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# Measuring leadership in sport: Development and validation of the Identity Leadership Inventory – Youth (ILI-Y)

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## ARTICLE INFO

## ABSTRACT

The social identity approach to leadership posits that leaders' effectiveness depends on their ability to represent, advance, create, and embed a shared sense of social identity among their followers. Although significant progress has been made in investigating the benefits of identity leadership in adult sports, research in youth sports is still in its infancy. One reason is the lack of a youth-centric inventory that adequately measures identity leadership in this population. To bridge this gap, we developed and validated a long (16 items) and short (5 items) version of the Identity Leadership Inventory for Youth Sport (ILI-Y or ILI-Y-Short-Form) through five studies conducted in three phases of research. Data were primarily collected in football in the United Kingdom, involving a total of 1096 participants. Results of Phase I of this study provided little to no evidence that the ILI – originally developed for adults – was understandable (Study 1) and had factor validity and internal consistency (Study 2) in a sample of youth athletes. Therefore, in Phase II, the ILI was revised, leading to the development of the ILI-Y, which was understandable for youth athletes (Study 3). Results from Phase II (Study 4) also indicated that the ILI-Y exhibited a unidimensional factor structure, which was subsequently confirmed in Phase III (Study 5). This last phase offered additional evidence for the discriminant, criterion, and incremental validity of the ILI-Y and its short form, along with their measurement invariance across genders and age groups, and internal consistency. This study provides sports psychology researchers and practitioners with a valid measure to assess identity leadership in youth sports.

## 1. Introduction

It is well-known that sports participation can be a vehicle for positive youth development as well as for the development of general life skills (Bruner et al., 2017; Gould & Carson, 2008). The mechanisms through which these benefits unfold have also become clearer over the last decade. One such mechanism is the building of shared social identities (Bruner et al., 2017). That is, by helping to build youth players' sense of themselves as group members, sport can help young people feel part of a larger 'we' and 'us' and to develop the skills associated with this sense of 'we' and 'us'.

The social identity approach, which combines insights from social identity theory (Tajfel & Turner, 1979) and self-categorisation theory (Turner et al., 1987), has emerged as a key approach to explain group

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processes in psychology (Reicher et al., 2010). At its roots, this approach contends that individuals can define themselves in multiple ways. On the one hand, they can make sense of who they are by reflecting on what makes them unique and different from others (i.e., in terms of their personal identity as 'I' and 'me'). On the other hand, they can also understand themselves by reflecting on the groups that they belong to and identify with (i.e., in terms of their social identity as 'us' and 'we'). Moreover, it is apparent that when social identities are internalised as a central part of people's sense of self, they have a significant bearing on the way they think, feel, and act (Turner et al., 1987).

Speaking to this point, evidence from youth[1] sport suggests that social identification with one's sport team has multiple benefits. In terms of athlete development, Bruner et al. (2017) found that youth athletes' identification with their sport team was associated with their acquisition of personal skills (e.g., being better at receiving feedback) as well as their social skills (e.g., being able to make new friends). Furthermore, these high-identifying youth players took more initiative (e.g., in improving their physical skills), demonstrated better goal-setting skills, and had fewer negative developmental experiences (e.g., social exclusion). Moreover, players who identify strongly with their team have also been found to have a higher sense of self-worth, to be more committed to their team, and to put more effort into sport-related activities (Martin et al., 2018). The positive effects of shared social identities also extend to affect youth athlete's broader health and well-being. For example, Jetten et al. (2022) and Vella et al. (2021) found that youth athletes who identified more strongly with their sports team reported better mental health (e.g., fewer symptoms of depression and/or anxiety).

The aforementioned research highlights the importance of social identity in youth sport. This in turn raises the question of how to foster such a shared social identity. Here, the social identity approach to leadership argues that leaders (e.g., coaches) play a key role in cultivating this shared sense of 'we' and 'us' through what is referred to as (social) *identity leadership* (Haslam et al., 2020). Effective identity leadership is argued to comprise four key dimensions. First, leaders need to be seen as *'identity prototypes'* who exemplify what 'we' (i.e., the in-group) stand for and what makes 'us' unique and special. Second, leaders need to work to promote the collective interests of the group — through 'identity advancement' — rather than their own interests or the interests of other groups. Third, leaders must act as 'identity entrepreneurs' who craft and cultivate a shared sense of who 'we' are and who 'we' want to be. Finally, leaders should also endeavour to make their shared vision for the group a social reality by serving as *'identity impresarios'* who create a world in which the group's sense of 'who we are' can be lived out and made to matter (e.g., through shared activities, events, and rituals).

As with any psychological concept, research into identity leadership was advanced through the development of a valid and reliable instrument for assessing the construct in various research contexts (not only in sport but also in organisations). To this end, Steffens et al. (2014) developed the Identity Leadership Inventory (ILI), which includes a total of 15 items (see Table 1) to operationalise the four dimensions (i.e., identity—*prototypicality*, *advancement*, *entrepreneurship*, and *impresarioship*) of identity leadership. These researchers also confirmed the ILI's, factor, discriminant, and criterion validity across four studies in organisational and adult sport contexts. More specifically, the ILI was shown to differentiate between the four dimensions of identity leadership, to capture concepts that were distinct from those derived from other leadership theories (e.g., authentic leadership), and to be positively associated with key outcomes (e.g., team confidence, team identification, and task cohesion).

Steffens et al.'s (2014) findings were subsequently supported by

research that van Dick et al. (2018) conducted across 20 countries as part of the Global Identity Leadership Development (GILD) project. Amongst other things, GILD research found that the ILI has (a) a consistent four-dimensional factor structure; (b) incremental validity (over and above authentic leadership, leader-member exchange, and transformational leadership); (c) measurement invariance (i.e., meaning that the items were interpreted in similar ways by members of different groups; Cheung & Rensvold, 2002); and (d) good test-retest reliability.

The development and validation of the ILI contributed to significant growth in research on identity leadership, showing that followers perceptions' of their leaders' identity leadership are the basis for increased social identification and a range of individual and team outcomes in adult sports (Steffens et al., 2020; Stephen et al., 2023). For example, studies have shown that the extent to which coaches engage in identity leadership predicts increased athlete attendance through social identification (Stevens et al., 2018; Stevens et al., 2020). Furthermore, Miller et al. (2020) found that coaches' engagement in identity leadership has a positive association – via social identification – with athletes' self-efficacy (i.e., their confidence to perform well in the upcoming match), social support, and control over their upcoming performance in ways that also encourage them to adopt approach goals (i.e., goals focused on achieving positive, rather than avoiding negative, outcomes). Extending this line of research, Fransen et al. (2020) found that coaches' identity leadership was positively associated with psychological safety and team identification, which in turn promoted teamwork, team resilience, member satisfaction with team performance, and athlete mental health. While the past decade has seen a substantial increase in identity leadership research in the context of adult sports, unfortunately, research in the domain of youth sports is still lagging behind. One possible reason for this is the lack of a measure to assess identity leadership in the youth sports context.

There are several reasons why it is not evident to use the ILI for adults for youth samples. One is that a scale's measurement properties (e.g., construct validity) seem likely to be context and population-dependent (Flake et al., 2017). Indeed, if researchers use an instrument such as the ILI with a very different population (e.g., younger age groups), then research is needed to establish that the instrument captures the construct appropriately in this context. In fact, it may be that the ILI does not adequately capture the nuances of youth athletes' identity leadership. In particular, it seems plausible that young athletes' level of development (i.e., cognitive, emotional and social; Lerner et al., 2010) has some bearing on the way they respond to items in this instrument. More specifically, during adolescence, youth athletes' cognitive capacities (e.g., their capacity to evaluate the logical consistency of statements) develop in parallel with the search for a coherent self-concept (i. e., their answer to the question 'Who am I?') and with their growth in language comprehension (e.g., associated with richer vocabulary; Soto et al., 2008). Together, these developmental factors may influence how adolescents understand and respond to ILI items and this may also have implications for within-domain coherence (i.e., the extent to which items that measure the same identity leadership dimension are correlated with each other) and between-domain differentiation (i.e., the extent to which items measuring the same dimension of identity leadership are more strongly associated with each other than with items measuring conceptually distinct dimensions of identity leadership; Soto et al., 2008).

