Cuadernos de Psicología del Deporte, vol. 25, 1, 257-271
Recibido: 12/02/2024
Aceptado: 13/01/2025

Murcia (España) ISSN edición impresa:1578-8423
ISSNediciónweb(http://revistas.um.es/cpd):1989-5879

Cita: Sánchez-López, R., Echeazarra, I. & Castellano, J. (2025). Differences on goal-scoring between first teams and reserve teams in the same football league. *Cuadernos de Psicología del Deporte*, *25*(1), 257-271

Differences on goal-scoring between first teams and reserve teams in the same football league

Diferencias marcando goles entre primeros equipos y equipos filiales de una misma liga de fútbol

Diferenças na marcação de gols entre equipes titulares e equipes reservas da mesma liga de futebol

Sánchez-López, Rubén[1,2], Echeazarra, Ibon[3], Castellano, Julen[3]

[1]*Physical Education, Sport & Human Movement, Autonomous University of Madrid, Madrid, Spain;* [2]*Physical Activity and Sport Sciences, University of Castilla-La Mancha, Toledo, Spain;* [3]*Physical Education and Sport, University of the Basque Country, Vitoria, Spain.*

ABSTRACT

Knowing how teams act when they score can help to propose better strategies and optimize the planning of training sessions. Thus, this study aimed to analyze the differences in the goals scored by the first teams (n = 11, goals = 398) and reserve teams (n = 5, goals = 242) of the same football league (Third Federation, group VII, Madrid, Spain). To record the goals, the observational methodology was used via CODITAG instrument. For analysis, the Chi-square test was applied in a general way, and the Z test at a particular level, comparing the proportions of the goals, and correcting the p values using the Bonferroni method. At a general level, significant differences ($p < .05$) were obtained in the criteria "contextualization of the last action" and "last contact surface". At a particular level, the results reflected that the reserve teams differed from the first teams by achieving a lower proportion of their goals in set-piece actions and in attacking plays that led to completions or involved headed assists. However, they achieved a higher proportion of goals in game situations where the player who scored received a pass outside the box, as well as in finishes with the right foot, or that involved the use of 2 or more contacts. Coaches of reserve teams and coaches who face reserve teams should consider these findings.

Keywords: soccer, offensive phase, attack, performance, team sports

RESUMEN

Conocer cómo actúan los equipos cuando consiguen marcar puede ayudar a plantear mejores estrategias y optimizar la planificación de las sesiones de entrenamiento. Por ello, este estudio tuvo como objetivo analizar las diferencias en los goles marcados por los primeros equipos (n = 11, goles = 398) y equipos filiales (n = 5, goles = 242) de una misma liga (3ª RFEF grupo 7, Madrid, España). Para el registro de los goles, se utilizó la metodología observacional a partir del instrumento CODITAG. Para su análisis, se aplicó el estadístico Chi-cuadrado de manera general, y la prueba Z a nivel particular, comparando las proporciones de los goles, y corrigiendo los valores *p* a

Correspondencia: **Rubén Sánchez-López**
Email: Ruben.SanchezLopez@uam.es

partir del método de Bonferroni. A nivel general, se obtuvieron diferencias significativas ($p < .05$) en los criterios "contextualización de la última acción" y "superficie del último contacto". A nivel particular, los resultados reflejaron que los equipos filiales se diferenciaron del resto de equipos por conseguir una menor proporción de sus goles en acciones a balón parado y en jugadas que desembocaron en remates o conllevaron asistencias en forma de descarga o prolongación de cabeza. En cambio, consiguieron una mayor proporción de goles en situaciones donde el jugador que consiguió marcar recibió un pase fuera del área, así como en finalizaciones con el pie derecho, o que supusiesen la utilización de 2 o más contactos. Los entrenadores de equipos filiales y aquellos que se enfrenten a equipos filiales deberían considerar estos hallazgos.

Palabras clave: fútbol, fase ofensiva, ataque, rendimiento, deportes de equipo

RESUMO

Saber como as equipes agem quando marcam pode ajudar a propor melhores estratégias e otimizar o planejamento dos treinos. Assim, este estudo teve como objetivo analisar as diferenças nos gols marcados pelas equipes titulares (n = 11, gols = 398) e equipes reservas (n = 5, gols = 242) de um mesmo campeonato de futebol (Terceira Federação, grupo VII, Madrid, Espanha). Para registro dos gols foi utilizada a metodologia observacional via instrumento CODITAG. Para análise, aplicou-se o teste Qui-quadrado de forma geral, e o teste Z em nível particular, comparando as proporções dos gols, e corrigindo os valores de *p* pelo método de Bonferroni. A nível geral, foram obtidas diferenças significativas ($p < .05$) nos critérios "contextualização da última ação" e "superfície do último contacto". A um nível particular, os resultados reflectiram que as equipas reservas diferiram das equipas titulares por atingirem uma menor proporção dos seus golos em lances de bola parada e em jogadas de ataque que levaram a finalizações ou envolveram assistências de cabeça. No entanto, conseguiram uma maior proporção de golos em situações de jogo em que o jogador que marcou recebeu um passe fora da área, bem como em finalizações com o pé direito, ou que envolveram a utilização de 2 ou mais contactos. Os treinadores de equipas reservas e os treinadores que enfrentam equipas reservas devem considerar estas conclusões.

