund, 2005; Hill, 2013; Lonsdale, Hodge, & Rose, 2009). Athlete burnout is defined as; “an experiential syndrome characterized by emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation” (Raedeke, 1997, p. 397). According to Raedeke (1997), athlete burnout is conceptualized into

1 three dimensions; *emotional and physical exhaustion*, characterized by feelings of fatigue from  
2 training or competitions, *reduced sense of accomplishment*, identified as a loss of control over  
3 performance and levels of proficiency, and *sport devaluation*, described as a loss of interest from  
4 one's sporting performance or sport, and doubts and disbelief about one's future participation  
5 within the sport (Cresswell & Eklund, 2006; Tabei, Fletcher, & Goodger, 2012; Raedeke, 1997).  
6 Raedeke's (1997) operational definition has been widely advocated as a useful conceptualization  
7 that has enabled researchers to explore the prevalence and experience of burnout across different  
8 contexts (e.g., Cresswell & Eklund, 2007; Gustafsson et al., 2007; Harris & Watson, 2011).

9         One influential perspective on athlete burnout in the literature (e.g., Goodger, Gorely,  
10 Lavalee, & Harwood, 2007; Gustafsson, Hancock, & Côté, 2014; Madigan & Nicholls, 2017) is  
11 Smith's (1986) stress-based, cognitive-affective model (C-A model). The C-A model proposes  
12 that athlete burnout is a result of one's appraisal of perceived demands and resources available to  
13 cope (Smith, 1986). Smith (1986) argued that if an individual's appraisals do not enable one to  
14 effectively cope with the perceived situational demands, physiological and behavioural responses  
15 ensue. It is such physiological and behavioural responses (e.g., muscle tension, irritability) that  
16 lead to athlete burnout (Smith, 1986). However, the stress perspective has been criticized as there  
17 is evidence to suggest that not all athletes' experience stress burnout (Raedeke, 1997).

18         Consequently, theoretical frameworks explaining the occurrence of athlete burnout have  
19 moved beyond a stress-based approach to others such as; a sport commitment-entrapment  
20 approach (Raedeke, 1997) and identity issues perspective (Coakley, 1992). Reflecting on these  
21 explanations, it appears that changes in the levels and quality of sport motivation (i.e., the  
22 reasons why one participates) could also be at the core of the athlete burnout issue (Lemyre,  
23 Roberts, & Gunderson, 2007). Specifically, research has begun to acknowledge that athletes who

1 develop symptoms of athlete burnout also demonstrate an extreme type of drive that energises  
2 participation to training and competition (Gustafsson et al., 2011).

### 3 **Passion**

4 Defined as “a strong inclination towards an activity that one loves, they find important,  
5 and in which they invest time and energy” (Vallerand et al., 2003, p. 757), Vallerand et al.’s  
6 (2003) Dualistic Model of Passion (DMP) provides a framework describing passion for activities  
7 (e.g., sport). Rooted in self-determination theory (Deci & Ryan, 2000a), the DMP states that  
8 passion can be categorised as two distinct but related forms (*Harmonious* and *Obsessive*).

9 *Harmonious passion* is derived from an autonomous internalization of values and beliefs  
10 through which the individual freely accepts the activity as important, without attached  
11 contingencies (Vallerand et al., 2006). Conversely, *obsessive passion* results from a controlled  
12 internalization of the activity into one’s identity, whereby the individual will typically participate  
13 because of certain contingencies that are attached, such as feelings of social acceptance or self-  
14 esteem (Vallerand et al., 2006). A recent meta-analysis on passion research (Curran, Hill,  
15 Appleton, Vallerand, & Standage, 2015) supported the trend that harmonious passion was  
16 generally positively associated with positive intrapersonal outcomes (e.g., positive affect, flow,  
17 performance) whereas obsessive passion was generally negatively related to such outcomes and  
18 positively associated with maladaptive outcomes (e.g., negative affect, rumination, rigidity).  
19 Specifically, harmonious passion has been found to influence adaptive engagement in activities  
20 that facilitate positive emotions and well-being (Vallerand et al., 2003); it functions as an  
21 important source of autonomous motivational energy, which in turn, is conducive to performance  
22 attainment (Vallerand et al., 2008). Obsessive passion, on the other-hand, has been associated  
23 with ill-being, increased negative emotions, and decreased feelings of connectedness (Philippe,

1 Vallerand, Houlfort, Lavigne, & Donahue, 2010), due to its controlling motivational energy.  
2 With the multiple theoretical perspectives of athlete burnout (Gould & Whitley, 2009) and the  
3 demonstrated link between obsessive passion and various maladaptive outcomes such as exercise  
4 dependence (Paradis, Cooke, Martin, & Hall, 2013), theorists suggest that obsessive passion may  
5 be a significant factor in athlete burnout (e.g., Curran, Appleton, Hill, & Hall, 2011; 2013).

6 Curran et al. (2011) posit that the passion-burnout relationship is underpinned by the  
7 internalization and integration processes within self-determination theory (Deci & Ryan, 2000a).  
8 Specifically, Curran et al. (2011) suggested that obsessively passionate individuals who  
9 experience negative emotional consequences from their engagement (e.g., life conflict) also  
10 demonstrate higher levels of non-self-determined forms of motivation; support has been  
11 provided for this contention within the occupational literature (e.g., Rip, Fortin, & Vallerand,  
12 2006). One potential reason that obsessively passionate athletes may be at risk of athlete burnout  
13 is due to the characteristic ego-invested structures which result in the motivation for engagement  
14 becoming increasingly non-self-determined (Hodgins & Knee, 2002). Conversely, the pattern of  
15 motivational regulation and internalization associated with harmonious passion facilitates more  
16 adaptive outcomes such as; positive affect and flow (Hodgins & Knee, 2002). Consequently, in  
17 the quest to develop robust interventions, research has begun to examine how passion could  
18 influence the pattern of motivational regulation that underpins athlete burnout (DeFreese &  
19 Smith, 2013; Lonsdale et al., 2009; Quested & Duda, 2010). One key theory that might explain  
20 how passion may impact athlete burnout is self-determination theory (Deci & Ryan, 2000a).

