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Mindfulness and its Relationship with Perceived Stress, Affect and Burnout in
Elite Junior Athletes

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Abstract

The purpose of this study was to examine the relationship between dispositional mindfulness and burnout and whether this relationship is mediated by perceived stress, negative affect and positive affect in elite junior athletes. Participants were 233 (133 males and 100 females) adolescent athletes, ranging in age from 15 to 19 years ($M = 17.50$; $SD = 1.08$). Bivariate correlations revealed that mindfulness had a significant negative relationship with both perceived stress and burnout. To investigate mediation we employed non-parametric bootstrapping analyses. These analyses indicated that positive affect fully mediated links between mindfulness and sport devaluation. Further, positive affect and negative affect, partially mediated the relationships between mindfulness and physical/emotional exhaustion as well as between mindfulness and reduced sense of accomplishment. The results point towards mindfulness being negatively related to burnout in athletes and highlight the role of positive affect. Future research should investigate the longitudinal effect of dispositional mindfulness on stress and burnout.

Key words: cognitive behavioral therapy, mindfulness, overtraining, stress management, youth sport

Mindfulness and its Relation with Stress, Affect and Burnout in Elite Junior Athletes

Competing at the elite level in sport requires athletes to invest a large amount of time and intense effort in training. This might lead to detrimental consequences such as overtraining, injuries and burnout (Gustafsson, Hassmén, Kenttä, & Johansson, 2008; Meeusen et al., 2013). Although training load is a considerable stressor for athletes it is only one aspect of the stress they endure; additional factors such as personal relationships, school and work demands, as well as competitive pressure must also be considered (Arnold & Fletcher, 2012; Gustafsson, Kenttä, & Hassmén, 2011; Sarkar & Fletcher, 2014). Managing various psychosocial stressors in the everyday life of a young aspiring athlete might be as important as managing training in order to avoid burnout (Appleton, Hall, & Hill, 2009; Rumbold, Fletcher, & Daniels, 2012). Recent research has indicated that mindfulness is associated with lower levels of burnout in athletes (Walker, 2013). The current investigation aimed to increase our understanding of burnout and to examine if the relationship between mindfulness and burnout can, in part, be explained by differences in affect and perceived stress.

Based on research in occupational settings, athlete burnout is defined as a psychophysiological syndrome comprising three core dimensions (Gustafsson et al., 2011; Raedeke, 1997). The first dimension is physical and emotional exhaustion, associated with the demands of training and competition. The second dimension is a sense of reduced accomplishment in regards to the athlete's achievements and ability development. The third dimension is a devaluation of the athlete's participation in sport. Although emotional/physical exhaustion is considered the core dimension of burnout, many researchers have strongly argued that the two other dimensions are required to adequately capture the syndrome (Gustafsson, et al., 2011; Maslach, Schaufeli, & Leiter, 2001). The prevalence of burnout is estimated to be 1-9% in competitive junior and elite athletes (Eklund & Cresswell, 2007;

Gustafsson, Kentta, Hassmén, & Lundqvist, 2007). Burnout in athletes has serious consequences, including poor performances and impaired well-being (Gustafsson et al., 2008; Raedeke & Smith, 2001).

Mindfulness has been forwarded as a way to effectively manage the everyday stress and the potential risk of burnout in ambitious athletes (Bernier, Thienot, Codron, & Fournier, 2009; Gardner & Moore, 2004; Joupper & Gustafsson, 2013; Moore, 2009). Mindfulness can be defined as: “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). In a related description mindfulness is characterized by a flexible, non-defensive and present focused awareness (Brown & Ryan, 2003). In the conceptualization by Brown and Ryan (2003), mindfulness is an inherent capability to be in a state of consciousness. This means that individuals differ in their frequency of being in the present moment and that this capability can also vary within the individual. Thus, dispositional mindfulness describes the ability to be mindful in everyday life, whereas mindfulness practice has been defined as the methods through which mindfulness is cultivated (Birrer, Röthlin & Morgan, 2012).

Based on eastern traditions of Buddhism, mindfulness has recently been gaining attention in western society (Brown, Ryan, & Creswell, 2007; Gardner & Moore, 2004); in particular, it has been shown to relate to several aspects of general well-being such as low levels of anxiety, depression and stress (Brown & Ryan, 2003; Grossman, Niemann, Schmidt, & Walach, 2004; Hanley & Garland, 2014). Meta-analytic studies provide evidence for the effectiveness of mindfulness-based interventions (Baer, 2003; Hoffman, Sawyer, Witt, & Oh, 2010; Kabat-Zinn, 2003), particularly in the treatment of anxiety and mood disorders. Collectively, these findings indicate that being mindful can have a positive role in stress reduction and potentially prevent burnout in athletes (Walker, 2013).

