**The Effects of an Authentic Coaching Intervention on Athlete Outcomes: A Pilot
Randomised Control Trial**

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AUTHENTIC COACHING INTERVENTION

Abstract

Objectives

Authentic leadership could produce promising outcomes in sport. However, no intervention designed to increase coaches' authentic leadership exists. The aim of this study was to develop and evaluate such an intervention by examining its efficacy on a range of athlete outcomes.

Design

Mixed design with Group (Intervention, Control) as between and Time (pre, post) as within-participants factors.

Method

A total of 18 coaches ($M_{age} = 37.89$; 83% male) who were coaching 153 athletes ($M_{age} = 20.48$; 50.3% females) were randomly allocated, via block randomisation, into either an intervention ($n = 60$) or a control group ($n = 93$). The coaches in the intervention group received a 2-hour-long workshop, had a midway-point meeting, and completed weekly coaching logs. The control group did not receive an intervention. Data were collected prior to the intervention and two months after the intervention had been completed.

Results

A manipulation check revealed the intervention group reported higher authentic leadership, compared to the control group. A repeated measures multivariate analysis of variance indicated that athletes in the intervention group reported significantly higher enjoyment and prosocial behaviours from pre to post-test compared to the control group.

Conclusions

The findings suggest that an authentic leadership intervention could be effective in improving coaches' authentic behaviours and promoting positive athlete outcomes.

Keywords: Commitment, Enjoyment, Athletes, Prosocial Behaviours.

The Effects of Authentic Coaching on Athlete Outcomes: A Pilot Randomised Control Trial

In sport, coaches are seen as highly influential (Vella et al., 2013). It has been suggested that effective coaching models need to focus on the positive psychological and social growth of athletes, including the formation of interpersonal relationships (Cote & Gilbert, 2009; Vella et al., 2013). Therefore, developing interventions, which promote effective coaching are vital in order to positively impact on athletes' developmental outcomes. This has become particularly important in the past few years, due to the current drop in sports participation with age and recent sport scandals such as doping, cheating, and aggression (Turnnidge & Cote, 2016). Authentic leadership is a form of leadership that could facilitate positive athlete outcomes and is the focus of the present research.

Authentic Leadership

Authentic leadership is a genuine style of leadership, whereby leaders display behaviours in line with their inner values (Avolio et al., 2004). Authentic leaders are concerned with their followers' development, involve their athletes in decision-making, act in an ethical manner and build trusting relationships with followers (Avolio et al., 2004). The specific focus that authentic leadership places on leader-follower relationships makes it an ideal model for sports environments as athletes can be highly influenced by the relationship they have with their coach (O'Boyle et al., 2015). Many definitions of authentic leadership exist, in this study, we utilize Walumbwa et al.'s (2008) definition, which defines authentic leadership as "a pattern of leader behaviour that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-

AUTHENTIC COACHING INTERVENTION

development” (p. 94). Authentic leadership consists of four components: self-awareness; relational transparency; balanced processing and internalised moral perspective.

Self-awareness refers to how one makes sense of the world and consequently their views of themselves (Walumbwa et al., 2008). As such, showing self-awareness means that the leader is aware of their own strengths, weaknesses, inner values and moral values and is able to accept themselves (Ilies et al., 2005; Neider & Schrieshem, 2011; Walumbwa et al., 2008). Self-awareness is essential to becoming an authentic leader, as one cannot act authentically until one is fully aware of oneself (Ilies et al., 2005). Relational transparency refers to acting in accordance with your true self, values and morals and being open with followers (Ilies et al., 2005). This can include telling athletes the hard truth, admitting mistakes and displaying emotions exactly in line with feelings (Walumbwa et al., 2008). Relational transparency is believed to result in trusting open relationships being developed between the leader and their followers (Kernis, 2003; Walumbwa et al., 2008).

Balanced processing pertains to leaders objectively processing all available information, including their followers’ perspective before coming to a decision (Walumbwa et al., 2008). As such, balanced processing suggests that authentic leaders are willing to consider different points of view, even if these challenge their own positions (Walumbwa et al., 2008). Finally, internalized moral perspective refers to having high moral standards, reflected in the authentic leaders’ behaviours, rather than being guided by external pressures, resulting in ethical decision-making; they also express where they stand on controversial issues and ask that their followers do the same (Walumbwa et al., 2008). Due to these qualities, authentic leaders are expected to have a positive impact on their followers.

Consequences of Authentic Leadership

Authentic leadership can influence several outcomes. A key outcome authentic leadership is believed to influence is trust, which has been defined as being able to rely on

AUTHENTIC COACHING INTERVENTION

your leader and believing that they have good intentions for the team (Dirks, 2000). Authentic leaders are expected to create trusting relationships with their followers as a result of them being genuine and credible leaders, leading followers to personally identify with their leader (Gardner et al., 2005). Furthermore, through being open and demonstrating high moral standards, authentic leaders and their followers are likely to develop positive trusting relationships (Gardner et al., 2005; Ilies et al., 2005). The relationship between authentic leadership and trust has been confirmed in two sport studies, which found a positive correlation between these two variables (Bandura & Kavussanu, 2018; Houchin, 2011).