21 Self-determination theory (SDT) examines the personal and contextual factors that  
22 determine optimum personal growth and development; a component that has been recognised as  
23 an important concept to explain a healthy engagement in sport is the satisfaction of three

1 fundamental basic psychological needs (Deci & Ryan, 2000b). Basic needs theory (BNT), a  
2 mini-theory within the SDT framework, proposes that the fundamental basis for positive well-  
3 being is when the social environment facilitates satisfaction of the basic psychological needs of  
4 *autonomy, competence, and relatedness* (Quested & Duda, 2011). *Autonomy* refers to the  
5 experience of choice, interest, and actions in accordance with one's self-endorsed values (Deci &  
6 Ryan, 2000b). *Competence* refers to the perception that one can effectively bring about desired  
7 effects and outcomes (Deci & Ryan, 2000b). Finally, *relatedness* refers to the feelings that one is  
8 securely connected to and understood by others (Deci & Ryan, 2000b). Individuals are naturally  
9 inclined to internalize and integrate behaviours that are perceived to be self-motivated and self-  
10 determined (Deci & Ryan, 2000b). Furthermore, for the internalization process to function  
11 optimally, people need to be in social environments that nurture innate needs for autonomy,  
12 competence, and relatedness. The extent to which an environment facilitates satisfaction of the  
13 basic needs is linked to the nature of internalized motives (i.e., autonomous vs. controlled) in  
14 sport (Hodgins & Knee, 2002). McDonough and Crocker (2007) found that motivation partially  
15 mediated the relationship between basic needs satisfaction and positive/negative affect in adult  
16 sport participants. More specifically, autonomy support and controlling behaviours from the  
17 coach have been associated with well-being and ill-being through either need satisfaction or need  
18 thwarting of autonomy, influencing the internalized motives for sport engagement (Cheval,  
19 Chalabaev, Quested, Courvoisier, & Sarrazin, 2017). If motives for participation are internalized  
20 in a controlled way, sporting engagement could result in athlete burnout symptoms manifested in  
21 the forms of higher perceived stress and emotional and physical exhaustion (Creswell & Eklund,  
22 2006). In contrast, the degree of satisfaction of basic psychological needs, particularly autonomy,  
23 can be more influential in the motivational processes which link to behaviours that accentuate or



1 thwart athlete burnout (e.g., Cresswell & Eklund, 2006; Raedeke & Smith, 2001). Thus,  
2 understanding the factors which may influence athletes' satisfaction of basic psychological needs  
3 is important when exploring the athlete burnout phenomenon. For example, Quested and Duda  
4 (2010) highlighted that personal qualities which may facilitate or thwart psychological needs  
5 appear to be primary predictors of maladaptive consequences such as athlete burnout.  
6 Furthermore, BNT offers a useful conceptual framework to describe how passion may influence  
7 the satisfaction of the basic psychological needs that may result in a pattern of motivation  
8 indicative of athlete burnout (Reinboth & Duda, 2006).

9       Obsessive passion is hypothesized to result from controlled internalization, where one's  
10 motives for engagement in a sport are predicted to be fuelled by a sense of compulsion  
11 (Vallerand et al., 2006). It is such compulsion for engagement that is likely to undermine a sense  
12 of personal control (autonomy), the fulfilment of expectations (competence), and/or satisfaction  
13 with inter-personal relations (relatedness) respectively (Vallerand et al., 2006). In turn,  
14 individuals who possess an obsessive passion for an activity could experience higher levels of  
15 athlete burnout based on the intra- and inter-personal pressures associated with participation  
16 (Martin & Horn, 2013). Passion has also been shown to influence the satisfaction of the basic  
17 psychological needs in exercise (Paradis, Cooke, Martin, & Hall, 2014) which researchers  
18 suggest is also indicative of negative consequences such as athlete burnout (Hodge, Lonsdale &  
19 Ng, 2008). Interestingly, although studies have shown that psychological need satisfaction may  
20 influence the passion-burnout relationship, the potential role of psychological needs in  
21 explaining this relationship has only been recently considered (Curran et al., 2013).

22       Curran et al. (2011) identified an inverse relationship between harmonious passion and  
23 athlete burnout which was mediated by higher levels of self-determined motivation; obsessive

1 passion was found to be unrelated to athlete burnout. Curran et al. (2011) suggested that future  
2 research may wish to examine the passion-athlete burnout-basic psychological needs  
3 relationship; due to the mediating processes of psychological need satisfaction which precedes  
4 self-determined motivation (Vallerand et al., 2006). Curran et al. (2013) extended their earlier  
5 work by examining the relationship between passion and athlete burnout, and whether this  
6 relationship was mediated through psychological need satisfaction. Their findings supported the  
7 expected mediating role of psychological needs in the harmonious passion-athlete burnout  
8 relationship, but not in the obsessive passion-athlete burnout relationship. It is however  
9 important to consider that the aim of Curran et al.'s (2013) study was to examine the mediating  
10 role of psychological needs (via statistical modelling) as a single composite variable. The  
11 mediating pathways of each individual psychological need (autonomy, competence, and  
12 relatedness) as separate variables were not considered within their study. Curran and colleagues'  
13 approach has also been used within the psychological literature (e.g., Lonsdale et al., 2009;  
14 Stebbings, Taylor, & Spray, 2011), as researchers argue that the weighted composite score  
15 reflects the contribution of each psychological need in the proposed statistical model. However,  
16 when Quested and Duda (2010) examined the role of psychological needs through a multiple  
17 mediation model, the effects of psychological needs as a single composite variable were  
18 significantly different to when each need was tested individually. Moreover, when examining the  
19 role of psychological needs Quested and Duda (2010) highlighted the importance of considering  
20 each psychological need as an independent influence. In line with the recommendations of  
21 Quested and Duda (2010), the current research is warranted to examine the alternative mediating  
22 pathways through each of the basic psychological needs separately, as this may offer further  
23 insight into the passion-athlete burnout relationship.

1 Reflecting on their research, Curran et al. (2013) noted that the sample of elite male  
2 junior soccer players may have restricted the generalizability and validity beyond the context of  
3 that specific population. Specifically, elite junior male soccer players have been especially  
4 susceptible to the development of athlete burnout due to the culture (and sub-cultures) of the  
5 sport (e.g., Appleton, Hall, & Hill, 2009; Gustafsson, Kentta, Hassmen, & Johansson, 2008; Hill,  
6 Hall, Appleton, & Kozub, 2008). Consequently, the objective of the current study was to  
7 examine the role of psychological need satisfaction in the passion-burnout relationship within a  
8 heterogeneous sample of competitive athletes.