Despite growing empirical evidence regarding the potential benefits of mindfulness in general psychology (cf. Brown et al., 2007) there are a limited number of studies that have investigated the utility of mindfulness in sport. Despite the initial call by Gardner and Moore (2004) for using mindfulness as a potential framework within sport psychology, it is only within recent years that mindfulness research in sport has gained momentum (c.f. Gardner & Moore, 2012; Pineau, Carol, & Keith, 2014). One area has been of interest in great interest is mindfulness and flow. Flow is a highly desired yet elusive state of mind; it is characterized by complete immersion in the task at hand and has been associated with enhanced skilled performance (cf. Jackson, & Csikszentmihalyi, 1999). Mindfulness has been shown to be positively related to flow in several studies, including both university-student athletes (Kee & Wang, 2008) and elite athletes (Cathart, McGregor, & Groundwater, 2014). Similarly, Aherne, Moran, and Lonsdale (2011) reported that athletes who completed mindfulness training scored higher on measures of global flow and flow dimensions related to goal clarity and sense of control. Furthermore, initial studies of mindfulness based interventions have also shown to enhanced performance (e.g., Bernier et al., 2009; Thompson, Kaufman, De Petrillo, Glass, & Arnkoff, 2011). Finally, a recent study randomized controlled study (Ivarsson, Johnson, Andersen, Fallby, & Altemyr, in press), explored the effects of a mindfulness and acceptance based intervention (Gardner & Moore, 2007), and significantly decreased risk of injury in soccer players.

Taken collectively, previous studies suggest a potential link between mindfulness and enhanced task performance. The benefits that are realized may also have long-term/ongoing implications for improved well-being, enhanced vitality, lowered stress and anxiety; thus increasing athletes' prospects of fulfilling their sporting potential (Birrer et al., 2012; Gardner & Moore, 2012). The proposition that mindfulness could be influential in decreasing stress and preventing burnout in athletes is of great interest due to the potentially increasing incidence of

athletes suffering from the syndrome (Gould & Dieffenbach, 2002). Further a limited number of established interventions are available for use in preventing its occurrence (Goodger, Gorely, Lavallee, & Harwood, 2007; Gustafsson et al., 2011).

Based on the transactional model and conceptualization of stress by Lazarus (Lazarus, 1999; Lazarus & Folkman, 1984), stress in sport has been defined as an, “ongoing process that involves individuals transacting with the environments, making appraisals of the situations they find themselves in and endeavoring to cope with any issue that may arise” (Fletcher, Hanton, & Mellalieu, 2006, p. 329). If the experience of stress becomes chronic it is postulated that it can lead to burnout (Gustafsson et al., 2011). In Smith’s (1986) cognitive-affective stress model of athlete burnout, stress and burnout develop in parallel. Smith posits that burnout develops through a four stage model. In the first stage demands are placed on the athlete, such as external pressure and training load. The second stage is the cognitive appraisal of these demands, which will be interpreted differently by each individual athlete. For example, some athletes will interpret the demands as harmful or overwhelming and this will prompt a physiological response (e.g., increased anxiety and cortisol release), which is the third stage. Importantly, if demands are perceived to be low or disinteresting, the athlete may experience boredom which can also be interpreted as being stressful. Finally, in the fourth stage, in order to handle the physiological response the athlete will implement a behavioral response such as avoidance thus resulting in decreased performance or withdrawal from sport. In addition, Smith posits that all four stages are influenced by motivational and personality factors, such as trait anxiety and perfectionism. In Smith’s framework, burnout is the consequence of the situational, cognitive, physiological as well as behavioral components of stress. Thus, burnout is a particular form of stress response. This model is by far the most influential model in athlete burnout research (Eklund & Cresswell, 2007; Gustafsson, Hancock, & Coté, 2014) and supported by research showing that athlete burnout is closely

associated with stress (Gustafsson & Skoog, 2012; Raedeke & Smith, 2004; Tabei, Fletcher, & Goodger, 2012).

In line with Smith's burnout model (1986) and the process of cognitive appraisal of stressful events and affective responses, research on mindfulness is of interest. Research undertaken within different domains of performance and well-being indicates that dispositional mindfulness is associated with lower levels of stress (Brown & Ryan, 2003). In an adaptation of the transactional model of stress (Lazarus & Folkman, 1984), Salmon, Sephton and Dreeben (2011) suggest a model outlining how stress reactivity and coping can be influenced by mindfulness. In this model, mindfulness is proposed to influence all stages of the stress process. This includes enhanced awareness and more suitable responses to potential stressors as well as more active coping in comparison to passive or avoidant coping. Thus, mindfulness can influence the appraisal of potential stressors and subsequent psychophysiological responses; over time, it diminishes habitual stress reactivity and promotes long term positive health outcomes (Salmon et al., 2011). As this model has the same theoretical foundation (i.e., Lazarus & Folkman, 1984) as the cognitive-affective burnout model by Smith (1986), it is a useful framework for stress and burnout research in athletes.

