

PCA IN FOOTBALL COACHING: COMPETENCIES AND LEADERSHIP

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Abstract: This exploratory study examines the competencies of professional football coaches through the application of Principal Component Analysis (PCA), a statistical technique used to reduce data dimensionality while retaining variance. While the literature on sport coaching is extensive, fewer studies have specifically examined coaching competencies in professional football using quantitative psychometric approaches. The primary aim of this study was to optimize a questionnaire designed to assess key coaching competencies by reducing the number of items while retaining an adequate representation of the variance accounted for by the extracted components. Additionally, the study explored potential differences in competencies between professional and semi-professional coaches. Data were collected through a structured questionnaire administered to 73 football coaches, covering areas such as cognitive flexibility, emotional intelligence, communication, and self-management. PCA was applied to identify underlying competency structures. The analysis yielded a two-component solution accounting for 64.21% of the total variance. The identified components reflect (1) analytical and adaptive professional competencies, and (2) cognitive and self-regulatory competencies. Furthermore, the findings support the possibility of reducing the original scale from 52 to 32 items while maintaining a meaningful representation of the underlying dimensions. These findings provide preliminary insights into the structure of coaching competencies and offer practical implications for coach education and performance development. However, further research using larger samples and confirmatory approaches is required to evaluate the stability, reliability, and generalizability of the proposed structure.

Keywords: coaching competencies; football leadership; skill development; performance management; principal component analysis (PCA).

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Introduction

In the contemporary landscape of professional football, the role of the coach has evolved far beyond traditional technical and tactical competencies. Modern coaches are expected to manage a wide range of responsibilities, including leadership, communication, emotional regulation, and the development of psychosocial skills within the team environment. Research on athlete perceptions has further shown that coaching effectiveness is often associated not only with technical expertise, but also with the quality of interpersonal behaviors and relational leadership demonstrated by the coach (Becker, 2009). As a result, coaching effectiveness is increasingly understood as a multidimensional construct integrating technical expertise, relational competence, and reflective practice (Côté & Gilbert, 2009; Jowett, 2017).

In team sports, and particularly in football, the coach plays a central mediating role between tactical preparation, athlete development, and the broader organizational dynamics of the team. Effective coaching therefore involves not only the transmission of technical knowledge but also the ability to create supportive motivational environments, facilitate learning processes, and manage complex interpersonal relationships within the team environment (Cushion et al., 2006; Gilbert & Trudel, 2004).

Although the literature on sport coaching has expanded significantly in recent decades, relatively fewer empirical studies have specifically examined the competencies of professional football coaches through quantitative psychometric approaches. Much of the existing research has focused on youth sport, coach education, or qualitative explorations of coaching practice, highlighting the need for further empirical investigation of competency structures in elite football contexts.

The primary objectives of this study are twofold: first, to optimize a quantitative instrument designed to assess key coaching competencies within professional football; and second, to explore whether these competencies differ between coaches operating at professional and semi-professional levels. Specifically, the study aims to reduce the number of items in the original questionnaire while retaining an adequate proportion of the variance accounted for by the retained components, thereby improving the usability of the instrument in applied contexts such as coach education, club development programs, and performance management systems.

To achieve these goals, Principal Component Analysis (PCA) was employed. PCA is widely used in psychometric research to identify latent structures and reduce the dimensionality of complex datasets, allowing researchers to identify the underlying components that organize observed variables.

By applying this method to a structured questionnaire administered to football coaches, the present study aims to contribute both theoretically and practically to the understanding of coaching competencies in professional football environments.

Over the past few decades, the concept of “effective coaching” has undergone a significant transformation, reflecting the evolving nature of professional sports and the increasing recognition of soft skills in enhancing coaching performance. Various theoretical models have contributed to reshaping the profile of the modern coach, emphasizing relational, cognitive, and emotional dimensions that extend beyond purely technical or tactical knowledge. This shift reflects the growing need for coaches to act not only as strategists or instructors but also as mentors, communicators, and facilitators of personal development.