9 Based upon Vallerand et al.'s (2003) Dualistic Model of Passion, harmonious passion is  
10 associated with autonomous internalization of an activity which facilitates basic need satisfaction  
11 (Vallerand et al., 2003; Vallerand et al., 2008). Conversely, obsessive passion is associated by an  
12 incomplete, controlled internalization of values, related to the thwarting of psychological needs  
13 (Perreault, Gaudreau, Lapointe, & Lacroix, 2007). Consequently, it was anticipated that  
14 harmonious passion would have a negative relationship with athlete burnout, but that this could  
15 be explained, at least in part, by fulfillment in basic psychological need satisfaction. In contrast,  
16 it was expected that obsessive passion would exhibit a positive relationship with athlete burnout,  
17 but again, that this could be explained by lack of fulfilment in basic psychological need  
18 satisfaction.

## 19 Method

### 20 Participants

21 The participant sample ( $N = 120$ ;  $M_{age} = 22.04$ ,  $SD = 5.83$ ) comprised of female ( $n = 45$ ;  
22  $M_{age} = 21.73$ ,  $SD = 5.90$ ) and male ( $n = 75$ ;  $M_{age} = 22.34$ ,  $SD = 5.76$ ) individual sport ( $n = 51$ )  
23 and team sport ( $n = 69$ ) competitive athletes from the United Kingdom. Athletes primarily self-

1 identified as being a starter ( $n = 113$ ) vs. a non-starter ( $n = 7$ ) and as a captain ( $n = 28$ ) vs. a non-  
2 captain ( $n = 92$ ). Athletes represented a variety of different sports namely; athletics, soccer,  
3 rugby, cricket, netball, and hockey. Competition levels varied from club ( $n = 6$ ), county ( $n = 34$ ),  
4 regional ( $n = 27$ ), national ( $n = 30$ ), and international ( $n = 23$ ) levels and had an average  
5 experience of  $M = 11.71$  years ( $SD = 5.12$ ). Finally, 76% of athletes reported a “very likely”  
6 intention to remain and continue participation in their chosen sport. Participants for the present  
7 study were selected through a combination of purposive and convenient sampling methods.  
8 Purposeful sampling was used to identify and select a range of information-rich cases that fit the  
9 criteria of a competitive athlete matching the criteria of a competitive athlete from Paradis,  
10 Martin, and Carron (2012). A competitive athlete was defined as an individual whose  
11 participation was higher than that of a recreational-based sport environment (e.g., intra-mural)  
12 and had been through some sort of a team selection process (e.g., try-outs) (Paradis et al., 2012).  
13 Thus, the one inclusion criteria of the current study for participants to be included was that of  
14 competitive athlete status. As such, competitive teams were targeted for participant recruitment  
15 and a geographically convenient sample of athletes participating in a wide variety of sports were  
16 collected. All participants provided written informed consent to take part in the study.

## 17 **Measures**

18 **Passion.** Passion was assessed using the Passion Scale (Vallerand et al., 2003) which has  
19 been widely utilised and demonstrated as reliable and valid within several studies (e.g.,  
20 Vallerand et al., 2006; 2008). For the purposes of the current study and for the scale to be  
21 specific for competitive athletes, the term ‘this activity’ was substituted with ‘this sport’. The  
22 Passion Scale is composed of two seven-item subscales: harmonious passion (e.g., “This sport is  
23 in harmony with other activities in my life”) and obsessive passion (e.g., “I cannot imagine my

1 life without this sport”). Participants provided responses on a 7-point Likert-type scale anchored  
2 at 1 (Do not agree at all) and 7 (Very strongly agree) with higher scores reflecting greater  
3 passion. Vallerand et al. (2003) demonstrated the Passion Scale to have adequate internal  
4 consistency scores for both *harmonious passion* ( $\alpha = .84$ ) and *obsessive passion* ( $\alpha = .84$ ). The  
5 current study also yielded adequate internal consistency scores for *harmonious passion* ( $\alpha = .79$ )  
6 and *obsessive passion* ( $\alpha = .91$ ).

7       **Basic Psychological Needs.** Basic psychological need satisfaction was assessed by the  
8 Basic Psychological Needs Satisfaction in Sport Scale (BPNSS; Ng, Lonsdale, & Hodge, 2011).  
9 The BPNSS was the preferred measurement scale because it is the only sport specific  
10 measurement tool which has also demonstrated valid psychometric properties within previous  
11 research (e.g., Mahoney, Gucciardi, Ntoumanis, & Mallett, 2014). The BPNSS is a 20-item  
12 scale, comprised of five subscales which include *autonomy* (separated into *choice*, *internal*  
13 *perceived locus of causality*, *volition*), *competence*, and *relatedness* (Ng et al., 2011).  
14 Participants responded on a 7-point Likert-type scale anchored at 1 (not true at all) and 7 (very  
15 true) with higher scores reflecting greater fulfillment of the psychological needs. Example items  
16 from each subscale include: “In my sport, I get opportunities to make choices” (autonomy); “I  
17 show concern for others in my sport” (relatedness); and “I overcome challenges in my sport”  
18 (competence). The autonomy element of the scale was comprised of a weighted mean of the  
19 *choice*, *internal perceived locus of causality*, and *volition*. Construct formation of autonomy was  
20 preferred because it allows for the reduction of the complexity of the model, making the results  
21 more interpretable. Thus, for the purposes of the current research, a global autonomy score was  
22 calculated. Hodge and Gucciardi (2015) explained that because the autonomy subscale  
23 components are inter-related there are no differences in the pattern of responses across the

1 autonomy subscales. Consequently, creating a total score of autonomy (mean score of  
2 satisfaction) will reduce the complexity of the model to make the data analysis more  
3 interpretable (Hodge & Gucciardi, 2015; Ng et al., 2011). Ng et al. (2011) demonstrated the  
4 BNSS subscales to have adequate internal consistency scores for *autonomy* ( $\alpha = .82$ ),  
5 *competence* ( $\alpha = .77$ ), and *relatedness* ( $\alpha = .77$ ). The current study also yielded adequate internal  
6 consistency scores for *autonomy* ( $\alpha = .90$ ), *competence* ( $\alpha = .92$ ), and *relatedness* ( $\alpha = .87$ ).

