

## Mental health in athletes

Kavussanu, Maria; Zhang, Shuge; Tang, Qing; Cumming, Jennifer; Mackman, Thomas

DOI:

[10.1016/j.psychsport.2024.102617](https://doi.org/10.1016/j.psychsport.2024.102617)

License:

Creative Commons: Attribution (CC BY)

*Document Version*

Publisher's PDF, also known as Version of record

*Citation for published version (Harvard):*

Kavussanu, M, Zhang, S, Tang, Q, Cumming, J & Mackman, T 2024, 'Mental health in athletes: Does authentic leadership matter?', *Psychology of Sport and Exercise*, vol. 73, 102617.  
<https://doi.org/10.1016/j.psychsport.2024.102617>

[Link to publication on Research at Birmingham portal](#)

### General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

### Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact [UBIRA@lists.bham.ac.uk](mailto:UBIRA@lists.bham.ac.uk) providing details and we will remove access to the work immediately and investigate.



## Mental health in athletes: Does authentic leadership matter?

Maria Kavussanu<sup>a,\*</sup>, Shuge Zhang<sup>b</sup>, Qing Tang<sup>c</sup>, Jennifer Cumming<sup>a</sup>, Thomas Mackman<sup>a</sup>

<sup>a</sup> University of Birmingham, UK

<sup>b</sup> University of Derby, UK & Hunan University of Technology, China

<sup>c</sup> Zhejiang University, China

### ARTICLE INFO

#### Keywords:

Psychological capital  
Mental illness  
Prosocial behaviour  
Antisocial behaviour  
Elite sport

### ABSTRACT

Recent research has attested to the prevalence of mental health issues in sport, and the need to identify factors that could promote athletes' mental health. In this study, we investigated: (a) whether authentic leadership is associated with athletes' mental health directly and indirectly via psychological capital and prosocial and antisocial behaviour experienced from one's teammates; and (b) whether the hypothesized model testing these relationships is the same in higher versus lower competitive level athletes. We examined two dimensions of mental health, namely positive mental health and mental illness. A total of 751 athletes ( $M_{age} = 22.92$ ,  $SD = 8.53$ ; 294 female) from a range of sports completed a multi-section questionnaire administered via an online survey. Path analysis showed that authentic leadership was positively related to positive mental health via psychological capital and prosocial behaviour and negatively linked to mental illness via psychological capital and antisocial behaviour. The effects of authentic leadership on positive mental health via prosocial teammate behaviour and subsequently psychological capital, and on mental illness via prosocial teammate behaviour, were stronger in higher compared to lower competitive level athletes. The findings suggest that by adopting an authentic leadership style coaches could strengthen athletes' positive mental health and protect them from mental illness. This may happen by increasing athletes' psychological capital and prosocial behaviour within the team and decreasing antisocial behaviour within the team.

### 1. Introduction

Mental health has received a lot of attention in the sport literature in recent years (e.g., [Kegelaers et al., 2022](#); [Kuettel & Larsen, 2020](#); [Pankow et al., 2021](#); [Reardon et al., 2019](#)). The World Health Organisation (WHO, 2005, p. 2) has defined mental health as "a state of well-being in which the individual realises his or her abilities, can cope with the normal stresses of life, work productively and fruitfully, and is able to make a contribution to his or her community". This definition implies that mental health is not only the absence of mental illness but also the presence of feeling good and functioning well in life, which is achieved by realizing one's potential and by contributing to community ([Keyes, 2002](#)). Contemporary theorists (e.g., [Keyes, 2002](#)) view mental health as existing in two dimensions, namely positive mental health and mental illness, and this conceptualisation has been supported by empirical evidence (e.g., [Iasiello & Van Agteren, 2020](#)). Examples of constructs that reflect positive mental health are positive affect, satisfaction with life, and psychological well-being, while indicators of mental illness are depression, anxiety, and psychological distress. A complete

understanding of mental health necessitates the examination of both positive mental health and mental illness.

Researchers have identified several protective and risk factors for athletes' mental health, particularly in elite sport, where the pressures are typically higher than in recreational sport ([Evans et al., 2017](#); [Kegelaers et al., 2022](#)). For example, sport environments that are supportive, promote feelings of autonomy and competence, positive social relationships, and trust, operate as protective factors for athletes' mental health, whereas lack of social support from teammates and coaches and negative social relationships could place athletes' mental health at risk ([Kuettel & Larsen, 2020](#)). One feature of the social environment, which could have implications for athletes' mental health is authentic leadership (e.g., [Bandura & Kavussanu, 2018](#); [Walumbwa et al., 2008](#)). In this study, we examined the relationship between authentic leadership and the two dimensions of mental health and explored potential mediating mechanisms of this relationship. Moreover, we investigated whether these relationships differ as a function of competitive level.

\* Corresponding author. School of Sport, Exercise & Rehabilitation Sciences University of Birmingham, Birmingham, B15 2TT, UK.  
E-mail address: [M.Kavussanu@bham.ac.uk](mailto:M.Kavussanu@bham.ac.uk) (M. Kavussanu).

<https://doi.org/10.1016/j.psychsport.2024.102617>

Received 4 September 2023; Received in revised form 22 February 2024; Accepted 26 February 2024

Available online 28 March 2024

1469-0292/© 2024 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

### 1.1. Authentic leadership and mental health

Authentic leadership is a genuine form of leadership, whereby leaders' behaviours are consistent with their inner values (Walumbwa et al., 2008). It is a values-based leadership style grounded on ethical principles. Various models and definitions of authentic leadership exist (e.g., Avolio et al., 2004; Gardner et al., 2005; Ilies et al., 2005; Walumbwa et al., 2008). In this study, we used the definition of Walumbwa et al. (2008), who proposed that authentic leadership is "a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development" (p. 94). In this conceptualisation, authentic leadership<sup>1</sup> consists of four components: self-awareness, which refers to showing an understanding of one's strengths and weaknesses and being aware of one's impact on others; relational transparency, which pertains to authentic leaders showing their true self to others, and expressing their true thoughts and feelings, while minimizing the expression of inappropriate emotions; balanced processing (of information), which involves considering and objectively analysing all relevant information, including followers' perspectives, before making a decision; and internalized moral perspective, whereby authentic leaders are guided in their behaviour by their internal moral standards.

Authentic leaders engage in practices which should have a positive impact on followers' mental health. They encourage their followers to share information and express their true thoughts and feelings, create trusting relationships and inclusive team environments, and involve followers in decision making (Ilies et al., 2005). Research in nurses has revealed a positive relationship between the manager's authentic leadership and nurses' psychological well-being (Nelson et al., 2014), while a sport environment where athletes felt involved in the decision making and experienced meaningful relationships contributed to their enhanced well-being and reduced ill-being (Kuettel et al., 2021). Authentic leadership of coaches has been positively associated with trust and enjoyment in British university athletes (e.g., Bandura & Kavussanu, 2018; Malloy & Kavussanu, 2021a) as well as with psychological well-being in American college athletes (Kim et al., 2020) and in Chinese female athletes (Ruan & Liu, 2021).

Although the link between authentic leadership and athletes' positive mental health (i.e., psychological well-being) has been examined in two studies (Kim et al., 2020; Ruan & Liu, 2021), researchers have not investigated the role of authentic leadership on mental illness. Moreover, researchers have not examined differences in these relationships between athletes competing at different levels of competition. In light of contemporary conceptualisations of mental health as existing in two separate continua (Keyes, 2022; Iasiello & Van Agteren, 2020), the prevalence of mental illness in elite athletes (Hamond et al., 2013), and calls for replication studies in psychological research (e.g., Pashler & Wagenmakers, 2012), the need exists for a study that investigates both dimensions of athletes' mental health. In addition, we need to understand whether the identified relationships vary as a function of competitive level.

### 1.2. Potential mediating mechanisms

As well as examining the relationship between coaches' authentic leadership and the two dimensions of mental health, it is important to understand the process through which these relationships might operate. This understanding could inform a theory/logic model of an intervention, that is, it will provide insights into how an authentic leadership intervention could work to improve athletes' mental health (O'Cathain et al., 2019). Two variables which could operate as mediating mechanisms are psychological capital and teammate moral behaviour.