Research on coaching effectiveness has increasingly emphasized that successful coaching requires the integration of technical knowledge, interpersonal skills, and reflective decision-making. Within contemporary coaching science, competencies such as cognitive flexibility, emotional intelligence, communication skills, and self-regulation are widely considered central to effective coaching practice (Côté & Gilbert, 2009; Nash & Collins, 2006).

Cognitive flexibility enables coaches to adapt their strategies to dynamic and unpredictable sporting contexts, allowing them to respond effectively to tactical, emotional, and organizational challenges. This competency is closely associated with problem-solving ability, situational awareness, and the ability to adapt training or match strategies in response to changing circumstances.

Emotional intelligence, defined as the ability to perceive, understand, and regulate emotions in oneself and others (Goleman, 2011), plays a critical role in leadership and team cohesion. In high-performance environments, coaches with higher levels of emotional competence may be better positioned to maintain supportive motivational climates, manage pressure, and support athletes' psychological development.

Empirical evidence has also shown significant relationships between emotional intelligence and coaching efficacy, particularly in high-performance sporting environments (Thelwell et al., 2008).

Communication skills represent another key dimension of coaching effectiveness. The quality of coach-athlete interactions has been consistently associated with athlete satisfaction, motivation, and performance outcomes (Jowett, 2017). Previous research has also demonstrated that leadership quality and positive coach-athlete relationships are associated with both team success and athlete development outcomes in football environments (Vella et al., 2013). Effective communication includes the ability to provide clear instructions, offer constructive feedback, and build trusting relationships within the team.

Finally, self-management and reflective practice are increasingly recognized as central aspects of professional coaching. Research on coach learning suggests that expert coaches continuously evaluate their own practice, integrating experiential knowledge with evidence-based approaches to improve decision-making and long-term performance development (Gilbert & Trudel, 2004).

Several theoretical frameworks have been proposed to conceptualize coaching effectiveness. Among the relevant frameworks is the model proposed by Côté and colleagues, which identifies three broad domains of coaching competence: professional knowledge, interpersonal skills, and intrapersonal reflection (Côté et al., 2007). This framework has been widely used in coach education and research to describe the multidimensional nature of coaching expertise.

In addition, Self-Determination Theory (Deci & Ryan, 2000) provides an important theoretical perspective for understanding how coaching behaviors influence athlete motivation and development. According to this framework, effective coaching environments support athletes' psychological needs for autonomy, competence, and relatedness, thereby promoting intrinsic motivation and long-term engagement in sport.

Contemporary coaching research has also increasingly integrated transformational leadership perspectives, highlighting the importance of inspirational communication, individualized consideration, and motivational influence within coaching practice (Turnnidge & Côté, 2018).

Within this perspective, the coach plays a central role not only in technical instruction but also in shaping the motivational climate and social dynamics of the team. These theoretical perspectives collectively highlight the importance of integrating technical, psychological, and relational competencies when analyzing coaching effectiveness.

Although the literature on sport coaching is extensive, empirical research specifically investigating the competency structures of professional football coaches remains relatively limited, particularly when quantitative psychometric approaches are employed. Many existing studies focus on coach education programs, youth sport environments, or qualitative analyses of coaching practice.

In addition, relatively few studies attempt to identify latent competency structures through statistical techniques capable of reducing complex datasets. Data-reduction and factor-analytic

approaches, including Principal Component Analysis (PCA) and Exploratory Factor Analysis (EFA), can be used to examine the dimensional structure of competency assessment instruments.

For example, Rodrigues et al. (2021) examined competitive behaviors among football coaches using a mixed-method research design, while De Lord et al. (2023) explored the use of performance analytics in football environments. These studies highlight the growing interest in evidence-based approaches to coaching analysis, yet standardized quantitative instruments specifically designed to assess coaching competencies in professional football contexts remain limited.

In response to these limitations, the present study applies PCA to a structured questionnaire administered to professional and semi-professional football coaches. The aim is to identify the core competency dimensions underlying coaching practice while simultaneously optimizing the instrument by reducing the number of items without compromising explanatory power.