7 **Athlete Burnout.** Athlete Burnout was assessed using The Athlete Burnout  
8 Questionnaire (ABQ; Raedeke & Smith, 2001). The ABQ is a 15-item scale which includes  
9 three, five item sub-scales. The sub-scales comprise of *emotional and physical exhaustion* (e.g.,  
10 “I feel I don't have energy”), *reduced sense of accomplishment* (e.g., “I'm not achieving much”)  
11 and *sport devaluation* (e.g., “I feel less concerned about being successful”) (Raedeke, 1997;  
12 Raedeke & Smith, 2001; 2009). Responses are provided on a 5-point Likert-type scale anchored  
13 at 1 (almost never), 2 (rarely), 3 (sometimes), 4 (frequently), and 5 (most of the time) with higher  
14 scores reflecting greater levels of burnout symptoms (Raedeke & Smith, 2001; 2009). Designed  
15 as a measure specific to competitive athletes, the ABQ has been used extensively and effectively  
16 to measure athlete burnout (e.g., Cresswell & Eklund, 2005; 2006; Raedeke & Smith, 2001;  
17 2009). Curran et al. (2011) reported adequate internal consistency scores for the ABQ for  
18 *emotional and physical exhaustion* ( $\alpha = .87$ ), *reduced sense of accomplishment* ( $\alpha = .73$ ), and  
19 *sport devaluation* ( $\alpha = .81$ ). The current study also reported adequate internal consistency scores  
20 for *emotional and physical exhaustion* ( $\alpha = .86$ ), *reduced sense of accomplishment* ( $\alpha = .91$ ), and  
21 *sport devaluation* ( $\alpha = .79$ ).

22

23

## 1 **Procedure**

2           Following institutional ethical approval, questionnaire booklets were distributed to  
3 competitive athletes over 18 years of age, during their competitive season (October-December).  
4 This was to ensure that the responses were reflective of participants' psychological and  
5 physiological state when in competition. The first author arranged with the coach at a mutually  
6 convenient time to visit the team and have the questionnaires administered. Participants  
7 completed the questionnaires in a quiet area outside of their normal training environment. Upon  
8 completion, the booklets were returned to the researcher by the coach on the same day or at a  
9 later date that was arranged for the researcher to return to retrieve them from the coach. The  
10 questionnaire booklet included demographic information which asked for age, gender, sport  
11 played, level of competition, leadership and starting status, and intention to remain in the sport.  
12 Participants were then asked to complete the Passion scale (Vallerand et al., 2003), the Basic  
13 Psychological Needs in Sport Scale (Ng et al., 2011) and the Athlete Burnout Questionnaire  
14 (Raedeke & Smith, 2001). Questionnaires were filled out in this order to reflect the conceptual  
15 hypotheses of the direct and indirect effects of passion to basic needs to athlete burnout.

## 16 **Analysis**

17           Initially, data were screened for outliers and normality using Mahalanobis distances.  
18 Descriptive statistics were calculated to firstly enable the researchers to reflect and examine if  
19 levels of passion, athlete burnout, and psychological need satisfaction were congruent with those  
20 of previous research. Second, missing values occurred for three cases which each had less than  
21 10% of the data missing at random, thus missing data were replaced using the series mean  
22 method (Tabachnick & Fidell, 2007). Means, standard deviations, and Cronbach's alpha scores  
23 (Cronbach, 1951) for the Passion Scale, ABQ, and BNSS are presented in Table 1. The

1 researchers also checked for any differences in the means of each variable between male and  
2 female, and team/ individual athletes to confirm a homogenous sample. Hodge et al. (2008)  
3 reported that it is also important to consider the variance of athlete burnout symptoms ‘within’  
4 the sample, explaining that insufficient variability (e.g., predominantly high level symptoms) can  
5 partly skew effects and potentially under/overestimate relationships with the burnout variable.  
6 Furthermore, prior to the main analysis, using thresholds advanced by Hodge et al. (2008), the  
7 researchers confirmed appropriate athlete burnout variability in their sample; 46 players (38%)  
8 scored greater than 2.70 for reduced accomplishment, higher than 3.00 for emotional exhaustion  
9 and higher than 3.00 for devaluation on all athlete burnout subscales (Raedeke & Smith, 2001)  
10 whereas 74 players (62%) scored low to moderate on athlete burnout subscales. This enabled the  
11 researchers to also demonstrate that the data collected contained enough variability to satisfy the  
12 assumption of normality (Tabachnick & Fidell, 2007). Assessment of further demographic  
13 information collected (e.g., age, gender etc.) did not yield and significant differences within the  
14 sample (possibly due to our limited sample) however such variables should also not infer a  
15 relationship to passion, basic needs, or burnout (Mageau et al., 2009).

16 In order to be able to estimate any unique relationships between the subscales of the  
17 variables of interest, the two passion subscales, the three basic needs subscales, and the three  
18 athlete burnout subscales were all considered individually as opposed to collapsing the variables  
19 of interest into one global score of passion, basic needs, and burnout. As mentioned, data were  
20 then screened for multivariate outliers and tested for normality, linearity, and homoscedasticity  
21 (Tabachnick & Fidell, 2007). Evaluation of assumptions for carrying out multiple regression  
22 analysis included Pearson’s bivariate correlations and collinearity diagnostics and assessment of  
23 variance proportion and tolerance statistics of the dimensions which yielded no evidence of



1 multicollinearity for variables of interest (see Table 1). In addition, correlation analysis enabled  
2 the researchers to confirm the relationships between athlete burnout, basic psychological needs,  
3 and both harmonious and obsessive passion. Hayes (2009) suggests that unrelated components  
4 should not be included within the multiple regression analysis.

