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Athlete Burnout Symptoms are Increasing:

A Cross-Temporal Meta-Analysis of Average Levels from 1997 to 2019

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Abstract

With the increasing prevalence of mental health difficulties in sport, athletes may be at greater risk of burnout than ever before. In the present study, we tested this possibility by examining whether average athlete burnout levels have changed over the past two decades, from 1997 to 2019. A literature search returned 91 studies (N = 21,012) and 396 effect sizes. Findings from cross-temporal meta-analysis suggested that burnout symptoms have increased over the past two decades. Specifically, we found that athletes' mean levels of reduced sense of athletic accomplishment and sport devaluation have increased. As burnout symptoms are now typically higher among athletes than in the past, we can expect more athletes to be prone to the negative effects of burnout. Sport is therefore in urgent need of prevention and intervention strategies to stop and reverse this trend.

Keywords: exhaustion, stress, health, sport, athletes

Introduction

Over the past two decades considerable effort has been dedicated to understanding the antecedents and consequences of athlete burnout (e.g., Eklund & DeFreese, 2020; Gustafsson, DeFreese, & Madigan, 2017; Smith, Pacewicz, & Raedeke, 2019). However, to date, there has been no systematic examination of changes in athlete burnout levels over time. Against a background of increased recognition and prevalence of mental health difficulties in sport (e.g., Reardon et al., 2019), it is possible that athletes are experiencing higher burnout than ever before. In the present study, we reviewed the large volume of existing research to evaluate whether average athlete burnout levels have changed over the past two decades. In examining this question, we provide important information for those involved in supporting athletes and determine whether more needs to be done to protect athletes from the development of burnout.

Athlete Mental Health

Mental health is a pressing wider societal concern. Research suggests that many individuals will experience some form of mental health difficulty in their lifetime – with estimates ranging between 27% and 46% of the adult population (e.g., Kessler et al., 2005). There is also mounting evidence that the prevalence of mental ill-health is on the rise. For example, several large studies have shown that depression, loneliness, and anxiety are all becoming increasingly common among student and general adult populations (e.g., Duffy, Twenge, & Joiner, 2019; Twenge, Joiner, Rogers, & Martin, 2018). It is little wonder, then, that mental health is high on the agenda of many public health organizations and government agencies (e.g., Patel et al., 2018).

Mental health is also increasingly a focus for those working in sport (e.g., Rice et al., 2016). While the benefits of exercise for mental health have been extensively examined and are well-known (e.g., Chekroud et al., 2018), the role of competitive sport is more complex

and may under some circumstances contribute to compromised mental health. Indeed, there is evidence that some mental health difficulties are more prevalent in athletes than in the general population (e.g., depressive symptoms; Åkesdotter et al., 2020; Gouttebarge et al., 2019). With this in mind, several recent position and consensus statements on mental health in sport have affirmed the importance of studying mental health in this domain and have called for a better understanding of the issues that athletes face (e.g., Moesch et al., 2018; Reardon et al., 2019; Schinke et al. 2018).

In the present study, we focus on one particular indication of poor mental health – burnout. Research and policy makers are increasingly recognizing the importance of burnout outside of sport (i.e., professional/work burnout). For example, public health bodies including Health Education England (2019), the Agency for Healthcare Research and Quality (2017), and the European Union (2017) have all now formally recognized burnout as a problem in a range of contexts. The World Health Organization also recently revised and significantly expanded its description of burnout as a syndrome in the 11th revision of the International Statistical Classification of Diseases (World Health Organization, 2018). Understanding more about athlete burnout, then, and its potential changes over time in sport, has perhaps never been more important and is essential to better inform ongoing relevant policy and guidelines.

Athlete Burnout

Burnout was initially observed in care-giving professions. It described the process of exhaustion and loss of commitment that had been observed in those working in these contexts. Based on extensive research, burnout was defined as a psychological syndrome comprised of three symptoms (Maslach & Jackson, 1981); namely, reduced professional efficacy (feelings of reduced competence and achievement in one's work with people), depersonalisztion (an unfeeling and impersonal response toward recipients of one's service,

care, treatment, or instruction), and emotional exhaustion (feelings of being emotionally overextended and exhausted at one's work; Maslach, Jackson, Leiter, Schaufeli, & Schwab, 1986). With a focus on these symptoms, researchers have examined burnout in many occupations including teachers, physicians, and nurses (e.g., Adriaenssens, De Gucht, & Maes, 2015; García-Carmona, Marín, & Aguayo, 2019; Rotenstein et al., 2018).

To reflect differences in the context of sport compared to care-giving settings, athlete burnout was conceptualized slightly differently. Athlete burnout is an extreme form of sport disillusionment and is comprised of three symptoms that are different, but equivalent, to those in the work domain: a reduced sense of athletic accomplishment, devaluation of sport, and physical and emotional exhaustion (Raedeke & Smith, 2001). Reduced sense of athletic accomplishment is the negative evaluation of one's sporting abilities and achievements. Sport devaluation is an increased lack of caring and loss of interest with regards to sport participation. Finally, physical and emotional exhaustion is the perceived depletion of emotional and physical resources resulting from training and competition.

Using this definition and corresponding measure (the Athlete Burnout Questionnaire; Raedeke & Smith, 2001), researchers have theorized and sought to empirically identify the antecedents and consequences of athlete burnout. The work has revealed that burnout has numerous potential negative consequences for athletes (Eklund & DeFreese, 2020; Goodger et al., 2007; Gustafsson et al., 2017). The negative consequences include diminished wellbeing, poorer performance, disrupted interpersonal relationships, and increased risk of depression (Smith, Pacewicz, & Raedeke, 2019). Ultimately, these consequences and other motivation difficulties are thought to make athletes more likely to leave their sport, and in some instances, never return (Larson, Young, McHugh, & Rogers, 2019). Research in this area has been relatively consistent with evidence of these types of consequences observed in

athletes of various sports (e.g., team, individual), age groups (e.g., junior, adult), and levels of competition (e.g., amateur, professional; Gustafsson, Madigan, & Lundkvist, 2018).

Changes in Athlete Burnout Over Time

Given the importance of burnout for athletes, it seems prudent to ask whether burnout levels are changing. It has been twenty years since Raedeke and Smith (2001) provided a means to measure athlete burnout. A considerable amount of research has taken place since then which offers an opportunity to answer this question by examining change in average athlete burnout levels observed in this work. In considering possible changes, over the past two decades, there have been many notable, complex, and multifaceted changes to the structure and culture of sport which may help explain why athletes may now be more at risk of burnout. We use three different theoretical perspectives to help explain why this is maybe the case and why burnout may have increased over time.

Smith's (1986) Cognitive-Affective Stress Model

Of the models that have been proposed to explain the development of athlete burnout, Smith's (1986) cognitive-affective stress model is the most well studied. The model posits that burnout develops in response to chronic stress. When athletes appraise an imbalance between the demands of a situation (e.g., competition) and the resources available to deal with these demands, they experience stress. Stress is common in sport and is potentially managed via coping processes. However, when the imbalance between perceived demands and resources becomes continual or chronic, emotions (e.g., shame, anxiety) and rigid behavioral responses (e.g., withdrawal) arise that are debilitative and prevent effective coping. Burnout is thought to be one of the possible responses when this happens.

Athletes negotiate a variety of stressors. These stressors include pressures for selection, psychosocial pressures from others, training related stress, risk of injury, and the potential for being dropped by one's team or sponsor (e.g., Gould et al., 1996; Nicholls & Polman, 2007).

As such, there are plenty of opportunities for athletes to experience stress. Consistent with Smith's (1986) model, research has consistently found that the more athletes experience stress, or utilize ineffective coping strategies (e.g., Madigan et al., 2020), the greater the risk of burnout. Notably, stress is one of the factors most strongly related to athlete burnout, as noted in a recent meta-analysis (e.g., Lin et al., in press), and longitudinal studies have found that increases in stress precede increases in athlete burnout (e.g., DeFreese & Smith, 2014).