*Psychological capital* refers to a positive psychological state that

consists of four components: self-efficacy, optimism, hope, and resilience (Luthans et al., 2007). Self-efficacy is the confidence one has about their ability to complete tasks successfully in given circumstances; optimism refers to making a positive attribution about succeeding at present and future tasks; hope is the motivational state of setting challenging but realistic goals and developing specific plans to achieve these goals; and resilience pertains to bouncing back when one encounters problems and adversity and looking for new opportunities for success.

Certain characteristics of coaches who are authentic leaders are likely to enhance athletes' psychological capital. Specifically, acknowledging the perspective of their followers and involving them in decision-making, should enhance followers' confidence, optimism, and hope, while by cultivating supportive and trusting relationships, authentic leaders could increase followers' resilience (Gardner et al., 2005). Several studies have shown a strong positive relationship between authentic leadership and psychological capital in a variety of contexts including sport (Kim et al., 2020; McDowell et al., 2018; Zhang, Guo, et al., 2021). Increased psychological capital should, in turn, positively influence athletes' mental health, as athletes would build coping mechanisms and seek more opportunities to achieve their goals (see Kim et al., 2019, 2020). Indeed, authentic leadership was indirectly related to psychological well-being via increased psychological capital in athletes (Kim et al., 2020; Ruan & Liu, 2021). However, we do not know whether psychological capital could also explain a potential relationship between authentic leadership and mental illness, thereby acting as a protective factor for athletes' mental health.

The second variable that might explain the influence of authentic leadership on mental health is *teammate moral behaviour*, which has been distinguished in prosocial and antisocial behaviour (Al-Yaaribi et al., 2016; Kavussanu & Boardley, 2009). Prosocial behaviour is voluntary behaviour intended to help or benefit another individual (Eisenberg & Fabes, 1998), and examples in sport are congratulating a teammate after good play and encouraging a teammate after a mistake. Antisocial behaviour is intentional behaviour that could harm or disadvantage another (Sage et al., 2006), such as criticizing and verbally abusing a teammate, and expressing frustration at a teammate's poor play. Authentic leadership could promote prosocial and discourage antisocial behaviour within the team, because authentic leaders are guided by ethical principles and act as moral exemplars, thereby instilling a norm to act ethically (Gardner et al., 2005; Ilies et al., 2005). Indeed, football players whose coaches took part in an authentic leadership intervention reported significantly more frequent prosocial behaviour toward their teammates compared to a control group (Malloy & Kavussanu, 2021a). In another study, athletes assigned to a high authentic leadership condition (induced via a script of an imaginary coach) reported that they would be less likely to be aggressive (i.e., antisocial) - if they played for the coach described as authentic leader - compared to participants in the low and neutral authentic leadership conditions (Malloy et al., 2023). Although the latter study examined antisocial behaviour only toward opponents, authentic leadership may also inhibit antisocial behaviour toward one's teammates.

Increased prosocial and reduced antisocial behaviour experienced from one's teammates should contribute to athletes' mental health both directly and indirectly by strengthening their psychological capital. The encouragement, positive feedback, and support experienced by the recipients of prosocial behaviour combined with reduced experiences of antisocial behaviour from one's teammates, could lead team members to feel more confident about their sport skills and increase their hope and optimism for achieving their goals, thereby enhancing their psychological capital and mental health. In support of this argument, athletes who perceived that their teammates acted prosocially toward them during a match or sport season, enjoyed the match more, experienced more positive affect during the season, and were less likely to report burnout, whereas athletes who experienced antisocial behaviour from their teammates were more likely to report anger, negative affect, and burnout (Al-Yaaribi et al., 2016; Al-Yaaribi & Kavussanu, 2017).

### 1.3. The present study

In sum, coaches who are authentic leaders are likely to strengthen their athletes' psychological capital (e.g., Kim et al., 2020), promote prosocial, and deter antisocial, behaviour within the team (Malloy et al., 2023; Malloy & Kavussanu, 2021a) with subsequent positive effects on athletes' mental health (e.g., Al-Yaaribi et al., 2016; Al-Yaaribi & Kavussanu, 2017). However, to date, only two studies have examined the relationship between authentic leadership and positive mental health (Kim et al., 2020; Ruan & Liu, 2021), and no study has investigated whether authentic leadership also reduces mental illness or promotes mental health via its effects on teammate moral behaviour. Investigating both positive mental health and mental illness will strengthen our confidence in the utility of authentic leadership interventions to promote mental health. Moreover, exploring other potential mediators besides psychological capital can aid the development of a logic model by identifying variables which could be measured in future authentic leadership interventions.

The main purpose of this cross-sectional study was to examine whether authentic leadership is related to athletes' mental health via psychological capital and teammate moral behaviour. We hypothesized that authentic leadership would be positively related to athletes' mental health (i.e., greater positive mental health, lower mental illness) via increased psychological capital, increased teammate prosocial behaviour, and reduced teammate antisocial behaviour. We also anticipated that authentic leadership would be indirectly related to psychological capital via increased prosocial and reduced antisocial behaviour experienced from one's teammates. We focused on psychological capital and perceived teammate moral behaviour as potential mediators because: (a) there was ample support in the literature for the potential mediating role of these variables (e.g., Al-Yaaribi et al., 2016; Al-Yaaribi & Kavussanu, 2017; Kim et al., 2020); and (b) they represent person- and team-level variables respectively; these choices allowed us to capture both individual difference and team social-psychological factors as potential mediators.

A secondary purpose was to examine our hypotheses in athletes from different competitive levels, as elite athletes are more likely than non-elite athletes to experience common mental health disorders (e.g., Evans et al., 2017; Hammond et al., 2013; Rice et al., 2016). We tentatively hypothesized that the effects of authentic leadership would be stronger in athletes competing at a higher competitive level compared to those competing at a lower competitive level. Understanding whether the effect of authentic leadership on mental health may vary as a function of competitive level could help with deciding whether future mental health interventions should be tailored according to competitive level.

## 2. Method

### 2.1. Participants

Participants were 751 athletes ( $M_{\text{age}} = 22.92$ ,  $SD = 8.53$ ; 294 female). At the time of data collection, most of our participants ( $n = 353$ , 47%) competed at recreational/club level, while the remaining competed at county ( $n = 37$ , 4.9%), regional/British universities league ( $n = 243$ , 32.4%), national ( $n = 78$ , 10.4%), or international ( $n = 40$ , 5.3%) levels. They were recruited from 22 individual (e.g., athletics, climbing, golf, swimming, weightlifting) and 25 team (e.g., basketball, cricket, football, hockey, rugby) sports. At the time of data collection, most participants were undergraduate university students ( $n = 401$ , 53.4%), some were in full time employment ( $n = 81$ , 10.8%), and some ( $n = 104$ , 13.8%) did not provide information on their employment status. Monte Carlo power analysis for serial mediation (see Zhang, 2014) showed that 485 participants were required to test a small total indirect effect (i.e., standardised total indirect effect = 0.01, beta coefficients for all paths = 0.1,  $\alpha = 0.05$ , power = 0.80) of authentic

leadership on study outcomes. The sample fulfilled this requirement and allowed about 0.80 power to detect small direct effects (beta coefficient = 0.1) of mediating variables on study outcomes.

### 2.2. Measures

#### 2.2.1. Authentic leadership

We measured authentic leadership with the 14-item Authentic Leadership Inventory (ALI; Neider & Schriesheim, 2011), which measures the four components of authentic leadership and has very good psychometric properties (Fusco et al., 2016). Based on pilot work with nine student-athletes, we made minor adaptations to ALI to ensure all items are relevant to, and understandable by our participants. For instance, we referred to a coach rather than to a leader; changed the pronouns 'him/her' to 'they' for simplicity; and modified the item "uses his/her core beliefs to make decisions" to "bases their decisions on their values". Participants were asked to respond to 14 statements while thinking about how accurately each statement describes their current coach with whom they interact the most. The stem for each item was "My coach ..." and example items were: "openly shares information with others" for relational transparency; "shows that they understand their strengths and weaknesses" for self-awareness; "is guided in their actions by internal moral standards" for internalized moral perspective; and "carefully listens to alternative perspectives before reaching a conclusion" for balanced processing. Participants responded on a Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (5). The internal consistency of this measure has been supported in past research (Kim et al., 2020), with Cronbach's alpha values for the four subscales ranging from 0.87 to 0.91. The average of the 14 items was computed and used in all analyses. We followed the same procedure for all measures.