5 Relationships between the variables of interest (passion, basic needs, athlete burnout)  
6 were explored through two models assessing the direct and indirect effects of the individual  
7 subscales that demonstrated significant correlations (Hayes, 2009). Therefore, in the two  
8 independent models that were tested, each model consisted of the two passion subscales  
9 (harmonious and obsessive) as the independent variables, and the significantly correlated athlete  
10 burnout variable of sport devaluation as the dependent variable. The bootstrap procedure  
11 outlined by Preacher and Hayes (2008) was followed to obtain the confidence intervals  
12 associated with the indirect effects (attributable to basic psychological need satisfaction) of  
13 passion on athlete burnout. The bootstrapping methodology was based on the recommendations  
14 of MacKinnon et al. (2002), where it was identified as the most effective confidence interval  
15 procedure that incorporated high statistical power and the best control for type one error  
16 (Mallinckrodt, Abraham, Wei, & Russell, 2006). The bootstrapping procedure builds a pseudo-  
17 sample distribution by a series of ‘resamples’ from the data, enabling the researcher to make an  
18 inference about the size of the indirect effect in the population sampled (Hayes, 2009). In line  
19 with the recommendations of Preacher and Hayes (2009) 5,000 samples for robust bootstrapping  
20 purposes was employed. Confidence limits derived from bootstrapping that are not zero at the  
21  $100 - ci$  % level of significance infers significant indirect effects between the measured variables  
22 (Hayes, 2009). Mathieu and Taylor (2006) suggest that indirect effects and mediation are similar  
23 in the way they both describe an intervening process, however there are subtle differences in the

1 nature of the relationships they each advance. As such, within the ‘apriori hypothesis’ we specify  
2 the nature of effects being examined.

### 3 **Results**

4 Bivariate correlations (see Table 2) revealed that harmonious passion shared a significant  
5 inverse relationship with the athlete burnout symptom of sport devaluation ( $r = -.46, p < .01$ ) but  
6 no significant relationship with the burnout symptoms of reduced sense of accomplishment ( $r = -$   
7  $.08$ ) and emotional and physical exhaustion ( $r = -.12$ ). Contrary to expectations, a significant  
8 inverse relationship emerged between obsessive passion and the athlete burnout symptom of  
9 sport devaluation ( $r = -.53, p < .01$ ). However, there was no significant relationship between  
10 obsessive passion and the burnout symptoms of reduced sense of accomplishment ( $r = .02$ ) and  
11 emotional and physical exhaustion ( $r = .07$ ).

12 Given the non-significant correlations between passion and the burnout symptoms of  
13 reduced sense of accomplishment and emotional and physical exhaustion, sport devaluation was  
14 the sole dependent variable considered in the regression models. Results from the multiple  
15 regression procedures indicated a significant regression models (*harmonious passion*  $R^2 = .25,$   
16  $F(2, 117) = 9.41, p < .05$  and *obsessive passion*  $R^2 = .35, F(2, 117) = 13.96, p < .05$  (see Table  
17 3). F-ratio scores obtained indicate the overall fit of a regression model. With observed values of  
18 harmonious passion ( $F = 9.41$ ) and obsessive passion ( $F = 13.96$ ) significantly above the F  
19 critical value ( $p < .05$ ), confidence can be garnered from the direct and indirect effects observed  
20 between the variables of interest. Further, follow-up boot-strapping procedures (Preacher &  
21 Hayes, 2008) indicated that basic needs satisfaction partially mediated the effects of harmonious  
22 and obsessive passion on athlete burnout. Specifically, satisfaction with autonomy accounts for

1 the indirect effect of harmonious (BCa 95% CI = -.77 to -.11), and obsessive passion (BCa 95%  
2 CI = -.76 to -.18) on sport devaluation (see Table 4).

### 3 **Discussion**

4 The primary purpose of the present investigation was to examine the relationship  
5 between passion and athlete burnout symptoms. A secondary purpose was to assess whether,  
6 individual basic psychological needs mediated this relationship. It was hypothesized that  
7 harmonious passion would have an inverse (negative) relationship with athlete burnout  
8 symptoms, while obsessive passion would have a positive relationship. In congruence with our  
9 expectations, harmonious passion indeed shared a significant inverse relationship with the athlete  
10 burnout symptom of sport devaluation (see Table 2), whilst the relationships with the other  
11 burnout symptoms were non-significant. These findings are partially consistent with research in  
12 sport contexts (e.g., Curran et al., 2011; 2013; Lonsdale et al., 2009) suggesting that harmonious  
13 passion may have the potential to protect competitive athletes from symptoms of athlete burnout  
14 however due to the correlational nature of the findings, no causal relationship can be assumed  
15 between harmonious passion and sport devaluation at this juncture.

16 In contrast, it was hypothesized that the adverse cognitive and affective outcomes  
17 associated with obsessive passion (Vallerand et al., 2003) would result in a positive relationship  
18 with athlete burnout symptoms (Curran et al., 2011; Gustafsson et al., 2011). However, the  
19 current study did not yield a significant relationship between obsessive passion and the athlete  
20 burnout symptoms of reduced sense of accomplishment and emotional and physical exhaustion.  
21 Contrary to expectations, an inverse relationship was identified between obsessive passion and  
22 the athlete burnout component of sport devaluation. It was anticipated that an obsessively  
23 passionate athlete would demonstrate higher symptoms of sport devaluation due to the perceived

1 lack of control over their sporting engagement, and the increased experience of maladaptive  
2 psychological outcomes attached to such rigid participation (e.g., family-life conflict). Although  
3 these results seem counter-intuitive, it could be explained in different ways.

4         Firstly, in line with the premise that those who are obsessively passionate tend to over-  
5 value and over identify with their chosen activity (Vallerand et al., 2003), it may offer some  
6 explanation as to why no significant association was found between obsessive passion and sport  
7 devaluation. Secondly, in obsessively passionate individuals', valuation of their sport could be  
8 argued to derive from the rewards attained (e.g., enhanced self-esteem) and/or punishments  
9 avoided (e.g., guilt) when participating (Paradis et al., 2013). Consequently, the influence of  
10 coaching behaviours and motivational climate can influence athlete goals, and how athletes  
11 attribute their source of success and accomplishment. For example, an ego-involving climate  
12 provides situational cues that promote intense focus on validating self-worth, fosters perceptions  
13 of incompetence, and heightens personal threat and anxiety, which could render athletes more  
14 vulnerable to burnout symptoms (Gustaffson, Hill, Stenling, & Wagnsson, 2016). Obsessively  
15 passionate individuals are more likely to engage in increased hours of deliberate practice  
16 (Vallerand et al., 2008) and are more likely to feel compelled to endorse all forms of their goals  
17 to achieve personal success and mastery; these might include performance-approach (i.e.,  
18 competence relative to others), and avoidance goals (i.e., avoiding incompetence or failure  
19 relative to others). Moreover, due to the strong attachment, valuation, and importance of the  
20 given sport, the pursuit of different goals may foster or hinder the opportunity to experience flow  
21 during performance and a sense of satisfaction when perceptions of competence are facilitated  
22 (Swann, Crust, & Vella, 2017).