Another variable authentic leadership may influence is the coach-athlete relationship, which is described by Jowett and colleagues' model as comprising the 3 Cs: closeness, commitment and complementarity (Vella et al., 2010). Closeness refers to how coaches and athletes emotionally express their relationships and includes factors such as trust (Jowett, 2005; Jowett & Cockerill, 2003). Commitment relates to athletes' cognitions about whether they share beliefs and values with their leader, which facilitates the development of individuals' intention to stay with the leader/ team (Jowett & Cockerill, 2003). Complementarity refers to the interactions between the coach and athletes, and the similarity in the interpersonal behaviours of the coach for the athlete (Jowett & Cockerill, 2003; Jowett & Chaundry, 2004). Authentic leadership should help create strong coach-athlete relationship due to authentic leaders being open and showing their true self to their followers thus instilling trust.

Authentic leaders may also improve team cohesion, defined as "a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of instrumental objectives and/or the satisfaction of group members affective needs" (Carron et al., 1998, p. 213). Authentic leaders are expected to create more cohesive teams as a result of followers identifying with their leader, and consequently their team, through

AUTHENTIC COACHING INTERVENTION

1 authentic leaders providing high levels of social support (Avolio et al., 2004; Ashford &
2 Mael, 1989). The relationship between authentic leadership and group cohesion has been
3 supported by two studies, which found that authentic leadership was positively related to
4 greater team cohesion in athletes (Bandura et al., 2019; Houchin, 2011).

5 Authentic leaders are also likely to create more positive culture within the team,
6 which is a concept similar to school culture. School culture consists of four components
7 (Higgins-D'Alessandro & Sath, 1998): normative expectations, leader/team relationships,
8 follower relationships, and educational opportunities. Authentic leaders may positively
9 influence team culture as they are transparent, create open relationships with their followers,
10 and provide opportunities to the team, which overtime may become the culture of the team.
11 Whilst no research has examined the relationship between authentic leadership and team
12 culture, studies have investigated the relationship between authentic leadership and similar
13 variables, such as team climate. This refers to a supportive and trusting social environment,
14 and research has found a positive relationship between authentic leadership and team climate
15 in organizational and nursing settings (e.g., Shirey, 2006; Nelson et al., 2014). However, to
16 date no study has examined the effects of authentic leadership on team culture in sport.

17 There is also evidence for a link between authentic leadership and athlete enjoyment
18 and commitment. Enjoyment is “a positive affective response to the sport experience that
19 reflects generalised feelings such as pleasure, liking and fun” and is considered an aspect of
20 wellbeing, while commitment is a “psychological construct representing the desire and
21 resolve to continue sport participation” (Scanlan et al., 1993, p. 6). Both are vital
22 psychological outcomes in sport as they can impact on athletes’ dedication to continued
23 sports participation (Scanlan et al., 1993). Authentic leaders are expected to promote
24 enjoyment and commitment through creating trusting relationships with followers, by
25 spreading their own positive emotions and by creating supportive team cultures (Gardner et

al., 2005; Ilies et al., 2005). Indeed, one study found that authentic leadership was related to athletes' commitment and enjoyment (Bandura & Kavussanu, 2018).

Authentic leaders may also influence their followers' prosocial behaviours, which are "voluntary behaviours intended to help or benefit another individual" (Kavussanu & Boardley, 2009, p. 99). They could promote followers' moral behaviours, by influencing the team culture to become more ethical and instilling a norm to act ethically (Gardner et al., 2005). This is because authentic leaders have a highly developed moral component and are expected to show moral behaviours in line with their moral values. Hannah et al. (2011) found that authentic leadership was positively related to soldiers' ethical and prosocial behaviours, common in a military training center, such as considering soldiers' impact on others and putting the good of the group ahead of their own self-interest.

An experimental study conducted in business employees found that participants assigned to a high authentic leadership condition were less likely to make unethical decisions in the face of temptation, compared to a low or neutral authentic leader (Cianci et al., 2014). This experiment provided evidence of causal relationships between authentic leadership and ethical decision making. However, it is not known whether it is possible to teach coaches how to change their behaviours to become more authentic and the impact this will have on athletes. Therefore, there is a need to develop and evaluate an intervention designed to change coaches' behaviours to become more authentic.

Current Investigation

In summary, authentic leadership has been related to several positive outcomes such as trust, cohesion, enjoyment, and commitment (e.g., Bandura et al., 2019; Bandura & Kavussanu, 2018; Shirey, 2006). As the literature reviewed above suggests, it could also be associated with coach-athlete relationships, team culture, and prosocial behaviours within the team. However, to date, no study has investigated the effects of authentic leadership on these

AUTHENTIC COACHING INTERVENTION

variables. In addition, much of the research conducted on authentic leadership in sport has been cross sectional. There is the need to develop an authentic leadership intervention for coaches to examine whether coaches can implement authentic behaviours and whether these behaviours influence athlete outcomes.