#### 2.2.2. Positive mental health

We measured positive mental health with the 14-item Warwick-Edinburgh Mental Well-Being Scale (Tennant et al., 2007). Participants were asked to respond to the 14 statements while thinking about the past month. The stem for each statement was "In the past month ..." and example items were: "I have been feeling cheerful", "I have been dealing with problems well", and "I have been feeling close to other people". Participants responded on a 5-point Likert scale ranging from "none of the time" (1) to "all of the time" (5). Tennant et al (2007) have provided evidence for the content, construct, and criterion validity of this scale as well as its internal consistency and test-retest reliability. The scale has been used successfully in British (Bird et al., 2021) and Danish (Kuettel et al., 2021) athletes and has shown very good levels of reliability.

#### 2.2.3. Mental illness

We measured mental illness with the Depression Anxiety and Stress Scale - 21 (DASS - 21; Lovibond & Lovibond, 1995), which consists of three 7-item subscales measuring depression, anxiety, and stress. Participants were asked to respond to the 21 statements, while thinking about the past month, and the stem for each statement was "In the past month ..." Example items are "I felt downhearted and blue" for depression, "I was worried about situations in which I might panic and make a fool of myself" for anxiety, and "I found it difficult to relax" for stress. Responses were made on a 5-point Likert scale ranging from "none of the time" (1) to "all of the time" (5). Previous research (De Francisco et al., 2016) has supported the internal consistency of the DASS-21 ( $\alpha$  range = 0.82 - 0.84).

#### 2.2.4. Psychological capital

We measured psychological capital with the short version of the Psychological Capital Questionnaire (PCQ; Luthans et al., 2007), the PCQ-12. In line with Kim et al (2020), we adapted this version to the context of sport. Specifically, based on discussions with nine

student-athletes, we changed “work” to “sport”, “colleagues” to “team or training group”, and “meetings with management” to “speaking with my coach”. In addition, we removed the following two items from the original PCQ-12: “If I have a problem in my sport, I could think of many ways to get out of it” and “I can be “on my own” during sport if I had to be”. This was because these items did not appear relevant to athletes. The two items were replaced with the following items: “Nowadays, I try to achieve my sporting goals with great energy”, “I feel that I can handle many things at the same time in sport”, and “In general, I can manage sport and its difficulties.”

Participants were asked to think about their current experiences in their main sport and indicate how accurately the statements that followed describe them. Example items are “I can see myself as being pretty successful in my sport” (hope); “I feel confident contributing when talking about sporting strategy” (efficacy); “I usually deal well with stressful sporting situations” (resilience); and “I always look on the bright side of things regarding my sport” (optimism). Responses were made on a 7-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (7). Previous research has provided evidence for the psychometric properties of the PCQ-12 for the version adapted to sport. For example, Kim et al. (2017) reported very good fit of the model to the data supporting its construct validity. Evidence of reliability has been provided by McDowell et al. (2018), who reported a Cronbach’s alpha coefficient of 0.88, and Kim et al. (2020), who reported composite reliability of 0.90. In this study, Confirmatory Factor Analysis conducted on this scale showed satisfactory fit of the model to the data: Robust Chi-square ( $R\chi^2$ ) = 316.095,  $df$  = 65,  $p$  < 0.01; Comparative Fit Index (CFI) = 0.94, Root Mean Square Error of Approximation (RMSEA) = 0.07, and Standardised Root Mean Square Residual (SRMR) = 0.05.

#### 2.2.5. Teammate moral behaviour

We measured teammate moral behaviour using adapted versions (see Al-Yaaribi et al., 2016; Al-Yaaribi & Kavussanu, 2017) of the two teammate behaviour subscales of the Prosocial and Antisocial Behavior in Sport Scale (PABSS; Kavussanu & Boardley, 2009). Participants were asked to think about their experiences with their team or training group and indicate how often their teammates or training partners engaged in prosocial (five items) and antisocial (five items) behaviours toward them that season. The stem for each item was “This season, my teammates ...” and example items of prosocial teammate behaviour are “congratulated me for good play” and “encouraged me”, while example items of antisocial teammate behaviour are “argued with me” and “swore at me”; response options ranged from “never” (1) to “very often” (5). The two adapted subscales have shown very good levels of internal consistency ( $\alpha$  = 0.83 for both subscales in British student-athletes, Al-Yaaribi et al., 2016).

#### 2.3. Procedure

After being granted ethical approval from the lead author’s university, we created an online survey with the measures described above using Jisc surveys and used this survey for all data collection. We recruited participants using convenience sampling via four methods: (a) contacting university coaches, sport colleges, and local teams; (b) visiting classes in the sport science department of the university; (c) advertising the study in university sport pages on social media platforms (i.e., Facebook, twitter, Instagram); and (d) approaching personal contacts. Our selection criteria were that at the time of data collection participants would be over the age of 16, would be training regularly in a team with a coach, and would be actively competing with that team.

Participants were sent an information sheet, which explained the purpose of the study, that participation was voluntary and that they could withdraw their data at any time within the next six months without giving a reason. They were also reassured about the confidentiality of their responses and were informed that if they felt uncomfortable with any of the questions, they could stop completing the

questionnaire. Responses to all questions were compulsory. Finally, participants were offered the opportunity to take part in a prize draw to win an amazon voucher, if they so wished, as an incentive to complete the survey. Once they read the information sheet and provided informed consent, participants completed the survey, which ended by providing information about mental health support networks. Participants were not asked to provide their name on the survey; those participants who wished to be entered into the amazon voucher prize draw provided their e mail. Each participant was assigned an ID number, and all data were stored in a password-protected server, accessed only by the researchers, to ensure confidentiality of all responses. Upon completion of the project, the lead investigator with one of the co-investigators conducted the prize draw and emailed the winners their amazon voucher.

#### 2.4. Data analysis

First, we calculated composite reliability, descriptive statistics and Pearson correlations between study variables using SPSS Version 28. Next, we tested the hypothesized multivariate serial mediation model using MPlus Version 8 (Muthén & Muthén, 2017). Specifically, we examined the direct and indirect effects of authentic leadership on the two dimensions of mental health and tested psychological capital and prosocial and antisocial teammate behaviours as mediators. We used the Robust Maximum Likelihood method for more accurate estimation of test statistics and standard errors in the hypothesized model, addressing potential data non-normality and error non-independence (Satorra & Bentler, 1994). In addition, since athletes ( $N$  = 751) were nested within sports ( $N$  = 47), we employed a clustered analysis with sport type as a cluster, which is equivalent to a random intercept fixed slope approach within the multilevel analysis framework (Hox, 1998). This allowed us to estimate Level 1 effects (i.e., athlete level, within sports) more precisely by adjusting potential confounds associated with sport type and addressing the nested effect in the hypothesized model (see also Zhang, Roberts, et al., 2021). This clustered approach is also recommended given its robustness in addressing potential error non-independence (Hayes, 2013).

Next, we conducted multigroup analysis<sup>2</sup> to test the multivariate serial mediation model in two groups of athletes: those competing at higher competitive level (i.e., international, national, regional/BUCS or county), labelled higher competitive level athletes and those competing at lower level (i.e., club/recreational), labelled lower competitive level athletes. In line with recommendations by Hu and Bentler (1999), we assessed model fit using Robust Chi-square ( $R\chi^2$ ), Comparative Fit Index (CFI), Standardised Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA), with values close to 0.95 for CFI, close to 0.08 for SRMR, and close to 0.06 for RMSEA, indicating a good model fit. We compared any observed differences in higher and lower competitive level athletes using the test of statistical equality (Paternoster et al., 1998).