Palavras-chave: futebol, fase ofensiva, ataque, rendimento, esportes coletivos

INTRODUCTION

Specific analysis of the actions that lead to goals in soccer can reveal the most effective ways to create offensive sequences to score (González-Ródenas, Aranda, et al., 2020). In this sense, the observational methodology (Anguera, 1992) seems one of the best alternatives to analyze the action of play, given that it presents a large number of possibilities and effective procedural resources for the study of everyday life and the relationships between behavior and environment (Anguera, 1999; Castellano y Hernández-Mendo, 2015), allowing the researcher to carry out adequate monitoring throughout a process (Anguera y Hernández-Mendo, 2014). In this specific process, observing the offensive game sequences from previously defined criteria and categories allows us to know how the teams act when they manage to score, either at the moment of offensive transition or developing their attacks in the offensive phase (Sánchez-López, Echeazarra, y Castellano, 2023a).

To fulfill this purpose, in recent years different observational tools have been used in order to analyze goals or goal-scoring opportunities, which can be found in a previous study (Sánchez-López, Echeazarra, y Castellano, 2023a). These and other tools have recently been used to study the impact on the achievement of goals of very different factors independent of the game action, such as substitutions (Amez et al., 2021), the final result of the match (Ugalde-Ramírez y Rodríguez-Porras, 2021), the football league (Papadopoulos et al., 2021), the playing season (Sánchez-Flores et al., 2016), the division or competition category (Raya-González et al., 2019), among others. However, to the authors' knowledge, there are no studies found in scientific literature that analyze the differences in how reserve teams and first teams that compete in the same league score their goals.

Goal-scoring: first teams vs reserve teams

The reserve teams act as second teams of a club or "B" teams and are mostly made up of young under-23 players. These players are selected because of their potentiality, that is, the prediction of the football competence that the participant may have in the future (Sánchez-López et al., 2024b). Therefore, in theory, the main purpose of this type of team is to optimize the football competence of its young players (Arcos et al., 2020), to lead them to compete at a professional level (Mills et al., 2012), either by promoting the first team or through a possible sale. For this reason, young players feel the need to shine in each match, showing all their impetus and energy and offering spectators more open matches, with more rhythm and verticality. The first teams are usually made up of young players who have managed to be promoted from the reserve team or signed from another club and veteran players. Regarding the veteran players, it is known that experience plays a key role, since practice makes the expert (Sánchez-López, 2024). In this sense, tactical synchronization of veteran players improves quicker than that of young players (Folgado et al., 2018), and the older the player the better the declarative tactical knowledge (Sánchez-López, Echeazarra, Arrieta, et al., 2023). Based on these facts, veteran players have a better understanding of the game, which allows them to choose the right moments to attack their opponent or pause the game. In other words, any fan knows that matches between two reserve teams are usually different from matches between two first teams, as well as those matches in which one of the two teams is a reserve team.

Considering all the above, the question is to know what specific differences can be found from goal-scoring to help coaches to design training sessions in a better way. This entry point is especially relevant given that most current competitive systems in Europe include reserve teams in the same leagues as the first teams. For example, considering the UEFA 2022/23 coefficients that refer to the ranking by country, it can be found that, on the one hand, England and Italy have specific leagues for their reserve teams that compete with each other. On the other hand, in Spain, France, Germany, the Netherlands and Portugal, along with most European leagues, there is not an express competition for reserve teams, but they are adhered to the same competitive system as the rest of the teams.

Therefore, the aim of this study was to analyze the differences in the goals scored by the first teams and reserve teams of the same football league. Our main hypothesis maintained that significant differences would be found in the proportions of the criteria observed when comparing how these two types of teams achieve their goals. Furthermore, although it was not an objective of this study, we thought that differences would also be found in the proportions of goals scored in the total sample with respect to those collected in the scientific literature in professional football, given that the study would take place in a semi-professional league. Responding to these hypotheses could help to propose better strategies, plan training sessions and design tasks in semi-professional teams in a more relevant way, given that being a reserve team coach does not seem to be the same as being a first team coach.

METHOD

Design

This study responded to a follow-up observational, nomothetic and multidimensional design (Anguera et al., 2011). It was follow-up because the data collection was carried out in one season or competitive period over several matches; it was nomothetic because the data was recorded in a cross-sectional way (Hernández-Mendo y Molina, 2002), coding the goals of all the teams that participated in the same league, independently, without any link between them; and it was multidimensional because the goals were analyzed according to several criteria. The data type, therefore, was concurrent and event-based, in other words, type II (Bakeman, 1978), because several dimensions were recorded in the same cluster, irrespective of the duration of the events.

Sample

The study was carried out in the group 7 (Madrid) of the Third Federation (fifth tier of the Spanish football league system), which was made up of 16 teams. A sample of 640 goals scored in the 240 matches corresponding to the 30

league rounds of the 2022-2023 season was used. The teams were divided into reserve teams (n = 5, goals = 242 goals) and the rest of the teams or first teams (n = 11, goals = 398), as can be identified in table 1.

Table 1

Teams according to their final classification, type (first team or reserve team), points and goals scored.