The aim of this study was to develop such an intervention in coaches and evaluate its effectiveness by examining its effects on a range of outcomes (i.e., trust, coach-athlete relationships, cohesion, culture, enjoyment, commitment and prosocial behaviours). To this end, once we developed the intervention, we recruited coaches and their athletes, who were assigned to an intervention or a control group. We hypothesised that compared to the control group, athletes in the intervention group would report higher scores on the outcomes we examined (trust, cohesion, culture, coach-athlete relationships, enjoyment, commitment and prosocial behaviours) from pre to post intervention (e.g., Bandura et al., 2019; Bandura & Kavussanu, 2018). This study has significance as no authentic leadership intervention currently exists; however, by teaching coaches to become more authentic this could have positive impacts on both positive team and athlete outcomes and create more inclusive and moral sports environments, which may help to address current issues in sport such as the drop in sports participation with age and immoral behaviours in sport (Turnnidge & Cote, 2016).

Method

Design

The study consisted of two phases. In the first phase, we developed the intervention. During the second phase we tested the intervention using a small-scale pilot cluster randomized control trial (RCT) with a pre-post parallel design, over one sports season.

Phase 1: Development of the Intervention

Prior to starting the study, ethical approval was obtained from the University ethical research committee. The development of the intervention was based on the authentic

AUTHENTIC COACHING INTERVENTION

leadership literature and previous successful intervention studies on transformational leadership (e.g., Barling et al., 1996; Vella et al., 2013) and coach effectiveness training/mastery approach to coaching (CET; Smith et al., 1979). The Intervention also covered the components of a successful intervention as proposed by Hoffman et al. (2014) such as using a theory to guide the intervention, which in this case was Walumbwa et al.'s (2008) proposed four components of authentic leadership, as discussed in the introduction of this article.

Full details of the intervention can be seen in Table 1. The intervention consisted of a group workshop for coaches and a training manual. The group workshop consisted of: presentations including written information, videos and quotes from well-known coaches; scenario tasks; role-play activities and group-based exercises, in order to facilitate social support and to improve coaches' understanding further; and SMART (Specific, Measurable, Achievable, Realistic, Time-Constraint) goals for each of the components of authentic leadership, in order to apply what the coaches had learnt during the session to their own coaching practice (Vella et al., 2013). The training manual contained the information presented in the workshop, and a coaching log in which coaches were asked to write their SMART goals. The coaches were also provided with a list of behaviours relating to each component of authentic leadership and were asked to focus on one component every week, for the first four weeks, tally every time they engaged in the behaviours, and provide examples of how they did so.

These were sent to the researchers each week to check their progress. After the first four weeks they were asked to choose one behaviour per component to do each week and again provide examples of how they did this. To ensure fidelity of the intervention we employed strategies proposed by Gearing et al. (2011) such as ensuring the study had well-

AUTHENTIC COACHING INTERVENTION

defined objectives, procedures and outcomes and by using pre and post-test self-report measures to measure changes that occurred as a result of the intervention.

Once the intervention material was developed, we conducted a focus group with 5 coaches to refine the material. This included a presentation of the intervention material; we asked coaches to give their feedback on the material using closed and open-ended questions. Responses to the closed questions revealed that the participants found the presentation highly interesting, clear, enjoyable and engaging. Responses to the open-ended questions revealed that the content could be improved by providing specific examples from the media and including more female coach examples. The intervention material was revised to implement these changes prior to administering the workshop in the main trial described below.

Phase 2: Evaluation of the Intervention

The second phase involved delivering the intervention to a group of coaches and evaluating its effectiveness. As this study was a pilot study and therefore not a fully powered study a priori power analysis was not needed (Hertzog, 2008). Furthermore, as this was a pilot study, only a small sample of coaches was used and therefore a priori power analysis could not be conducted for the coach sample. However, a guide power analysis is included in the Endnote¹. The coaches were randomly allocated into either the intervention group, who received the intervention workshop or the control group, who did not. The CONSORT (2010) flow diagram for participant flow is presented in Figure 1.

Participants. Participants were 18 coaches and their 153 athletes. The eligibility criteria for the athlete participants were that they are healthy and participated in sport at the time of data collection. As can be seen in Table 2, the majority of the coaches were male (83.3%) and coached within British Universities and Colleges Sport (BUCS) leagues ($n = 10$), with the remaining coaching in external leagues.

Measures

AUTHENTIC COACHING INTERVENTION

The pre-test questionnaires was given to both coaches and athletes, at the start or end of a practice session, at their normal training location, towards the middle of the season. For the pre-test questionnaire, participants were asked to think about their experiences and or behaviours so far this season. The same questionnaires were then given to the coaches and athletes 2 months later, after the intervention. For the post-intervention questionnaire, participants were asked to think about their experiences/behaviours over the past 2 months.