For all analyses, we report completely standardised estimates of direct ( $\beta$ ) and indirect effects (Preacher & Hayes, 2008), 95% confidence intervals (CI), and precise  $p$  values of the estimates where appropriate. An effect (direct or indirect) was considered significant when the 95% CI did not include 0. We report completely standardised estimates for direct and indirect effects to provide a common metric for the magnitude of the effect size and to allow comparison of effects across populations or studies (Hayes, 2013). We considered 0.10, 0.30, and 0.50 standardised coefficients as small, medium, and large direct effects, respectively (Cohen, 1988). Given the shared properties of direct (i.e., indicated by a coefficient) and indirect (i.e., derived by the multiplication of coefficients) effects in mediation models, we took a consistent approach building on Cohen’s (1998) effect size for regression coefficients to assess the magnitude of an indirect effect. Thus, we considered 0.01, 0.09, and 0.25 (i.e., multiplication of two coefficients or direct effects for assessing indirect effect through one mediator), and 0.001, 0.027, 0.125 (i.e., multiplication of three coefficients or direct effects for assessing

indirect effect through two mediators) as small, medium, and large effects, respectively (see also Preacher & Kelley, 2011).

### 3. Results

#### 3.1. Preliminary analysis

There were no missing data in the study variables, as responses to the key study items were compulsory. Thus, no participants were eliminated from the analysis. For all study variables tested in the hypothesized model, skewness and kurtosis values were  $\pm 1.02$  and  $\pm 1.62$  respectively, fulfilling the requirements (i.e.,  $\pm 3$  for skewness and  $\pm 10$  for kurtosis) for running path models (see Kline, 2016). There were no outliers, that is no participant responses were greater than three SDs from the mean.

Table 1 displays composite reliability, descriptive statistics, and correlations for all variables. Composite reliability ranged between 0.84 and 0.92 indicating very-good-to-excellent internal consistency of scores for all measures. On average, our participants reported moderately high levels of positive mental health and low levels of mental illness (scores  $> 2.86$  indicate mental illness), perceived their coach to be an authentic leader, and reported moderately high psychological capital. They also perceived their teammates as engaging often in prosocial and rarely in antisocial behaviours toward them. With respect to zero-order correlations, authentic leadership manifested a strong, positive relationship with athletes' psychological capital; moderate-to-strong positive relationships with prosocial teammate behaviour and athletes' positive mental health; and weak negative relationships with antisocial teammate behaviour and athletes' mental illness.

#### 3.2. Testing the hypothesized model

The test of the multivariate serial mediation model yielded very good model fit: Robust  $\chi^2 = 4.94$ ,  $df = 1$ ,  $p = 0.03$ ; CFI = 0.99, SRMR = 0.02, RMSEA = 0.07. Figure 1 shows the model and estimates of each hypothesized path. Table 2 displays all regression statistics for each direct and indirect path tested.

The model accounted for 25.2% of the variance in positive mental health. As shown in Table 2 and Figure 1, psychological capital ( $\beta = 0.41$ ,  $p = 0.00$ ) and prosocial teammate behaviour ( $\beta = 0.13$ ,  $p = 0.00$ ) were directly related to positive mental health; there was no direct effect of authentic leadership ( $\beta = 0.05$ ,  $p = 0.22$ ) or antisocial teammate behaviour ( $\beta = 0.06$ ,  $p = 0.12$ ) on positive mental health. Importantly, in line with our hypothesis, authentic leadership manifested a significant, positive indirect effect on positive mental health via increased athletes' psychological capital (standardised indirect effect = 0.18,  $p = 0.00$ ) and prosocial teammate behaviour (standardised indirect effect = 0.05,  $p = 0.00$ ); there was no significant indirect effect via antisocial teammate

behaviour ( $\beta = -0.01$ ,  $p = 0.11$ ). The serial mediation path of authentic leadership on positive mental health via prosocial teammate behaviour and subsequently psychological capital was significant (standardised indirect effect = 0.04,  $p = 0.00$ ), whereas the path via antisocial teammate behaviour and subsequently psychological capital was nonsignificant (standardised indirect effect = 0.00,  $p = 0.28$ ).

The model accounted for 13.1% of the variance in mental illness. Psychological capital ( $\beta = -0.32$ ,  $p = 0.00$ ), and prosocial teammate behaviour ( $\beta = -0.09$ ,  $p = 0.04$ ) were directly related to alleviated mental illness, whereas antisocial teammate behaviour was positively related to mental illness ( $\beta = 0.18$ ,  $p = 0.00$ ). Unexpectedly, authentic leadership manifested a small, positive direct effect ( $\beta = 0.13$ ,  $p = 0.00$ ) on mental illness. Importantly, in line with our hypothesis, authentic leadership was significantly related to lower mental illness via increased athletes' psychological capital (standardised indirect effect =  $-0.14$ ,  $p = 0.00$ ), increased prosocial behaviour (standardised indirect effect =  $-0.04$ ,  $p = 0.01$ ), and attenuated antisocial behaviour (standardised indirect effect =  $-0.03$ ,  $p = 0.00$ ). The serial mediation path of authentic leadership on mental illness via prosocial teammate behaviour and subsequently psychological capital was also significant and negative (standardised indirect effect =  $-0.03$ ,  $p = 0.00$ ).

The model accounted for 30.7% of the variance in psychological capital. Both authentic leadership ( $\beta = 0.44$ ,  $p = 0.00$ ) and prosocial behaviour ( $\beta = 0.22$ ,  $p = 0.00$ ) were positively linked to psychological capital, whereas antisocial behaviour had no effect ( $\beta = 0.04$ ,  $p = 0.21$ ) on psychological capital. Authentic leadership was indirectly related to psychological capital via prosocial behaviour (standardised indirect effect = 0.09,  $p = 0.00$ ) but not antisocial behaviour (standardised indirect effect =  $-0.01$ ,  $p = 0.28$ ).

#### 3.3. Multigroup analysis

Multigroup analysis (comparing higher versus lower competitive level athletes) of the hypothesized model yielded excellent model fit: Robust  $\chi^2 = 4.73$ ,  $df = 2$ ,  $p = 0.09$ ; CFI = 1.00, SRMR = 0.02, RMSEA = 0.06. Table 3 displays estimates for each direct and indirect path and the differences between the two groups. The analysis indicated no significant difference in any of the direct effects on positive mental health. However, the indirect effect of authentic leadership on positive mental health via prosocial teammate behaviour was significant in higher but not lower competitive level athletes. Moreover, its effect via prosocial teammate behaviour and subsequently psychological capital was stronger in higher compared to lower competitive level athletes ( $Z = 2.10$ ,  $p = 0.04$ ).

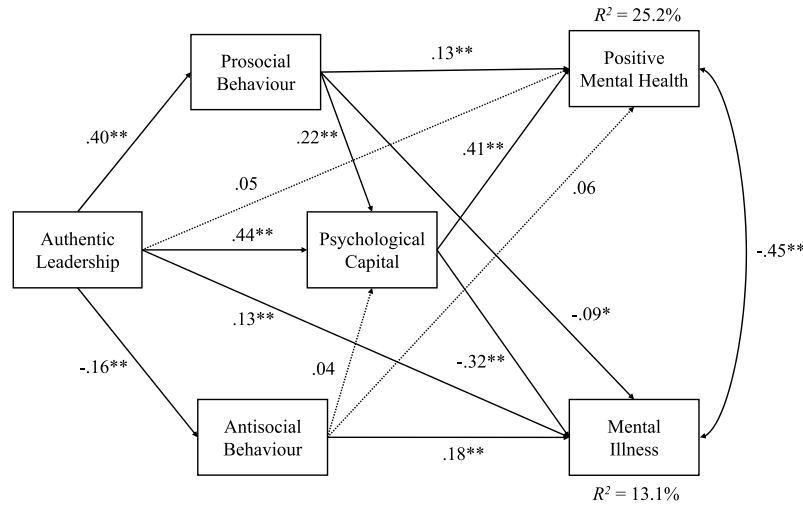
Multigroup analyses showed no differences between higher versus lower competitive level athletes in most effects of the predictors on mental illness. However, teammates' prosocial behaviour was negatively linked to mental illness only in higher competitive level athletes

**Table 1**  
Descriptive statistics, composite reliability, and Pearson correlations of study variables (N = 751).

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Positive mental health	3.43	0.73	(.93)								
2. Mental illness	2.03	0.73	-.50**	(.94)							
3. Authentic leadership	3.83	0.63	.31**	-.10**	(.90)						
4. Psychological capital	5.36	0.99	.48**	-.30**	.52**	(.92)					
5. Prosocial behaviour	3.94	0.65	.30**	-.19**	.40**	.39**	(.87)				
6. Antisocial behaviour	2.09	0.79	.01	.19**	-.16**	-.06	-.15**	(.84)			
7. Age	22.9	8.53	.06	-.08*	-.02	.08*	-.11**	-.04	-		
8. Sex	-	-	.14**	-.11**	-.01	.05	-.08*	.40**	-.04	-	
9. Sport	-	-	.06	-.10**	-.05	.05	.01	.25**	.12**	-.02	-
10. Competitive level	-	-	.05	-.13**	.04	.13**	.12*	-.01	-.21**	-.00	-.03

Note. Sex was coded 0 = female and 1 = male; sport was coded 0 = individual sport and 1 = team sport; competitive level was coded 0 = lower competitive level and 1 = higher competitive level. Possible range of scores is 1–7 for psychological capital and 1–5 for all other variables. Values of composite reliability are presented in the diagonal in brackets.