Position	Team	Type	Points	Goals
1	C.D.E. Ursaria	First Team	68	62
2	RSC Internacional F.C. (Real Madrid C.F. "C")	Reserve Team	67	73
3	Getafe C.F. S.A.D. "B"	Reserve Team	54	49
4	C.D.B. Paracuellos Antamira (Rayo Majadahonda "B")	Reserve Team	48	48
5	C.D. Mostoles U.R.J.C. "A"	First Team	47	38
6	R.S.D. Alcalá S.A.D.	First Team	46	31
7	Las Rozas C.F. "A"	First Team	45	37
8	C.F. Trival Valderas Alcorcón	First Team	37	38
9	C.F. Pozuelo de Alarcón "A"	First Team	37	37
10	A.D. Torrejón C.F. "A"	First Team	35	31
11	C.D. Galapagar "A"	First Team	35	38
12	CLUB Unión Collado Villalba "A"	First Team	34	30
13	C.D. Canillas "A"	First Team	34	34
14	Rayo Vallecano de Madrid "B"	Reserve Team	33	42
15	C.D.E. Madrid 2021 "A" (C.F. Fuenlabrada "B")	Reserve Team	32	31
16	Real Aranjuez C.F.	First Team	16	21

The study conformed to the recommendations of the Declaration of Helsinki (Bošnjak, 2001; Tyebkhan, 2003). According to what is established in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 2014), which describes guidelines regarding ethical issues in research involving human subjects, informed consent is not required from participants when images are in the public domain. Consequently, ethical approval was not required because the study involves observation of people in public places (stadium), the individuals or groups being observed have no reasonable expectation of privacy and does not involve any staged intervention by the researcher or direct interaction with the individuals. This league was selected because of the free access to the goals sequences and because it involved five reserve teams. This game sequences were observed using the videos that the Madrid Football Federation offers openly and publicly on its internet portal, in which all the goals are shown after each matchday. When necessary, complete recordings of the matches were also used, which were filmed by the teams involved in the league themselves and shared with a collaborative group of analysts for their use. The main researcher of this study was part of this collaborative group as he was linked to one of the league teams.

Instrument

To collect data, the Coding Tool to Analyse Goals -CODITAG- was used, which had been designed and scientifically validated in a previous study (Sánchez-López, Echeazarra, y Castellano, 2023a). The tool consists of a combination of a field format and exhaustive and mutually exclusive category systems, with 11 criteria, as shown in Table 2.

Table 2

Criteria and categories of the Coding Tool to Analyse Goals in Football -CODITAG-.

Criterion	Categories	Definition for observation
Match day	1 to total number of days (rounds)	Number of match days in which the match that gives rise to the analysed goal is played
Home team	1 to total number of teams	Number of the home team that gives rise to the analysed goal
Away team	1 to total number of teams	Number of the away team that gives rise to the analysed goal
Team that scores	Home	The home team scores the goal
	Away	The away team scores the goal
Minute	1 to the minute signifying the end of the match	Minute that the goal was scored
Scoreboard status before the goal was scored	Draw	Neither of the teams were winning before the goal
	Home victory	The home team were beating the away team by one goal
	2+ home victory	The home team were beating the away team by two or more goals
	Home defeat	The home team were losing against the away team by one goal
	2+ home defeat	The home team were losing against the away team by two or more goals
Type of attack	Positional combination play	The goal is preceded by a combination of passes by the team's players that allows them to progressively advance towards the opponent's goal, getting past an organised defence and completing most of the following indices: the opposing team is forced into their own half, great width of play, many players in front of the ball during the development of play, alternating pause and rhythm in the execution, very elaborate and positional attack.
	Quick combination play	The goal is preceded by a combination of passes by the team's players that allows them to advance quickly to the opponent's goal, getting past an organised defence and completing most of the following indices: distance and space is taken advantage of between the opponent's lines, verticality in the play, few players involved in the creation of play, great rhythm and speed in the execution and simplicity in a completion.
	Direct attack	The goal is preceded by a long ball to the team's attacking line over the opponent's midfielding area.
	Completion after recovery on exit of opposition's ball	The goal is preceded by a steal or interception of the ball in the opposition's starting area (from the baseline to the box line).
	Counter-attack after recovery at the opposition's half	The goal is preceded by a quick move by the team's players that allows them to advance towards the opposition's goal, getting past an unorganised defence. The ball is recovered in the opposition's half, excluding the opposition's starting area.
	Counter-attack at team's own half	The goal is preceded by a quick move by the team's players that allows them to advance towards the opposition's goal, getting past an unorganised defence. The ball is recovered in own half.
	Set piece: foul to the penalty box	The goal is preceded by a set-piece action from a direct or indirect free kick that is kicked into the opponent's penalty box.
	Set-piece: foul to restart play	The goal is preceded by a set-piece action from a direct or indirect free kick that is not kicked into the opponent's penalty box.
	Set-piece: corner to the penalty box is touched in by an attacker	The goal is preceded by a set-piece from a corner. The corner is played into the box and the first contact is made by an attacker.
	Set-piece: corner to the penalty box is touched in by a defender	The goal is preceded by a set-piece from a corner. The corner is played into the box and the first contact is made by a defender.
	Set-piece: corner outside the box	The goal is preceded by a set-piece from a corner. The corner is not hit into the penalty box, is taken short or sought by an attacker outside the penalty box.
	Set-piece: throw-in	The goal is preceded by a set-piece from a throw-in.
	Penalty	The goal came from a penalty either directly or from a second action.
	Other	It is not properly indicated what precedes the goal or it is not possible to include it in any of the other categories.

Table 2 (continued)

Criteria and categories of the Coding Tool to Analyse Goals in Football -CODITAG-.