Underlining complications of using scales developed with adult populations for youth populations, Smith et al. (1995) found that the original three-factor structure underlying the Sport Anxiety Scale was not reproduced in a factor analysis of data produced by younger athletes. Smith et al. (1995) therefore chose to treat the scale as unidimensional, using total scores rather than subscale scores. Similarly, in the process of validating the cohesion questionnaire for youth athletes,

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[1] In previous literature, the term 'youth' has been used to refer to different age classifications (Petersen et al., 2019). In this study, we employ this term to refer to individuals between the ages of 12 and 17.

Eys et al. (2009) needed to reduce the conventional four dimensions of cohesion (i.e., group integration-task, individual attractions to the group-task, group integration-social, and individual attractions to the group-social) to just two dimensions (i.e., task and social) because youth athletes could not distinguish between group-oriented and individual-oriented cohesion.

This discussion raises a series of questions concerning the psychometric properties of the ILI when it is administered to a youth sporting population. Given the developmental level of youth (vs. adult) athletes, to what extent can they understand the relatively abstract issues that the ILI invites them to reflect on? Which items and/or words (if any) do they find hard to comprehend and/or respond to? As a result, can the ILI's factor structure be reproduced in data collected from youth athletes? And, most fundamentally, does the ILI reliably measure identity leadership amongst youth athletes?

To address these questions and develop a valid and internally consistent measure of identity leadership in youth sports, we began with Phase I of this research program. This first phase consisted of two studies (a qualitative Study 1 and a quantitative Study 2) that assessed the understandability, factor validity, and internal consistency of the ILI. Building on the results of Phase I, in Phase II, we went back to the drawing board and started with adapting the ILI items and/or words to make them more understandable for youth populations. This was followed by a series of two exploratory studies. In the first of these (Study 3), we qualitatively investigated the modified ILI's (referred to hereinafter as the Identity Leadership Inventory—Youth or the ILI-Y) understandability. The second study of Phase II (Study 4) *explored* the ILI-Y's factor structure and internal consistency. Phase III of the research built on the previous phases and included one study (Study 5) that aimed to confirm the ILI-Y's and the ILI-Y-Short Form's (i.e., ILI-Y-SF) validity (i. e., its factor, discriminant, criterion, and incremental validity), measurement invariance (across genders and age groups), and internal consistency in a larger sample.

This study's philosophical foundation lies in pragmatism, positioned between positivism (which posits a singular reality uncovered through objective quantitative methods) and constructivism (which denies objective reality, advocating for subjective inquiry through qualitative methods; Feilzer, 2009). More specifically, pragmatism dismisses the dichotomy between positivism and constructivism, opting for research methods best suited to address the specific research questions at hand.

Overall, having a validated instrument to assess identity leadership in youth sports will assist future research on whether identity leadership can be used to build social identities in ways that develop youth athletes' life skills, promote their positive development, and benefit their mental health. In this way, it also enables extending the boundaries of the social identity approach to leadership and may even inspire future scholars to expand this research line to youth in educational, family, and clinical settings.

## 2. Phase I: Testing the understandability, factor validity, and internal consistency of the ILI in youth sports contexts

The aims of Phase I were to assess the understandability, factor validity, and internal consistency of the ILI. Given the exploratory nature of such assessments, no a priori hypotheses were formulated. However, if participants understood the ILI clearly, and if its factor structure and internal consistency were reproduced in ways similar to those observed in adults, it would suggest that the ILI is suitable for use in a youth sample.

A mixed-method design was used to address the aims of this phase. The studies received institutional ethical approval from one of the two first authors' universities. Participants were recruited via convenience sampling after contacting representatives at provincial sporting institutions (competing in categories 3 or 4) from popular team sports in the United Kingdom (Etikan et al., 2016). Written informed consent was also obtained from all study participants and their guardians before data collection. Participation was voluntary, and participants were assured that their data would be treated confidentially. Research assistants collected the data after participants had finished their training sessions.

### 2.1. Study 1: Qualitative analysis of the ILI

#### 2.1.1. Methods

**Participants**. We recruited a total of 14 youth athletes from two team sports, including 12 young men who were football players and two young women who were netball players. Participants were, on average, 13.50 (SD = 2.12) years old.

**Procedure and measures**. Youth athletes who agreed to participate indicated their perceptions of the extent to which their coach engaged in identity leadership by responding to the items of the ILI on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). This was followed by a face-to-face interview using a technique commonly known as cognitive interviewing (Ryan et al., 2012). This technique refers to a collection of methods such as verbal probes (i.e., asking questions about participants' thinking) and think-out-loud protocols (i. e., asking participants what they think as they respond to a survey item or just after they have responded to an item). Cognitive interviewing allows researchers to analyse the degree to which respondents understand a questionnaire and to use the resulting data to improve the understandability of the questionnaire (Ryan et al., 2012).

Using this technique, we developed and employed a list of verbal probes including: (a) 'What did you think about the questionnaire?'; (b) 'Was it difficult or easy to understand?'; (c) 'What items did you find difficult to understand?'; and (d) 'Which words in this item did you find difficult to understand?' The interviews lasted under 10 min and were recorded for analyses purposes.

**Data analyses**. The interviews were transcribed verbatim, and the resulting data were analysed using supplementary counting methods (Hannah & Lautsch, 2011). In doing this, we counted the number of times youth athletes reported difficulties in understanding specific words, items, and/or the entire questionnaire.

#### 2.1.2. Results

Seven of the 14 participants found the ILI as a whole difficult to understand, while four participants had difficulties understanding some parts of it. The three remaining participants did not comment on the questionnaire as a whole and instead reported directly on the individual items that they found difficult to understand. Table 1 reports on the nature of participants' difficulties, and shows that participants struggled most with items P1, P4, A2, E2, E3, E4, and I3 (i.e., 7 of the 15 items). Furthermore, when we asked participants which words – among these items – they found difficult to understand, they tended to mention the following: (a) "embodies", (b) "exemplifies", (c) "champion", (d) "cohesion", (e) "values and ideals", (f) "devises", and (g) "structures". Overall, the findings of this qualitative study indicate that youth athletes had difficulty understanding the ILI, as well as the individual items within it. At the same time, they also shed light on the precise source (e. g., words) of these difficulties.

**Table 1**
Results of the qualitative analyses in study 1.

| ILI dimensions | | Items | n |
|---|---|---|---|
| Prototypicality (P) | P1 | My coach embodies what the training group stands for | 14 |
| | P2 | My coach is representative of the training group | 2 |
| | P3 | My coach is a model member of the training group | 3 |
| | P4 | My coach exemplifies what it means to be a member of the training group | 11 |
| Advancement (A) | A1 | My coach promotes the interests of the members of the training group | 3 |
| | A2 | My coach acts as a champion for the training group | 13 |
| | A3 | My coach stands up for the training group | 1 |
| | A4 | When my coach acts, they have the training groups interests at heart | 3 |
| Entrepreneurship (E) | E1 | My coach makes people feel as if they are part of the same training group | 1 |
| | E2 | My coach creates a sense of cohesion within the training group | 11 |
| | E3 | My coach develops an understanding of what it means to be a member of the training group | 6 |
| | E4 | My coach shapes members' perceptions of the training groups values and ideals | 11 |
| Impresarioship (I) | I1 | My coach devises activities that bring the training group together | 5 |
| | I2 | My coach arranges events that help the training group function effectively | 4 |
| | I3 | My coach creates structures that are useful for the training group | 11 |

Note. In column 2, the numbers signify the item number. For example, P1 means Prototypicality item 1; n indicates the number of participants who reported finding the item difficult to understand.