\* $p < 0.05$ ; \*\* $p < 0.01$ .



**Figure 1.** Serial Mediation Model of Direct and Indirect Effects of Authentic Leadership on Positive Mental Health and Mental Illness.

*Note.* The model was tested with sport type ( $N = 48$ ) controlled as a cluster variable (i.e., random intercept and fixed slope across different sport types) and showed very good fit:  $\chi^2 = 4.94$ ,  $df = 1$ ,  $p = 0.03$ ; CFI = 0.99, SRMR = 0.02, RMSEA = 0.07. Uni-directional, arrowed paths indicate hypothesized direct effects, while the bi-directional path represents the correlation between the two outcome variables. Standardised coefficients are reported, with solid lines indicating significant direct effects and dotted lines indicating non-significant effects. Indirect effects are presented in Table 2. \* $p < 0.05$ ; \*\* $p < 0.01$ .

**Table 2**  
Standardised direct and indirect effects of all hypothesized paths ( $N = 751$ ).

	Estimate	SE	95% CI
<b>Direct paths</b>			
AL → PMH	0.05	0.05	[-0.03, 0.14]
PC → PMH	0.41**	0.03	[0.35, 0.46]
PB → PMH	0.13**	0.02	[0.08, 0.17]
AB → PMH	0.06	0.03	[-0.02, 0.13]
AL → MI	0.13**	0.03	[0.07, 0.19]
PC → MI	-0.32**	0.05	[-0.41, -0.23]
PB → MI	-0.09*	0.04	[-0.17, -0.01]
AB → MI	0.18**	0.03	[0.12, 0.24]
AL → PC	0.44**	0.05	[0.34, 0.54]
PB → PC	0.22**	0.03	[0.17, 0.27]
AB → PC	0.04	0.03	[-0.02, 0.11]
AL → PB	0.40**	0.05	[0.30, 0.50]
AL → AB	-0.16**	0.04	[-0.24, -0.08]
<b>Indirect paths</b>			
AL → PC → PMH	0.18**	0.02	[0.13, 0.22]
AL → PB → PMH	0.05**	0.01	[0.03, 0.07]
AL → AB → PMH	-0.01	0.01	[-0.02, 0.00]
AL → PC → MI	-0.14**	0.03	[-0.19, -0.09]
AL → PB → MI	-0.04*	0.01	[-0.06, -0.01]
AL → AB → MI	-0.03**	0.01	[-0.05, -0.01]
AL → PB → PC	0.09**	0.02	[0.05, 0.12]
AL → AB → PC	-0.01	0.05	[-0.02, 0.01]
AL → PB → PC → PMH	0.04**	0.01	[0.02, 0.05]
AL → AB → PC → PMH	0.00	0.01	[-0.01, 0.00]
AL → PB → PC → MI	-0.03**	0.01	[-0.04, -0.01]
AL → AB → PC → MI	0.00	0.00	[-0.01, 0.01]

*Note.* AL = coach’s authentic leadership, PB = teammates’ prosocial behaviour, AB = teammates’ antisocial behaviour, PC = psychological capital, PMH = positive mental health, MI = mental illness. CI = confidence interval. “→” indicates the hypothesized direction of influence. Full details of this analysis can be found in the supplementary material (Table S1). \* $p < 0.05$ ; \*\* $p < 0.01$ .

( $Z = -2.01$ ,  $p = 0.04$ ). Importantly, the indirect negative effect of authentic leadership on mental illness via teammate prosocial behaviour was stronger ( $Z = -2.06$ ,  $p = 0.04$ ) in higher competitive level athletes; the indirect effect of authentic leadership on mental illness via psychological capital was weaker in this group of athletes ( $Z = 2.36$ ,  $p = 0.02$ ). Finally, the indirect effect of authentic leadership on psychological capital via prosocial behaviour ( $Z = 1.97$ ,  $p = 0.05$ ) and the direct

**Table 3**  
Standardised Estimates and their Z-score Differences Between Higher and Lower Competitive Level Athletes.

	Competitive Level				Z-Score
	Higher ( $n = 398$ )		Lower ( $n = 353$ )		
	Estimate	SE	Estimate	SE	
<b>Direct paths</b>					
AL → PMH	.03	.04	.10	.08	0.74
PC → PMH	.43**	.05	.38**	.05	0.71
PB → PMH	.15**	.04	.09*	.04	1.12
AB → PMH	.09	.06	.03	.05	0.83
AL → MI	.11*	.04	.14**	.05	-0.48
PC → MI	-.24**	.07	-.37**	.03	1.77
PB → MI	-.16**	.03	-.01	.07	-2.01*
AB → MI	.23**	.05	.14*	.06	0.26
AL → PC	.36**	.05	.51**	.07	-1.90
PB → PC	.29**	.04	.13**	.04	2.85**
AB → PC	.05	.06	.03	.03	0.30
AL → PB	.39**	.05	.40**	.07	-0.12
AL → AB	-.19**	.05	-.14**	.05	-0.72
<b>Indirect paths</b>					
AL → PC → PMH	.15**	.03	.19**	.02	-1.14
AL → PB → PMH	.06**	.01	.03	.02	1.33
AL → AB → PMH	-.02	.01	.00	.01	-1.60
AL → PB → PC	.11**	.03	.05**	.01	1.97*
AL → AB → PC	-.01	.01	.00	.01	-0.77
AL → PC → MI	-.09**	.03	-.19**	.03	2.36*
AL → PB → MI	-.06**	.01	.00	.03	-2.06*
AL → AB → MI	-.04**	.01	-.02	.01	-1.17
AL → PB → PC → PMH	.05**	.01	.02**	.01	2.10*
AL → AB → PC → PMH	.00	.01	.00	.00	0.00
AL → PB → PC → MI	-.03*	.01	-.02**	.01	-0.75
AL → AB → PC → MI	.00	.00	.00	.00	0.00

*Note.* AL = coach’s authentic leadership, PB = teammates’ prosocial behaviour, AB = teammates’ antisocial behaviour, PC = psychological capital, PMH = positive mental health, MI = mental illness. CI = confidence interval. “→” indicates the hypothesized direction of influence. \* $p < .05$ ; \*\* $p < .01$ .

effect of prosocial behaviour on psychological capital ( $Z = 2.85$ ,  $p = 0.05$ ) were stronger in higher compared to lower competitive level athletes.

#### 4. Discussion

Mental health has been receiving growing attention in the sport literature in recent years (e.g., Kuettel & Larsen, 2020; Pankow et al., 2021; Reardon et al., 2019) and is particularly relevant to elite sport due to the pressures experienced by athletes, who compete at that level. Although researchers have identified several protective and risk factors for athletes' mental health (see Kuettel & Larsen, 2020), little is known about the role of authentic leadership on athletes' mental health, despite its empirical link with positive affective outcomes (e.g., Bandura & Kavussanu, 2018; Kim et al., 2020). In this study, we examined the relationship between coaches' authentic leadership – as perceived by their athletes – and two dimensions of athletes' mental health (see Keyes, 2002): positive mental health and mental illness; we also explored psychological capital and teammate moral behaviour as potential mediating mechanisms of this relationship.