Criterion	Categories	Definition for observation
Contextualization penultimate action	Pass into space (outside-outside and outside-inside)	The player who scores receives a pass at the back of the last line of defence. The passer is outside the box.
	Pass outside the box (outside-outside and inside-outside)	The player who scores receives a pass outside the box. The passer can be inside or outside the box (not including passes into space and long balls).
	Pass inside the box (inside-in)	The player who scores receives a pass inside the penalty box. The passer is also inside the box.
	Pass or cross from the wing (outside-inside)	The player who scores receives a pass or cross inside the box from a runner on the wing.
	Long ball (outside-outside and outside-inside)	The player who scores receives a long ball (not including balls at the back of the defence which are considered passes into space).
	Through-pass (outside-inside)	The player who scores receives a pass inside the box from the inside corridor (excludes passes into space and long balls).
	Header	The player who scores receives the ball after a header action.
	Rebound	The player who scores takes advantage of a rebound or a failure to clear the ball.
	Steal-interception	The player who scores steals the ball or intercepts a pass.
	Throw-in	The player who scores receives the ball from a throw-in.
	None	In penalties and direct fouls.
	Other	How the scoring player receives the ball is not correctly displayed or it is not possible to include it in any of the other categories
Contextualization last action	1v0 (empty goal)	The player who scores the goal shoots with no challenge from the opposition between the ball and the goal (not including scenarios where the goalkeeper or the last defender is dribbled past).
	1vGk	The player who scores the goal shoots or dribbles to finish with only the goalkeeper or a defender marking them (not including completions).
	Completion	The player who scores the goal contacts the ball in the air (not including goals from outside the box or empty goals).
	Inside shot (no 1vGk)	The player who scores the goal shoots inside the penalty box with at least one defender and the goalkeeper marking them. Contact with the ball is at ground level.
	Outside shot	The player who scores the goal shoots from outside the box (not including direct free kicks).
	Own goal	The player who scores the goal does so in their own goal.
	Direct foul	The player who scores the goal shoots a direct free kick.
	Penalty	The player who scores the goal kicks a penalty.
	Other	It is not properly indicated how the player scores the goal or it is not possible to include it in any of the other categories.
Number of contacts last action	1 touch	The player who scores the goal does so with their first touch of the ball.
	2 touches	The player who scores the goal does so after a previous control of the ball.
	3 touches	The player who scores the goal touches the ball three times.
	4+ touches	The player who scores the goal makes four or more touches with the ball.
Last action surface	Right side	The player who scores the goal does so with their right foot.
	Left side	The player who scores the goal does so with their left foot.
	Header	The player who scores the goal does so with their head.
	Other	The player who scores the goal scores with any part of the body except their right foot, left foot or head.

Due to the objective of this study, exclusively the criteria linked to the game action were analyzed. These were: the type of attack, the contextualization of the penultimate action, the contextualization of the last action, the number of contacts used in the last action and the surface used in the last contact before the goal.

Procedure

The coding instrument developed in Microsoft Excel 365 software (Microsoft Corporation, Washington, USA) was used to record the 640 league goals. The goals were recorded round after round by the same observer, who had participated in the design and validation of the tool and had enough knowledge to use it. Once all the goals were recorded, the categories of the instrument were converted to numerical format to transfer them to the SPSS Statistics for Windows software, v19 (IBM Corporation, New York, USA) for treatment and analysis. Finally, the quality of the process was evaluated using the checklist for studies based on observational methodology (MQCOM) (Chacón-Moscoso et al., 2019), obtaining a 19.5 out of 20 points.

Data analysis

As already mentioned, the coding instrument was designed and validated in relation to the quality of the data in a previous study (Sánchez-López, Echeazarra, y Castellano, 2023a), obtaining excellent values of intra-observer reliability ($k \geq .87$), and inter-observer agreement values between good and excellent ($\bar{k} \geq .62$). Using the SPSS Statistics software, the Chi-square test was applied in a general way, and the Z test at a particular level, comparing the proportions of the columns, and correcting the *p* values using the Bonferroni method.

For the correct application of the Chi-square statistical test, the condition linked to the expected frequency in the observations had to be met. These observations should not be less than 5 in any of the categories studied. For this condition, after data collection, several categories were unified in the different criteria. In the “type of attack” criterion, the few observations in the category “completion after recovery on exit of opposition's ball” became part of the category “counter-attack after recovery at the opposition's half”. Regarding set-pieces, the three categories linked to the corner were unified into a single category, and the categories of “foul in the penalty box”, “foul to restart play” and “throw-in” were also unified into a single category. These unions were not a problem, since there was no intention to go into detail about set-pieces (Gouveia et al., 2022). In “contextualization penultimate action” criterion, the observations from the “throw-in” category were discarded because they were very few, without including them in any other category, in other words, they became missing values. In the “contextualization last action” criterion, the categories “outside shot” and “direct foul” were unified into a single category. In the “last contact surface” criterion, the categories “header” and “other” were unified.

In addition, those observations that had been recorded in the categories “other” (from the “type of attack” criterion), “other” (from the “contextualization penultimate action” and “contextualization last action” criteria) were considered as missing values. Also, observations recorded in the “own goal” category of the “contextualization last action” criterion were considered as missing values as they were normally unintentional actions. In this way, the percentage of missing values in each criterion did not exceed 5%.