## 2.2. Study 2: Quantitative analysis of the ILI

### 2.2.1. Methods

**Participants**. We recruited a sample of 100 football players for this study who were on average 14.42 (SD = 1.58) years old. Participants were stratified by age: 12 to 13-year-olds (n = 32); 14 to 15-year-olds (n = 34); 16 to 17-year-olds (n = 34); and gender (50 young women and 50 young men).

**Procedure and measures**. Youth athletes completed a questionnaire that took no more than 10 min to complete. It included demographic questions and the 15-item ILI (see a full list of items in Table 1), which asked participants to rate their perceptions of the extent to which their coach engaged in identity leadership on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

**Data analyses**. All data were analysed in R Studio (R Studio Team, 2019), and were initially screened for missing values, outliers, and normality. Next, descriptive statistics and correlations between all study variables were calculated. Following this, we examined the validity of the ILI's factor structure by conducting Confirmatory Factor Analyses (CFA). Based on prior evidence and theory, we specified three models (Steffens et al., 2014; van Dick et al., 2018). First, we specified a one-factor model where all items loaded on an undifferentiated global identity leadership factor. Second, we specified a correlated four-factor model where the items corresponding to the four distinct identity leadership factors (i.e., identity prototypicality, identity advancement, identity entrepreneurship, and identity impresarioship) loaded on their respective factor. Third, we specified a hierarchical second-order model in which the items loaded onto a factor corresponding to a given identity leadership dimension (e.g., identity prototypicality), and these four factors, in turn, loaded onto one overarching identity leadership factor. According to Steffens et al. (2014) and van Dick et al. (2018), the four-factor solution was the best-fitting model among adult participants, followed by the hierarchical second-order model, and finally the one-factor model. Therefore, if we observed similar trends amongst youth participants in this study, it implied that the factor structure observed for adults also held for youth participants. The factors were scaled by fixing the first loading on each latent variable to be 1. Latent variables were permitted to correlate based on prior evidence of positive relationships between them (Steffens et al., 2014). Cross-loadings of items on unintended factors were constrained to zero and the maximum likelihood function was used to estimate the models.

Each model's fit was evaluated using a variety of goodness-of-fit indexes (Cheung & Rensvold, 2002) including Comparative Fit Index (i.e., CFI; Bentler, 1990), Tucker-Lewis Index (i.e., TLI; Tucker & Lewis, 1973), Root Mean Square Error of Approximation and its 90% confidence interval (i.e., RMSEA; Steiger, 1990), and Standardised Root

Mean Square Residual (i.e., SRMR; Bentler, 1995). Models were deemed to fit the data if the CFI and TLI values were $\geq$ 0.90, and the RMSEA and SRMR values were $\leq$ 0.06 and $\leq$ 0.08, respectively (Hooper et al., 2008). If the models fit, interpretation of the strength of the standardised factor loadings was informed by Comrey and Lee's (1992) recommendations (i. e., where > 0.71 = 'excellent', > 0.63 = 'very good', > 0.55 = 'good', > 0.45 = 'fair', < 0.45 to 0.32 = 'poor'). Items with factor loadings < 0.32 were not included among those defining a specific factor. We also calculated the internal consistency of the ILI using Omega-total. The ILI was considered internally consistent at $\geq$ 0.70 (Nunnally, 1978).

### 2.2.2. Results

Missing values accounted for 0.002% of the data and were therefore omitted from further analyses. Furthermore, there was no indication that any of the participant responses were outliers, and skewness and kurtosis values did not indicate any apparent deviations from normality. The means, standard deviations, and correlations between study variables are presented in Table 2. All identity leadership dimensions were significantly positively correlated with the strength of their associations ranging between low and high (0.43 < r < 0.84; Mukaka, 2012).

CFAs indicated that none of the three models tested fit the data well (as shown in Table 2). Data also revealed that adequate standards were met for the internal consistency of the ILI ($\omega_u$ = 0.86, 95% CI [0.82,0.90]) and the identity entrepreneurship ($\omega_u$ = 0.78, 95% CI [0.70-0.85]) sub-dimension of the ILI. However, these standards were not reached for the ILI's other three sub-dimensions — identity prototypicality ($\omega_u$ = 0.69, 95% CI [0.59-0.79]), identity advancement ($\omega_u$ = 0.62, 95% CI [0.51-0.73]), or identity impresarioship ($\omega_u$ = 0.44, 95% CI [0.23-0.65]).

## 2.3. Discussion phase I

Phase I results indicated little to no evidence for the understandability, factor validity, and internal consistency of the ILI in a sample of youth athletes. Taking these findings into account, we conclude that the ILI needs to be modified for youth athletes to enhance its understandability, the validity of its factor structure, and its internal consistency. This might be achieved by using simpler words, simplifying the sentence structure of items, and/or eliminating particular items. Moreover, we could also achieve this by 'going back to the drawing board,' so to speak, and *exploring* the factor structure of the ILI in a sample of youth. Indeed, it may be that in youth samples, the ILI has two or three factors instead of the four evidenced for adults (Steffens et al., 2014; van Dick et al., 2018). Phase II involved making and road-testing these changes to the ILI.

**Table 2**

Study 2: Descriptive statistics, correlations, and CFA model fit indices.

| | M (SD) | Identity Leadership | Prototypicality | Advancement | Entrepreneurship |
|---|---|---|---|---|---|
| Identity leadership | 5.19 (0.80) | | | | |
| Prototypicality | 5.31 (0.96) | 0.83** | | | |
| Advancement | 5.32 (0.92) | 0.78** | 0.57** | | |
| Entrepreneurship | 5.17 (1.12) | 0.84** | 0.60** | 0.53** | |
| Impresarioship | 5.04 (0.97) | 0.74** | 0.49** | 0.43** | 0.51** |

| | A: One-factor model | B: Correlated four-factor model | C: Hierarchical second-order model |
|---|---|---|---|
| df | 90 | 84 | 86 |
| $\chi^2$ | 165.20 | 151.79 | 153.22 |
| CFI | 0.80 | 0.82 | 0.82 |
| TLI | 0.77 | 0.77 | 0.78 |
| RMSEA | 0.09 | 0.09 | 0.09 |
| RMSEA CI's | [0.07, 0.12] | [0.07, 0.12] | [0.07, 0.11] |
| SRMR | 0.08 | 0.07 | 0.08 |

Note.**p < 0.01.

## 3. Phase II: Adapting the ILI and exploring the understandability, factor structure, and internal consistency of the ILI-Y in youth sports contexts

Building on the findings of Phase I, we first revised the ILI with the aim of simplifying its items and generating suitable items for the *Identity Leadership Inventory – Youth* (ILI-Y). Next, in Study 3, we qualitatively assessed whether youth athletes understood the ILI-Y, while Study 4 quantitatively explored the ILI-Y's factor structure and internal consistency. Thus, Phase 2 also employed a mixed-methods design. Given the exploratory nature of the studies in Phase II, no a priori hypotheses were formulated.

Institutional ethical approval for this phase was obtained from one of the two first authors' universities. We contacted representatives of football teams (the most popular team sport in the United Kingdom) and used convenience sampling to recruit participants competing in categories 3 or 4 (Etikan et al., 2016). Before collecting data, all study participants and their guardians provided written informed consent. Participation in both studies was voluntary, and participants were assured that their information would be kept strictly confidential. Data

were collected by research assistants after training sessions of youth football teams.