Research in non-sport settings has shown that dispositional mindfulness is negatively related to burnout (Cohen-Katz, Wiley, Capuano, Baker, Kimmel, & Shapiro, 2005; Hansen, Lund, Homman, & Wång-Larsson, 2009; McCracken & Yang, 2008). A recent study (Walker, 2013) tested the relationship between mindfulness and burnout in 104 competitive tennis players. The study showed that mindfulness was negatively related to all burnout dimensions and athletes with low mindfulness score higher on global burnout than athletes with moderate or high mindfulness scores. From the correlations, reduced sense of

accomplishment most strongly negatively correlated with mindfulness. Taken together, these findings indicate the potential of mindfulness in the prevention of burnout.

In order to better understand the relationship between mindfulness and burnout found by Walker (2013), the potential role of stress and affect in the mindfulness-burnout relationship is of interest. Stress and negative affect are associated with burnout risk within athletes (Lemyre, Treasure, & Roberts, 2006) and recent research also highlights the potential importance of positive affect in athlete burnout (Gustafsson, Podlog, Skoog, Lundqvist, & Wagnsson, 2013). As mindfulness appears to assist with the management of negative emotions and affect (Birrer et al., 2012; Broderick, 2005), being mindful can therefore provide a means to regulate symptoms of stress in addition to feelings of frustration related to declines in performance. Moreover, mindfulness may reduce the impact of negative emotions associated with the devaluation of participation in sport; the influence of negative emotions has been acknowledged in the development of burnout as well as being central to the burnout experience (Gustafsson et al., 2008; Raedeke, 1997). Based on research conducted in other domains, mindful athletes would perceive less stress and negative affect (Brown & Ryan, 2003; Brown et al., 2007; Cash & Wittingham, 2010), and this would be a potential mechanism in the relationship found between mindfulness and burnout (Walker, 2013).

In summary, there is limited knowledge about the relationship between mindfulness and burnout. Although there is preliminary research indicating that being mindful is beneficial, the potential mechanisms in this relationship are not extensively researched in athletes. Therefore, there is a need to test potential mediators in the relationship between dispositional mindfulness and burnout. The present study aimed to examine whether perceived stress and affect are mediators in the relationship between mindfulness and burnout. We hypothesized that perceived stress and negative/positive affect would mediate the relationship between mindfulness and all three burnout dimensions: emotional/physical

exhaustion; reduced sense of accomplishment; and sport devaluation. Finally, as the role of positive affect has recently been tested in association with athlete burnout, we also aimed to test the strength of the mediators to compare their influence (Gustafsson et al., 2013).

Method

Participants

Participants were 233 athletes (133 males and 100 females, M age =17.50 years, age range: 15-19 years). Three athletes did not state gender. Athletes competed in cross-country-skiing ($N = 174$; 74%), track and field ($N = 23$; 10%), biathlon ($N = 7$; 3%), ski-orienteeing ($N = 11$; 5%) and alpine skiing ($N = 20$; 8.5%). All participants were studying at four sport high schools in Sweden which are part of the Swedish national talent program. On average, athletes were training 11.30 hours per week ($SD = 2.46$) and the average number of years in their main sport was 8.0 years ($SD = 2.90$). The majority of participants were competing at a national level ($N = 113$, 89%), and thereby considered elite junior level athletes. Fourteen athletes (11%) were competing at an international level (i.e. representing the junior national team).

Measures

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). Mindfulness was measured using a Swedish translation of the MAAS (Hansen et al., 2009). The MAAS is a dispositional measure of mindfulness comprised of 15 items (e.g., ‘I find it difficult to stay focused on what’s happening in the present’) to which responses are provided on a six-point scale from 1 (‘almost always’) to 6 (‘almost never’) with high scores indicating greater mindfulness. Prior research provides support for the MAAS as a valid measure of mindfulness and adequate internal reliability, with α coefficients ranging from .82 to .86 (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003). In addition, Feldman, Hayes, Kumar, Greeson & Laurenceau (2007) found that the MAAS was strongly correlated with

other mindfulness measures such as the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldmen et al., 2007) thereby demonstrating good construct validity. The scale has successfully been used with athletes (Gooding & Gardner, 2009). The Swedish version has been validated with adults and adolescents (Hansen et al., 2009) indicating promising construct validity.

The Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001). In the current study symptoms of burnout was used to assess the participants' level of burnout. The ABQ is a 15-item self-report inventory that contains three subscales, including emotional/physical exhaustion (e.g., "I feel overly tired from my sport participation"), reduced sense of sport accomplishment (e.g., "I am not performing up to my ability in sport"), and sport devaluation (e.g., "I don't care as much about my sport performance as I used to"). The stem for each item was "How often do you feel this way?" to which participants responded on a five-point Likert scale with anchors from 1 ("*almost never*") to 5 ("*almost always*"), where higher scores reflects greater symptoms of burnout. The ABQ has shown good psychometric properties with internal consistencies ($\alpha > .80$) for all three subscales in both the original and the Swedish version (Raedeke & Smith, 2001; Gustafsson et al., 2013; Smith, Gustafsson, & Hassmén, 2010).