Coach Measures

Authentic Leadership. We measured coaches' perceptions of their authentic leadership behaviours, as a manipulation check, using the Authentic Leadership Questionnaire (ALQ; Walumbwa et al., 2008). The wording of the questionnaire was changed so that it stated, "When I coach...". The ALQ measures the four components of authentic leadership using 16 items and four subscales: self-awareness (e.g., "I accurately describe how others view my capabilities"); balanced processing (e.g., "I listen to different points of view before coming to a decision"); relational transparency (e.g., "I say exactly what I mean"); and internalized moral perspective (e.g., "I make decisions based on my core values"). The coaches were asked to think about their experiences with their athletes and rate their behaviours on a 5-point scale with 1 corresponding to "*not at all*" and 5 corresponding to "*frequently if not always*".

Athlete Measures

Authentic Leadership. Athletes rated their perceptions of their coach's level of authentic leadership using the ALQ (Walumbwa et al., 2008). The wording was changed from the coaching scale, by stating "my coach" rather than "when I coach" and items were adapted accordingly. Athletes were asked to think about their experiences with their coach and rate their coach's frequency of the behaviours listed in the questionnaire on a 5-point scale with 1 corresponding to "*not at all*" and 5 corresponding to "*frequently if not always*".

AUTHENTIC COACHING INTERVENTION

Trust. Athletes rated their levels of trust towards their coach using the Trust Questionnaire (Dirks, 2000). This scale consists of nine items, and an example item is “I trust and respect my coach.” Participants are asked to think about their experiences with their coach this season and circle an appropriate answer using a 7-point Likert scale, with 1 representing “*strongly disagree*” and 7 “*strongly agree*”. This scale has been found to be reliable, as shown by a Cronbach alpha of .96 (Dirks, 2000).

Coach-Athlete Relationship. Athletes rated the nature of their relationship with their coach using the CART-Q (Jowett & Ntoumanis, 2004). The wording of the questionnaire was changed to reflect the athletes’ perception of their relationship with their coach. An example item of the closeness subscale is “I feel close to my coach”, an example of the complementarity subscale is “when I am coached by my coach, I feel at ease” and the commitment subscale is “I feel committed to my coach”. The athletes were asked to think about their experience with their coach and rate their agreement to each statement using a 7-point Linkert scale with 1 corresponding to “*strongly disagree*” and 7 “*strongly agree*”.

Team Cohesion. We measured team cohesion using the Youth Sport Environment Questionnaire (Eys et al., 2009), which measures both task and social cohesion, with nine items for each subscale. An example item for social cohesion is “I spend time with my teammates” and for task cohesion “my approach to playing is the same as my teammates”. Participants were told to think about their experience with their team this season and circle the appropriate number using a 9-point Likert scale with 1 corresponding to “*strongly disagree*” and 9 corresponding to “*strongly agree*”. For this study we computed an average score for the two subscales and used this in all analysis, as the correlation amongst the two subscales was high (.69).

Team Culture. Athletes’ perceptions of their team culture were measured using an adapted version of the School Culture Scale to sport (SCS; Higgins-D’Alessandro & Sadh,

1998). The wording of the questionnaire was also changed so that “teacher” became “coach” and “students” became “athletes.” We included three subscales with 14 items: teacher/school relationships (5 items, e.g., “athletes generally treat each other with respect and fairness”), athlete relationships (3 items, e.g., “my coach generally treats their athletes with respect and fairness”), and educational opportunities (6 items, e.g., “athletes learn how to listen to other people’s ideas better”). Participants were asked to rate how true the statements were for the team this season using a 5-point scale with 1 corresponding to “*false*” and 5 “*true*”. The average of the three subscales was used in the analyses, as the subscales were found to be highly correlated (.65, .76, .71). This scale has been found to be reliable ($\alpha = .85$; Higgins-D’Alessandro, & Sath, 1998).

Enjoyment and Commitment. The athletes rated their levels of enjoyment and commitment using two subscales with 4 items respectively, from the Sport commitment model (Scanlan et al., 1993). An example item from the enjoyment scale includes “are you happy playing for this team” and from the commitment subscale “how hard what it be for you to quit playing for this team”. Participants were asked to think about their experiences in their team and circle the appropriate number using a 5-point Likert scale with one corresponding to “*not at all*” or “*not at all dedicated*” and five “*very much*” or “*very dedicated*” for the enjoyment and commitment scales, respectively. The scale has shown to have good reliability of $\alpha = .90$ for enjoyment and $\alpha = .92$ for commitment (Weiss et al., 2010).

Prosocial Teammate Behaviours. Athletes rated their levels of prosocial behaviours using the prosocial behaviour towards teammate subscale of the Prosocial and Antisocial Behaviour in Sport Scale (PABSS; Kavussanu & Boardley, 2009). This is because we expected that authentic leadership would influence athletes’ prosocial behaviour towards their teammates. This scale consists of five items (e.g., “Congratulated a teammate for good play”). Athletes were asked how often they engaged in the behaviours this season using a

AUTHENTIC COACHING INTERVENTION

five-point Likert scale with 1 corresponding to “*never*” and 5 “*very often*”. This scale was found to be reliable, as shown by Cronbach alphas of .74 (Kavussanu & Boardley, 2009).