Sport may now be more demanding and stressful than it ever has been, which may help explain possible increases in burnout. Participation rates in sport continue to increase (e.g., American Time Use Survey, 2018; Eime et al., 2016; Sport England, 2019) - evident both in respect to the number of sports that now have organized participation and the increased numbers of qualified coaches (e.g., Sports Coach UK, 2017). One consequence is that there are now more people for athletes to compete against, drastically increasing pressures for selection (Eime, Harvey, Charity, & Payne, 2016). To accommodate this increase, there are now more competitions, longer seasons, and more matches per season, even at amateur and junior levels, intensifying the possibility of exposure to sport related stressors such as training related stress and risk of injury (e.g., Klostermann & Nagel, 2014). In addition, athletes themselves may have fewer strategies to deal with such demands. Evidence for this idea comes from research suggesting that early specialization may stunt athletes' psychological development and reduce their breadth of personal coping skills (e.g., LaPrade et al., 2016; Myer et al., 2015). Consequently, athletes may now face more demands and have fewer resources to deal with these demands, resulting in greater stress and burnout.

Deci and Ryan's (2002) Self-Determination Theory (SDT)

The second theory we think is useful in understanding potential changes in burnout is SDT (see Cresswell and Eklund 2005a, 2006a). This organismic theory argues that social-environmental conditions are fundamental to motivated behavior and health and are derived

from fulfillment of three basic psychological needs (autonomy, relatedness, and competence; Ryan & Deci, 2017). SDT assumes that characteristics of the social environment are critical to the level of need satisfaction or need thwarting that individuals experience (Ryan & Deci, 2000). When needs are satisfied, athletes develop intrinsic motives for participation and experience optimal health. When needs are thwarted, athletes develop less intrinsic motives for participation, and less optimal health. In this model, athlete burnout is a state of ill-being that results from psychological need thwarting over time and is characterized by lower intrinsic motivation and a lack of motivation (amotivation).

Aspects of self-determination theory have repeatedly been linked to burnout. In this regard, there is evidence that need thwarting is positively associated with burnout and that need satisfaction is negatively associated with burnout (Jowett, Hill, Hall, & Curran, 2016a). In addition, coach created climates that focus on autonomy are negatively associated with burnout, while those based on controlled practices are positively associated with burnout (Bartholomew et al., 2011). Studies have also shown that burnout is positively associated with amotivation and negatively associated with intrinsic motivation (Cresswell and Eklund 2005a). This is the case in individual studies and across studies (Li et al., 2013). Finally, motivation and burnout have been shown to have similar seasonal variation (e.g., Cresswell and Eklund 2005b). Thus, it is possible that chronically frustrated or unfulfilled psychological needs, as a result of the social environment, will lead to athlete burnout and that altered motivational regulation is an integral part of this process.

Given the importance of social environments in both this and other burnout models, reflecting on what social-structural changes have taken place over the last 20 years is useful in understanding any increases in burnout. In this regard, the professionalization of youth sport and how this has impacted coach and parent behaviours is informative (Gould, 2019). There is evidence that coaches have become more professionalised and more stressed

themselves, both of which are likely to affect coach behaviours towards their athletes (Norris et al., 2017). In combination with an increasing emphasis on performance outcomes and heightened pressure to win that accompany professionalised sport, it is possible autonomy supportive practices have been replaced by controlling ones (e.g., Bartholomew et al., 2009). Likewise, reports are that parents are becoming increasingly over-involved in their children's sport participation potentially signalling more controlling parental behaviour (at least for junior athletes; e.g., Stefansen et al., 2018). Therefore, it may well be that the social environment of sport has shifted towards one that increasingly promotes need thwarting, more controlled motives for participation, and higher burnout levels.

Raedeke's (1997) Commitment-based Model

The final model we use to help provide the basis for understanding changes in burnout is Raedeke's commitment-based model (Raedeke, 1997). Broadly, commitment represents the desire and resolve to continue participating in sport. Commitment is seen as a function of three things. First, how attractive or enjoyable the activity is perceived. Second, which alternatives to the activity are viewed as in a greater or lesser degree as attractive. And, finally, restrictions the athlete perceives to withdraw from sport such as personal investments and social constraints. How athletes interpret these facets determine whether their commitment is based on attraction ("want to") or entrapment ("have to"). According to this perspective, athletes who burn out do so because they are committed solely for entrapment reasons (Raedeke, 1997).

In comparison to the previous models, there is less evidence to support this approach to understanding burnout. The absence of support reflects the fact fewer studies have been conducted rather than the existence of contradictory evidence. There is, however, at least some empirical support for this model. This includes evidence from Raedeke's (1997) original study and more recently from Woods et al. (2020). There is also evidence for the

relevance of commitment more broadly (Gucciardi, Jackson, Coulter, & Mallett, 2011). In addition, there is support for this perspective from both athlete and coach testimonies and interviews, as well as descriptions of entrapment from those that have left sport (e.g., Gustafsson et al., 2008). Consequently, the concepts of commitment and entrapment may give valuable insights into burnout, and may do so over and above the other perspectives we have outlined.

Our contention is that athletes today may well be more committed to their sports than they used to be – this is because they have to be. In response to a more competitive environment, athletes are increasing the amounts of time they invest in their sports. Athletes are now estimated to spend more time in direct training and other related activities than previously (e.g., Baker & Young, 2014). Increased accountability and competitiveness for funding has also prompted athletes to leave less time dedicated to other, competing activities. Accompanying evidence suggests this investment reflects feelings of entrapment (rather than attraction). For example, increasing social pressures to train and perform may restrict athletes' ability to withdraw from sport (e.g., Wheeler & Green, 2014). There may also be a greater range of alternative activities vying for athletes' time including education and online entertainment, and yet, athletes are increasingly becoming more specialized, are doing so at earlier ages, and may be enjoying sport less as a result (e.g., Normund et al., 2017). Overall, changes to the way in which sport is structured may be leading athletes to increasingly commit to sport but to also feel entrapped and obliged to continue sports participation and consequently develop burnout.

The Present Study

There are many reasons to believe that athletes may be more at risk to burnout today than two decades ago. Although speculative, we have presented three frameworks for understanding why this may be the case. However, to date, no study has sought to explore

whether burnout levels are changing. Consequently, the aim of the present study was to examine whether average athlete burnout levels have changed over the past two decades, from 1997 to 2019. In doing so, we note that the findings would be very useful for sports organizations to provide a basis from which to inform policy, develop guidelines, and prioritize burnout prevention. In the present study, we examined the three symptoms of burnout – reduced sense of athletic accomplishment, sport devaluation, and physical and emotional exhaustion – individually, and we also examined a total burnout score where possible. We hypothesized that athletes today would have higher levels of burnout than they did two decades ago. We hypothesized this would apply to all three symptoms and a total burnout score.

Method

Literature Search

In reporting our methodology, we followed recommended guidelines (Stroup et al., 2000). First, an extensive computerized literature search was conducted of the following databases: PsycINFO, PsycARTICLES, MEDLINE, and SPORTDiscus. The following search terms were used: “athlete” and “burn*”. The search date was between January 2001 (the year the first studies with the Athlete Burnout Questionnaire were published) and January 2019. Overall, the search returned 1,016 studies. As well as the standardized search, an exploratory search was conducted on GoogleScholar and by scanning the reference lists of relevant reviews, book chapters, and journal articles. The search and subsequent coding were conducted by the first and second authors. After removing duplicates and screening abstracts for relevance, 727 journal articles remained. These were assessed further using the inclusion criteria below.

Inclusion Criteria

The studies we retrieved were included in the meta-analysis if they included the mean

score of one or more burnout dimensions from the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001); or sufficient information for computation or estimation of these values, and met the following criteria: (a) were published in English; (b) were a published journal article, thesis/dissertation, or conference presentation; and (c) included a sample that was not replicated elsewhere (e.g., included in both a journal article and a thesis/dissertation). These criteria resulted in the final inclusion of 91 journal articles reporting 111 samples and 396 effect sizes from a total of 21,012 athletes. See Figure 1 for an overview of this process.