Methodology

Study Design

This study adopted a quantitative cross-sectional design, aimed at analysing the key competencies of football coaches through dimensionality reduction techniques, specifically Principal Component Analysis (PCA). This methodological approach enabled the identification of underlying latent structures within the measured variables, facilitating the extraction of components that account for substantial proportions of variance in the profile of an effective coach.

Participants

The study involved a non-probabilistic convenience sample of 73 football coaches operating at various competitive levels, including both professional and semi-professional contexts. Inclusion criteria required participants to possess an officially recognized technical qualification and to have accumulated a minimum of three years of coaching experience. Participation was voluntary, and informed consent was obtained prior to data collection. Anonymity and confidentiality were ensured in accordance with ethical research standards.

It is important to note that coaching competencies are shaped by organizational and cultural contexts, including club norms, national federations, and regional sport systems. In this study, participants were predominantly based in Italy (83.6%), which may influence their professional behaviors, decision-making, and interpersonal skills. Acknowledging these contextual factors aligns with recent studies emphasizing the role of environment in shaping elite coaching competencies (Greenwood et al., 2012; De Lord et al., 2023; Rodrigues et al., 2021).

Data Collection Instrument

Data were collected using a structured questionnaire composed of 52 closed-ended items, designed to assess different dimensions of coaching competencies. Most items were rated on a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This format allowed participants to express the extent to which each statement reflected their coaching

practices or professional behaviors. The instrument was divided into three main sections, each targeting a different dimension of the coaches' personal and professional profiles.

- **First Section – Background and Coaching Approach:**

This section gathered basic demographic and background information, such as age, ethnicity, coaching experience, previous football background as a player, level of technical certification, and educational qualifications. Furthermore, it explored self-perception and the quality of interpersonal relationships maintained with key stakeholders in the football environment, including technical staff, medical staff, players, club management, and media representatives. The overarching goal of this section was to provide a comprehensive descriptive profile of the sample.

The section was subdivided into three thematic areas:

- Educational background.
- Professional experience.
- Coaching methodology and approach.

- **Second Section – Learning Behaviors and Technical-Professional Competencies:**

This section focused on assessing the coaches' learning abilities, aiming to identify the behavioral and cognitive strategies developed throughout their careers. It investigated both areas of consolidated competence and potential domains requiring further development. The objective was to delineate distinct learning profiles and coaching styles.

The section comprised the following ten areas:

- Time management and goal setting.
- (B) Active learning.
- (C) Focus and concentration.
- (D) Information processing.
- (E) Communication mindset.
- (F) Evaluation of change capacity.
- (G) Empathy and player assessment.
- (H) Data interpretation and evidence-based practice.
- Skill development and action planning.
- (L) Self-management.

- **Third Section – Cognitive and Emotional Dimensions:**

The final section addressed more personal and introspective aspects of the participants' coaching-related characteristics, focusing on cognitive and emotional traits relevant to their coaching practice. This section was not intended to constitute a psychological assessment, which would have fallen outside the scope and competencies of the study. Rather, it sought to offer a descriptive insight into individual qualities with potential implications for coaching effectiveness.

It was divided into the following three domains:

- Self-assessment of cognitive flexibility;
- Evaluation of compassion (including both self-compassion and coaching-related compassion);
- Emotional self-awareness and regulation.

The questionnaire underwent a process of expert review by specialists in sports psychology and coaching science to ensure content relevance and clarity. Additionally, a pilot test was conducted with a subset of coaches to verify the comprehensibility of the items and their alignment with the research objectives.

Internal consistency was assessed separately for each of the original questionnaire domains using Cronbach's alpha coefficient. Each domain initially consisted of five items. Where the deletion of one or more items resulted in an appreciable improvement in internal consistency, a revised Cronbach's alpha coefficient was calculated and reported. Cronbach's alpha coefficients ranged from .271 to .827 across the original subscales and from .535 to .827 following item refinement, as shown in Table 1. This reliability assessment was performed prior to the Principal Component Analysis (PCA), which subsequently reduced the overall questionnaire from 52 to 32 items.