Procedure

Initially, a total of 62 coaches were contacted via email or phone, using purposeful sampling techniques. They were asked for their permission to be involved in either an intervention or a control group and for their athletes to take part in the study. Each coach and their athletes were told the purpose of the study, that data would be confidential and for research purposes only, that they could withdraw their data at any point, and that participation was voluntary. The recruitment took place over a period of two months. Once the coaches agreed to take part in the study a date and time was arranged for Time 1 data collection. The order of the measures in the questionnaire was counterbalanced to avoid order effects. The questionnaire took 10-15 minutes to complete and the researcher remained present at all times. The same questionnaire was then given to all participants 2 months later, in order to allow for enough time for the coaches in the intervention group to implement the behaviours they had learnt during the intervention.

The coaches, and their respective athletes, were then randomly allocated to either the intervention or the control group, by the lead experimenter using block randomisation techniques, as the sample size was small (Kim & Shin, 2014). A strength of RCT is that it eliminates selection bias, as participants are randomly allocated into the different conditions (Hannan, 2008). Specifically, the coaches were allocated a number and their names removed to ensure they would be randomly allocated anonymously. We then used a block randomization online calculator which randomly split the coaches into four blocks of two groups (group A relating to the intervention group, and B being the control) and picked the fourth block of random numbers. The letters A or B were added next to the 18 numbers, which were then checked against the original list of coaches. The intervention group then

AUTHENTIC COACHING INTERVENTION

received the three-hour workshop; there was no intervention for the control group. The coaches in the intervention group were required to complete weekly coaching logs to assess their progress. The overall compliance with the weekly coaching log reporting through Week one to four was high (100%) from all coaches. The percentage of coaches who completed the coaching logs for week 5 (66.7%), 6 (66.7%), 7 (66.7%), and 8 (50%) was lower.

Booster Session

The workshop was followed up by regular contact and a booster session with the intervention group coaches half-way through the intervention time (four weeks in). The aim of the session was to give a refresher of the material and to address any issues they may have had in the first month. The meeting used the GROW (Goals: relating to what they want to achieve; Reality: meaning where they are now in terms of achieving goal; Options: describing what they could do to achieve their goal; What: meaning what are they going to do now to achieve their goals) format, used by Vella et al. (2013). This influenced the conversations with each coach, in terms of the structure of the conversation, and assessed their progress towards their SMART goals, and if necessary led to a discussion of strategies they could employ to ensure they achieved their goals. All the steps of the study are presented in Table S1 of the supplementary material .

Data Analysis

Data analyses were conducted using the Statistical Program for Social Sciences (SPSS v. 26). Preliminary data analysis was firstly conducted to examine whether there was any missing data and in order to calculate the Cronbach alphas. Descriptive statistics were then calculated for the coach and athlete variables. Although data were collected from both coaches and athletes, the main analysis was conducted on only the athlete data. This was due to the small number of coaches and because followers' perceptions of their leaders' authentic behaviours are more reliable than coach self-report measures (e.g., Avolio et al., 2004).

However, we have included the coach data for indicative purposes. The coach data and athletes' perception of their coaches' authentic leadership were used as a manipulation check.

For the main analysis we conducted a repeated measures MANOVA, followed by a post hoc analysis of pairwise comparisons based on estimated marginal means to examine whether athletes of coaches in the intervention group would report higher scores on the outcomes from pre to post-intervention, compared to the control group. We report the partial eta-squared (η_p^2) as the effect sizes, with .02, .13 and .25 considered small, medium, and large effect sizes respectively Cohen (1992). For the variables which demonstrated a significant interaction effect, an Analysis of Covariance (ANCOVA) was conducted, to examine whether group differences on each variable in the Time 2 scores were significant, when controlling for Time 1 scores.

Results

Descriptive Statistics, Alpha Coefficients, and Zero-Order Correlations

Preliminary data analysis revealed the data to be normally distributed according to the Shapiro-Wilk test and visual inspection of the histograms, Q-Q plots, and boxplots. There were no missing data from the coach data set. For the athlete data set, 0.7% of the data were missing at time 1 and 13.1% of the data were missing at Time 2. A MCAR test showed the data to be missing completely at random (Chi-square = 505.44, $p = .999$), supporting the null hypothesis. Missing values were therefore replaced using the multiple imputation procedure, which generated five data sets. The sum of these imputed data sets was used to replace the missing values and used throughout the rest of the analysis. Therefore, for each of the following analysis the data from the original 153 athletes and 18 coaches was used.