Recorded Variables

Next, a coding sheet was completed for each study. The coding sheet included: (a) publication information, (b) year, (c) mean age, (d) percentage of the sample that were female, (e) mean score of each burnout dimension, and (f) standard error of each burnout dimension. Table 1 presents the coded information for each study.

To code the year of data collection, we either: (i) if the year of data collection is described in the study, we coded it as such, (ii) otherwise, the year of data collection was coded as 2 years before publication. This is a strategy that is common in similar meta-analyses (Curran & Hill, 2019; Twenge et al., 2001; Twenge et al., 2008).

Several studies included multiple effect sizes (e.g., they measured burnout on separate occasions). In such instances, only one effect size was included in the meta-analyses. This effect size was the average of the reported effect sizes. This is a commonly used strategy to ensure that effect sizes used in the analyses are independent and avoids artificial inflation of sample size, distortion of standard error estimates, and overrepresentation of studies that include multiple effect sizes (Lipsey & Wilson, 2001).

To create and examine a total burnout score, where data were available, we averaged across the three symptoms. In three instances, authors adopted a different response format to that of the original ABQ (6-point Likert-like scale as opposed to 5-point). To ensure all

scores were based on the same five-point scale we used the following formula: Y = (B - A) * (x - a) / (b - a) + A (where A and B are the lower and upper bounds of the new format, and a and b are the lower and upper bounds of the old format; see also Hamamura & Septarini, 2017).

In addition, we examined inter-rater reliability across all coded information (Table 1), which was high (Kappa = .95; McHugh, 2012). The few disagreements were resolved via a consensus of coders with reference to the original material.

Finally, we screened the data for outliers by examining Z scores (Tabachnick & Fidell, 2007). Those with extreme scores (> ±3.29) were removed from further analyses (reduced sense of athletic accomplishment = 2; devaluation = 2, exhaustion = 1, total burnout = 1).[1]

Meta-Analytical Procedures

To examine whether athlete burnout levels have changed over time, we used cross-temporal meta-regression analyses (Twenge et al., 2004; Twenge et al., 2012) with restricted maximum likelihood estimation. To do so, we used JASP, which is based on the metafor Package in R (Viechtbauer, 2010). For these analyses, the year of data collection was entered as the predictor and burnout mean levels as the criterion. To allow for between-sample residual heterogeneity, random-effects meta-regression models were used with an additive between-sample variance component derived from restricted maximum likelihood estimation (see Thompson & Sharp, 1999).

Given the potential for burnout scores to differ based on demographic factors, we first ran exploratory analyses examining whether age, gender (percentage of the sample that were female), competitive level (percentage elite; defined as the percent of the sample competing at national level or above), and sport type (percentage of athletes competing in individual

[1]We note that findings were consistent with and without the exclusion of outliers.

sports) predicted burnout levels. To control for potential confounders (factors that could explain changes in burnout), we included significant predictors in the second step of our main analyses.

Following similar meta-analyses (e.g., Curran & Hill, 2019), we also computed the effect sizes for overall change in average burnout levels over time. To do so, we used regression equations ($y = bx + c$) to derive predicted burnout scores for the first year of our dataset (1997) and the latest year (2019). We subtracted the two scores and divided it by the weighted-average of within-sample standard deviations to quantify change in terms of Cohen's *d* (see also Twenge, 2001). Effect size magnitude was estimated using conventional standards (small, $d = 0.20$; medium, $d = 0.50$; large, $d = 0.80$; Cohen, 1992).

Results

Sample Characteristics

In the 91 journal articles included in the meta-analyses, 21,012 athletes were recruited. They were on average 18.76 (*SD* = 4.38) years old, 30.77 (*SD* = 24.50) percent female, 55.27 (*SD* = 45.44) percent elite, and 36.70 (*SD* = 43.19) percent from individual sports. Across all studies, athletes reported average reduced sense of athletic accomplishment levels of 2.46 (*SD* = 0.44), average devaluation levels of 2.03 (*SD* = 0.47), average exhaustion levels of 2.45 (*SD* = 0.41), and average total burnout levels of 2.29 (*SD* = 0.40).

Demographic Analyses

Reduced sense of athletic accomplishment. Results suggested that age (*B* = .012, 95% CI = -.003 to .028, *p* = .12), gender (*B* = -.003, 95% CI = -.006 to .0002, *p* = .06), competitive level (*B* = -.0004, 95% CI = -.002 to .001, *p* = .64) and sport type (*B* = -.002, 95% CI = -.004 to .0005, *p* = .14) did not predict differences in average levels of reduced sense of athletic accomplishment.

Devaluation. Results suggested that age (*B* = .023, 95% CI = .006 to .04, $p < .05$) did

predict differences in devaluation. However, gender (B = .002, 95% CI = -.002 to .005, p = .27), competitive level (B = -.001, 95% CI = -.003 to .0007, p = .20), and sport type (B = .0008, 95% CI = -.001 to .003, p = .46) did not.

Exhaustion. Results suggested that age (B = .0003, 95% CI = -.015 to .016, p = .97), gender (B = .0009, 95% CI = -.002 to .004, p = .57), competitive level (B = -.001, 95% CI = -.003 to .0004, p = .15), and sport type (B = .00007, 95% CI = -.002 to .002, p = .95) did not predict differences in average levels of exhaustion.

Total burnout. Results suggested that age (B = .012, 95% CI = -.001 to .026, p = .07), gender (B = .001, 95% CI = -.0009 to .004, p = .22), competitive level (B = -.0001, 95% CI = -.001 to .001, p = .85), and sport type (B = .0007, 95% CI = -.0008 to .002, p = .36), did not predict differences in average levels of total burnout.

Overall, average burnout symptoms did not appear to differ based on demographic factors, with the exception of age for devaluation, which we controlled for in our main analyses below.

Cross-Temporal Meta-Regression

Reduced sense of athletic accomplishment. Results of cross-temporal meta-regression (k = 97) suggested that year did predict mean levels of reduced sense of athletic accomplishment (B = .02, 95% CI = .0006 to .039, $p < .05$, R^2 = .06). These findings suggest that average levels of a reduced sense of athletic accomplishment have increased over time (see Figure 2).[2]

Devaluation. Results of cross-temporal meta-regression (k = 97) suggested that year

[2]We ran additional analyses examining whether demographic factors moderated the relationship between year and average burnout levels. Neither age, gender, competitive level, nor sport type moderated the present relationships.

did predict mean levels of devaluation (B = .024, 95% CI = .004 to .044, $p < .05$, R^2 = .07). This was also the case when controlling for age (Year: B = .022 95% CI = .006 to .038, $p <$ .05; Age: B = .025, 95% CI = .009 to .042, $p < .05$). Overall, these findings suggest that average levels of sport devaluation have also increased over time (see Figure 3).

Exhaustion. Results of cross-temporal meta-regression (k = 110) suggested that year did not predict mean levels of exhaustion (B = -.001, 95% CI = -.017 to .020, p = .90, R^2 = .01). These findings suggest that average levels of physical and emotional exhaustion have not changed over time (see Figure 4).

Total burnout. Results of cross-temporal meta-regression (k = 92) suggested that year did not predict mean levels of total burnout (B = .008, 95% CI = -.006 to .022, p = .26, R^2 = .04). These findings suggest that average levels of total burnout have not changed over time (see Figure 5).

Effect sizes. We calculated Cohen's d as an effect size measure for the differences in burnout levels over the study period (22 years). In this regard, the effect size for increases in average levels of a reduced sense of athletic accomplishment could be considered medium (d = 0.55) and for increases in average levels of sport devaluation could be considered medium-to-large (d = 0.66). The effect sizes for exhaustion (d = 0.03) and total burnout (d = 0.22) could be considered small.