RESULTS

From the chi-square test, significant differences ($p < .05$) were found in the criteria “contextualization last action” and “last contact surface”. In addition, the other three criteria studied showed values close to said level of significance. It is because of that, the Z test revealed differences in the proportions associated with the categories of all the criteria studied, as shown in Table 3.

Table 3

Descriptive analysis of the goals recorded and differences between first teams and reserve teams.

Criterion	Total Goals		Reserve Team goals		First Team goals				
Category	n	%	n	%	n	%	χ2	df	p value
Type of attack	611						12,268	7	0.092
Positional combination play	101	16.5%	46$_a$	19.8%	55$_a$	14.5%			
Quick combination play	73	11.9%	32$_a$	13.8%	41$_a$	10.8%			
Direct attack	61	10.0%	22$_a$	9.5%	39$_a$	10.3%			
Counter-attack at team's own half	80	13.1%	35$_a$	15.1%	45$_a$	11.9%			
Counter-attack after recovery at the opposition's half	74	12.1%	27$_a$	11.6%	47$_a$	12.4%			
Set-piece: foul and throw-in	87	14.2%	22$_a$	9.5%	65$_b$	17.2%			
Set-piece: corner	76	12.4%	24$_a$	10.3%	52$_a$	13.7%			
Penalty	59	9.7%	24$_a$	10.3%	35$_a$	9.2%			
Contextualization penultimate action	630						12,561	9	0.184
Pass into space (outside-outside and outside-inside)	57	9.0%	24$_a$	10.1%	33$_a$	8.4%			
Pass outside the box (outside-outside and inside-outside)	57	9.0%	29$_a$	12.2%	28$_b$	7.1%			
Pass inside the box (inside-in)	96	15.2%	39$_a$	16.4%	57$_a$	14.5%			
Pass or cross from the wing (outside-inside)	138	21.9%	43$_a$	18.1%	95$_a$	24.2%			
Long ball (outside-outside and outside-inside)	24	3.8%	8$_a$	3.4%	16$_a$	4.1%			
Through-pass (outside-inside)	19	3.0%	7$_a$	2.9%	12$_a$	3.1%			
Header	37	5.9%	8$_a$	3.4%	29$_b$	7.4%			
Rebound	109	17.3%	41$_a$	17.2%	68$_a$	17.3%			
Steal-interception	20	3.2%	8$_a$	3.4%	12$_a$	3.1%			
None	73	11.6%	31$_a$	13.0%	42$_a$	10.7%			
Contextualization last action	627						11,189	5	0.048
1v0 (empty goal)	51	8.1%	21$_a$	8.7%	30$_a$	7.8%			
1vGk	118	18.8%	52$_a$	21.6%	66$_a$	17.1%			
Completion	165	26.3%	46$_a$	19.1%	119$_b$	30.8%			
Inside shot (no 1vGk)	133	21.2%	58$_a$	24.1%	75$_a$	19.4%			
Outside shot and direct foul	103	16.4%	41$_a$	17.0%	62$_a$	16.1%			
Penalty	57	9.1%	23$_a$	9.5%	34$_a$	8.8%			
Number of contacts last action	637						6,760	3	0.080
1 touch	448	70.3%	156$_a$	64.7%	292$_b$	73.7%			
2 touches	106	16.6%	45$_a$	18.7%	61$_a$	15.4%			
3 touches	46	7.2%	21$_a$	8.7%	25$_a$	6.3%			
4+ touches	37	5.8%	19$_a$	7.9%	18$_a$	4.5%			
Last contact surface	640						6,952	2	0.031
Right side	321	50.2%	137$_a$	56.4%	184$_b$	46.3%			
Left side	208	32.5%	73$_a$	30.0%	135$_a$	34.0%			
Header or other surfaces	111	17.3%	33$_a$	13.6%	78$_b$	19.6%			

Notes: χ2, Chi-square. df, degrees of freedom.

$_{ab}$ Each subscript letter indicates a subset whose column proportions do not differ significantly from each other at the .05 level.

DISCUSSION

The aim of this study was to analyze the differences in the goals scored by the first teams and reserve teams of the same football league, given that the study of variables specific to the final phase has a greater relationship with the result (Ramos Pérez et al., 2021). For fulfill this purpose, the observational methodology was used via CODITAG, taking to account five of their criteria linked to the game action: the type of attack, the contextualization of the penultimate action, the contextualization of the last action, the number of contacts in the last action, and the surface used in the last contact before the goal.

Regarding the type of attack, it could be revealed that the reserve teams scored a lower proportion of their goals in set-piece actions, with these differences being significant in free-kick and throw-in actions. Furthermore, it could be observed that set-piece actions accounted for 36.3% of the goals recorded in the entire sample, with 40.1% for first teams. These values exceed those found in other studies that have recorded goals in professional football: 24.1% in the 2016-2017 UEFA Champions League (González-Ródenas, López-Bondia, et al., 2020), 31% in the 2020-2021 English Premier League and Spanish La Liga (Gouveia et al., 2023). This warns that set-piece actions in semi-professional football represent a critical moment of the game when it comes to changing the score, having a greater impact than in professional football. Therefore, regardless of the type of team, coaches of semi-professional teams should not forget to include time for this content during the weekly microcycle. In addition, during those moments of reflection and questioning, which revolve around understanding the game (Sánchez-López, Echeazarra, y Castellano, 2023c), coaches of reserve teams should persuade young players of the importance of each set-piece action, specially goalkeepers, because they have a privileged position (Sánchez-López et al., 2024a).