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). The whole stress process is difficult to measure (c.f. Arnold & Fletcher, 2012b) and researchers are advised to identify which aspect is of central interest for their study. In line with the transactional model of stress (Lazarus & Folkman, 1984), the PSS was used as it measures the self-appraised stress and the frequency of stress experiences (e.g., "During the past month, how often have you felt that you were unable to control the important things in your life?"). This measure consists of ten items rated on a five-point Likert-type scale from 0 ("*never*") to 4 ("*very often*"). This questionnaire has been reported to have good construct validity (Cohen &

Williamson, 1988). The Swedish version has been validated using confirmatory factor analysis, been found to have acceptable internal consistency ($\alpha = .84$; Smith et al., 2010) and has been previously used in sport research (Gustafsson, et al., 2013; Smith et al., 2010).

The Positive and Negative Affect Scale PANAS (PANAS; Kercher, 1992; Watson, Clark, & Tellegen, 1988). To measure affect, the short form of the PANAS was employed. The stem for each item was “Indicate to what extent you have felt this way during the past few weeks?” The Swedish version consists of four positive (e.g., inspired) and four negative (e.g., scared) items. Each item is rated on a five-point Likert scale from 1 (“*not at all or a little*”) to 5 (“*extremely*”). Previous athlete burnout research has indicated the validity of using the PANAS with athletes (Lemyre et al., 2006; Gustafsson et al., 2013). The Swedish version has been used with adolescent athletes and found to have acceptable internal consistency; it also has demonstrated acceptable model fit with confirmatory factor analysis (Gustafsson et al., 2013).

Procedure

After receiving institutional ethics approval, head coaches were contacted to obtain their permission to include athletes in the study. Informed written consent was obtained from the athletes before they completed the questionnaire. The data were collected during early spring, which corresponds with the end of the competitive season for all athletes except for track and field, which was in the early stages of their competitive season. The data collection took place at the sport academies under supervision of a research assistant.

Data Analysis

Bivariate correlations were examined for significant associations between variables of interest. Furthermore, to investigate mediation we employed non-parametric bootstrapping analyses developed by Preacher and Hayes (2008). The bootstrapping procedure is superior to traditional techniques for testing mediation (e.g. the Casual steps approach by Baron and

Kenny (1986) and Sobel's test) in terms of power, multivariate non-normality, and testing multiple mediators (Briggs, 2006; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2008). For this purpose, we used the SPSS macros developed by Preacher and Hayes (2008); with 1000 bootstrap resamples and 95% bias corrected confidence intervals (CIs). According to this procedure, there is evidence of mediation, or a specific, unique indirect effect, when zero is not included in the 95% CI. In the current study, full mediation was used to describe a scenario in which the direct effect of the predictor variable on the outcome variable was reduced to non-significance. Partial mediation was used for describing a scenario in which there were significant indirect effect(-s) of mediator(-s), but the link between the predictor variable and outcome variable were, albeit not as strongly, still significantly linked. In addition to verbally describing the strength of the mediation as full or partial, effect sizes are reported as completely standardized indirect effects (ab_{cs}) according to Preacher and Kelly (2011). In terms of strengths of the effects, .01 equals a small effect size, .09 is interpreted as a medium effect size, and .25 is a large effect size (Ellis, 2010). We also examined contrasts for significant specific indirect effects using bias corrected CIs. When zero is not included in the 95% CI, there is evidence of different magnitudes of the unique mediating effects.

Results

Preliminary analyses

Initially, participants' scores were examined for missing values. Six participants had more than 5% missing data and were therefore deleted from the sample (DiLalla & Dollinger, 2006). A few participants had missing item-values ($N = < 3\%$). These values were imputed with mean (within person) substitution (Graham, Cumsille & Elek-Fisk, 2003). Data were thereafter screened for univariate outliers according to guidelines outlined by Tabachnick and

Fidell (2007). Standardized z-scores and 3.29 as a critical value ($p < .001$) were used for univariate outliers. Mahalanobis distances and the critical value of $\chi^2_{(5)} = 20.52$ ($p < .001$) were used for multivariate outliers. No univariate outliers were found; five multivariate outliers were identified and consequently removed from the sample. Consequently, the final sample consisted of 228 athletes.

Descriptive statistics

The lower part of Table 1 shows the means, standard deviations and reliability estimates for the measures used in the study. The ABQ scores in this study are low to moderate, indicating that many of the participants were experiencing low or moderate levels of perceived burnout; this is consistent with findings commonly reported in related literature (Raedeke & Smith, 2009).

Bivariate correlations

Bivariate correlations were examined amongst the main study variables. Mindfulness was negatively correlated with all three aspects of burnout ($ps < .01$); thus, participants who were more mindful were less likely to report symptoms of burnout. According to Cohen (1988), the strength of the correlations ranged from weak to moderate.