Discussion

The present study aimed to examine whether average athlete burnout levels have changed over the past two decades. Capitalizing on the large volume of work that has been conducted since Raedeke and Smith introduced their multidimensional measure, we conducted a cross-temporal meta-analysis of 91 journal articles including over 21,000 athletes. Overall, we found that athletes' mean levels of reduced sense of athletic accomplishment and sport devaluation have increased. We did not, however, find that

physical and emotional exhaustion or total burnout had increased.

Changes in Athlete Burnout Over Time

Sport is a domain in which the study of mental health difficulties including burnout is becoming increasingly important. For the first time, we provide evidence that athletes are now at greater risk of burnout symptoms than ever before. Because burnout negatively affects athletes in many ways, including reducing performance, hindering interpersonal relationships, and impairing wellbeing (Eklund & DeFreese, 2020; Gustafsson et al., 2017), these findings are worrying. Growing numbers of athletes may be susceptible to burnout and these negative consequences, and if the trend persists, many more athletes will be in the future. Accordingly, the present findings highlight the need for increased awareness of burnout in sport.

We found that mean levels of a reduced sense of athletic accomplishment have increased. This effect was considered medium sized. It appears that athletes have responded to the increase in competitors and competitions with a greater negative evaluation of their own performances and abilities. It is also possible that a narrower array of coping skills (as a function of early specialisation), higher external pressures, and increasingly thwarted needs (especially competence) have contributed to these evaluations. We, therefore, speculate that increasing stress and controlling environments mean that more athletes are now likely to consider their sporting ability and accomplishments to be lower than athletes from two decades ago.

We also found evidence that average levels of sport devaluation have increased. This finding remained when controlling for athlete age. Interestingly, although athletes typically report lower levels of devaluation compared to the other burnout symptoms, the rate of increase in devaluation was similar, if not slightly larger, to that of reduced accomplishment. Consequently, at the same time that athletes are evaluating their achievements in sport more

negatively, they are becoming more detached and less interested in their sport. As per the three burnout models, this increasing detachment could be due to (failing) coping mechanisms (Smith, 1986), shifts away from autonomous motives for participation (Cresswell & Eklund 2005a, 2006a), or increasing social pressures coupled with unattractive or undesirable alternatives that diminish the value of sport (Raedeke, 1997). Regardless of the mechanisms, the present findings suggest that as more athletes evaluate their sport abilities more negatively, they have concurrently felt the need to distance themselves from their sport more readily too.

We did not find evidence that average levels of physical and emotional exhaustion have increased over time. This is an interesting finding given the increases in the other two symptoms. We think there are several possible explanations for this finding. For example, sport has always been extremely taxing and pushed athletes both physically and emotionally. It is, therefore, possible that sport has changed less in this regard over time. This is perhaps best supported by the fact we did not find that exhaustion had decreased either – instead, we found no changes. It may also be the case that with the progress that has been made in understanding recovery (e.g., Doeven et al., 2018; Vitale et al., 2019), athletes are now being supported in this aspect of their participation better. As such, although athletes are doing more, and more is expected of them, the chances that they become overwhelmed by the physical demands of their sport have not changed.

The finding that some symptoms are increasing and others are not is indicative of how the sociocultural context affects the symptoms differently (see also Leiter, 1993). In addition, they also signal how some symptoms of athlete burnout are more susceptible to change and are less stable over time than others. With these things in mind, the findings emphasise the importance of examining each of the symptoms separately. Indeed, a focus only on total burnout in the current study would have revealed no changes over time and disguised the

worrying underlying trends for two of its symptoms. Instead, by focusing on the three symptoms, a more nuanced picture is allowed to emerge. That is, it appears that while athletes continue to *feel* the same way about their sport participation (i.e., physically and emotionally exhausted to the same degree), they may be *thinking* about their participation somewhat differently, perceiving fewer accomplishments and less attachment to their sport.

Practical Implications

This study provides important information for those working in sport. First and foremost, the present findings highlight that it has never been more crucial to protect athletes from burnout and its consequences. Like in other contexts (e.g., healthcare, education; e.g., Brock-Utne & Jaffe, 2020), clear guidelines for athletes, coaches, and sports organizations are needed. Recently, there have been attempts to provide athletes and those working with athletes with such guidelines. For example, Madigan et al. (2019) provided an expert statement aimed at reviewing research and providing key recommendations in this area. We briefly summarise these here, and wish to add the importance of burnout awareness - increasing athletes' and coaches' understanding of what burnout is and where to seek help should they experience the symptoms themselves, or notice the symptoms in others - in this regard also.

Coaches and support staff can be trained to provide athletes with environments that are less likely to be conducive to burnout development. This could include offering more autonomy support to athletes (e.g., providing athletes with the opportunity to make choices and decisions), positive feedback, and social support (Pacewicz, Mellano, & Smith, 2019), which have all been found to be effective in research outside of sport (e.g., West et al., 2016). Interventions targeting athletes themselves should aim to reduce the potential for chronic stress and equip athletes with a range of coping resources and strategies. This could include psychological skills training which has been found to effectively reduce stress in athletes

(e.g., Birrer & Morgan, 2010).

Unfortunately, however, very little research has evaluated the efficacy of any of these approaches in reducing the risk of burnout in sport. We are aware of only three intervention studies that have been evaluated in athlete samples (see Madigan, 2021, for a review). Of these, two are observational studies that focused on student-athletes, and one is a randomized controlled trial focused on Gaelic football players (Dubuc-Charbonneau & Durand-Bush, 2015; Gabana et al., 2019; Langan et al., 2015). The latter has provided preliminary support for increasing autonomy supportive coach behaviors, at least in attenuating increases in burnout. What is readily apparent is that we need more research that tests and evaluates interventions to prevent and reduce burnout in athletes. This is going to be central to halting increases in burnout and will hopefully provide the means to begin to reverse this trend.

Limitations and Future Research

The present study has several limitations. First, in analyzing changes in mean athlete burnout levels, although we controlled for demographic factors, we have not tracked the same individuals over time, and have instead adopted a year-based cohort design. Future studies are therefore necessary that track individuals to determine whether the present findings replicate when intraindividual change is examined. Such studies are likely to require large groups of researchers and multi-site collaborations.

Second, the present findings are based on data that only extends back two decades. As such, we are unable to make conclusions regarding burnout levels before this time.

Third, in examining changes in burnout we did not examine factors that may underpin these changes. We provided three possible theoretical explanations for increased burnout. As such, future work is necessary to assess which of these various pathways might be more or less contributing to this temporal phenomenon and unpicking which of these perspectives – stress, motivation, or commitment – is best for understanding the present findings. This

would help further guide prevention and intervention in sport.

In a similar vein, there may be alternate explanations for these trends. For example, it is plausible that it is now more acceptable now than two decades ago to report symptoms tied to mental health. It is also possible that the ubiquity of social media has resulted in a greater tendency and capacity for social comparison with other athletes, comparisons to more and potentially more successful athletes could help to explain the greater levels of reduced accomplishment found in the present study (see also Madigan et al., in press). Further research is required to begin to test the plausibility of these ideas and other possible pathways through which increased average burnout symptoms have emerged.

Fourth, in the present review, we included studies that employed translations of the Athlete Burnout Questionnaire. As such, given that the studies were from different countries, an examination of cultural differences in trends over time would be a worthwhile direction for future work. More broadly, we are also unable to discount a range of possible methodological effects in explaining the present findings. We recommend that future studies ensure the routine reporting of such information (e.g., data collection method) to allow for an examination of additional methodological covariates.

Finally, given the links between burnout and wellbeing (e.g., depression), it would be interesting to see whether the present findings help explain recent increases in mental health difficulties in athletes. This is a clear and important direction for future work.

Conclusion

The present study sought to determine whether average athlete burnout levels had changed over the past two decades. In this regard, average levels of a reduced sense of athletic accomplishment and sport devaluation have increased. The findings suggest that growing numbers of athletes are at risk of burnout symptoms and their negative consequences. Accordingly, sport is in urgent need of prevention and interventions strategies

to stop and reverse this trend.