Table 3 displays the Cronbach alphas and descriptive statistics for the coach and athlete variables. In general, the Cronbach alphas for the coach and athlete measures were considered good to excellent, whilst the scores for the PABSS scale were considered

AUTHENTIC COACHING INTERVENTION

acceptable, as suggested by George and Mallery (2003) ($> .9$ = Excellent; $> .8$ = Good; $> .7$ = Acceptable). Interestingly, athletes reported medium levels of perceived coach authentic leadership, team cohesion and teammate prosocial behaviours. Athletes also reported high levels of commitment, trust, team culture, enjoyment and coach-athlete relationship.

Manipulation check

Coaches in the intervention group reported lower authentic leadership ($M = 3.68$, $SD = .59$) compared to the control group ($M = 4.44$, $SD = .71$), at Time 1, and higher authentic leadership ($M = 4.33$, $SD = .35$), compared to the control group ($M = 4.18$, $SD = .35$), at Time 2. A repeated measures MANOVA, conducted on the athletes' responses revealed a significant Group effect and Group x Time interaction for authentic leadership. The follow up ANCOVA controlling for Time 1 scores revealed that athletes in the intervention group reported higher perceptions of authentic leadership, compared to the control group, thus confirming that the intervention was successful in changing coaches' authentic leadership.

Main Analysis

The main purpose of our study was to examine whether the coaching intervention was effective in increasing the outcomes and to this end we examined scores in the intervention group from pre to post intervention, compared to the control group. Table 4 shows the results of a repeated measures MANOVA, with a 2 Group (Intervention, Control) x 2 Time (pre, post). There was a significant Time effect for team culture and coach athlete relationship. We also found significant Group x Time interaction effects for enjoyment, commitment and prosocial behaviour. These effects are illustrated in Figures 2-4. We found no main or interaction effects for cohesion and trust.

For the variables which showed a significant interaction effect we also compared the Time by the intervention Group, using pairwise comparisons based on estimated marginal means to examine whether the mean of the variables was different or the same for the two

AUTHENTIC COACHING INTERVENTION

groups at Time 1 and 2. As can be seen in Table 3, the intervention group showed that authentic leadership, enjoyment and prosocial behaviours were not different at the first time point, but were respectively different at follow-up. Pairwise comparisons showed that, at Time 2, athletes in the intervention group reported significantly higher authentic leadership, enjoyment and prosocial behaviour than athletes in the control group. Commitment was not found to be significantly different at the first or second Time point.

The Mixed ANOVAs which showed a significant Group x Time interaction, were also followed up by an ANCOVA. As can be seen in Table 5, in Time 2, athletes reported significantly higher authentic leadership, enjoyment and prosocial behaviour, when controlling for Time 1 scores of each variable. However, Time 2 commitment was not significantly different between groups, when controlling for Time 1 commitment.

Discussion

To date, a limited amount of research has been carried out on authentic leadership in sport, and this research has shown that authentic leadership is related to several positive athlete outcomes (e.g., Bandura et al., 2019; Bandura & Kavussanu, 2018; Houchin, 2011). However, these studies were cross sectional and therefore, there was the need to develop an intervention designed to increase coaches' use of authentic behaviours. Our results showed that coaches in the intervention group were perceived by their athletes to display more frequent authentic leadership behaviours, compared to the control group from pre to post intervention. This is an important finding as it shows that authentic leadership can be taught in coaches. However, the main purpose of the study was to examine whether the intervention was effective in influencing a range of athlete and team outcomes. Below we discuss our findings in relation to this study purpose.

Effects of Intervention on Outcomes

AUTHENTIC COACHING INTERVENTION

1 In line with our hypothesis, athletes of coaches who received the intervention reported
2 greater enjoyment compared to the control group, from pre to post intervention. The findings
3 of the impact of the intervention on athletes' enjoyment extends the results of a cross-
4 sectional study in sport (Bandura & Kavussanu, 2018). Our study is the first to show that by
5 implementing authentic leadership behaviours, coaches can actually increase enjoyment in
6 their athletes. The increase in enjoyment, in the intervention group, in comparison to the
7 control group, is a significant finding as this variable is highly influenced by factors in the
8 social environment, such as the type of leadership coaches display, and plays an important
9 role in continued sports participation (Scannlan et al., 1993). The results enhance our
10 understanding of the relationship between authentic leadership and athletes' enjoyment, by
11 suggesting that when coaches display authentic behaviours, such as those highlighted in our
12 coaching programme, they are able to produce greater enjoyment amongst their athletes. The
13 mechanism through which this occurs is not entirely clear, however, previous research
14 suggests, this could be due to authentic coaches spreading their own positive emotions to
15 their followers (Gardner et al., 2005; Ilies et al., 2005).

16 Our results also supported our hypothesis that athletes in the authentic leadership
17 condition would report more frequent prosocial behaviours after the intervention, compared
18 to the control group. This finding supports and extends previous research (e.g., Hannah et al.,
19 2011), which found that authentic leadership was positively related to soldiers' prosocial
20 behaviours. The findings suggest that an authentic coaching intervention is effective in
21 increasing prosocial behaviours, by increasing coaches use of authentic leadership behaviours
22 such as showing their true moral self to followers and asking their followers to do the same.
23 Therefore, coaches should be encouraged to show authentic behaviours in their coaching
24 practice in order to increase athletes' prosocial behaviour toward their teammates. In turn,

1 this could lead to other desirable outcomes such as athletes' positive affect, group cohesion,
2 and performance (Al-Yaaribi et al., 2016; Al-Yaaribi & Kavussanu, 2017).