Table 1. *Internal consistency analysis of the original questionnaire domains*

Questionnaire domain	Initial items	Initial α	Item(s) removed	Final items	Refined α
Time management and goal setting	5	.619	Yes	4	.640
Active learning	5	.739	No	5	.739
Focus and concentration	5	.500	Yes	4	.535
Communicative mindset	5	.271	Yes	2	.742
Information processing ability	5	.797	No	5	.797
Assessment of the capacity for change	5	.719	No	5	.719
Empathy and player evaluation	5	.692	No	5	.692
Understanding the data and evidence-based practice	5	.827	No	5	.827
Skills development and action plan	5	.733	No	5	.733
Self-management	5	.665	No	5	.665

Note. Internal consistency was assessed separately for each original questionnaire domain before conducting the Principal Component Analysis (PCA). Where deletion of one or more items substantially improved internal consistency, the refined Cronbach's alpha coefficient is reported.

Procedure

The questionnaire was administered electronically via email and online survey platforms. Participants received a cover letter outlining the purpose of the study and information concerning data collection, storage, and handling procedures. All participants provided written informed consent before participation. Participation was voluntary, and all responses were collected anonymously. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The data collection period spanned approximately four months. All responses were coded and analyzed using statistical software packages, specifically SPSS and R.

Data Analysis

To reduce the dimensionality of the dataset while retaining a substantial proportion of the total variance, Principal Component Analysis (PCA) was employed. PCA is commonly used in exploratory psychometric research to identify latent structures within complex datasets and to simplify the interpretation of multiple correlated variables.

Prior to conducting PCA, the suitability of the correlation matrix for component analysis was assessed using the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity.

Components were initially retained according to the Kaiser criterion (eigenvalues greater than 1). In addition, the scree plot was visually inspected to confirm the appropriate number of components to retain. An orthogonal Varimax rotation was applied in order to improve the interpretability of the extracted components by maximizing the variance of the factor loadings.

Given the exploratory nature of the study and the relatively limited sample size, the results of the PCA should be interpreted as preliminary indications of the underlying competency structure, rather than as definitive confirmation of a factorial model.

Results

Sample Adequacy and Preliminary Analyses

Prior to conducting the Principal Component Analysis (PCA), the adequacy of the data for factor analysis was assessed. The Kaiser–Meyer–Olkin (KMO) measure yielded a value of 0.835, indicating a satisfactory level of sampling adequacy. Additionally, Bartlett’s test of sphericity was statistically significant ($p < 0.001$), indicating that the correlation matrix was significantly different from an identity matrix and supporting the suitability of the data for PCA. The KMO and Bartlett’s test results are summarized in Table 2.

Table 2. *KMO and Bartlett’s Test*

KMO and Bartlett’s Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.835
Bartlett’s Test of Sphericity	Approx. Chi-Square	398.953
	df	45.000
	Sig.	$p < .001$

These indicators suggest that the dataset was suitable for dimensionality reduction techniques and exploratory component extraction.

Dimensionality Reduction through Principal Component Analysis (PCA)

Principal Component Analysis (PCA) was conducted on the 52-item scale to explore the latent structure underlying the coaching competencies assessed in the questionnaire. The objective was to identify clusters of related variables and reduce the dimensionality of the dataset while retaining as much variance as possible.

Components were initially extracted based on the Kaiser criterion (eigenvalues > 1). The analysis identified two principal components satisfying this criterion. The corresponding variance structure is reported in Table 3.