### 3.1. Adapting the ILI

To adapt the ILI, the two first authors compiled a document containing the 15 ILI items, highlighting the items and/or words identified as being difficult to understand in Study 1. This document was distributed to researchers with expertise in identity leadership and measurement development. Based on their recommendations, we revised the ILI items to make them more understandable for youth athletes while retaining their meaning and theoretical adequacy. Additionally, we included an extra item to measure identity impresarioship (i.e., 'Our coach is a good organiser of team activities and events'), ensuring an equal number of items (i.e., four) per identity leadership dimension. Following these modifications, the ILI had 16-items (see Table 3) and was referred to as the *Identity Leadership Inventory-Youth* and was subjected to qualitative and quantitative analysis.

**Table 3**

Study 4 and 5: Factor loadings and model fit indices for the ILI-Y(-SF).

| Identity Leadership Inventory - Youth items | PAFA Factor loadings Study 4 | CFA Factor loadings Study 5 |
|---|---|---|
| ILI-Youth – Full scale | | |
| 1. Our coach is good at things that matter to our team | 0.64 | 0.83 |
| 2. Our coach represents our team | 0.56 | 0.75 |
| 3. Our coach is a role model for our team | 0.58 | 0.77 |
| 4. Our coach is a good example for players on our team | 0.50 | 0.74 |
| 5. Our coach helps the players in our team | 0.69 | 0.81 |
| 6. Our coach supports what our team wants to do | 0.64 | 0.75 |
| 7. Our coach stands up for our team | 0.44 | 0.73 |
| 8. When our coach acts, it is always to help our team | 0.67 | 0.79 |
| 9. Our coach makes us feel that we are all part of one close team | 0.66 | 0.77 |
| 10. Our coach helps players in our team get along with each other | 0.75 | 0.87 |
| 11. Our coach helps players understand what is means to be a good player on our team | 0.60 | 0.69 |
| 12. Our coach explains to players how they can be a good member of our team | 0.66 | 0.76 |
| 13. Our coach organises activities that bring our team together | 0.71 | 0.75 |
| 14. Our coach arranges activities that help our team work well together | 0.68 | 0.68 |
| 15. Our coach is a good organiser of team activities and events | 0.72 | 0.85 |
| 16. Our coach plans useful things for our team to do | 0.69 | 0.83 |
| ILI-Youth – Short Form | | |
| 1. Our coach is good at things that matter to our team | | 0.84 |
| 2. Our coach helps the players in our team | | 0.80 |
| 3. Our coach helps players in our team get along with each other | | 0.88 |
| 4. Our coach is a good organiser of team activities and events | | 0.87 |
| 5. Our coach plans useful things for our team to do | | 0.83 |

ILI-Y: Model fit CFA Study 5: ($\chi$2[df = 104] = 196.38, p < 0.001; CFI = 0.98; TLI = 0.98; RMSEA = 0.03, 90%, RMSEA CI = 0.03-0.04; SRMR = 0.03)
ILI-Y-SF: Model fit CFA Study 5: ($\chi$2[df = 5] = 7.49, p < 0.001; CFI = 1.00; TLI = 1.00; RMSEA = 0.03, 90%, RMSEA CI = 0.00-0.06; SRMR = 0.01)

Note. Abbreviations: Principal Axis Factor Analyses (PAFA); Confirmatory Factor Analyses (CFA)

### 3.2. Study 3: Qualitative analysis of the ILI-Y

#### 3.2.1. Methods

**Participants**. We recruited 10 youth football players (5 young men and 5 young women) with an average age of 13.10 ($SD = 1.28$) years.

**Procedure and measures**. All participants completed the ILI-Y, keeping their coach in mind. This was followed by a face-to-face interview using the same cognitive interviewing techniques employed and described in Study 1 (Ryan et al., 2012). The interviews lasted less than 10 min and were recorded for analyses purposes.

**Data analyses**. The interviews were transcribed verbatim, and the resulting data were analysed using the supplementary counting method (described in greater detailed in Study 1; Hannah & Lautsch, 2011).

#### 3.2.2. Results

The ILI-Y was easy for all ten participants to understand, with only one participant expressing difficulty with item 2 (see Table 3 to read the items). More specifically, this participant struggled with the word 'role model'. In summary, these results revealed no more than one minor issue in terms of understandability, indicating that the ILI-Y is suitable for use with youth athletes.

### 3.3. Study 4: Quantitative analysis of the ILI-Y

#### 3.3.1. Methods

**Participants**. We recruited a sample of 150 youth football players for this study. On average participants were 14.39 years old ($SD = 1.73$) and were stratified based on age: 12 to 13-year-olds ($n = 50$); 14 to 15-year-olds ($n = 50$); 16 to 17-year-olds ($n = 50$); and gender (63 young women and 87 young men).

**Procedure and measures**. Participants completed a questionnaire that requested demographic information and asked them to evaluate their perceptions of their coach's identity leadership using the IIL-Y. Responses were recorded on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

**Data analyses**. Data were analysed in R Studio (R Studio Team, 2019) and screened for missing values, outliers, and normality. To explore the factor structure of identity leadership in youth using the ILI-Y, we employed Principal Axis Factor Analyses with direct oblimin rotation (because we expected the factors to be correlated). The determination of the number of factors was based on (a) eigenvalues, which should be $> 1$ to be retained (Kaiser, 1960); (b) the scree plot, which involves identifying the point at which the scree begins and only retaining factors that do not belong to the scree (Cattell, 1966); and (c) a parallel analysis (Hayton et al., 2004). Items were deemed interpretable if their factor loadings were $\geq 0.32$ and retained only if they had large primary loadings and comparatively small cross-loadings ($< 0.30$; Tabachnick et al., 2013). Next, internal consistency of the resulting factor(s) was calculated using Omega-total and considered adequate at $\geq 0.70$ (Nunnally, 1978).

#### 3.3.2. Results

There were no missing values or outliers in the dataset, and the skewness and kurtosis values of the ILI-Y items indicated that the data were normally distributed. In our analysis, we identified one factor with an eigenvalue $> 1$, which was 6.64 (the remaining eigen values have been reported in Supplementary Materials). Next, the scree plot suggested the existence of one to three factors. Lastly, the parallel analysis indicated the presence of three factors. Based on these results, we proceeded with examining the factor solutions for one, two, and three factors (factor loadings and cross-loadings for the two and three factor models are reported in Supplementary Materials). Both the one-factor and two-factor solutions were parsimonious. Thus, based on the results of the factor analyses and our understanding of the identity

leadership framework, the one-factor solution was retained (see Table 3 for factor loadings of the items). The mean of this one factor was 5.82 ($SD = 0.75$), and the ILI-Y was internally consistent ($\omega_u = 0.92$, 95% CI [0.89 - 0.94]).

### 3.4. Discussion phase II

Phase II results indicated that the ILI-Y (the revised version of the ILI), which employs simpler language, was easy for youth athletes to understand. Furthermore, unlike in adult populations, we observed that youth could not clearly distinguish between the four dimensions of identity leadership. Instead, the exploratory factor analysis suggested the presence of a single undifferentiated identity leadership factor. Additionally, we found evidence supporting the internal consistency of the ILI-Y.

In Phase III, following scale development guidelines (Boateng et al., 2018), our objectives were to confirm the ILI-Y's factor validity through CFA, broaden its validity to include discriminant, criterion, and incremental validity, establish its measurement invariance across genders and age groups, and reassess its internal consistency. Considering the unidimensionality of the ILI-Y, we also validated a shorter version of it, referred to as the ILI-Y-Short Form (or ILI-Y-SF). A shorter version might be more efficient in terms of administration, particularly in time-restricted conditions (Allen et al., 2022). It could also enhance the overall experience for test-takers and significantly reduce data processing costs. A much larger sample was leveraged to achieve these ends.