1           A high level of sport valuation is likely to ensue if an obsessively passionate individual  
2 demonstrates competence in an activity that is deemed to be of a high level of importance to  
3 them. Such suggestions are supported by Stenseng and Harvold-Dalskau (2010), who identified  
4 that with success and mastery, obsessively passionate individuals (in comparison to  
5 harmoniously passionate individuals) had the largest increase in self-esteem. Consequently,  
6 perceived success in a meaningful task which results in an elevation of self-esteem, is likely to  
7 enhance the positive attachment and valuation towards that activity. Although, conceptually and  
8 theoretically speaking, the perceptions of competence of an obsessively passionate athlete are  
9 more likely to be construed on the basis of others, and thus a risk of negative psychological  
10 outcomes (e.g., worthlessness) when they do not perceive success could ensue (Vallerand et al.,  
11 2008). Subsequently, previous research suggests performance failure over a long period time is  
12 likely to have a significant negative impact upon perceptions of competence, which in turn can  
13 influence the value assigned to their sport. However, in the current study, performance factors  
14 were not assessed and an inverse relationship between competence and sport devaluation was  
15 observed. Sport performance could be an important factor to consider for future work as this may  
16 also reinforce why sport devaluation develops towards the end of the burnout process when  
17 performance progressively declines in association with emotional and physical exhaustion  
18 (Raedeke, 1997; Taris, Le Blanc, Schaufeli, & Schreurs, 2005).

19           In a further deviation from anticipated findings, no significant relationship was found  
20 between obsessive passion and the athlete burnout components of emotional and physical  
21 exhaustion and reduced sense of accomplishment. This result was surprising given that obsessive  
22 passion has been found to be related to high levels of rigid and compulsive engagement  
23 (Vallerand et al., 2003), and has found this association with emotional and physical exhaustion

1 symptom of athlete burnout (Curran et al., 2011; Gustafsson et al., 2016; Lonsdale et al., 2009).  
2 The absence or lack of salience pertaining to emotional and physical exhaustion—a core  
3 component of burnout (Gustafsson et al., 2016)—suggests that perhaps obsessive passion may  
4 not be as maladaptive for high level athletes as it may be for the general population pursuing  
5 recreational activities. In line with the previous suggestions, it could be surmised that the more  
6 obsessively passionate athletes within the current sample, were effectively managed or self-  
7 regulated to ensure sufficient rest, and thus avoid performance decrements. Interestingly,  
8 examination of values for the current sample of athletes suggest higher levels of burnout  
9 symptomology than found in other associated studies (e.g., Curran et al., 2013; Lemyre,  
10 Treasure, & Roberts, 2006), however, passion levels, and basic need satisfaction levels were  
11 comparable with previous research (e.g., Perreault et al., 2007). It is important to note that while  
12 obsessively passionate individuals may take part in more hours of deliberate practice (Vallerand  
13 et al., 2008), competitive athletes have structured training programmes and competitions which  
14 will incorporate rest days. Interestingly, some studies on obsessive passion have found that  
15 obsessively passionate athletes experienced anxiety when they were not training/not able to train  
16 which fostered rigid persistence and rumination leading to train in unsafe conditions and to train  
17 at the risk of injury (e.g., Rip et al., 2006; Vallerand et al., 2003). Perhaps it could be argued that  
18 an obsessively passionate individual may feel less ‘guilt’ or ‘anxiety’ if their structured training  
19 programme that is agreed upon with the coach calls for lower volume training days, or rest and  
20 recovery from their sport/training environment. This of course requires positive coach-athlete  
21 relationships and trust and confidence in the coach (Lafrenière, Jowett, Vallerand, &  
22 Carbonneau, 2011). Interestingly, obsessively passionate athletes have been identified to have a  
23 strong and committed relationship with their coach who sets their training schedule (Lafrenière,

1 Jowett, Vallerand, Donahue, & Lorimer, 2008). Expert coaches must be mindful of this fact in  
2 that it is likely that the athlete will adhere to instructions to rest from the coach, and subsequently  
3 minimise over-training situations normally attributable to physical and mental exhaustion.

#### 4 **Basic Psychological Needs as a Mediator**

5 As anticipated, the nature of engagement and emotions derived from being  
6 harmoniously passionate was conducive to the satisfaction of basic needs. In accordance with  
7 expectations, harmonious passion positively correlated with the three basic psychological needs  
8 of autonomy, competence, and relatedness (Vallerand et al., 2003). Similarly, harmonious  
9 passion has been identified to be related to situational positive affect, high-quality coach-athlete  
10 relationships, increased cohesion, decreased conflict, and positive interpersonal behaviours with  
11 others (e.g., Paradis, Carron, & Martin, 2014; Vallerand et al., 2003; Vallerand et al., 2008).  
12 Furthermore, harmonious passion was related to the burnout symptom of sport devaluation  
13 directly, and indirectly through the three basic psychological needs. These findings extended  
14 upon previous passion-burnout research (e.g., Curran et al., 2011; 2013; Rip et al., 2006.) by  
15 identifying a mediating role of psychological needs for the relationship between harmonious  
16 passion and athlete burnout, within a generalizable sample of competitive athletes. Whilst,  
17 Curran et al. (2013) investigated the passion-needs-burnout relationship, their research utilised a  
18 specific sample of elite junior soccer players. Youth soccer players are a unique specialized  
19 sample due to the highly pressurised climate (Sagar, Busch, & Jowett, 2010) and encounter a  
20 greater variety of personal challenges in comparison to other sports (Mills, Butt, Maynard, &  
21 Harwood, 2012). The current study permits findings to be applied to a broader spectrum of  
22 competitive athletes.