In the contextualization of the penultimate action, on the one hand, it was evident that the reserve teams scored a greater proportion of their goals in attacking situations where the player who managed to score the goal received a pass outside the box. This may be because the talent that many of these young players possess allows them to build individual plays that end in goals, despite receiving the ball far from the goal. This finding suggests that first teams coaches facing reserve teams made up of young talents should focus their weekly defensive work on preventing drives and penetrations close to the area, ensuring successive coverage and closing spaces inside the structure. Collective dominance of the low block can be a fundamental aspect to avoid conceding a goal in games where the team can spend a long time without the ball. On the other hand, it was also found that the reserve teams scored a lower percentage of their goals in situations where a header occurred before the last action. That is to say, the creation of goal-scoring opportunities from this type of actions did not seem to be dominated by the reserve teams. Regarding this fact, coaches of reserve teams that play against first teams should pay special attention to second plays and aerial play, demanding high concentration in these types of situations. In contrast, coaches of first teams that play against reserve teams should promote lateral crosses in their weekly offensive dynamics, incorporating different situational variables (Torreblanca-Martínez et al., 2024) to constantly look for aerial duels inside the opponent's area.

Regarding the contextualization of the last action, it was observed that the reserve teams achieved a lower proportion of their goals from completions. This type of action was defined in the coding tool as one in which the player scores the goal by contacting the ball in the air. The lack of experience of the players who compete in reserve teams could be key factors that prevent them from winning a greater number of aerial duels. Also, young players often have bodies under construction and being part of a reserve team can be a very stressful situation (Nicholls et al., 2022), negatively impacting the execution of this type of actions. In this sense, coaches of reserve teams can focus the offensive training on this type of actions, offering young players different scenarios from different game systems (Falces Prieto et al., 2021). This will allow a progressive adaptation of the players to this type of situations and improve their football competence (Sánchez-López et al., 2021).

The criterion that refers to the number of contacts in the last action showed, on the one hand, that the first teams achieved a greater proportion of their goals with the first touch, usually a product of the finishing situations described in the previous paragraph. On the other hand, the reserve teams achieved a greater proportion of their

goals by making one or more contacts with the ball prior to shooting on goal, that is, many of these goals occurred from individual plays. In this sense, the proportions of goals in terms of outside shots were similar, but not in terms of inside shots and 1 vs goalkeeper situations, which reflects that many of the goals scored by reserve teams were born from situations where the attacker penetrated the rival box, surpassing the defensive device based on a control or driving. It seems then that another possible aspect to work on in reserve teams is first-touch completion.

Finally, the last contact surface criterion reflected that the reserve teams scored a higher proportion of their goals with the right foot (56.4% compared to 46.3%), while the rest of the teams scored a higher percentage of goals with a header or with other surfaces (19.6% vs. 13.6%). At a general level, the results found in this criterion were similar to those published in a recent study (Mićović et al., 2023) that analyzed the goals scored in 14 soccer World Cups (1966–2018), where the majority of the goals were marked with the right foot (51.6%), followed by the left foot (28%), head (17.8%) and the door itself (2.6%).

Regarding the limitations of this study, it can be noted that the context of the league could influence the results, as well as the smaller number of reserve teams with respect to first teams. In this way, future researchers are invited to replicate this type of study by analyzing how reserve teams behave when they compete in other leagues, since although the leagues may have a similar level of play, the contexts of confrontation may be different due to the cultural system (Sánchez-López, Echeazarra, y Castellano, 2023b). Likewise, it would be very interesting to investigate how teams behave when competing in leagues exclusively of reserve teams, as happens in England and Italy. Another limitation could be the situation in the qualifying table, since it could influence the results, although three reserve teams qualified for the play-offs, and the other two occupied direct relegation positions, as well as the effective playing time (Castellano et al., 2024), the home advantage (Fernández-Cortés et al., 2024) and the momentary result (Errekagorri et al., 2022).

CONCLUSION

This study descriptively reflected how the goals of all the teams in a semi-professional league in Spain were distributed, evidencing differences at an inferential level in the proportions of goals scored by reserve teams and first teams with respect to the analyzed criteria.

The reserve teams obtained a greater proportion of their goals in combinative attacks and counterattacks after recovery at the opposition's half, although no significant differences were obtained. They differed significantly from the first teams by achieving a higher proportion of goals in situations where the player who managed to score received a pass outside the box. Differences were also found in the proportions of inside shots and 1vGk situations, as a result of individual plays where the attacker made 2 or more contacts, as well as in finishes with the right foot.

For their part, the first teams scored a greater proportion of their goals from set-pieces, especially those originating from fouls and throw-ins. They also scored a significantly higher percentage of their goals on attacking plays that led to completions or involved headed assists. This also meant a higher proportion of goals produced with the first touch and with the head or other parts of the body other than the feet.

PRACTICAL APPLICATIONS

About the implications and applications for practice, on the one hand, reserve team coaches should worry about working on set-pieces during the week, persuading young players of the importances of this kind of situation, especially in defense. First-touch finishing could be a key aspect to improve, especially in attacking plays that led to completions or involved headed assists. Coaches can focus the offensive training on this type of action, offering young players different scenarios to improve their football competence. On the other hand, coaches of first teams should focus on training the defensive phase when facing a reserve team, working on mechanisms to effectively defend the positional attack, such as, for example, dissuading when the rival receives close of the box, preventing drives and penetrations, since there was a higher percentage of goals in actions where the player who scored the

goal received a pass outside the box. Collective dominance of the low block, ensuring successive coverages and closing spaces, can be a fundamental aspect to avoid conceding a goal in games where the team can spend a long time without the ball. In attack, should promote lateral crosses to constantly look for aerial duels inside the opponent's area.