Table 3. Total Variance Explained

Component	Initial Eigenvalues	% of Variance	Cumulative %	Extraction Sums of Squared Loadings	% of Variance	Cumulative %
	Total			Total		
1	5.42	54.23	54.23	5.42	54.23	54.23
2	1.00	9.98	64.21	1.00	9.98	64.21
3	0.90	9.04	73.25			
4	0.62	6.18	79.43			
5	0.50	4.98	84.41			
6	0.45	4.51	88.92			
7	0.38	3.79	92.72			
8	0.36	3.64	96.35			
9	0.24	2.41	98.76			
10	0.12	1.24	100.00			

Note: Extraction Method: Principal Component Analysis.

The first component accounted for 54.23% of the total variance, while the second component explained an additional 9.98%, resulting in a cumulative variance of 64.21%.

To further support the decision on the number of retained components, the scree plot was examined. Figure 1 presents the corresponding scree plot.

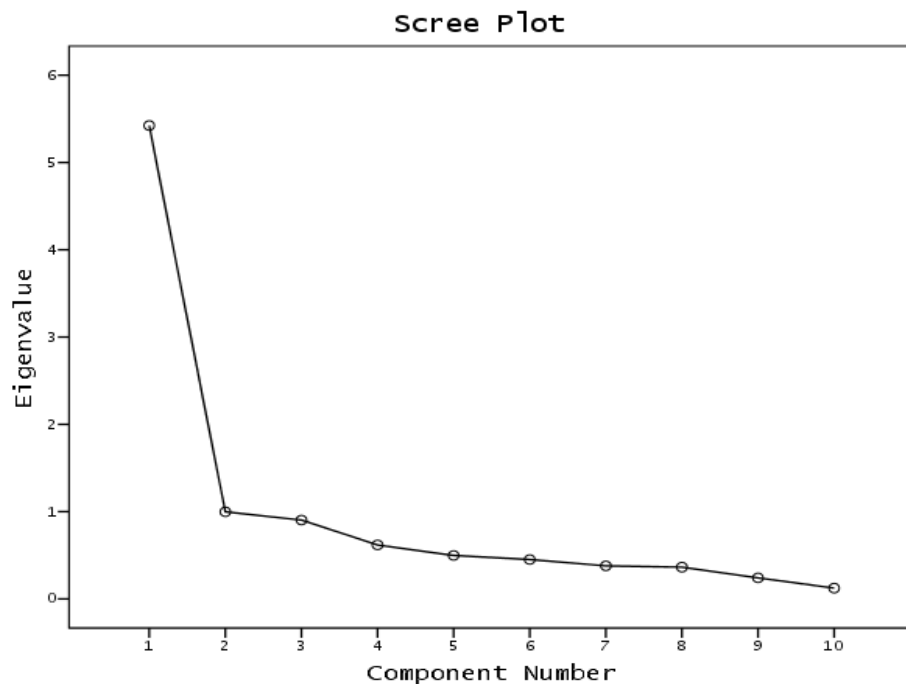


Figure 1. Scree Plot

The scree plot showed an apparent inflection point after the second component, providing additional support for retaining a two-component solution. Both the Kaiser criterion and the scree plot supported the retention of a two-component solution.

To enhance interpretability, an orthogonal Varimax rotation was applied. The rotated component matrix is presented below in Table 4.

Table 4. *Rotated Component Matrix (Varimax Rotation)*

Rotated Component Matrix		
	Component	
	1	2
Time mgmt & Goal Setting	0.084	0.887
Active learning	0.393	0.740
Focus	0.517	0.510
Information processing ability	0.825	0.240
Communicative mindset	0.455	0.275
Assessment of the capacity for change	0.826	0.129
Empathy and Player Evaluation	0.826	0.218
Understanding the data and Evidence Based Practice	0.743	0.300
Skills Development and Action Plan	0.777	0.341
Self-Management	0.738	0.202

Note: Only component loadings ≥ 0.40 are interpreted

Interpretation of Components

The rotated component matrix revealed a clear two-component structure.

The first component showed high loadings for the following areas:

- Information processing.
- Evaluation of change capacity.
- Empathy and player assessment.
- Data interpretation and evidence-based practice.
- Skill development and action planning.
- Self-management.