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Table 1.

Characteristics of Studies Included in the Meta-Analysis

	Sample				Means and Standard Errors							
Study	*N*	Year	Age	%Female	E-*M*	E-*SE*	R-*M*	R-*SE*	D-*M*	D-*SE*	T-*M*	T-*SE*
Adie, Duda, & Ntoumanis, 2012	91	2010	13.82	0.00	2.19	0.10	–	–	–	–	–	–
Adie, Duda, Ntoumanis, 2008	539	2006	22.75	49.70	2.31	0.04	–	–	–	–	–	–
Ahmed, Ho, & Lee, 2015 (Sample 1)	70	2013	–	0.00	3.46	0.09	3.57	0.10	3.35	0.10	–	–
Ahmed, Ho, & Lee, 2015 (Sample 2)	65	2013	–	0.00	3.76	0.09	3.80	0.08	–	–	–	–
Ahmed, Ho, & Lee, 2015 (Sample 3)	80	2013	–	0.00	–	–	3.72	0.08	–	–	–	–
Al-Yaaribi & Kavussanu, 2017	272	2015	21.86	64.70	2.24	0.05	2.40	0.05	1.83	0.05	2.16	0.05
Appleton & Duda, 2016	406	2014	23.10	33.00	2.45	0.04	2.32	0.03	2.09	0.04	2.29	0.04
Appleton & Hill, 2012	231	2010	16.92	11.70	2.40	0.06	3.07	0.05	1.80	0.06	2.42	0.05
Appleton, Hall, & Hill, 2009	201	2007	15.64	0.00	2.25	0.06	2.10	0.05	1.66	0.05	2.00	0.05
Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011	289	2009	14.54	72.70	2.13	0.05	–	–	–	–	–	–
Black & Smith, 2007	182	2005	16.00	57.10	2.92	0.07	2.29	0.06	1.99	0.07	2.40	0.06
Chen & Chang, 2014	293	2012	16.14	43.00	3.32	0.25	2.80	0.24	2.98	0.25	3.03	0.25
Chiu, Lu, Lin, Nien, Hsu, & Liu, 2016	196	2014	19.88	29.08	2.78	0.26	2.71	0.25	2.38	0.26	2.62	0.26
Cremades, Wated, & Wiggins, 2011 (Sample 1)	72	2009	20.15	0.00	2.40	0.09	2.26	0.09	1.84	0.09	2.17	0.09

Cremades, Wated, & Wiggins, 2011 (Sample 2)	85	2009	20.15	100.00	2.96	0.10	2.53	0.08	2.20	0.09	2.56	0.09
Cresswell & Eklund, 2005a	102	2003	24.75	–	2.39	0.06	2.26	0.07	1.79	0.06	2.15	0.06
Cresswell & Eklund, 2005b	199	2003	25.19	0.00	2.32	0.05	2.43	0.05	2.16	0.05	2.30	0.05
Cresswell & Eklund, 2006a	109	2004	25.23	–	2.47	0.05	2.22	0.05	1.83	0.06	2.17	0.05
Cresswell & Eklund, 2006b	392	2004	25.30	0.00	2.32	0.04	2.43	0.03	2.16	0.04	2.30	0.04
Cresswell, 2009	183	2007	25.19	0.00	2.82	0.05	2.39	0.04	1.96	0.05	2.39	0.05
Curran, Appleton, Hill, & Hall, 2011,	149	2009	16.20	0.00	2.46	0.07	2.15	0.05	1.63	0.06	2.08	0.06
Curran, Appleton, Hill, & Hall, 2013	173	2011	15.46	0.00	2.37	0.05	2.10	0.05	1.59	0.05	2.02	0.05
Davis, Appleby, Davis, Wetherell, & Gustafsson, 2018	82	2016	19.87	32.90	2.61	0.07	–	–	–	–	–	–
DeFreese & Smith, 2013	227	2011	19.70	0.00	2.59	0.05	2.25	0.05	2.08	0.06	2.31	0.05
DeFreese & Smith, 2013	235	2011	19.80	61.30	2.73	0.06	2.31	0.05	2.08	0.06	2.37	0.06
DeFreese & Smith, 2014	465	2012	19.70	59.00	2.87	0.05	2.67	0.04	2.31	0.05	2.61	0.05
Fernadez-Rio, Cecchini, & Mendez-Gimenez, 2017	48	2015	25.14	100.00	2.74	0.12	2.60	0.08	3.09	0.08	2.81	0.09
Gillet, Berjot, Vallerand, Amoura, & Rosnet, 2012	153	2010	41.29	15.00	1.79	0.06	–	–	–	–	–	–
Gillham, Burton, & Gillham, 2013	380	2011	19.90	57.30	2.30	0.05	2.10	0.04	1.80	0.04	2.07	0.04
Gomes, Faria, & Vilela, 2017	673	2015	14.78	12.60	2.04	0.03	2.06	0.03	1.68	0.03	1.93	0.03
Gotwals, 2011	117	2009	21.28	41.03	2.80	0.09	2.51	0.07	2.10	0.07	2.47	0.08

Grobbelaar, Malan, Dawie, Steyn, & Ellis, 2010 (Sample 1)	12	2007	23.15	0.00	1.85	0.18	2.30	0.22	1.63	0.19	1.93	0.20
Grobbelaar, Malan, Dawie, Steyn, & Ellis, 2010 (Sample 2)	15	2007	22.67	0.00	1.70	0.11	2.18	0.11	1.44	0.12	1.77	0.11
Grobbelaar, Malan, Dawie, Steyn, & Ellis, 2010 (Sample 3)	14	2007	21.05	0.00	1.72	0.10	2.26	0.11	1.38	0.10	1.79	0.10
Gucciardi, Jackson, Coulter, & Mallett, 2011 (Sample 1)	199	2009	16.89	23.12	2.20	0.06	2.18	0.05	1.67	0.05	2.02	0.05
Gucciardi, Jackson, Coulter, & Mallett, 2011 (Sample 2)	321	2009	26.07	19.00	2.29	0.04	2.26	0.04	2.01	0.05	2.19	0.04
Gustaffsson, Skoog, Davis, kentta, & Haberl, 2015	233	2013	17.50	45.90	1.87	0.04	2.49	0.05	1.70	0.05	2.02	0.05
Gustafsson & Skoog, 2012	217	2010	17.21	36.00	2.24	0.05	2.34	0.05	2.15	0.06	2.24	0.06
Gustafsson, Sagar, & Stenling, 2017	258	2015	17.40	41.90	2.17	0.05	2.50	0.05	2.13	0.05	2.27	0.05
Gustafsson, Carlin, Podlog, Stenling, & Lindwall, 2018	391	2016	20.60	48.60	2.15	0.03	2.48	0.03	1.79	0.04	2.14	0.04
Gustafsson, Hassmén, & Podlog, 2010	178	2008	17.10	35.40	2.02	0.05	2.47	0.06	1.95	0.06	2.15	0.05
Gustafsson, Hassmén, & Hassmén, 2011	258	2009	17.30	36.40	2.30	0.05	2.50	0.05	2.10	0.05	2.30	0.05
Gustafsson, Hill, Stenling, & Wagnsson, 2016	237	2014	16.99	47.70	2.41	0.06	2.59	0.04	2.33	0.06	2.44	0.06
Gustafsson, Skoog, Podlog, Lundqvist, &	238	2011	17.00	29.80	2.33	0.05	2.36	0.05	2.10	0.06	2.26	0.05