##### 4.1. Authentic leadership and positive mental health

Authentic leadership corresponded to positive mental health via both simple (i.e., separately via prosocial teammate behaviour and psychological capital) and serial (i.e., via prosocial teammate behaviour and then psychological capital) mediation paths. Thus, when athletes perceived that their coach engaged in authentic leadership behaviours, such as openly sharing information, showing understanding of their strengths and weaknesses, acting in an ethical manner, and listening to alternative perspectives, athletes also reported enhanced psychological capital and perceived their teammates as engaging in prosocial behaviours toward them such as supporting them, encouraging them after a mistake, and offering them positive and constructive feedback. In turn, psychological capital and prosocial teammate behaviour were positively associated with athletes' positive mental health, which was evidenced in experiences such as dealing with problems well and feeling cheerful and close to other people. These findings support the results of previous research (Kim et al., 2020; Ruan & Liu, 2021), which also revealed indirect positive effects of coaches' authentic leadership on athletes' psychological well-being via psychological capital.

The indirect link of authentic leadership to positive mental health via prosocial teammate behaviour extends previous studies (Kim et al., 2020; Ruan & Liu, 2021), which had identified psychological capital as a key mechanism explaining the effects of authentic leadership on psychological well-being, and points to a social-environmental mechanism through which this leadership style might promote athlete well-being. This finding is in line with research in university athletes showing that an authentic leadership intervention led to more frequent intrateam prosocial behaviour (Malloy & Kavussanu, 2021a) and that intrateam prosocial behaviour was associated with positive affect (Al-Yaaribi & Kavussanu, 2017). By identifying authentic leadership and prosocial teammate behaviour as factors that could promote athletes' mental health, our study also extends research in Danish athletes (Kuettel et al., 2021), which showed that the social support athletes received from their coaches, teammates, or physiotherapists corresponded to better mental health.

An interesting finding of this study was that the indirect effect of authentic leadership on positive mental health via prosocial teammate behaviour and subsequently psychological capital was stronger in higher versus lower competitive level athletes, suggesting that authentic leadership and prosocial behaviour are particularly important in athletes who compete at higher levels, such as national, international, or university leagues. These athletes tend to train together for longer hours, thus they have the opportunity for more frequent social interaction with each other. The relationships that develop within the team become important, thus experiencing prosocial behaviours such as support and encouragement from their teammates, which can be promoted by adopting an authentic leadership style (Malloy & Kavussanu, 2021a) may have greater potential to strengthen these athletes' psychological

capital with subsequent beneficial effects on their positive mental health. Indeed, generic social support and resilience and optimism (i.e., two components of psychological capital) were associated with mental health outcomes in several studies examining the mental health of student-athletes (Kegelaers et al., 2022). The stronger effect of authentic leadership on the mental health of athletes competing at higher level via prosocial teammate behaviour and subsequently psychological capital extends previous research and is a unique finding, which is worth exploring further in future research.

Although authentic leadership had a direct negative effect on anti-social teammate behaviour, it had no indirect effect on athletes' positive mental health via attenuated antisocial behaviour. Thus, frequent anti-social behaviours among teammates or training partners such as arguing, criticizing, verbally abusing, and expressing one's frustration at the teammates' poor play are unlikely to diminish athletes' positive mental health, even if such behaviours may be less common in a team led by a coach who is perceived to be authentic leader. On average, these behaviours were not very frequent in our sample, which may have contributed to this null finding.

##### 4.2. Authentic leadership and mental illness

As hypothesized, authentic leadership was indirectly related to lower mental illness (reflected in feelings of depression, anxiety, and stress experienced in the month prior to data collection) via greater psychological capital, more frequent prosocial, and less frequent antisocial teammate behaviour. However, multigroup analysis showed that the indirect effects via prosocial and antisocial behaviour were significant only for higher competitive level athletes. Moreover, the negative indirect link of authentic leadership to mental illness via psychological capital was significantly stronger in lower compared to higher competitive level athletes. Personal characteristics/resources may be more important for lower competitive level athletes in protecting them from mental illness. Nevertheless, our findings suggest that adopting an authentic leadership style may have the potential to protect athletes from mental illness by strengthening their psychological capital, increasing prosocial, and decreasing antisocial intrateam behaviour. Our findings extend previous research on authentic leadership and psychological well-being (Kim et al., 2020; Ruan & Liu, 2021) by identifying two additional team-level mechanisms through which authentic leadership could exert its protective effects on mental illness. They are also in line with reports that experiencing antisocial behaviour from one's teammates is associated with negative affect and burnout (Al-Yaaribi & Kavussanu, 2017).

One unexpected finding in our path model was the direct positive effect of authentic leadership on mental illness. This was not in line with our hypothesis and was contrary to the indirect effects (e.g., via psychological capital, prosocial behaviour, antisocial behaviour) of authentic leadership on mental illness, all of which were negative, in line with our hypotheses. This situation suggests the potential existence of a suppression effect. Within a mediation model, a suppression effect would be present when the direct and mediated effects of an independent variable on a dependent variable have opposite signs (Tzelgov & Henik, 1991). This was the case in our model, as authentic leadership had a direct positive effect on mental illness but an indirect negative effect through psychological capital. Suppressor variables operate by partialing out irrelevant variance of the other predictors, that are correlated with, and revealing the true relationships between the predictor and outcome variables. Their inclusion in a model increases the predictive power of a predictor variable. Indeed, in this case, the effect of psychological capital on mental illness, when tested in the same model as authentic leadership was larger ( $-0.32$ ) than its zero-order correlation with mental illness ( $-0.30$ ).

It is also worth noting that the zero-order correlation between authentic leadership and mental illness – although in the predicted direction – was small ( $-0.10$ ). It may be that authentic leadership does not



have much to do with mental illness as a protective factor on its own but operates only through the three variables that we examined as mediators. Authentic leadership appears to have much in common with psychological capital, as reflected in its strong correlation (0.40) with this variable. It is likely that by including authentic leadership in our model, the irrelevant elements of psychological capital were partialled out, “purifying the predictor” and improving the prediction of mental illness (see Maassen & Bakker, 2001). Although it is encouraging that including authentic leadership in the model strengthened the predictive power of psychological capital on mental illness, the suppression effect revealed in our study would also suggest that our hypotheses, when considering both the path coefficients and the theoretical model, may need to be revised (see Maassen & Bakker, 2001). Therefore, future research should attempt to replicate our findings to determine whether the suppressor effect is evident in other samples and further clarify the role of authentic leadership on mental illness.

#### 4.3. Practical implications

Our findings have some practical implications for coaches, who wish to promote athletes’ mental health as well as for researchers designing interventions aimed to promote athletes’ mental health. The findings suggest that in their social interactions with athletes, coaches should adopt authentic leadership behaviours, such as being open and honest, acting ethically, and carefully listening to alternative perspectives before reaching a conclusion. In addition, coaches should explicitly encourage and reward prosocial behaviours and discourage antisocial behaviours within the team. Taken together with previous research (e.g., Malloy & Kavussanu, 2021a) the insights gained from this study could be used to inform the programme theory/logic model of an authentic leadership intervention (i.e., how the intervention is expected to lead to its effects and under what conditions) to improve athletes’ mental health (O’Cathain et al., 2019). We recommend that psychological capital and intrateam moral behaviour are measured in future authentic leadership interventions that are aimed to promote athletes’ mental health.

#### 4.4. Limitations and directions for future research

Our research has some limitations, which need to be considered when interpreting the findings. First, the study is cross-sectional, which limits assertions about the direction of causality in the identified relationships. It is possible that enhanced positive mental health strengthened athletes’ psychological capital, which in turn could have influenced their perceptions of their coach as an authentic leader or their perceptions of their teammates as acting prosocially toward them. Future research should employ longitudinal designs or conduct field experiments to obtain solid evidence for the direction of causality in the relationships identified in this study. Second, our data were collected from a single source (i.e., all questionnaires were completed by athletes), at one time point, which could raise concerns about common method bias. However, as suggested by Podsakoff et al. (2012), we implemented multiple procedural remedies before data collection, including reducing evaluation apprehension by emphasizing that there are no right or wrong answers, improving item clarity, and minimizing the scale format similarity (e.g., diversified anchors and points of Likert). Nevertheless, future research could collect data for different constructs from different sources or separate temporally the measurement of predictor and outcome variables to minimise common method bias.