This pattern suggests that these areas are associated with a component characterised by analytical, adaptive, and decision-making competencies, reflecting the ability of coaches to process information, evaluate situations, and implement effective actions in dynamic contexts.

The second component was primarily associated with:

- Time management and goal setting.
- Active learning.
- Focus and concentration.

This component appears to reflect individual cognitive and organizational competencies, related to self-regulation, attentional control, and structured goal-oriented behavior.

The communication mindset variable showed moderate loadings across components, suggesting a less clearly defined association with a single latent dimension. This may indicate that communication-related attitudes operate as a partially independent aspect of coaching practice.

Overall, the PCA results suggest that the measured coaching competencies in this sample can be summarized into two broad component domains:

1. Analytical and adaptive professional competencies.
2. Cognitive and self-regulatory competencies.

Scale Optimization

Based on the results of the PCA, a reduced version of the scale was developed by selecting items with relatively high component loadings and strong conceptual alignment with the retained components.

The optimized version includes 32 items, ensuring representation of both extracted dimensions while improving the usability of the instrument.

This reduction enhances the practical applicability of the scale in contexts such as coach education, performance evaluation, and professional development programs.

However, given the exploratory nature of the present study and the relatively limited sample size, the proposed scale should be considered preliminary. Further research using larger samples and confirmatory approaches, such as Confirmatory Factor Analysis (CFA), is required to evaluate the stability and dimensional structure of the proposed instrument.

Discussion

The main objective of this study was to explore the structure of coaching competencies in football through Principal Component Analysis (PCA) and to develop a more concise version of an existing assessment instrument. The findings provide preliminary evidence that a reduced version of the scale can retain a meaningful representation of key competency domains while improving its practical usability.

The PCA results identified a two-component structure, suggesting that coaching competencies in this sample may be broadly organized into two main domains:

- (1) analytical and adaptive professional competencies, and
- (2) cognitive and self-regulatory competencies.

These findings should be interpreted within the exploratory nature of the study and the characteristics of the sample.

The first component, which included areas such as information processing, evaluation of change capacity, empathy, data interpretation, skill development, and self-management, appears to reflect a cluster of competencies related to analytical thinking, adaptive decision-making, and integrated coaching practice. These competencies are consistent with theoretical perspectives that emphasize the importance of reflective practice, situational awareness, and evidence-based decision-making in coaching (Gilbert & Trudel, 2004; Nash & Collins, 2006).

Similar findings have emerged in elite sport leadership research, where effective performance management has been associated with adaptive leadership, interpersonal regulation, and decision-making under pressure (Fletcher & Arnold, 2011).

The second component, characterized by time management, active learning, and focus, suggests a dimension associated with individual cognitive and organizational skills, particularly self-regulation and attentional control. These aspects may be particularly relevant to managing the demands of coaching in high-performance environments, where planning, concentration, and continuous learning play a central role.

Taken together, these findings are consistent with the possibility that coaching effectiveness may involve an interaction between decision-making capacities in complex environments and individual cognitive and self-regulatory processes. Rather than representing a large number of independent competencies, the findings suggest a more integrated and parsimonious structure, in which multiple coaching behaviors cluster around broader functional domains.

These results are broadly consistent with existing literature emphasizing the multidimensional nature of coaching effectiveness, particularly the interplay between interpersonal, cognitive, and reflective competencies (Côté & Gilbert, 2009; Jowett, 2017). However, the present findings suggest that, at least within this sample, these competencies may organize into fewer underlying dimensions when examined through quantitative methods such as PCA.

From a practical perspective, the results indicate that the original 52-item scale can be reduced without entirely losing its ability to capture relevant aspects of coaching practice. The optimized 32-item version provides a more concise instrument that may be easier to implement in applied contexts, such as coach education programs, professional development pathways, and organizational evaluation systems.