Wagnsson, 2013												
Harris & Waton II, 2011	88	2009	10.36	55.60	2.11	0.11	1.87	0.09	1.95	0.09	1.98	0.09
Harris & Watson II, 2014 (Sample 1)	45	2012	9.17	–	1.89	0.15	–		1.74	0.10	–	–
Harris & Watson II, 2014 (Sample 2)	87	2012	12.61	–	2.56	0.11	2.15	0.09	2.03	0.10	2.25	0.10
Harris & Watson II, 2014 (Sample 3)	45	2012	16.00	–	2.03	0.18	2.20	0.11	2.06	0.16	2.10	0.15
Hill & Appleton, 2011	202	2009	18.80	0.00	2.15	0.05	2.39	0.04	1.65	0.05	2.06	0.05
Hill, 2013	171	2011	16.17	0.00	2.45	0.05	2.28	0.05	1.74	0.05	2.16	0.05
Hill, Hall, & Appleton, 2010	206	2008	15.15	52.90	2.33	0.06	2.29	0.05	1.92	0.06	2.18	0.06
Hill, Hall, Appleton, & Kozub, 2008	151	2006	14.40	0.00	2.28	0.07	2.35	0.06	1.86	0.07	2.16	0.07
Hill, Hall, Appleton, & Murray, 2010	150	2008	26.05	42.70	2.57	0.07	2.56	0.06	2.23	0.07	2.45	0.06
Ho, Appleton, Cumming, & Duda, 2015 (Sample 1)	212	2013	27.30	26.40	2.41	0.06	2.26	0.05	2.22	0.05	2.30	0.05
Ho, Appleton, Cumming, & Duda, 2015 (Sample 2)	205	2013	18.80	38.00	2.50	0.06	2.41	0.05	2.00	0.06	2.30	0.06
Hodge, Lonsdale, Ng, 2008	133	2006	19.70	0.00	2.76	0.05	2.35	0.05	2.00	0.06	2.37	0.05
Holmberg & Sheridan, 2013	598	2011	21.30	49.50	2.63	0.04	2.20	0.03	2.12	0.04	2.32	0.03
Ingrell, Johnson, & Ivarsson, 2018	67	2016	12.70	38.50	2.43	0.11	2.22	0.09	1.78	0.10	2.14	0.10
Isoard-Gautheur, Guillet-Descas, & Duda, 2013	309	2011	15.40	50.80	2.61	0.04	2.72	0.03	1.80	0.04	2.37	0.04
Isoard-Gautheur, Guillet-Descas, Gaudreau, Chanal, 2015 (Sample 1)	11	2007	–	–	2.60	0.21	–	–	1.46	0.14	–	–

Isoard-Gautheur, Guillet-Descas, Gaudreau, Chanal, 2015 (Sample 2)	142	2007	–	–	2.65	0.06	2.98	0.05	1.58	0.05	2.40	0.05
Isoard-Gautheur, Guillet-Descas, Gaudreau, Chanal, 2015 (Sample 3)	343	2007	–	–	2.75	0.04	2.90	0.03	1.70	0.04	2.45	0.04
Isoard-Gautheur, Guillet-Descas, Gaudreau, Chanal, 2015 (Sample 4)	219	2007	–	–	2.71	0.05	2.84	0.04	1.89	0.05	2.48	0.05
Isoard-Gautheur, Guillet-Descas, Gaudreau, Chanal, 2015 (Sample 5)	131	2007	–	–	2.62	0.07	2.82	0.06	2.11	0.08	2.52	0.07
Isoard-Gautheur, Guillet-Descas, Gaudreau, Chanal, 2015 (Sample 6)	49	2007	–	–	2.49	0.13	2.72	0.10	2.32	0.17	2.51	0.13
Isoard-Gautheur, Martinent, Guillet-Descas, Trouilloud, Cece, & Mette, 2017	209	2015	19.00	46.89	2.64	0.06	2.22	0.05	1.78	0.04	2.21	0.05
Isoard-Gautheur, Oger, Martin-Krumm, & Guillet, 2010	461	2008	15.68	46.20	2.65	0.05	2.73	0.04	2.02	0.04	2.47	0.04
Isoard-Gautheur, Trouilloud, Gustafsson, & Guillet-Descas, 2016	360	2014	21.00	26.60	2.88	0.06	2.80	0.06	2.32	0.06	2.67	0.06
Jordalen, Lemyre, & Durand-Bush, 2016	199	2014	17.00	36.20	1.98	0.05	–	–	–	–	–	–
Jowett, Hill, Hall, & Curran, 2013	211	2011	15.61	23.70	2.41	0.06	2.20	0.04	1.79	0.02	2.13	0.04
Kent, Kingston, & Paradis, 2018	120	2016	22.04	37.50	3.76	0.14	–	–	3.18	0.15	–	–
Lemyre, Hall, & Roberts, 2008	141	2006	20.10	43.00	2.11	0.06	2.57	0.07	2.11	0.06	2.26	0.06

Lemyre, Roberts, & Stray-Gundersen, 2007	141	2005	20.10	42.60	2.23	0.06	2.73	0.07	–	–	–	–
Lemyre, Treasure, & Roberts, 2006	63	2004	20.10	30.10	2.88	0.12	2.50	0.12	1.92	0.10	2.43	0.11
Li, Wang, & Pyun, 2017	691	2015	14.11	50.40	2.70	0.03	2.75	0.03	2.33	0.03	2.59	0.03
Lonsdale & Hodge, 2011	119	2009	24.74	57.14	2.65	0.07	2.25	0.06	1.96	0.07	2.28	0.07
Lonsdale, Hodge, Rose, 2009	201	2007	22.90	60.10	2.47	0.06	2.30	0.05	2.37	0.05	2.38	0.05
Lu, Hsu, Chan, Cheen, & Kao, 2012	334	2010	19.26	33.80	2.94	0.24	2.87	0.25	2.73	0.24	2.85	0.24
Madigan & Nicholls, 2017	102	2015	17.70	27.50	2.31	0.07	2.30	0.06	2.02	0.07	2.21	0.07
Madigan, Stoeber, & Passfield, 2015	103	2014	17.70	20.79	2.24	0.06	2.81	0.05	2.40	0.06	2.48	0.06
Madigan, Stoeber, & Passfield, 2016a	141	2015	17.30	12.10	2.20	0.06	2.80	0.07	2.28	0.06	2.43	0.06
Madigan, Stoeber, & Passfield, 2016b	129	2015	24.80	48.84	2.23	0.07	2.37	0.06	2.13	0.07	2.24	0.07
Markati, Psychountaki, Kingston, Karteroliotis, & Apostolidis, 2018	142	2016	15.75	61.00	2.06	0.06	2.48	0.05	–	–	–	–
Martinent, Decret, Guillet-Descas, & Isoard-Gautheur, 2014	145	2012	13.98	31.70	2.99	0.08	2.39	0.06	1.79	0.07	2.39	0.07
Martinent, Decret, Isoard-Gautheur, Filaire, & Ferrand, 2014	148	2012	14.20	31.10	2.82	0.07	2.43	0.06	1.78	0.07	2.34	0.07
Moen & Wells, 2016	78	2014	18.50	33.00	2.52	0.10	2.60	0.09	2.20	0.08	2.44	0.09
Moen, Federici, & Skaalvik, 2014	211	2012	17.20	–	2.27	0.06	–	–	–	–	–	–
Pacewicz, Gotwals, & Blanton, 2018	173	2016	19.83	0.50	2.99	0.07	2.97	0.03	2.20	0.07	2.72	0.06
Perreault, Gaudreau, Lapointe, & Lacroix, 2007	259	2005	14.80	26.60	2.16	0.05	1.92	0.04	1.62	0.04	1.90	0.04