1           With regards to obsessive passion, the results of the current study found no significant  
2 relationship with perceptions of competence and relatedness. However, unexpectedly a  
3 significant positive relationship emerged between obsessive passion and the perception of  
4 autonomy. The regression analyses and follow-up bootstrapping analysis indicated that obsessive  
5 passion was associated with sport devaluation directly and indirectly through the basic  
6 psychological need of autonomy. Previous research has regularly demonstrated an association  
7 between obsessive passion and a pressured, rigid, and life-conflicting engagement that would  
8 undermine autonomy (e.g., Rip et al., 2006). However, by making inferences from other studies,  
9 an explanation of the current study's findings can be cautiously assembled. Firstly, it is possible  
10 that an individual may perceive to have autonomy if their engagement aligns well with their own  
11 personal objectives (Deci & Ryan, 2000b). For example, Bonneville-Roussy, Lavigne, and  
12 Vallerand (2012) identified that despite neglecting other life pursuits at the expense of increased  
13 training hours to improve, obsessive passion would not undermine autonomy if participation fits  
14 well within the objectives sought (e.g., goal objectives). The objectives sought for obsessively  
15 passionate athletes are attributed to performance accomplishments (Vallerand et al., 2008).

16           Consequently, obsessively passionate athletes are likely to believe they have autonomous  
17 sporting engagement because they understand why they are engaging in that sport (e.g.,  
18 performance success, rewards of self-esteem); the underlying reasons for engagement are thus  
19 meaningful to the athlete. Subsequently, although obsessive passion is related to rigid  
20 engagement in an activity (Rip et al., 2006), if an athlete understands the rationale behind their  
21 engagement, then they are more likely to perceive that they are the initiator of their behaviour;  
22 facilitating a sense of autonomy and ownership over their actions. The partial mediating role of



1 autonomy identified within the current study suggests that if achievement settings foster  
2 autonomy, effort energized by obsessive passion may not pose as great a risk for athlete burnout.

### 3 **Practical Implications**

4 Athlete burnout has been identified as a maladaptive experience for sport participants  
5 (Raedeke & Smith, 2001; 2009). Thus an implication of the present study was the contribution to  
6 understanding the factors that are associated with protecting or manifesting symptoms of athlete  
7 burnout and in the present study specifically, sport devaluation. Harmonious passion was  
8 identified to be inversely associated with the perception of the athlete burnout symptom of sport  
9 devaluation. Thus, it is important for coaches and athletes to be aware of the adaptive role of  
10 harmonious passion, which may safeguard athletes from the development of athlete burnout.  
11 Further, the importance of mental health and well-being has been advanced (e.g., Vallerand et  
12 al., 2003) and thus the allocation of appropriate resources to raise awareness, education, and  
13 understanding for important stakeholders (e.g., athletes, coaches, parents, sport psychology  
14 practitioners, sport administrators) pertaining to the experiences of maladaptive experiences such  
15 as burnout continues to be a worthwhile endeavour in modern sport. Specifically, as it pertains to  
16 the present study, understanding the adaptive and maladaptive functions of harmonious and  
17 obsessive passion and being able to promote healthy sport engagement, fostering mindfulness,  
18 and appropriate self-regulation of behaviour, cognition, and emotional responses to experiencing  
19 passion for a sport continues to be an important exercise.

20 The current study also offers important practical implications regarding the obsessive  
21 passion-athlete burnout relationship. Only adaptive effects of obsessive passion were identified,  
22 suggesting that obsessive passion was not necessarily associated with athlete burnout.  
23 Nevertheless, obsessive passion was also not associated with safeguarding athletes from the

1 development of athlete burnout symptoms via psychological need satisfaction as saliently as  
2 harmonious passion. Therefore, although obsessive passion is an important determinant of robust  
3 engagement for deliberate practice and performance excellence (Vallerand et al., 2008), coaches  
4 should focus on promoting harmonious passion tendencies within achievement settings in order  
5 that there is an increased probability of adaptive behavioural outcomes ensuing.

6         Although the direct effects of passion on athlete burnout is important, from an applied  
7 perspective, the potential indirect role that basic need fulfilment has on protecting athletes from  
8 burnout symptoms is pertinent. Despite previous research demonstrating the maladaptive nature  
9 of obsessive passion (e.g., Vallerand et al., 2006); the current study identified that a reduction in  
10 athlete burnout symptoms may occur if the obsessively passionate individual also possesses high  
11 perceptions of autonomy. Consequently, coaches should aim to facilitate the creation of social  
12 environments (Paradis & Martin, 2012) that satisfy the three basic psychological needs. One way  
13 coaches' may aim to do this is through providing a rationale for training and the importance of  
14 recovery days. To do so may enhance obsessively passionate individuals' perception of  
15 autonomy through helping the athletes to feel that they are involved in decisions regarding their  
16 training behaviours, and the consequences thereof. This is likely to promote a sense of ownership  
17 over their actions and motives for engagement (Goose & Winter, 2012). Moreover, by sharing  
18 responsibility for decisions, the respected coach can reduce the potential anxiety and 'guilt'  
19 associated with resting from their sport. Likewise, it is important for sport psychology  
20 practitioners working with athletes whom may be experiencing symptoms of burnout to consider  
21 the role of the individual's passion for their sport, and their overall satisfaction and fulfilment of  
22 their basic psychological needs. Further practitioners should attempt to equip athletes with the  
23 appropriate mental skills to foster well-being. Developing appropriate intervention strategies

1 such as Rational Emotive Behavioural Therapy (e.g., Vertopoulos & Turner, 2017) for athletes  
2 who may experience associated symptoms of burnout such as rigidity and rumination, cognitive  
3 dissonance, irrational beliefs, anxiety, anger, or denial that they may be burnt out from sport are  
4 also important considerations for practitioners.

### 5 **Limitations and Future Directions**

6         Although the current study produced some interesting findings, certain limitations  
7 should be acknowledged. First, the current study was conducted with a relatively small sample  
8 size, although it satisfied the conditions for minimal power required for such analyses, sample  
9 sizes of 300 or more are often preferred and thought of as comforting (Tabachnick & Fidell,  
10 2007). A larger sample size may have yielded more significant results and provided greater  
11 confidence in the findings.