The links between mindfulness and the three hypothesized mediators (i.e., perceived stress, negative affect, and positive affect) were examined. According to Cohen (1988), the links between mindfulness and all three potential mediators were weak to moderately strong ($ps < .001$). Athletes scoring higher on mindfulness were less likely to report high levels of perceived stress and negative affect, and more likely to report high levels of positive affect. Finally, moderate associations between perceived stress, negative, and positive affect on the one hand, and the three aspects of burnout on the other ($ps < .001$) were found. That is, athletes with higher levels of perceived stress and negative affect also displayed higher levels of the three aspects of burnout. Conversely, athletes reporting higher levels of positive affect

reported lower levels of the three aspects of burnout. The strengths of the links ranged from weak/moderate to moderate/strong.

Mediation analyses

We tested the mediation hypotheses for the three aspects of burnout – emotional/physical exhaustion, sport devaluation, and a reduced sense of accomplishment – in three separate models. The results of the mediation analyses are presented in Table 2 and Figure 1. In the first model, mindfulness was entered as the independent variable, perceived stress, negative and positive affect were entered as mediating variables, and emotional/physical exhaustion was entered as the outcome variable (Figure 1, panel A). The total effect, which does not take into account the effects of the mediators, of mindfulness on emotional/physical exhaustion was significant (total effect = $-.27$, $p < .001$). Negative (indirect effect = $-.07$, 95% *CI*: -0.11 , -0.03 , $ab_{cs} = -.07$) and positive affect (indirect effect = $-.04$, 95% *CI*: -0.08 , -0.02 , $ab_{cs} = -.04$), but not perceived stress (indirect effect = $-.02$, 95% *CI*: -0.08 , 0.02 , $ab_{cs} = -.02$), constituted significant indirect effects in the link between mindfulness and emotional/physical exhaustion. The strengths of the individual indirect effects were small to medium. Still, the direct effect, which takes the effects of the mediators into consideration, of mindfulness on emotional/physical exhaustion was significant, although reduced from the total effect (direct effect = $-.14$, $p < .01$); thus, there was evidence of partial mediation. The tests of contrasts between significant indirect effects revealed that the magnitude of the indirect effects did not differ significantly. This finding indicates that negative and positive affect were equally important mechanisms or explanations of the link between mindfulness and emotional/physical exhaustion.

In the second model, we entered sport devaluation as the outcome variable (Figure 1, panel B). Again, we included mindfulness as the predictor variable and perceived stress, negative and positive affect as mediators. The total effect of mindfulness on sport devaluation

was significant (total effect = $-.14$, $p < .01$). Positive affect constituted a significant indirect effect in the link between mindfulness and sport devaluation (indirect effect = $-.10$, 95% *CI*: $-0.18, -0.05$, $ab_{cs} = -.09$) as did negative affect (indirect effect = $-.05$, 95% *CI*: $-0.10, -0.00$, $ab_{cs} = -.04$; indirect effects for perceived stress $-.04$, 95% *CI*: $-0.11, 0.01$, $ab_{cs} = -.03$). The strengths of the individual indirect effects were small to medium. The tests of contrasts between significant indirect effects revealed that the magnitude of the indirect effects did not differ significantly. This finding indicates that negative and positive affect were equally important mechanisms or explanations of the link between mindfulness and sport devaluation. The direct effect of mindfulness on sport devaluation was close to zero (direct effect = $.04$, $p > .05$) and non-significant; thus, there was evidence of full mediation.

In the final model, we entered reduced sense of accomplishment as the dependent variable (Figure 1, panel C). Once more, we included mindfulness as the predictor variable and perceived stress, negative and positive affect as mediators. The total effect of mindfulness on reduced sense of accomplishment was significant (total effect = $-.25$, $p < .001$). Negative (indirect effect = $-.07$, 95% *CI*: $-0.13, -0.02$, $ab_{cs} = -.06$) and positive affect (indirect effect = $-.05$, 95% *CI*: $-0.11, -0.02$, $ab_{cs} = -.05$) constituted significant indirect effects in the link between mindfulness and reduced sense of accomplishment (indirect effect of perceived stress = $-.04$, 95% *CI*: $-0.11, 0.02$, $ab_{cs} = -.03$) and the direct effect of mindfulness on reduced sense of accomplishment was non-significant (direct effect = $-.09$, $p > .05$); thus, there was evidence of full mediation. The strengths of the individual indirect effects were small to medium. The tests of contrasts between significant indirect effects revealed no significant difference.

Discussion

The aim of the present study was to investigate the relationship between dispositional mindfulness and burnout among elite junior athletes. The findings supported the hypotheses that mindfulness is significantly negatively related to all burnout dimensions, supporting

recent research in athletes (Walker, 2013). Perceived stress and positive and negative affect were also examined for their potential to act as mediators in the relationship between mindfulness and burnout. The present study thereby provides additional evidence for the benefits of dispositional mindfulness in relation to burnout in athletic settings. Furthermore, in line with earlier research investigating the influence of mindfulness and acceptance based interventions on stress, affect and burnout in non-sport settings (Brown & Ryan, 2003; Hayes et al., 2004), our findings demonstrate that mindful athletes experience less perceived stress and negative affect as well as more positive affect than less mindful athletes.