## 4. Phase III: Confirming and extending the validity and internal consistency evidence of the ILI-Y and ILI-SF in youth sports contexts

In Phase III, we conducted a cross-sectional study to address six aims. Aim 1 focused on confirming the factor structure of the ILI-Y and ILI-Y-SF. Based on Phase II findings, we expected both versions of the ILI-Y to demonstrate factor validity for their unidimensional structure (H1). Aim 2 evaluated the internal consistency of the ILI-Y and ILI-Y-SF and hypothesised that they met adequacy standards (H2). Aim 3 explored measurement invariance across genders and age groups for both the long and short forms of ILI-Y. We hypothesised that both forms of the ILI-Y would be approximately invariant across genders and age groups (H3). Aim 4 assessed the discriminant validity of ILI-Y and ILI-Y-SF by evaluating whether they measure a concept distinct from that assessed by the Transformational Teaching Questionnaire (i.e., TTQ; Beauchamp et al., 2010). The TTQ measures transformational leadership, an extensively researched leadership theory in sports psychology (Malloy & Kavussanu, 2021). According to proponents, transformational leaders can transcend their self-interests to empower, inspire, and challenge others to perform at a higher level (Beauchamp et al., 2010). For this aim, in line with Steffens et al. (2014) and van Dick et al. (2018), we expected the ILI-Y and ILI-Y-SF to be empirically distinct from the TTQ (H4).

The fifth aim (Aim 5) of this study was to examine the criterion validity of the ILI-Y and ILI-Y-SF by assessing their associations with key outcomes. Consistent with the literature described in the introduction (e.g., Fransen et al., 2020), we hypothesised that both versions of the ILI-Y would be positively associated with youth athletes' perceptions of social identification, collective efficacy, and prosocial behaviour (H5). The sixth and final aim (Aim 6) was to assess whether the ILI-Y and ILI-Y-SF explained any unique variance in social identification, collective efficacy, and prosocial behaviour after accounting for the TTQ. Building on the insights from van Dick et al. (2018), we hypothesised that the ILI-Y and ILI-Y-SF would explain unique variance in these outcomes beyond what is explained by the TTQ (H6).

*4.1. Study 5: Quantitative analysis of the ILI-Y and ILI-Y-SF*

*4.1.1. Methods*

**Participants**. For this study, we recruited 812 participants who were stratified based on age: 12 to 13-year-olds (*n* = 332); 14 to 15-year-olds (*n* = 252); 16 to 17-year-olds (*n* = 228); and gender (402 young women and 410 young men). Participants were on average 14.17 (*SD* = 1.64) years old and attended an average of two training sessions with their sports team per week.

**Procedure**. Institutional ethical approval was obtained at one of the first authors' universities. Participants were football players competing in categories 3 or 4 in the United Kingdom and were recruited using convenience sampling (Etikan et al., 2016). We chose to recruit players from football as it is the most popular team sport in the United Kingdom. Participation in the study was voluntary, and participants were assured that their information would be kept confidential. All study participants and their guardians provided informed consent before data collection, which took place following a training session. During the data collection, research assistants guided participants through each question to ensure clarity, reading out each item one at a time with the aim of minimising attrition and falsified responses (e.g., selecting answers at random). The questionnaire, which included demographic questions and the measures listed below, took 20–30 min to complete.

**Measures**. Unless indicated otherwise, responses to all scales were anchored on a 7-point Likert scale ranging from 1 *(strongly disagree)* to 7 *(strongly agree)*.

**Identity Leadership Inventory – Youth (i.e., ILI-Y)**. Participants indicated their perceptions of the extent to which their coach engaged in identity leadership.

**Transformational Teaching Questionnaire (i.e., TTQ)**. Participants indicated the extent to which their coach engaged in transformational leadership. The TTQ developed by Beauchamp et al. (2010) contains 16-items designed to measure four dimensions of transformational leadership (i.e., individualised consideration, idealised influence, intellectual stimulation, and inspirational motivation). Items on the TTQ were prefixed with "my coach", and representative items included: "shows that he/she cares about me" (i.e., individualised consideration), "treats me in ways that build my respect" (i.e., idealised influence), "creates training sessions that really encourage me to think" (i.e., intellectual stimulation), and "demonstrates that he/she believes in me" (i.e., inspirational motivation).

**Social Identification Sport Questionnaire (i.e., SISQ)**. Participants' identification with their sports team was measured using the SISQ developed by Bruner and Benson (2018). This contains nine items designed to measure three dimensions of social identity (i.e., ingroup ties, cognitive centrality, and ingroup affect). Exemplar items of the SISQ include: "I feel strong ties to other members of my team" (i.e., ingroup ties), "overall, being a member of my team has a lot to do with how I feel about myself" (i.e., cognitive centrality), and "in general, I'm glad to be a member of my team" (i.e., ingroup affect). We used the combined global measure of social identification in our analyses.

**Collective Efficacy Questionnaire for Sports (i.e., CEQS)**. Short et al.'s (2005) CEQS was used to assess participants' perceptions of their team's collective efficacy. The original CEQS contains 20-items designed to measure five dimensions of collective efficacy (i.e., ability, effort, persistence, preparation, and unity). However, for the sake of brevity, we used the highest loaded item on each of these five dimensions. Items on the CEQS are prefixed with "your team has the ability to …" and items include: "play more skilfully than the opponent" (i.e., ability), "demonstrate a strong work ethic" (i.e., effort), "persist when obstacles are present" (i.e., persistence), "devise a successful strategy" (i.e., preparation), and "keep a positive attitude" (i.e., unity). Responses were anchored on a 7-point scale ranging from 1 *(not confident at all)* to 7 *(extremely confident)*. We used the combined global measure of collective efficacy in our analyses.

**Prosocial and Antisocial Behaviour in Sport Scale (i.e., PABSS)**.

We used an adapted version of the PABSS (Kavussanu & Boardley, 2009; McLaren et al., 2021). This prosocial and antisocial behaviour questionnaire originally consists of four dimensions, but for brevity, we only measured two of them, including prosocial behaviour (a) engaged in and (b) received during games or practice sessions. Representative items for these two dimensions are: "while playing for my team this season, I gave positive feedback to a teammate" (i.e., prosocial behaviour engaged in) and "while playing for my team this season, my teammates gave me positive feedback" (i.e., prosocial behaviours received). Responses to each item were made on a 7-point Likert scale anchored between 1 *(never)* and 7 *(always)*. We used the total measure of prosocial behaviour in our analyses.

**Data analyses**. The data were analysed in R Studio (R Studio Team, 2019) and inspected for missing values, outliers, and normality. Following that, descriptive statistics and correlations between all study variables were calculated. To achieve Aim 1, we first conducted a one-factor CFA for the ILI-Y using the same data analysis procedures as those employed in Study 2. Results of this CFA were screened, and the five highest-loaded items were chosen for the ILI-Y-SF, which was subsequently also subjected to a one-factor CFA. To address Aim 2, we calculated the Omega-Total for the ILI-Y and ILY-SF, considering the measures to meet adequacy at $\geq 0.70$ (Nunnally, 1978).

Next, Aim 3 was addressed by employing the alignment optimisation method (refer to Asparouhov & Muthén, 2014 for a comparative overview of this method's merits and drawbacks against traditional invariance testing methods) to test the invariance of the ILI-Y and ILI-Y-SF across genders (young women and young men) and age groups (12–13 year olds; 14–15 year olds; and 16–17 year olds). This invariance testing method is a measure of approximate invariance and gives two critical statistics, including $R^2$ and the proportion of non-invariant factor intercepts (scalar invariance) and factor loadings (metric invariance). Generally, a measure is considered approximately invariant when its $R^2$ values approach 1 and the average percentage of its non-invariant factor loadings and intercepts is below 25%.