Although we focused on psychological capital and teammate moral behaviour as potential mediators of the relationship between authentic leadership and mental health, future research could examine other potential mediators of this relationship, for example, satisfaction of basic psychological needs. There is evidence to suggest that authentic leadership is positively related to the satisfaction of the need for autonomy (e.g., Bandura & Kavussanu, 2018), while satisfaction of basic

psychological needs has been associated with mental health outcomes in several studies of student-athletes (for a review see Kegeles et al., 2022). Finally, future research could investigate whether the gender of the coach influences athlete perceptions of authentic leadership (e.g., McDowell et al., 2018), and whether the quality of the coach-athlete relationship may mediate or moderate the effects of authentic leadership on mental health (see Jowett et al., 2023).

#### 4.5. Conclusion

In conclusion, authentic leadership could promote athletes’ mental health by enhancing their psychological capital, increasing prosocial behaviour and reducing antisocial behaviour within the team. By adopting authentic leadership behaviours, coaches could confer benefits to athletes’ mental health. Hence, incorporating authentic leadership into existing coach training programmes might be a promising practice, which could benefit athletes by helping develop their self-confidence, resilience, optimism and hope, facilitate positive social behaviours within the team, and ultimately promote mental health particularly in elite athletes.

#### Endnotes

1. There has been a long debate regarding the conceptual and empirical overlap between authentic leadership and other positive leadership styles such as transformational or ethical leadership (e.g., Banks et al., 2016; Brown & Treviño, 2006). Authentic leadership is distinguished from these leadership styles in that it stresses alignment between the leaders’ (moral) values and behaviour (Banks et al., 2016). Hoch et al.’s (2018) meta-analysis further differentiates authentic leadership from other positive leadership styles, highlighting its role in predicting affective commitment and trust in the supervisor. Finally, empirical evidence supports that authentic and transformational leadership represent two distinct leadership styles (e.g., Malloy & Kavussanu, 2021b).
2. We also conducted multigroup (athlete) gender analysis but didn’t find any significant differences in the direct and indirect effects of authentic leadership across different genders.

#### CRedit authorship contribution statement

**Maria Kavussanu:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Shuge Zhang:** Writing – review & editing, Formal analysis, Data curation, Conceptualization. **Qing Tang:** Writing – review & editing. **Jennifer Cumming:** Writing – review & editing, Supervision, Methodology. **Thomas Mackman:** Methodology, Data curation.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Data availability

Data will be made available on request.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.psychsport.2024.102617>.