The current study extend initial research on mindfulness and burnout (Walker, 2013), by looking at potential mechanism in this relationship. Partial support was found for the hypothesis that negative and positive affect was acting as mediators in the relationship between mindfulness and burnout. In the case of emotional/physical exhaustion partial mediation was found. Specifically, negative and positive affect acted as mediators; however, perceived stress did not. The role of negative affect in burnout has been highlighted in earlier research, suggesting that negative affect can be an indicator of burnout susceptibility (Lemyre et al., 2006). Furthermore, the role of positive affect has also been recently underscored; specifically, emotions such as hope have been identified as being protective against the manifestation of burnout symptoms (Gustafsson, et al., 2013). Upon initial reflection it may seem surprising that perceived stress did not act as a mediator, particularly as emotional/physical exhaustion are considered as the stress related dimension of burnout (Maslach et al., 2001). However, the meditation was partial and burnout in athletes is also associated with physical exhaustion along with possible signs of overtraining (Gustafsson, Kenttä, Hassmén, Lundqvist, & Durand-Bush, 2007; Gould, Tuffey, Udry, & Loehr, 1996). Therefore, as training stress and symptoms of overtraining are not directly evaluated with the

PSS, future research may be advised to include a measure that assesses these potentially underpinning aspects of stress related to burnout.

In the model examining the relationship between mindfulness and both reduced sense of accomplishment and sport devaluation, perceived stress did not act as a mediator. Furthermore, positive and negative affect fully mediated the relationship with mindfulness. This is in line with earlier findings, showing that mindfulness tends to be associated with less negative affect (Brown & Ryan, 2003). Additionally, positive and negative affect fully mediated the relationship between mindfulness and reduced sense of accomplishment. The current study shows that being mindful is associated with more positive and less negative emotions; however more research is needed as targeting aspects of emotion might offer a future means of preventing athlete burnout. Recent research has shown that positive affect might have an important role in preventing athlete burnout (Gustafsson et al., 2013). This proposal is based on research showing that positive affect, independent of negative affect, is related to better health and can potentially act as a protecting factor from negative stress (Fredricksson; 1998; Moskowitz, 2003; Pressman & Cohen, 2005). These results taken collectively, suggest the role of mindfulness and burnout prevention requires further exploration; specifically, underlying mechanisms and the role of both positive and negative affect warrant additional examination (cf. Salmon et al., 2011).

To advance understanding of the influence of mindfulness on burnout, future studies should be undertaken with athletes presenting severe burnout symptoms across all three dimensions. Guided by the theoretical perspective suggested by Salmon and associates (Salmon et al., 2011), athletes that experience the physical/emotional exhaustion associated with hard training, may benefit from dispositional mindfulness by accepting negative thoughts and emotions associated with this state. The findings from the present study lend support to this proposal as a negative relationship between mindfulness and emotional/physical

exhaustion was observed. Specifically, mindful athletes may be protected from negative rumination during exhausted states; these athletes who are non-judgmentally aware of their thoughts, emotions and physical sensations in critical moments may be less likely to adopt ineffective behavioral responses and prevent further maladaptation (cf. Brown, et al., 2007; Jouper & Gustafsson, 2013). This must however, be empirically tested in an athlete population.

In the present study, the association between dispositional mindfulness and burnout was only partly associated with perceived stress and affect; this suggests there is a unique relationship between mindfulness and exhaustion that has the potential to extend beyond perceived stress and affect. Mindfulness and the ability to be aware but not judgmental about the self (e.g., rumination), is a potential mechanism and protective factor from burnout (Paul, Stanton, Greeson, Smoski, & Wang 2013). Although athlete burnout has been explained by a cognitive-affective model (Smith, 1986), alternative explanations of the burnout syndrome in athletes have been suggested. In the entrapment model by Raedeke (1997), feelings of being trapped in their sport with few alternative options and participating in sport not because the athlete *wants* to but they *have* to, is suggested to lead to burnout. This model has initial support (Raedeke, 1997) and being able to handle feelings of entrapment with mindfulness is an interesting future research venue. The findings of the present study highlight that the relationship between mindfulness and burnout extends beyond a stress induced association. Therefore, future research should more closely investigate the underlying mechanisms of burnout and mindfulness, such as the role of rumination and feelings of entrapment, to elucidate the link observed in athletes.