Before undertaking analyses to fulfil Aim 4, we assessed the validity of the TTQ's factor structure and its internal consistency. To do the former, we defined three CFA models based on transformational leadership theorising (Beauchamp et al., 2010; Vella et al., 2012). This included: (a) a one-factor model, which would indicate one overarching transformational leadership factor; (b) a correlated four-factor model, which would indicate four transformational leadership factors consisting of individualised consideration, idealised influence, intellectual stimulation, and inspirational motivation; and (c) a hierarchical second-order model, which would indicate that the four transformational leadership factors specified above, all load on one broad transformational leadership factor. The remaining CFA data analyses procedures remained the same as those followed for the ILI, ILI-Y, and ILI-Y-SF in Studies 2 and 5. The internal consistency of the TTQ was calculated using Omega-Total. The TTQ was considered internally consistent at $\geq 0.70$ (Nunnally, 1978).

After conducting preliminary checks, we addressed Aim 4 by evaluating the discriminant validity of the ILI-Y and ILI-Y-SF using the CI$_{CFA}$ $_{(sys)}$ procedure. This procedure was described by Rönkkö and Cho (2022) in a recent paper that observed: "two measures intended to measure distinct constructs have discriminant validity if the absolute value of the correlation between the measures after correcting for measurement error is low enough for the measures to be regarded as measuring distinct constructs." According to the CI$_{CFA(sys)}$ procedure, we had to identify what a 'low enough' correlation was and chose 0.80 as a conservative starting point. The next step according to this procedure was to estimate CFA models based on the ILI-Y(-SF) and TTQ models that were most parsimonious and inspect the confidence intervals of the correlations between the specified latent variables. The CFA data analyses strategy was like that of Studies 2 and 5 except that we fixed the factor variances to 1 rather than fixing the first loading on the factors to be 1. The benefit of this approach was that the estimated factor covariances
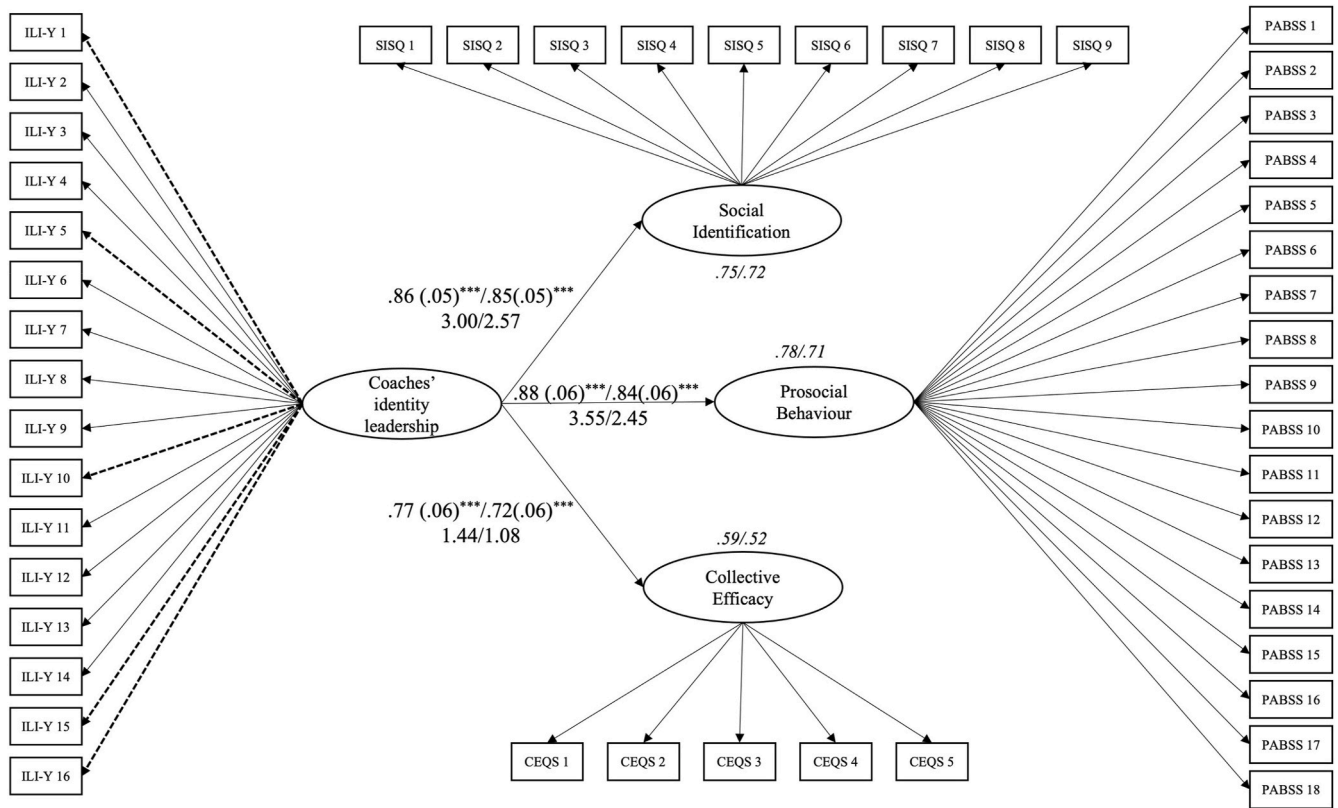
**Fig. 1.** Model specifications and results for criterion validity testing. Note. The dotted black lines indicate the items that were also part of the ILI-Y-SF; Line 1: B(SE) ILI-Y/ILI-Y-SF; Line 2: Cohen's f²ILI-Y/ILI-Y-SF; ***p < 0.001; Abbreviations: Social Identity in Sports Questionnaire (SISQ); Prosocial and Antisocial Behaviour in Sport Scale (PABSS); Collective Efficacy Questionnaire for Sports (CEQS); Factor Loadings for ILI-Y 1, SISQ 1, PABSS 1, and CEQS 1 are fixed to 1.

**Table 4**
Study 5: Means, standard deviations, and correlations.

| Variable | M(SD) | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1. Coaches identity leadership (ILI-Y) | 5.46 (0.81) | | | | | |
| 2. Coaches identity leadership (ILI-Y-SF) | 5.70 (0.91) | 0.92** | | | | |
| 3. Coaches transformational leadership | 5.07 (0.91) | 0.74** | 0.68** | | | |
| 4. Social identification | 5.36 (0.87) | 0.78** | 0.73** | 0.65** | | |
| 5. Prosocial behaviour | 4.87 (0.82) | 0.77** | 0.71** | 0.64** | 0.70** | |
| 6. Collective efficacy | 5.10 (1.00) | 0.64** | 0.58** | 0.53** | 0.61** | 0.68** |

Note. *p < 0.05; **p < 0.01.

**Table 5**
Measurement invariance results.

| | $R^2$ (λ) | $R^2$ (ν) | % of noninvariant λ | % of noninvariant ν | % of noninvariant λ and ν |
|---|---|---|---|---|---|
| **ILI-Y** | | | | | |
| Gender | 1.00 | 1.00 | 0.00% | 0.00% | 0.00% |
| Age | 1.00 | 1.00 | 0.00% | 14.60 % | 7.30% |
| **ILI-Y-SF** | | | | | |
| Gender | 1.00 | 1.00 | 0.00% | 0.00% | 0.00% |
| Age | 1.00 | 1.00 | 0.00% | 13.30% | 6.65% |

Note. Abbreviations: ν (factor intercepts); λ (factor loadings)

were correlations that could be interpreted directly without the need for any additional calculations (Rönkkö & Cho, 2022). Finally, we categorised correlations based on the upper limit of the confidence interval. More specifically, if the upper limit of the correlation's confidence interval was ≥ 1, then it would indicate a 'severe discriminant validity problem'. If it was between 0.90 and 1, then that would indicate a 'moderate problem'. If it was between 0.80 and 0.90, then it would indicate a 'marginal problem,' and if it was < 0.80, then it would indicate 'no problem'.