3 Whilst we found that the intervention groups scores for trust, cohesion, team culture,
4 commitment and coach-athlete relationships either remained the same or increased over time,
5 compared to the control group; contrary to our hypotheses, these variables were not found to
6 be significantly different from the control group from pre to post intervention. These null
7 findings could be due to our study not including a long enough time between data collection
8 points. Variables such as trust and coach-athlete relationships develop over time, as followers
9 identify and begin to trust their leader (Avolio et al., 2004). Thus, trust and coach-athlete
10 relationships may not have been influenced sufficiently by the small-time frame used in this
11 study. Similarly, team culture and cohesion develop over time as they require the team's
12 values to change; and this may not be adequately captured with time points relatively close
13 together. However, the results of this study still provide important initial evidence of the
14 effectiveness of an authentic leadership coaching intervention (Cruickshank & Collins, 2013).

15 Overall, the results of the study demonstrate that our authentic coaching intervention
16 was effective in increasing athletes' perceptions of their coaches use of authentic leadership
17 and reported enjoyment and prosocial behaviours. These findings suggest that authentic
18 leadership is a potentially viable addition to coach education programmes. This research is
19 important because there is a substantial need for theoretically driven and coherent coach
20 education models (Vella et al., 2013). Authentic leadership can provide a theoretically sound
21 approach to sport leadership as it could lead to positive athlete outcomes. Furthermore, the
22 results suggest authentic leadership behaviours should be encouraged amongst coaches.

23 **Practical Implications**

24 The results of this study demonstrated that it is feasible to implement an authentic
25 coaching programme and that this promotes beneficial outcomes to sports participation and

more moral sports behaviours. Therefore, coaches should be encouraged to change their coaching behaviour to display more authentic behaviours, such as having a greater understanding of themselves, being open with their followers, including their athletes in decision making, and displaying moral behaviours in-line with their inner values, in order to produce positive athlete outcomes. The results also suggest that authentic leadership models should be incorporated in future coach education models.

Limitations and Future Research Directions

Despite the interesting findings, our study was not without limitations. Firstly, only a small sample of coaches were included. We did this because this was the first study that has developed such an intervention for coaches, and we wished to determine whether it is feasible to conduct such an intervention in coaches. Future research needs to include a larger sample and a wider range of coaches, from different sports or age ranges, to increase the generalisability of the results. The small sample size may also have been responsible for the null findings in several of our outcomes. Secondly, future research should refine and develop the material further, and then evaluate the intervention using a full-scale randomized control trial over a longer period of time in order to increase confidence in the results and to examine the casual mechanisms between the relationships proposed in this study.

Conclusions

Our findings extend the current literature on authentic leadership in sport by demonstrating that it is feasible to deliver an authentic leadership coaching intervention in order to increase coaches use of authentic behaviours. Importantly, such an intervention can lead to greater enjoyment and more frequent prosocial behaviour toward one's teammates. Our findings suggest that coaches should be encouraged to display more authentic behaviours. Finally, authentic leadership may provide a good theoretical foundation for future coach education programmes.

AUTHENTIC COACHING INTERVENTION

Table 1

Authentic Coaching Intervention

Component	Content
Workshop	<ul style="list-style-type: none">• Discuss the importance of good coaching and present information on how it can lead to positive athlete outcomes.• Explain what authentic leadership is, its four components, its link with athlete outcomes, and its importance.• Provide examples of why authentic leadership is important and how behaviours of famous effective coaches illustrate each component.• Give practical examples of how to show each component in coaching.• Discuss with the group each component and ways coaches can solve common problems in their coaching in an ‘authentic’ way.• Come up with SMART goals based on what was presented.
Training Manual	<ul style="list-style-type: none">• Provide with main points of workshop content, additional space to contribute to group tasks and activities.
Coaching Log	<ul style="list-style-type: none">• Space for SMART goals set during session• Provide information on how to show the behaviours relating to each component and space to tally how often engaged in authentic behaviours relating to different components and examples.
Booster Session	<ul style="list-style-type: none">• Main points of workshop reiterated.• Provide additional mentoring towards SMART goals using GROW format

Figure 1

CONSORT 2010 Flow Diagram

Note. This figure illustrates the CONSORT flow diagram of participant flow.