DISCLOSURE OF INTEREST

The authors report there are no competing interests to declare.

FUNDING

The authors received no financial support for the research, authorship, and/or publication of this article.

DATA AVALABILITY STATEMENT

The data generated and analyzed during the current study is not publicly available.

REFERENCES

1. Amez, S., Neyt, B., Van Nuffel, F. y Baert, S. (2021). The right man in the right place? Substitutions and goal-scoring in soccer. *Psychology of Sport and Exercise*, *54*. https://doi.org/10.1016/j.psychsport.2021.101898

2. Anguera, M. T. (1992). *Metodología de la observación en las las ciencias humanas*. Catedra.

3. Anguera, M. T. (1999). *Hacia una evaluación de la actividad y su contexto: ¿Presente o futuro para la metodología? Discurso de ingreso a la Real Academia de Doctores. Barcelona: 23 de noviembre.*

4. Anguera, M. T., Blanco-Villaseñor, Á., Hernández-Mendo, A. y Losada, J. L. (2011). Diseños observacionales: Ajuste y aplicación en psicología del deporte. *Cuadernos de Psicologia del Deporte*, *11*(2), 63-76.

5. Anguera, M. T. y Hernández-Mendo, A. (2014). Metodología observacional y psicología del deporte: Estado de la cuestión. *Revista de Psicologia del Deporte*, *23*(1). https://doi.org/2445/148502

6. Arcos, A. L., Martínez-Santos, R. y Castillo, D. (2020). Spanish Elite Soccer Reserve Team Configuration and the Impact of Physical Fitness Performance. *Journal of Human Kinetics*, *71*(1). https://doi.org/10.2478/hukin-2019-0085

7. Bakeman, R. (1978). Untangling streams of behavior: Sequential analysis of observation data. En *G. P. Sackett (Ed.), Observing Behavior: Vol. 2. Data collection and analysis methods* (pp. 63-78).

8. Bošnjak, S. (2001). The Declaration of Helsinki - The cornerstone of research ethics. En *Archive of Oncology* (Vol. 9, Número 3).

9. Castellano, J. y Hernández-Mendo, A. (2015). La observación aplicada en diferentes ámbitos de la actividad física y el deporte: Los fundamentos base. . 409,. *Revista Española de Educación Física y Deportes -REEFD-*, *409, año L*. https://doi.org/10.55166/reefd.v0i409.84

10. Castellano, J., Olaizola, A., Guerrero, C. y Errekagorri, I. (2024). Análisis del Tiempo de Juego Efectivo y de la Posesión de Balón en el Fútbol Femenino Profesional. *Cuadernos de Psicología del Deporte*, *24*(1), 242-256. https://doi.org/10.6018/cpd.568171

11. Chacón-Moscoso, S., Anguera, M. T., Sanduvete-Chaves, S., Losada, J. L., Lozano-Lozano, J. A. y Portell, M. (2019). Methodological quality checklist for studies based on observational methodology (MQCOM). *Psicothema*, *31*(4). https://doi.org/10.7334/psicothema2019.116

12. Errekagorri, I., Calzón, O., Echeazarra, I. y Castellano, J. (2022). Análisis de la influencia del marcador en el rendimiento del juego de un equipo de la Tercera División Española de Fútbol: Estudio de caso. *Cuadernos de Psicología del Deporte*, *22*(3), 163-178. https://doi.org/10.6018/cpd.510051

13. Falces Prieto, M., Marcos Gutierrez, I. y Martín Barrero, A. (2021). Performance analysis of the tactical systems of a professional soccer. *E-Balonmano Com Journal Sports Science*, *17*(2), 111-120. https://doi.org/10.17398/1885-7019.17.111

14. Fernández-Cortés, J., Gómez-Carmona, C. D., García-Rubio, J. y Ibáñez-Godoy, S. J. (2024). Is crowd support important in professional football's home advantage? A systematic review based on covid-19 effect | ¿Es importante el apoyo del público en la ventaja como local en fútbol profesional? Una revisión sistemática basada en el efecto del COVID. *E-Balonmano.com: Revista de Ciencias del Deporte*, *20*(2), 169-188. https://doi.org/10.17398/1885-7019.20.169

15. Folgado, H., Gonçalves, B. y Sampaio, J. (2018). Positional synchronization affects physical and physiological responses to preseason in professional football (soccer). *Research in sports medicine (Print)*, *26*(1). https://doi.org/10.1080/15438627.2017.1393754

16. González-Ródenas, J., Aranda, R., Tudela, A., Sanz, E., Crespo, J. y Aranda, R. (2020). Past, present and future of goal scoring analysis in professional soccer. *Retos*, *37*, 774-785. https://doi.org/10.47197/retos.v37i37.69837

17. González-Ródenas, J., López-Bondia, I., Aranda-Malavés, R., Desantes, A. T., Sanz-Ramírez, E. y Malaves, R. A. (2020). Technical, tactical and spatial indicators related to goal scoring in European elite soccer. *Journal of Human Sport and Exercise*, *15*(1), 186-201. https://doi.org/10.14198/jhse.2020.151.17