Next, we conducted linear regressions within the SEM framework to assess criterion validity (Aim 5). The specified model is visualised in Fig. 1. We employed maximum likelihood with robust standard errors as the model estimator, with model fit indices being assessed in ways that were similar to the CFAs in Studies 2 and 5. Moreover, before

performing this analysis, we examined the factor validity (by specifying one-factor CFAs, since we did not have expectations on the dimension level) and internal consistency (using Omega Total) of the instruments used to measure outcomes. These instruments were considered internally consistent at ≥ 0.70 (Nunnally, 1978). Effect sizes for the modelled relations were calculated using Cohen's f² on StatCal (Cohen, 1988; Soper, 2023).

In addressing Aim 6, we conducted two-step hierarchical regressions within an SEM framework. In Step 1, transformational leadership was the independent variable, while social identification, prosocial behaviour, and collective efficacy were the dependent variables.

All variables were modelled as latent constructs, and we employed maximum likelihood estimation with robust standard errors as the estimation method. The factor loading of the first item measuring each latent construct was fixed to 1. In Step 2, we kept all model specifications the same as in Step 1, except for one change: we added identity leadership (measured with the ILI-Y or ILI-Y-SF) as an independent variable, following transformational leadership.

**Table 6**

Criterion validity: Model fit indices and internal consistency.

| | SISQ | PABSS | CEQS | ILI-Y | ILI-Y-SF |
|---|---|---|---|---|---|
| | | | | Model | Model |
| $\chi^2/df$ | 47.96/27 | 190.14/135 | 10.12/5 | 1562.47/1074 | 897.52/623 |
| CFI | 0.99 | 0.98 | 0.99 | 0.97 | 0.97 |
| TLI | 0.99 | 0.98 | 0.99 | 0.96 | 0.97 |
| RMSEA | 0.03 | 0.02 | 0.04 | 0.02 | 0.02 |
| RMSEA CI | 0.02–0.05 | 0.01–0.03 | 0.00–0.07 | 0.02–0.03 | 0.02–0.03 |
| SRMR | 0.02 | 0.03 | 0.02 | 0.03 | 0.03 |
| $\omega_u$ | 0.89 | 0.84 | 0.74 | | |
| $\omega_u$ CI | 0.86–0.91 | 0.82–0.87 | 0.69–0.78 | | |

Note. Abbreviations: Social Identity in Sports Questionnaire (SISQ); Prosocial and Antisocial Behaviour in Sport Scale (PABSS); Collective Efficacy Questionnaire for Sports (i.e., CEQS).

**Table 7**

Incremental validity testing results.

| Independent variables | Social identification | Prosocial behaviour | Collective efficacy |
|---|---|---|---|
| | *B(SE)* | *B(SE)* | *B(SE)* |
| Step 1: | | | |
| Coaches' transformational leadership | 0.73(0.05)*** | 0.74(0.05)*** | 0.65(0.05)*** |
| $R^2$ | 0.53 | 0.55 | 0.42 |
| Model fit | ($\chi^2[df = 1074] = 1359.34$, $p = 0.00$; CFI = 0.98; TLI = 0.98; RMSEA = 0.02, 90% RMSEA CI = 0.02-0.02; SRMR = 0.03) | | |
| Step 2: | | | |
| Coaches' transformational leadership | 0.10(0.04)* | 0.09(0.04)* | 0.10(0.06) |
| Coaches' identity leadership (ILI-Y) | 0.78(0.06)*** | 0.81(0.07)*** | 0.69(0.08)*** |
| $R^2$ | 0.75 | 0.78 | 0.60 |
| $\Delta R^2$ | 0.22 | 0.23 | 0.18 |
| Model fit | ($\chi^2[df = 1942] = 4746.71$, $p = 0.00$; CFI = 0.87; TLI = 0.86; RMSEA = 0.04, 90% RMSEA CI = 0.04-0.04; SRMR = 0.03) | | |
| Step 2: | | | |
| Coaches' transformational leadership | 0.18(0.04)*** | 0.22(0.04)*** | 0.23(0.06)*** |
| Coaches' identity leadership (ILI-Y-SF) | 0.70(0.06)*** | 0.68(0.06)*** | 0.55(0.07)*** |
| $R^2$ | 0.73 | 0.73 | 0.55 |
| $\Delta R^2$ | 0.20 | 0.18 | 0.13 |
| Model fit | ($\chi^2[df = 1315] = 1742.99$, $p = 0.00$; CFI = 0.97; TLI = 0.97; RMSEA = 0.02, 90% RMSEA CI = 0.02-0.02; SRMR = 0.03) | | |

Note. *p < 0.05; **p < 0.01; ***p < 0.001.

*4.1.2. Results*

The dataset contained no missing values or outliers, and variables under study were normally distributed. The means, standard deviations, and correlations of study variables are displayed in Table 4.

**Aim 1: Factor Validity.** Results are presented in Table 3 and show that one-factor models for both the ILI-Y and ILI-Y-SF were a good fit for the data. Moreover, factor loadings for the ILI-Y ranged from 'very good' (i.e., 0.68) to 'excellent' (i.e., 0.87), while all factor loadings for the ILI-Y-SF were 'excellent' (i.e., between 0.80 and 0.88; Comrey & Lee, 1992). Thus, consistent with H1, the ILI-Y and ILI-Y-SF had factor validity.

**Aim 2: Internal Consistency**. In line with H2 the ILI-Y ($\omega_u = 0.91$, 95% CI [0.89-0.93]) and ILI-Y-SF ($\omega_u = 0.86$, 95% CI [0.83-0.89]) were internally consistent.

**Aim 3: Measurement Invariance**. In support of H3, both the ILI-Y and ILI-Y-SF were approximately invariant across genders and age groups (see Table 5 for more detail).

**Aim 4: Discriminant Validity**. The one factor model for the TTQ was most parsimonious as it fit the data well ($\chi^2[df = 104] = 156.39$, p < 0.001; CFI = 0.99; TLI = 0.99; RMSEA = 0.03, 90%, RMSEA CI = 0.02-0.03; SRMR = 0.02), had 'excellent' factor loadings (i.e., between 0.83 and .92; Comrey & Lee, 1992), did not produce model errors like the four-factor correlated and second-order hierarchical models (Brown, 2015), and was internally consistent ($\omega_u$ = 0.91, 95% CI [0.89-0.93]).

For tests of discriminant validity, we specified two separate two-factor models. In the first model, all items of the ILI-Y loaded on an identity leadership factor, and all TTQ items loaded on a transformational leadership factor. In the second model, all specifications remained the same, except that only ILI-Y-SF items were loaded onto the identity leadership factor. Upon examining the upper limits of the confidence intervals in both models, we found correlations of 0.83 between the ILI-Y and the TTQ, and 0.81 between the ILI-Y-SF and the TTQ. These results highlight a 'marginal discriminant validity problem' indicating that, despite high correlations between ILI-Y(-SF) and TTQ, they measure empirically distinct constructs (Rönkkö & Cho, 2022). Therefore, study results are in line with H4.

**Aim 5: Criterion Validity.** The SISQ, PABSS, and CEQS demonstrated factor validity and internal consistency, and the specified SEM models were a good fit to the data (see Table 6). Fig. 1 presents the results of the linear regressions, and in line with H5, it shows that both the ILI-Y and ILI-Y-SF have criterion validity. More specifically, participants perceptions of their coaches' identity leadership were positively associated with social identification, collective efficacy, and prosocial behaviour.

**Aim 6: Incremental Validity.** The results, provided in Table 7, revealed that the TTQ contributed significantly to all dependent variables at step one. Nonetheless, the introduction of the ILI-Y or ILI-Y-SF at step two always explained additional variance in social identification, collective efficacy, and prosocial behaviour, thus supporting H6.

*4.1.3. Discussion phase III*

In line with study hypotheses, Phase III provided robust evidence supporting the validity (factor, discriminant, criterion, and incremental), measurement invariance (across genders and age groups), and internal consistency of both the ILI-Y and ILI-Y-SF.