In professional football environments, where time constraints and operational demands are significant, shorter and more focused assessment tools may facilitate the integration of competency evaluation into everyday practice. Previous studies have demonstrated that athlete perceptions of coaching effectiveness are strongly associated with motivational and performance-related outcomes, reinforcing the practical importance of competency assessment tools in sport environments (Boardley et al., 2008). In addition, identifying broader competency domains may support the design of targeted training interventions, helping coaches to develop specific areas such as decision-making under pressure or self-regulation in complex environments.

It is important to note, however, that the reduced scale should not yet be regarded as a definitive measurement instrument, but rather as an exploratory instrument that may support reflective practice and professional development.

From a methodological perspective, this study contributes to the ongoing effort to develop more efficient and context-specific tools for assessing coaching competencies. By applying PCA to a multidimensional questionnaire, the study offers an initial attempt to identify clusters of related competencies and simplify the structure of the assessment instrument.

The reduction from 52 to 32 items was guided by empirical criteria, particularly factor loadings, while also considering conceptual coherence. This approach sought to balance statistical dimensionality reduction with substantive interpretability.

Future research using larger samples and confirmatory statistical techniques, such as Confirmatory Factor Analysis (CFA), will be necessary to verify the stability and robustness of the proposed structure.

Despite its contributions, several limitations should be acknowledged.

First, the use of a convenience sample of 73 coaches limits the generalizability of the findings and may constrain the robustness of the PCA results. While the sample included both professional and semi-professional coaches, the predominance of participants from the Italian football context may reflect specific cultural and organizational characteristics.

Second, the reliance on self-report measures introduces potential biases associated with social desirability, subjective self-perception, and response tendencies. Although anonymity was

ensured, future research should consider integrating multiple sources of data, including athlete feedback, peer evaluation, or observational methods.

Third, the cross-sectional design provides a cross-sectional assessment of perceived competencies at a single point in time. Longitudinal studies would be valuable in understanding how coaching competencies evolve across different stages of professional development.

Finally, the factorial structure identified through PCA should be interpreted as exploratory and preliminary, given the sample size and methodological approach.

Furthermore, although preliminary reliability analyses supported the internal consistency of most questionnaire domains, some subscales demonstrated relatively low to moderate internal consistency and should therefore be interpreted with caution until further validation is conducted.

Future research should aim to further validate the proposed competency structure using larger and more diverse samples of football coaches. Confirmatory statistical approaches, such as CFA, would allow for a more rigorous evaluation of the dimensional structure identified in this study.

Longitudinal designs would be valuable for examining how coaching competencies develop over time and in response to experience, education, and contextual factors. Research on coach learning has further emphasized the importance of continuous professional development and experiential learning processes in the evolution of coaching expertise (Mesquita et al., 2014). In addition, integrating multi-source data, including athletes, staff members, and organizational stakeholders, may offer a more comprehensive understanding of coaching effectiveness.

Finally, cross-cultural and cross-sport comparisons could help determine whether the component structure identified in this study is stable across cultural and organizational contexts or is specific to particular football environments.

Conclusions

This exploratory study examined the component structure of coaching competency measures among professional and semi-professional football coaches using Principal Component Analysis (PCA). The results suggest that coaching competencies may be organized into two main domains: analytical and adaptive professional competencies, and cognitive and self-regulatory competencies. These findings highlight the potential for simplifying the assessment of coaching competencies by identifying broader underlying dimensions rather than multiple independent constructs.

In addition, the study provides preliminary evidence that the original 52-item scale can be reduced to a more concise 32-item version while retaining representation of key competency domains identified in the present analysis. This may have practical implications for the development of more efficient and usable tools in coach education and professional development contexts.

However, the findings should be interpreted with caution due to the exploratory nature of the study and the relatively small sample size. Further research using larger and more diverse samples, as well as confirmatory statistical techniques, is necessary to further evaluate the stability, validity, and generalizability of the proposed component structure.

Overall, this study provides preliminary evidence concerning the component structure of coaching competency measures and contributes to ongoing efforts to develop structured and evidence-informed approaches to competency assessment in professional football.

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Data Availability Statement: Data can be made available upon request to the contact author.

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