## References

- Al-Yaaribi, A., & Kavussanu, M. (2017). Teammate prosocial and antisocial behaviors predict task cohesion and burnout: The mediating role of affect. *Journal of Sport & Exercise Psychology*, 39(3), 199–208. <https://doi.org/10.1123/jsep.2016-0336>
- Al-Yaaribi, A., Kavussanu, M., & Ring, C. (2016). Consequences of prosocial and antisocial behavior for the recipient. *Psychology of Sport and Exercise*, 26, 102–112. <https://doi.org/10.1016/j.psychsport.2016.06.012>
- Avolio, B. J., Gardner, W. L., Walumbwa, F. O., Luthans, F., & May, D. R. (2004). Unlocking the mask: A look at the process by which authentic leaders impact follower attitudes and behaviors. *The Leadership Quarterly*, 15(6), 801–823. <https://doi.org/10.1016/j.leaqua.2004.09.003>
- Bandura, C. T., & Kavussanu, M. (2018). Authentic leadership in sport: Its relationship with athletes' enjoyment and commitment and the mediating role of autonomy and trust. *International Journal of Sports Science & Coaching*, 13(6), 968–977. <https://doi.org/10.1177/1747954118768242>
- Banks, G. C., McCauley, K. D., Gardner, W. L., & Guler, C. E. (2016). A meta-analytic review of authentic and transformational leadership: A test for redundancy. *The Leadership Quarterly*, 27(4), 634–652. <https://doi.org/10.1016/j.leaqua.2016.02.006>
- Bird, G. A., Quinton, M. L., & Cumming, J. (2021). Promoting athlete mental health: The role of emotion regulation. *Journal of Clinical Sport Psychology*, 17(2), 112–130. <https://doi.org/10.1123/jcsp.2021-0022>
- Brown, M. E., & Treviño, L. K. (2006). Ethical leadership: A review and future directions. *The Leadership Quarterly*, 17(6), 595–616. <https://doi.org/10.1016/j.leaqua.2006.10.004>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- De Francisco, C., Arce, C., Vilchez, M. D. P., & Vales, Á. (2016). Antecedents and consequences of burnout in athletes: Perceived stress and depression. *International Journal of Clinical and Health Psychology*, 16(3), 239–246. <https://doi.org/10.1016/j.ijchp.2016.04.001>
- Eisenberg, N., & Fabes, R. A. (1998). Prosocial development. In N. Eisenberg (Ed.), *Handbook of child psychology: Social, emotional & personality development* (pp. 701–778). Wiley.
- Evans, M. B., Allan, V., Erickson, K., Martin, L. J., Budziszewski, R., & Côté, J. (2017). Are all sport activities equal? A systematic review of how youth psychosocial experiences vary across differing sport activities. *British Journal of Sports Medicine*, 51(3), 169–176. <https://doi.org/10.1136/bjsports-2016-096725>
- Fusco, T., O'Riordan, S., & Palmer, S. (2016). Assessing the efficacy of authentic leadership group-coaching. *International Coaching Psychology Review*, 11(2), 118–128.
- Gardner, W. L., Avolio, B. J., Luthans, F., May, D. R., & Walumbwa, F. (2005). Can you see the real me?" A self-based model of authentic leader and follower development. *The Leadership Quarterly*, 16(3), 343–372. <https://doi.org/10.1016/j.leaqua.2005.03.003>
- Hammond, T., Gialloretto, C., Kubas, H., & Davis, H. (2013). The prevalence of failure-based depression among elite athletes. *Clinical Journal of Sport Medicine*, 23, 273–277.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Hoch, J. E., Bommer, W. H., Dulebohn, J. H., & Wu, D. (2018). Do ethical, authentic, and servant leadership explain variance above and beyond transformational leadership? A meta-analysis. *Journal of Management*, 44(2), 501–529. <https://doi.org/10.1177/0149206316665461>
- Hox, J. (1998). Multilevel modeling: When and why. In I. Balderjahn (Ed.), *Classification, data analysis, and data highways* (pp. 148–154). Berlin: Heidelberg: Springer-Verlag.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55. <https://doi.org/10.1080/10705519909540118>
- Iasiello, M., & Van Agteren, J. (2020). Mental health and/or mental illness: A scoping review of the evidence and implications of the dual-continua model of mental health. *Evidence Base: A Journal of Evidence Reviews in Key Policy Areas*, (1), 1–45. <https://doi.org/10.21307/e>
- Ilies, R., Morgeson, F. P., & Nahrgang, J. D. (2005). Authentic leadership and eudaemonic well-being: Understanding leader-follower outcomes. *The Leadership Quarterly*, 16(3), 373–394. <https://doi.org/10.1016/j.leaqua.2005.03.002>
- Jowett, S., Do Nascimento-Júnior, J. R. A., Zhao, C., & Gosai, J. (2023). Creating the conditions for psychological safety and its impact on quality coach-athlete relationships. *Psychology of Sport and Exercise*, 65, Article 102363. <https://doi.org/10.1016/j.psychsport.2022.102363>
- Kavussanu, M., & Boardley, I. D. (2009). The prosocial and antisocial behavior in sport scale. *Journal of Sport & Exercise Psychology*, 31(1), 97–117. <https://doi.org/10.1123/jsep.31.1.97>
- Kegelaers, J., Wylleman, P., Defruyt, S., Praet, L., Stambulova, N., Torregrossa, M., ... De Brandt, K. (2022). The mental health of student-athletes: A systematic scoping review. *International Review of Sport and Exercise Psychology*, 1–34. <https://doi.org/10.1080/1750984X.2022.2095657>
- Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 43(2), 207–222. <https://doi.org/10.2307/3090197>
- Kim, M., Kim, Y. D., & Lee, H. (2020). It is time to consider athletes' well-being and performance satisfaction: The roles of authentic leadership and psychological capital. *Sport Management Review*, 23(5), 964–977. <https://doi.org/10.1016/j.smr.2019.12.008>
- Kim, M., Kim, A. C. H., Newman, J. I., Ferris, G. R., & Perrewé, P. L. (2019). The antecedents and consequences of positive organizational behavior: The role of psychological capital for promoting employee well-being in sport organizations. *Sport Management Review*, 22(1), 108–125. <https://doi.org/10.1016/j.smr.2018.04.003>
- Kim, M., Kim, A. C. H., & Reid, C. (2017). Positive organisational behaviour in NCAA division I football: A head coach's authentic leadership and assistant coaches' psychological constructs. *International Journal of Sport Management and Marketing*, 17(1–2), 121–143. <https://doi.org/10.1504/IJSM.2017.083985>
- Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford.
- Kuettel, A., & Larsen, C. H. (2020). Risk and protective factors for mental health in elite athletes: A scoping review. *International Review of Sport and Exercise Psychology*, 13, 231–265. <https://doi.org/10.1080/1750984X.2019.1689574>
- Kuettel, A., Pedersen, A. K., & Larsen, C. H. (2021). To flourish or languish, that is the question: Exploring the mental health profiles of Danish elite athletes. *Psychology of Sport and Exercise*, 52, Article 101837. <https://doi.org/10.1016/j.psychsport.2020.101837>
- Lovibond, P., & Lovibond, S. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. *Behaviour Research and Therapy*, 33(3), 335–343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
- Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology*, 60(3), 541–572. <https://doi.org/10.1111/j.1744-6570.2007.00083.x>
- Maassen, G. H., & Bakker, A. B. (2001). Suppressor variables in path models: Definitions and interpretations. *Sociological Methods & Research*, 30(2), 241–270. <https://doi.org/10.1177/0049124101030002004>
- Malloy, E., & Kavussanu, M. (2021a). The effects of an authentic coaching intervention on athlete outcomes: A pilot randomised controlled trial. *Psychology of Sport and Exercise*, 57, Article 101957. <https://doi.org/10.1016/j.psychsport.2021.101957>
- Malloy, E., & Kavussanu, M. (2021b). A comparison of authentic and transformational leadership in sport. *Journal of Applied Social Psychology*, 51(7), 636–646. <https://doi.org/10.1111/jasp.12769>
- Malloy, E., Kavussanu, M., & Mackman, T. (2023). The effects of authentic leadership on athlete outcomes: An experimental study. *Sport, Exercise and Performance Psychology*, 12, 29–42. <https://doi.org/10.1037/spy0000307>
- McDowell, J., Huang, Y. K., & Caza, A. (2018). Does identity matter? An investigation of the effects of authentic leadership on student-athletes' psychological capital and engagement. *Journal of Sport Management*, 32(3), 227–242. <https://doi.org/10.1123/jsm.2017-0241>
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide* (8th ed.).
- Neider, L. L., & Schriesheim, C. A. (2011). The authentic leadership inventory (ALI): Development and empirical tests. *The Leadership Quarterly*, 22(6), 1146–1164. <https://doi.org/10.1016/j.leaqua.2011.09.008>
- Nelson, K., Boudrias, J. S., Brunet, L., Morin, D., De Civita, M., Savoie, A., & Alderson, M. (2014). Authentic leadership and psychological well-being at work of nurses: The mediating role of work climate at the individual level of analysis. *Burnout Research*, 1(2), 90–101. <https://doi.org/10.1016/j.burn.2014.08.001>
- O' Cathain, A., Croot, L., Duncan, E., Rousseau, N., Sworn, K., Turneer, K. M., Yardley, L. Y., & Hoddinott, P. (2019). Guidance on how to develop complex interventions to improve health and healthcare. *BMJ Open*, 9(8), Article e029954. <https://doi.org/10.1136/bmjopen-2019-029954>
- Pankow, K., McHugh, T. L. F., Mosewich, A. D., & Holt, N. L. (2021). Mental health protective factors among flourishing Canadian women university student-athletes. *Psychology of Sport and Exercise*, 52, Article 101847. <https://doi.org/10.1016/j.psychsport.2020.101847>
- Pashler, H., & Wagenmakers, E.-J. (2012). Editors' introduction to the special section on replicability in psychological science: A crisis of confidence? *Perspectives on Psychological Science*, 7, 528–530. <https://doi.org/10.1177/1745691612465253>
- Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. (1998). Using the correct statistical test for the equality of regression coefficients. *Criminology*, 36(4), 859–866. <https://doi.org/10.1111/j.1745-9125.1998.tb01268.x>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Preacher, K. J., & Hayes, A. F. (2008). Contemporary approaches to assessing mediation in communication research. In A. F. Hayes, M. D. Slater, & L. B. Snyder (Eds.), *The Sage sourcebook of advanced data analysis methods for communication research* (pp. 13–54). Thousand Oaks, CA: Sage.
- Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods*, 16(2), 93–115. <https://doi.org/10.1037/a0022658>
- Reardon, C. L., Hainline, B., Aron, C. M., Baron, D., Baum, A. L., Bindra, A., ... Engbretnsen, L. (2019). Mental health in elite athletes: International Olympic Committee consensus statement. *British Journal of Sports Medicine*, 53(11), 667–699. <https://doi.org/10.1136/bjsports-2019-100715>
- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: A narrative systematic review. *Sports Medicine*, 46(9), 1333–1353. <https://doi.org/10.1007/s40279-016-0492-2>
- Ruan, Z., & Liu, W. (2021). Coach authentic leadership connected with performance satisfaction and psychological well-being of team: The mediating role of team cohesion and psychological capital. *Revista de Psicología del Deporte*, 30(1), 189–203.
- Sage, L., Kavussanu, M., & Duda, J. (2006). Goal orientations and moral identity as predictors of prosocial and antisocial functioning in male association football

- players. *Journal of Sports Sciences*, 24(5), 455–466. <https://doi.org/10.1080/02640410500244531>
- Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In *Latent variables analysis: Applications for developmental research* (pp. 399–419). Sage Publications, Inc.
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ... Stewart-Brown, S. (2007). The warwick–edinburgh mental well-being scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes*, 5(1), 63–76. <https://doi.org/10.1186/1477-7525-5-63>
- Tzelgov, J., & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications, and applications. *Psychological Bulletin*, 109(3), 524–536. <https://doi.org/10.1037/0033-2909.109.3.524>
- Walumbwa, F. O., Avolio, B. J., Gardner, W. L., Wernsing, T. S., & Peterson, S. J. (2008). Authentic leadership: Development and validation of a theory-based measure. *Journal of Management*, 34(1), 89–126. <https://doi.org/10.1177/0149206307308913>
- World Health Organization. (2005). *Promoting mental health: Concepts, emerging evidence, practice: A report of the world health organization*. Department of Mental Health and Substance Abuse in collaboration with the Victorian Health Promotion Foundation and the University of Melbourne.
- Zhang, Z. (2014). Monte Carlo based statistical power analysis for mediation models: Methods and software. *Behavior Research Methods*, 46(4), 1184–1198. <https://doi.org/10.3758/s13428-013-0424-0>
- Zhang, Y., Guo, Y., Zhang, M., Xu, S., Liu, X., & Newman, A. (2021). Antecedents and outcomes of authentic leadership across culture: A meta-analytic review. *Asia Pacific Journal of Management*, 39, 1399–1435. <https://doi.org/10.1007/s10490-021-09762-0>
- Zhang, S., Roberts, R., Woodman, T., Pitkethly, A., English, C., & Nightingale, D. (2021). Foresee the glory and train better: Narcissism, goal setting, and athlete training. *Sport, Exercise, and Performance Psychology*, 10, 381–393. <https://doi.org/10.1037/spy0000264>