**5. General discussion**

In a series of five studies conducted in three research phases involving 1096 participants, we developed the Identity Leadership Inventory - Youth (ILI-Y) for use in youth sports. To recapitulate, in Phase I (including Studies 1 and 2), we found limited evidence that the original ILI, designed for adults, was understandable, valid, and internally consistent when used with youth. This prompted Phase II, where we made significant revisions to create the ILI-Y and found evidence that this revised measure was considerably more comprehensible than the ILI for our target population (Study 3). Results of this same phase revealed that the ILI-Y was unidimensional (Study 4), a finding that was subsequently confirmed in Phase III (Study 5). In this final phase, we also obtained support for the discriminant, criterion, and incremental validity of the ILI-Y and ILI-Y-Short-Form, as well as their measurement invariance (across genders and age groups) and internal consistency. The implications, strengths, limitations, and practical applications of the present findings are discussed below.

*5.1. Implications*

Five main implications emerge from the results of this study. First, our findings underline the importance of examining the applicability of adult sport measures that use advanced vocabulary before their use with youth athletes. Accordingly, in Study 1, we found that youth athletes have difficulty understanding the ILI developed for adult athletes, which is consistent with previous research indicating that youth athletes'

language comprehension skills are not on par with those of adults and are still undergoing development (Soto et al., 2008). Indeed, research suggests that instruments based on adult measures tend to overburden children's language skills and are difficult for them to understand (Eiser & Morse, 2001; Park & Kwon, 2021). To overcome these issues, researchers have proposed changing the wording of adult instruments to make them more intelligible for youth, which is what we did in Phase II (Eiser & Morse, 2001; Park & Kwon, 2021). Speaking to the wisdom of these recommendations, the results of Study 3 of Phase II showed that the ILI-Y was much easier for youth athletes to understand than the ILI.

Second, it appears that adults make sense of identity leadership by perceiving it in terms of a more complex, multi-dimensional factor structure than youth respondents are able to. In line with this observation, we found that identity leadership exhibited a unidimensional factor structure, in contrast to the multidimensional four-factor structure found in adults (Steffens et al., 2014; van Dick et al., 2018). This finding is consistent with previous studies, which indicated that adult measures, when applied to or adapted for youth, typically exhibit fewer dimensions than they do with adults (Eys et al., 2009; Smith et al., 1995). In light of the ILI-Y's unidimensionality, our study also provided strong support for the ILI-Y-Short-Form (ILI-Y-SF) which holds promise for use in research and applied contexts that demand the use of short scales.

Third, the results of this study corroborate the idea that identity leadership and transformational leadership are both theoretically and empirically separate and that the former offers something unique to the analyses and thus the outcomes of leadership (Bracht et al., 2023; Steffens et al., 2014; van Dick et al., 2018). To elaborate, in contrast to transformational leadership, identity leadership situates the leader-follower relationship within a specific group and social context (Haslam et al., 2020).

Fourth, our study highlights the importance of the identity leadership framework in youth sports settings. More specifically, we found that athletes' perceptions of coaches' identity leadership relate positively to important outcomes including social identification, collective efficacy, and prosocial behaviour, all of which are relevant for positive youth development and the development of youth's life skills. The study results align with the theoretical predictions of the social identity approach to leadership and suggest that identity leadership provided by coaches in youth sports may yield benefits similar to those observed in adults sports (Haslam et al., 2020; Steffens et al., 2020).

Finally, study findings provide support for the validity of the ILI-Y (-SF), which affords assessments of leadership aspects that centre on fostering a sense of 'we' and 'us' amongst followers. In this way, the current study lays the foundation for theoretical and empirical advancements in the field of youth sports leadership, an area that has been narrow in scope until now (Michalski & Lee, 2021).

## 5.2. Strengths

The research presented in this paper has four key strengths. First, the ILI-Y (-SF) is the first rigorously validated and internally consistent instrument to assess not just identity leadership but leadership more generally within youth sports. Second, this study is among a few in sports settings to test the incremental validity of a measurement instrument. Third, we augmented the more frequently used methods in measurement development (i.e., quantitative methods) with qualitative methodologies by conducting cognitive interviews (Ryan et al., 2012). This method helped isolate issues related to specific items and words within the ILI (Steffens et al., 2014) and allowed us to engage participants in the measurement development process. Finally, we recruited samples that were stratified in terms of gender and age to enhance the findings' generalisability.

## 5.3. Limitations and future research

Of course, this research is not without its limitations. The first among

them concerns the generalisability of our findings across other sports and countries, as virtually all the data for this study were acquired from football players in the United Kingdom. Therefore, future researchers should explore the ILI-Y's validity and internal consistency in other team sports, training groups in individual sports, as well as cross-nationally. A second limitation is the use of cross-sectional techniques, which, while suitable for criterion and incremental validity testing, are susceptible to common method biases (Podsakoff et al., 2012). Future research could address this limitation by employing longitudinal designs. The fourth limitation is that the TTQ – used to establish discriminant and incremental validity – was developed and validated in an educational context as opposed to a sports context (Beauchamp et al., 2010). We chose the TTQ over other appropriate youth sport leadership measures (e.g., LSS and DTLI) because, unlike these latter measures, it is supported by validity evidence (e.g., concurrent and criterion validity) that goes beyond factor validity (Beauchamp et al., 2010; Teques et al., 2021; Vella et al., 2012). To confirm that the TTQ was appropriate for use with our study sample, we examined its factor validity and internal consistency, which were determined to be acceptable.

## 5.4. Practical applications

There are at least two important practical implications of this study. First, there is a growing body of evidence within adult sports that identity leadership behaviours can be developed through interventions (e.g., Mertens et al., 2021). Thus, given the evidenced associations between coaches' identity leadership and important developmental outcomes (e.g., social identity) in this study, training coaches in youth sports how to enact such leadership behaviours may be important. Second, coaches can use the ILI-Y or ILI-Y-SF to assess their identity leadership behaviours. The ILI-Y items can then be used as actionable guidance as they provide clear illustrations of the tangible leadership behaviours coaches should exhibit.

## 5.5. Conclusion

The development of social identities that can be facilitated by identity leaders is essential to fully realising the benefits of sports participation for youth. In the last decade, most research in adult sports has focused on how leaders who embody, advance, create and, embed a shared sense of 'we' and 'us' can promote team effectiveness as well as team members' well-being. However, unlike adult sports, research on identity leadership in youth sport is still in its infancy. One reason for this is the lack of a youth-centric inventory with which to assess identity leadership in this population. To address this lacuna, the present paper presented a series of five studies that enabled us to establish the validity and internal consistency of a measure – the Identity Leadership Inventory (ILI-Y) – that can assess the identity leadership of coaches in youth sports contexts. Overall, we hope that the availability of the ILI-Y as well as its shorter form will encourage researchers to further examine whether and how identity leadership can increase youth athletes' social identification and, in turn, unlock other benefits for youth athletes and their sport teams.

## CRediT authorship contribution statement

**Radhika Butalia:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. **Anthony Miller:** Conceptualization, Data curation, Investigation, Methodology, Writing – review & editing. **Niklas K. Steffens:**

Conceptualization, Methodology, Writing – review & editing. **S. Alexander Haslam:** Conceptualization, Methodology, Writing – review & editing. **Mark W. Bruner:** Writing – review & editing. **Colin D. McLaren:** Writing – review & editing. **Filip Boen:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Matthew J. Slater:** Writing – review & editing. **Kyle Dunn:** Methodology. **Katrien Fransen:** Conceptualization, Methodology, Supervision, Writing – review & editing.

### 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

The data and analysis code are available at: https://osf.io/cdta9/?view_only=cfde3969c8644650874c7b3adc06edd2.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.psychsport.2024.102630.

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