Raedeke & Smith, 2001 (Sample 1)	244	1997	15.80	53.70	3.06	0.05	2.30	0.05	2.19	0.06	2.52	0.05
Raedeke & Smith, 2001 (Sample 2)	208	1999	19.60	63.90	2.62	0.06	2.37	0.05	2.02	0.06	2.34	0.06
Raedeke, Arce, De Francisco, Seoane, & Ferraces, 2013	302	2011	19.06	32.00	2.24	0.05	1.73	0.04	2.37	0.05	2.11	0.04
Reinboth & Duda, 2004	265	2002	16.44	0.00	2.43	0.05	–	–	–	–	–	–
Smith, Gustafsson, & Hassmén, 2010	206	2008	17.20	35.40	2.23	0.05	2.33	0.06	2.15	0.06	2.24	0.06
Smith, Hill, & Hall, 2018	162	2015	16.15	0.00	2.04	0.06	2.17	0.05	1.54	0.04	1.91	0.05
Smith, Ntoumanis, & Duda, 2007	210	2005	21.02	49.00	2.20	0.07	–	–	–	–	–	–
Strachan, Côté, & Deakin, 2009a	123	2007	13.90	74.80	2.34	0.08	1.77	0.06	1.58	0.06	1.90	0.07
Strachan, Côté, & Deakin, 2009b (Sample 1)	34	2007	13.40	–	2.03	0.12	1.65	0.10	1.35	0.08	1.68	0.10
Strachan, Côté, & Deakin, 2009b (Sample 2)	40	2007	13.80	–	2.70	0.15	1.82	0.09	1.83	0.09	2.12	0.11
Tabei, Fletcher, & Goodger, 2012 (Sample 1)	46	2010	–	0.00	2.16	0.09	2.31	0.09	1.64	0.10	2.04	0.09
Tabei, Fletcher, & Goodger, 2012 (Sample 2)	4	2010	–	0.00	3.20	0.20	3.25	0.25	3.15	0.15	3.20	0.20
Tabei, Fletcher, & Goodger, 2012 (Sample 3)	43	2010	–	0.00	2.84	0.14	2.76	0.10	2.64	0.14	2.75	0.13
Tabei, Fletcher, & Goodger, 2012 (Sample 4)	5	2010	–	0.00	3.16	0.12	3.36	0.13	3.48	0.21	3.33	0.15
Torrado, Arce,Vales-Vázquez, Areces, Iglesias, Valle, & Patiño, 2017	219	2015	24.12	0.00	2.11	0.05	–	–	1.92	0.05	–	–
Turner & Moore, 2016	46	2014	15.62	0.00	1.95	0.09	–	–	–	–	–	–
Verkooijen, van Hove, & Dik, 2012 (Sample 1)	61	2010	19.20	59.00	2.37	0.09	2.19	0.07	1.68	0.07	2.08	0.08
Verkooijen, van Hove, & Dik, 2012 (Sample 2)	62	2010	18.60	43.00	2.13	0.09	1.89	0.08	1.82	0.09	1.95	0.09

Vitali, Bortoli, Bertinato, Robazza, & Schena, 2015	87	2013	15.92	52.90	1.73	0.07	2.27	0.08	1.55	0.08	1.85	0.08
Walker, 2013	104	2011	16.00	50.00	2.27	0.10	2.57	0.07	2.35	0.11	2.40	0.09
Zhang, Chung, Si, 2017	379	2015	19.59	42.74	2.62	0.04	2.75	0.03	2.47	0.05	2.61	0.04
Zhang, Si, Chung, & Gucciardi, 2016	387	2014	15.44	42.40	2.88	0.04	2.80	0.04	2.50	0.04	2.73	0.04

Note. E = Exhaustion. R = Reduced sense of accomplishment. D = Devaluation. T = Total burnout *M* = Mean. *SE* = Standard error. Presented effect sizes are rounded to two decimal places.

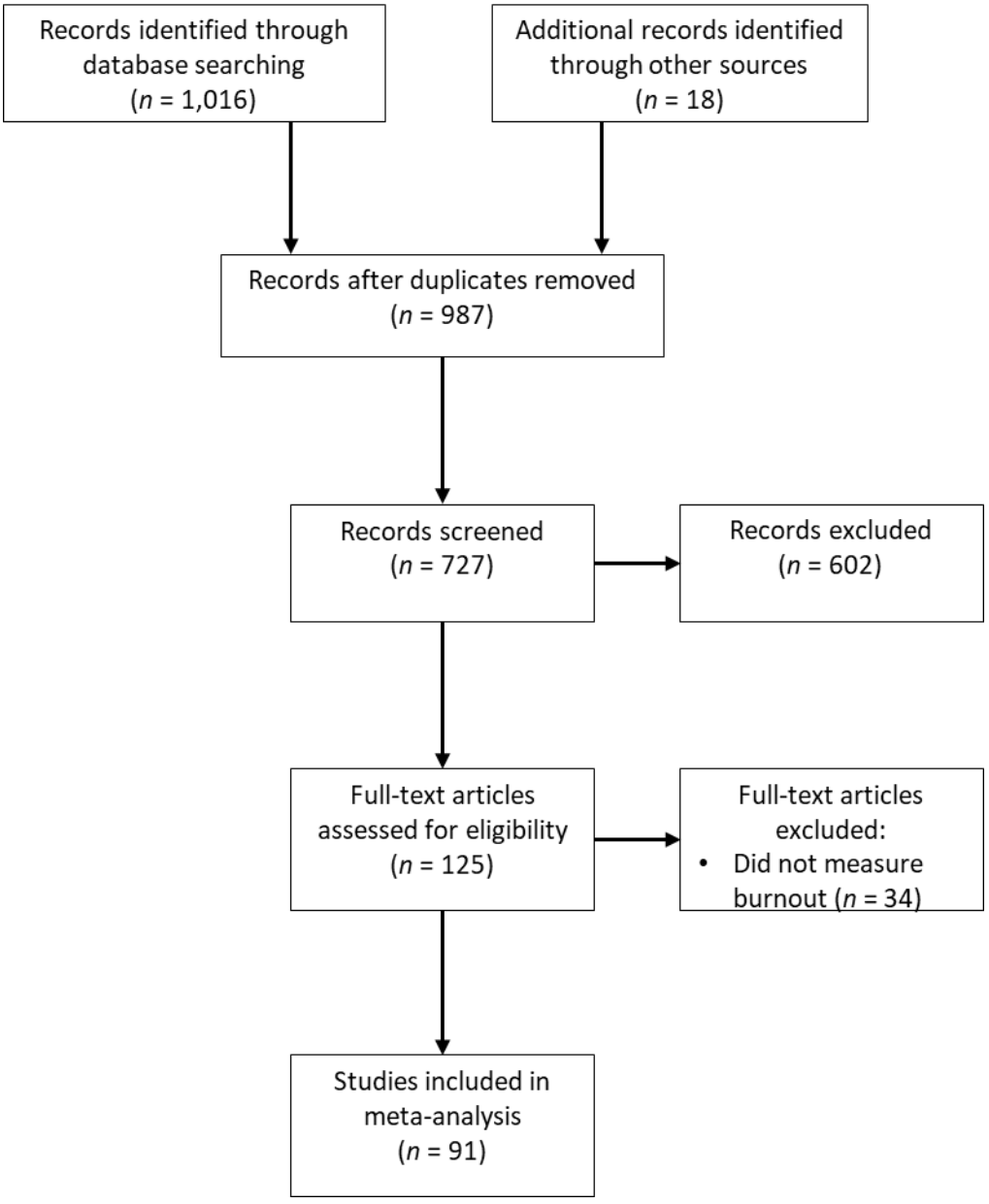

Figure 1. PRISMA diagram outlining the study selection process.