Table 2*Participant Characteristics ($N_{Coaches} = 18$; $N_{Athletes} = 153$)*

Variable		Group	
		Coaches $M (SD)$	
		Intervention ($N = 6$)	Control ($N = 12$)
Sex	Male	6 (100%)	9 (75.0%)
	Female	0 (0.0%)	3 (25.0%)
Sport	Football	3 (50.0%)	4 (33.3%)
	Athletics	2 (33.3%)	5 (41.7%)
	Mixed Martial Arts	1 (16.7%)	0 (0%)
	Korfball	0 (0%)	2 (16.7%)
	Cheerleading	0 (0%)	1 (8.3%)
Age		32.66 (18.90)	40.50 (20.29)
Years of coaching		10.83 (14.63)	8.33 (10.69)
Years of coaching team		8.33 (15.55)	4.04 (3.93)
		Athletes $M (SD)$	
		Intervention ($N = 60$)	
		Control ($N = 93$)	
Age		32.66 (18.90)	40.50 (20.29)
Years of coaching		10.83 (14.63)	8.33 (10.69)
Years of coaching team		8.33 (15.55)	4.04 (3.93)
Sex	Male	49 (81.7%)	26 (28.00%)
	Female	11 (18.3%)	67 (72.04%)
Sport type	Football	34 (56.7%)	43 (46.2%)
	Athletics	17 (28.3%)	21 (22.58%)
	MMA	9 (15%)	0 (0%)
	Korf ball	0 (0%)	18 (19.4%)
	Cheerleading	0 (0%)	11 (11.8%)
Age		21.77 (6.85)	20.24 (3.56)
Years training with team		10.70 (5.53)	8.87 (6.08)
Years training with coach		1.42 (1.24)	1.82 (1.28)

Table 3*Cronbach Alphas and Descriptive Statistics for Athlete Variables*

Variable	α	Group			
		Intervention		Control	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Authentic Leadership					
Time 1	.92	3.98	.69	3.98	.55
Time 2	.92	4.20	.51	3.84	.60
Trust					
Time 1	.93	6.34	.66	6.12	.93
Time 2	.90	6.27	.61	6.10	.77
Team Culture					
Time 1	.92	4.10	.52	4.08	.58
Time 2	.93	4.35	.50	4.27	.58
Team Cohesion					
Time 1	.90	7.12	1.20	7.35	1.05
Time 2	.85	7.23	.87	7.15	.85
Coach-Athlete Relationship					
Time 1	.96	5.95	1.06	6.04	.90
Time 2	.95	6.22	.63	6.11	.89
Enjoyment					
Time 1	.96	4.58	.66	4.67	.59
Time 2	.93	4.62	.47	4.40	.53
Commitment					
Time 1	.86	4.28	.70	4.43	.60
Time 2	.85	4.44	.49	4.40	.58
Prosocial Behaviour					
Time 1	.79	3.87	.63	3.96	.59
Time 2	.77	4.00	.53	3.88	.51

Note. ** $p < .01$, * $p < .05$.

Table 4*Repeated measures MANOVA Results for Athlete Variables (N = 151)*

Variable	Effects (<i>F</i> (1,151), <i>ES</i>)					
	Within-Subjects		Between-Subjects		Interaction	
	Time		Group		Group x Time	
	<i>F</i>	<i>ES</i>	<i>F</i>	<i>ES</i>	<i>F</i>	<i>ES</i>
Authentic Leadership	.41	.00	5.21*	.03	10.19*	.06
Trust	.61	.00	2.89	.02	.25	.00
Team Culture	21.40**	.12	.37	.00	.29	.00
Cohesion	.33	.00	.52	.00	2.46	.01
Coach-Athlete Relationship	5.47*	.02	.01	.00	1.81	.01
Enjoyment	4.04*	.03	.86	.01	7.54**	.05
Commitment	1.50	.01	.44	.00	3.56*	.02
Prosocial Behaviour	.32	.00	.06	.00	4.74*	.03

Note. *ES* = effect sizes are partial eta squared (η_p^2): .02, .13 and .25 are considered small, medium and large effects, respectively (Cohen, 1992).

** $p < .01$, * $p < .05$.

Table 5*ANCOVA Results for Time 2 Scores Controlling for Time 1 scores*

Variable	Group				$F(1,151)$	η^2
	Intervention		Control			
	M	SD	M	SD		
Authentic Leadership	4.20	.07	3.84	.06	16.58**	.10
Enjoyment	4.64	.06	4.39	.05	9.06*	.06
Commitment	4.48	.06	3.38	.05	1.56	.01
Prosocial Behaviour	4.02	.06	3.86	.05	4.28*	.03

Note. ** $p < .01$; * $p < .05$

Figure 2

Authentic Leadership, Enjoyment and Prosocial Behaviour as a Function of Group and Time

Note. This figure shows athletes' perceptions of their coaches' authentic leadership, enjoyment and prosocial behaviour over time as a function of intervention group.

The range for the authentic leadership, enjoyment and prosocial behaviour variables is 1-5.

Endnotes

¹A priori power calculation using G*Power, showed that for a mixed ANOVA with 2 between-subject groups (intervention, control), and two time points (Time 1, Time 2), in order to detect a medium effect size for the within-between interaction (.25), 128 participants were required to reach 80% power, assuming a significance level of .05.

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