12         A common assumption of athlete burnout is that it is an evolving process where factors  
13 influencing psychological need satisfaction may affect motivational dynamics over time  
14 (Cresswell & Eklund, 2006; Deci & Ryan, 2000a). Specifically, within coaching and physical  
15 training environments, it is common for athletes to experience mixed patterns of positive and  
16 negative events (e.g., poor performance, within career transitions). Consequently, feelings of  
17 high or low need satisfaction are likely to fluctuate over the course of the competitive season  
18 (Smoll & Smith, 2002). Moreover, whilst the findings from the current study broaden the  
19 knowledge of the passion-basic needs-burnout relationship, the current study only represents a  
20 snapshot of burnout symptomology. Furthermore, whilst the current study did identify athlete  
21 burnout symptomology higher than reported in previous studies (e.g., Lemyre et al., 2006), this  
22 could be a result of the context (winter training) which might be a time when burnout symptoms  
23 are most likely manifested due to a high volume of train loading in preparation for the

1 competitive season. Consequently, future research should consider longitudinal studies that will  
2 monitor the passion-athlete burnout relationship and how basic psychological needs may mediate  
3 the athlete burnout process over time.

4         Second, it is also important to consider contextual differences within the  
5 conceptualisation of athlete burnout which may account for the current study's findings. For  
6 example, within occupational burnout the sport devaluation symptom is measured by  
7 depersonalisation and/or cynicism, which refers to a detachment from an individual's identity  
8 such as dehumanizing clientele/labelling (Tassell & Flett, 2007). However, it could be argued  
9 that the sporting operationalization of burnout may not align fully conceptual and  
10 operationalization of passion which infers that the activity becomes a central component of the  
11 individual's identity (Vallerand et al., 2003). Within the context of sport, depersonalization or  
12 cynicism is replaced with sport devaluation, which refers to a decrease in the value of sport  
13 participation (Raedeke & Smith, 2001; 2009). If anything, in obsessively passionate individuals,  
14 the activity is over-valued and over represented in the person's identity. This may explain why  
15 contrary findings were experienced with obsessive passion and burnout. Considering these  
16 contextual differences, Hagger and Chatzisarantis (2009) suggested that one way to explain the  
17 true nature of the passion-basic needs-burnout effect is a qualitative approach, which could be  
18 achieved through semi-structured interviews, or focus groups with athletes and coaches. This  
19 approach will enable the acquisition of detailed and reflective accounts of rich experiences from  
20 participants that cannot be always be captured quantitatively. This approach can yield participant  
21 insights about the experience, meaning, and interpretation of athlete burnout symptoms, how  
22 basic needs are fulfilled (or not fulfilled), and how individual passion influences these factors.  
23 With the great advances in qualitative methodology for sport and exercise psychology research

1 (e.g., Smith & McGannon, 2017), future researchers seeking to advance this line of research are  
2 encouraged to adopt an appropriate qualitative approach to this line of inquiry.

3           The current study partially supported the mediating role of satisfaction with one basic  
4 psychological need (autonomy) between passion (harmonious and obsessive) and one athlete  
5 burnout symptom of sport devaluation. Consistent with hypothesized predictions, harmonious  
6 passion may provide an athlete with greater resilience against developing symptoms of athlete  
7 burnout. However, contrary to expectations (e.g., Curran et al., 2011; 2013; Vallerand et al.,  
8 2003) obsessive passion did not yield a predisposition for athlete burnout.

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Table 1

Means, standard deviations and Cronbach's alphas for competitive athletes

Variable	M	SD( $\pm$ )	$\alpha$
HP	5.68	0.79	0.91
OP	4.76	1.38	0.79
ABQ-RSA	4.61	0.65	0.91
ABQ-EPE	3.76	1.57	0.86
ABQ-SD	3.18	1.59	0.79
BPN-A	6.87	1.13	0.90
BPN-C	6.04	1.80	0.92
BPN-R	6.05	1.32	0.87

*Note: Obsessive Passion (OP) Harmonious Passion (HP), Reduced Sense of Accomplishment (ABQ-RSA), Emotional and Physical Exhaustion (ABQ-EPE), Sport Devaluation (ABQ-SD), Autonomy (BPN-A), Competence (BPN-C), Relatedness (BPN-R).*

Table 2

Significant Pearson correlations for passion, basic needs and athlete burnout

Variable	1	2	3	4	5	6	7	8
1. Harmonious	-	-	-	-	-	-	-	-
2. Obsessive	.608**	-	-	-	-	-	-	-
3. Autonomy	.516**	.451**	-	-	-	-	-	-
4. Competence	.323**	.143	.354**	-	-	-	-	-
5. Relatedness	.319**	.155	.367**	.252**	-	-	-	-
6. Sport Devaluation	-.459**	-.534**	-.331**	-.260**	-.071	-	-	-
7. Reduced Sense of Accomplishment	-.076	.024	.073	.065	-.003	.389**	-	-
8. Emotional and Physical Exhaustion	-.121	.071	.085	.038	.014	.256**	.222**	-

*Note.* \*\* Correlation is significant at the 0.01 level (2-tailed)

Table 3

Regression squared, Standardized Beta coefficients, F Values, and F-change scores for the relationship between passion, basic needs, and athlete burnout

Independent Variable	$R^2$	$\beta$ (Autonomy)	$\beta$ (Sport Devaluation)	F
Harmonious Passion	.247	.38	-.21	9.411
Obsessive Passion	.347	.22	-.41	13.961

Note: Dependent variable: Sport Devaluation ( $p < 0.05$ )

Table 4

Bootstrapping results for the total indirect effect of passion on basic psychological needs (based on 5000 bootstrap samples).

Variable	<i>SE</i>	<i>BCa</i> <i>L</i>	<i>95% CI</i> <i>U</i>
Harmonious Passion			
Autonomy	.17	-.77	-.11
Competence	.10	-.34	.04
Relatedness	.11	-.12	.30
Obsessive Passion			
Autonomy	.15	-.76	-.18

*Note: Dependent Variable = Sport Devaluation ( $p < 0.05$ )*