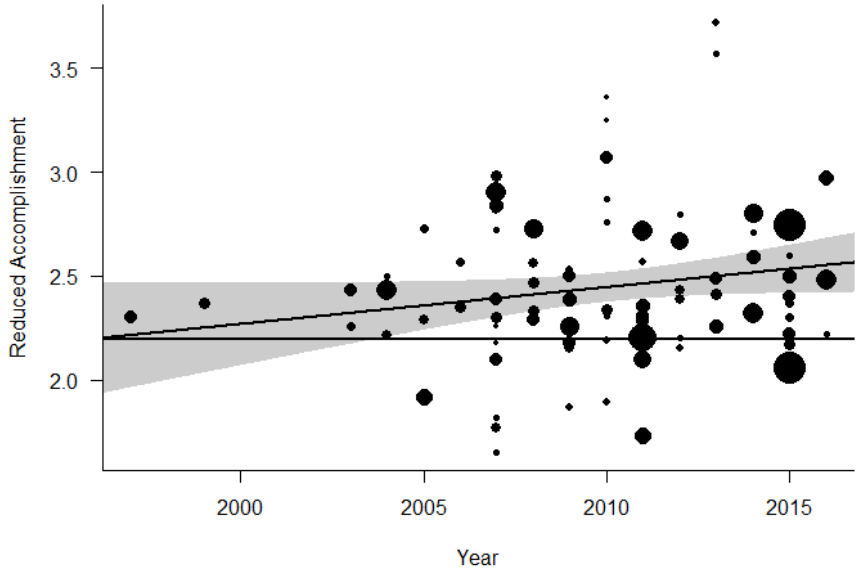

Figure 2. Changes in mean levels of athletes' reduced sense of athletic accomplishment over time.

Note. Black circles represent study means, with the size illustrating its contribution to the meta-analytic effect. The solid line reflects the predicted values from our meta-regression. The grey shaded area depicts the upper and lower limits of the 95% confidence interval for the predicted values. For comparison, the horizontal line reflects no change. Y-axis values represent the following descriptors: 1.0 = "almost never", 2.0 = "rarely", 3.0 = "sometimes", 4.0 = "frequently", 5.0 = "almost always".

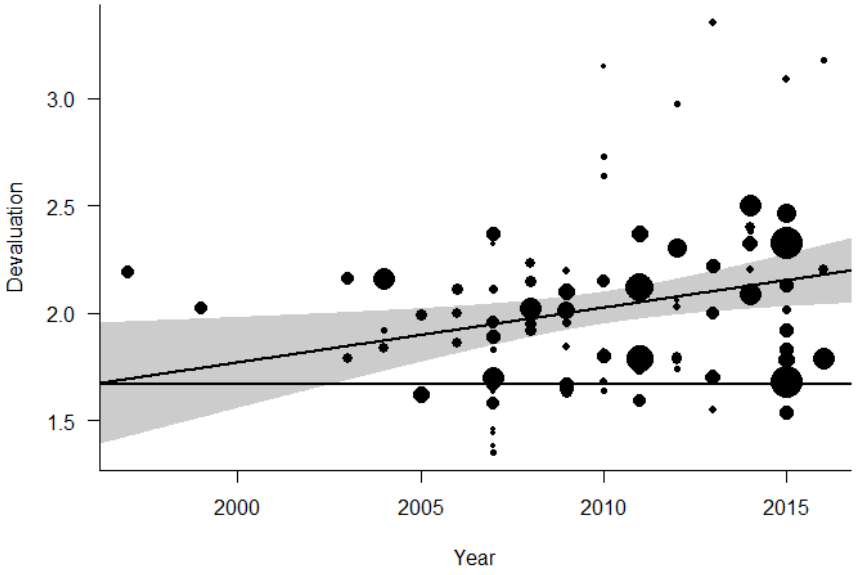

Figure 3. Changes in mean levels of athletes' sport devaluation over time.

Note. Black circles represent study means, with the size illustrating its contribution to the meta-analytic effect. The solid line reflects the predicted values from our meta-regression. The grey shaded area depicts the upper and lower limits of the 95% confidence interval for the predicted values. For comparison, the horizontal line reflects no change. Y-axis values represent the following descriptors: 1.0 = "almost never", 2.0 = "rarely", 3.0 = "sometimes", 4.0 = "frequently", 5.0 = "almost always".

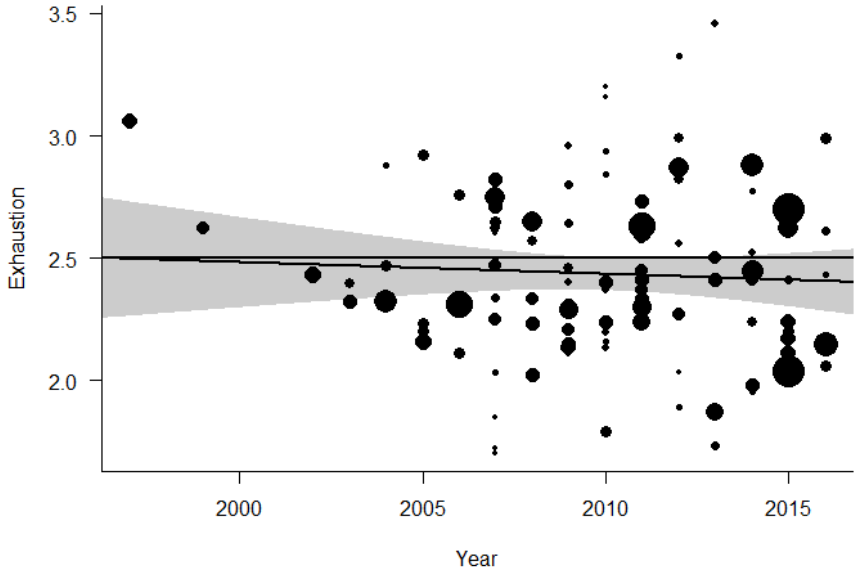

Figure 4. Changes in mean levels of athletes' physical and emotional exhaustion over time.

Note. Black circles represent study means, with the size illustrating its contribution to the meta-analytic effect. The solid line reflects the predicted values from our meta-regression. The grey shaded area depicts the upper and lower limits of the 95% confidence interval for the predicted values. For comparison, the horizontal line reflects no change. Y-axis values represent the following descriptors: 1.0 = "almost never", 2.0 = "rarely", 3.0 = "sometimes", 4.0 = "frequently", 5.0 = "almost always".

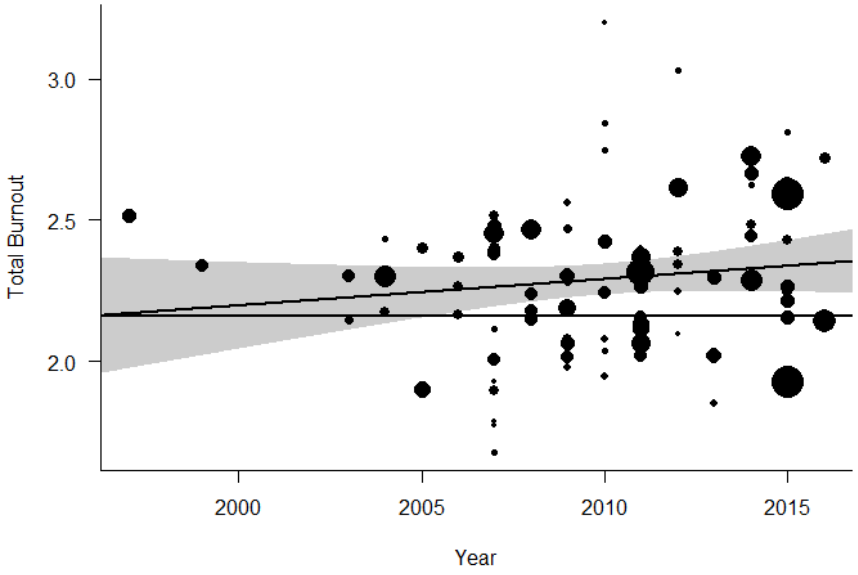

Figure 5. Changes in mean levels of athletes' total burnout over time.

Note. Black circles represent study means, with the size illustrating its contribution to the meta-analytic effect. The solid line reflects the predicted values from our meta-regression. The grey shaded area depicts the upper and lower limits of the 95% confidence interval for the predicted values. For comparison, the horizontal line reflects no change. Y-axis values represent the following descriptors: 1.0 = "almost never", 2.0 = "rarely", 3.0 = "sometimes", 4.0 = "frequently", 5.0 = "almost always".