Despite the potential contribution of the present study, there are a number of limitations that should be taken into account in the development of future research. First, the cross-sectional design does not permit the study of the potential long-term effects of

mindfulness on perceived stress, affect and burnout or causal explanations. That said, the extensive research that has recently been undertaken examining mindfulness, stress and affect across a number of performance domains lends support to the findings of the present study (c.f. Brown et al., 2007). It also needs to be considered that the levels of burnout symptoms could be considered to be low to moderate, a common problem in research on burnout (cf. Eklund & Cresswell, 2007; Raedeke & Smith, 2009), where the athletes who are experiencing the highest levels of burnout potentially already have left sport (Gustafsson et al., 2007)

To advance understanding of the potential role of mindfulness in elite sports, other measures of the stress experienced by athletes might be of interest, these include organizational stress (Arnold, Fletcher, & Daniels, 2013) and training stress/lack of recovery (Kellmann & Kallus, 2001). This is particularly important because participants in the present study may have reported their perceived stress, burnout and affect based on recent salient experiences that do not necessarily reflect the aggregate of the many potential stressors athletes manage within a season of high level competition. Psychophysiological data collected during alternative times in the competitive season, or periods of training, may have revealed different relationships between mindfulness and burnout based on acute perceptions of exhaustion. The fact that the athletes in this study were in different phases of their season might have affected the results. However, burnout is considered to be chronic in nature (e.g., Shirom, 2005), but this needs further investigation in sport settings. Further, we studied dispositional mindfulness, future studies should investigate the efficacy of MBSR programs (Kabat-Zinn, 2003) and interventions based on Acceptance Commitment Therapy (Hayes et al., 2004; Hayes, Strosahl, & Wilson, 1999) in both healthy athletes as well as athletes displaying burnout symptoms. Findings from non-sport settings indicating the effectiveness of such interventions (e.g., Flook, Goldberg, Pinger, Bonus, & Davidson, 2013) and greater appreciation of the utility of mindfulness based interventions may enhance the applied

practice of sport psychology professionals and ultimately benefit athletes' performance and wellbeing. In addition, the role of mindfulness and resilience (Algoe & Fredrickson, 2011; Fletcher & Sarkar, 2012), in relation to both burnout and consequently performance in young elite athletes are of great interest in future studies.

The findings emerging from the present study are in line with the preliminary research in sport and further strengthen the claim that being able to be present in a mindful, non-judgmental state is associated with enhanced well-being and less perceived stress. The results show that the relationship between burnout and mindfulness is partially mediated through positive and negative affect. Particularly interesting is the role of positive affect which demands further exploration to fully understand its influence on athletes' health and performance. The implications of the current study extend the proposed utility of mindfulness in potentially decreasing the risk of burnout in athletes (e.g., Jøuper & Gustafsson, 2013). Mindfulness can thereby be a valuable tool for athletic development as well as to handle stress and prevent maladaptation.

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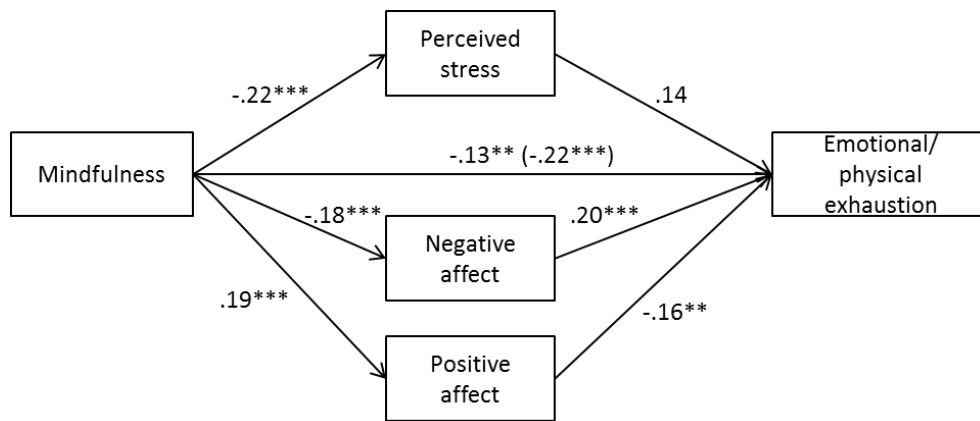
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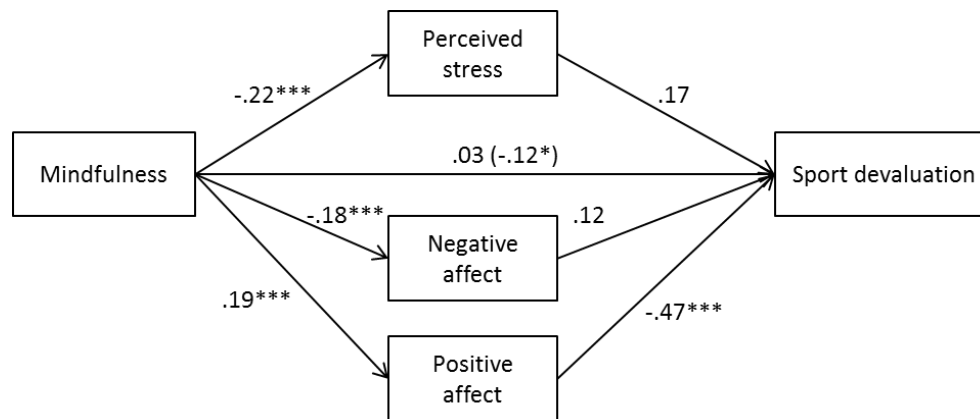
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A



B



C

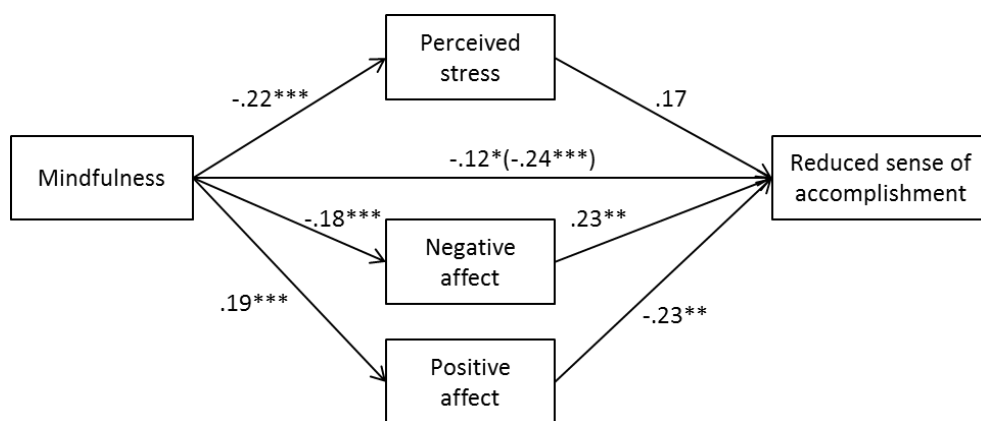


Figure 1. Models predicting emotional/physical exhaustion (panel A), sport devaluation (panel B), and reduced sense of accomplishment (panel C) from mindfulness and perceived stress, negative and positive affect. Values signify unstandardized coefficients. The direct effects of mindfulness on

Table 1

Summary of Intercorrelations, Means, Standard Deviations, and Reliability Estimates for Study Variables

	1	2	3	4	5	6	7
1.Mindfulness	1						
2.Perceived stress	-.35***	1					
3.Negative affect	-.24***	.53***	1				
4.Positive affect	.27***	-.35***	-.18**	1			
5.Emotional/physical exhaustion	-.34***	.38***	.38***	-.31***	1		
6.Sport devaluation	-.14***	.30***	.24***	-.43***	.59***	1	
7.Reduced accomplishment	-.27***	.33***	.32***	-.29***	.39***	.52***	1
<i>M</i>	4.31	1.52	1.89	3.69	1.87	1.71	2.50
<i>SD</i>	0.90	0.56	0.69	0.64	0.60	0.78	0.78
Cronbach's alpha	.89	.77	.76	.72	.80	.83	.81

Note. *** $p < .001$, ** $p < .01$

- 1 Table 2.
 2 *Indirect Effects of Mindfulness on Burnout (Emotional/Physical Exhaustion, Sport Devaluation, and Reduced Sense of Accomplishment) through*
 3 *Perceived Stress, Negative Affect, and Positive Affect.*

	Bootstrap effect	Normal effect	Normal theory tests			Bias corrected and accelerated C.I.'s	
			<i>SE</i>	<i>Z</i>	<i>p</i>	Lower	<i>Upper</i>
Emotional/physical exhaustion							
Total effect	-.10	-.10	.03	-4.29	<. 001	-.16	-.05
Perceived Stress	-.03	-.03	.02	-1.71	.09	-.09	.00
Negative affect	-.04	-.04	.01	-2.56	.01	-.08	-.01
Positive affect	-.03	-.03	.01	-2.39	.02	-.06	-.01
Model	$F(4,228) = 19.86^{***}; R^2 = .26; \text{Adj. } R^2 = .25$						
Contrasts for indirect effects							
Negative vs. positive affect	-.01	-.01	.02	-.30	.77	-.05	.03

Sport devaluation

Total effect	-.15	-.15	.03	-4.41	<. 001	-.24	-.08
Perceived Stress	-.04	-.04	.02	-1.61	.11	-.10	.00
Negative affect	-.02	-.02	.02	-1.46	.14	-.08	.00
Positive affect	-.09	-.09	.03	-3.44	<. 001	-.16	-.04

Model $F(4,228) = 16.10^{***}; R^2 = .22; \text{Adj. } R^2 = .21$

Reduced sense of accomplishment

Total effect	-.12	-.12	.03	-4.06	<. 001	-.20	-.06
Perceived Stress	-.04	-.04	.02	-1.52	.13	-.09	.01
Negative affect	-.04	-.04	.02	-2.29	.02	-.10	-.01
Positive affect	-.04	-.04	.02	-2.35	.02	-.09	-.01

Model $F(4,190) = 46.88^{***}; R^2 = .50; \text{Adj. } R^2 = .49$

Contrasts for indirect effects

Negative vs. positive affect	.00	.00	.02	.01	.99	-.05	.05
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