18. Gouveia, V., Duarte, J. P., Nóbrega, A., Sarmento, H., Pimenta, E., Domingos, F., Antunes, R., Monteiro, D., Matos, R., Amaro, N. y Araújo, I. (2023). Notational Analysis on Goal Scoring and Comparison in Two of the Most Important Soccer Leagues: Spanish La Liga and English Premier League. *Applied Sciences (Switzerland)*, *13*(12). https://doi.org/10.3390/app13126903

19. Gouveia, V., Duarte, J. P., Sarmento, H., Freitas, J., Rebelo-Gonçalves, R., Amaro, N., Matos, R., Antunes, R., Field, A. y Monteiro, D. (2022). Systematic Observation of Corner Kick Strategies in Portuguese Football Players. *Sustainability (Switzerland)*, *14*(2). https://doi.org/10.3390/su14020896

20. Hernández-Mendo, A. y Molina, M. (2002). Cómo usar la observación en la psicología del deporte: principios metodológicos. *Lecturas: EF y Deportes. Revista Digital*, *49, junio*. http://www.efdeportes.com/efd49/obs.htm [Consulta: 06 de enero de 2025].

21. Mićović, B., Leontijević, B., Dopsaj, M., Janković, A., Milanović, Z. y Garcia Ramos, A. (2023). The Qatar 2022 World Cup warm-up: Football goal-scoring evolution in the last 14 FIFA World Cups (1966–2018). *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2023.954876

22. Mills, A., Butt, J., Maynard, I. y Harwood, C. (2012). Identifying factors perceived to influence the development of elite youth football academy players. *Journal of Sports Sciences*, *30*(15). https://doi.org/10.1080/02640414.2012.710753

23. National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (2014).

The Belmont Report. Ethical principles and guidelines for the protection of human subjects of research. *The Journal of the American College of Dentists*, *81*(3). https://doi.org/10.1017/cbo9780511550089.028

24. Nicholls, A. R., Madigan, D. J. y Earle, K. (2022). Multi-wave analyses of coping, athlete burnout, and well-being among F. A. Premier League academy players. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.979486

25. Papadopoulos, S., Papadimitriou, K., Konstantinidou, X., Matsouka, O., Pafis, G. y Papadopoulos, D. (2021). Factors leading to goal scoring in the Spanish and Italian soccer leagues. *Sport Mont*, *19*(1), 13-18. https://doi.org/10.26773/SMJ.210205

26. Ramos Pérez, D., Castellano, J. y Hernández-Mendo, A. (2021). Relación entre indicadores de procedimiento y de resultado durante una temporada de fútbol en las cinco grandes ligas europeas. *E-balonmano com Journal Sports Science*, *17*(1), 59-72. https://doi.org/10.17398/1885-7019.17.59

27. Raya-González, J., Pérez Rodríguez, D. J., Domínguez Díez, M. y Castillo, D. (2019). Análisis de los goles anotados en la Primera y Segunda División española durante la temporada 2017/2018. *SPORT TK: Revista Euroamericana de Ciencias del Deporte*, *9*(1), 37-44. https://doi.org/10.6018/sportk.412501

28. Sánchez-Flores, J., Martín-González, J. M., García-Manso, J. M., De Saa, Y., Arriaza-Ardiles, E. J. y Da Silva-Griglotetto, M. E. (2016). Análisis de los goles conseguidos en 13 temporadas (2000/01-2012/13) correspondientes a la Primera División de la Liga Española de Fútbol Profesional. *Revista Andaluza de Medicina del Deporte*, *9*(2). https://doi.org/10.1016/j.ramd.2015.05.006

29. Sánchez-López, R. (2024). *Competencia Futbolística y Conocimiento Táctico. Construyendo un marco para su análisis.* [Universidad del País Vasco (UPV/EHU)]. http://hdl.handle.net/10810/68822

30. Sánchez-López, R., Echeazarra, I., Arrieta, J. M. y Castellano, J. (2023). Declarative Tactical Knowledge from 12 to 22 years old in a professional football club: Real Sociedad. (in press). *International Journal of Sports Science & Coaching*. https://doi.org/10.1177/17479541231208928

31. Sánchez-López, R., Echeazarra, I., Arrieta, J. M. y Castellano, J. (2024a). Declarative Tactical Knowledge and Playing Position in a Professional Football Club: Real Sociedad. *Apunts Educación Física y Deportes*, *in press*.

32. Sánchez-López, R., Echeazarra, I., Arrieta, J. M. y Castellano, J. (2024b). Exploring the Relationship of Declarative Tactical Knowledge With Participation, Football Competence, and Potentiality in a Professional Club (Real Sociedad). *Journal of Sport and Exercise Psychology*, *46*(4), 218-228. https://doi.org/10.1123/jsep.2023-0242

33. Sánchez-López, R., Echeazarra, I. y Castellano, J. (2021). Validation of a Football Competence Observation System (FOCOS), Linked to Procedural Tactical Knowledge. *Sustainability*, *13*(12), 6780. https://doi.org/10.3390/su13126780

34. Sánchez-López, R., Echeazarra, I. y Castellano, J. (2023a). Assessment of a Coding Tool to Analyse Goals in Football (CODITAG). *Apunts Educación Física y Deportes*, *151*, 58-69. https://doi.org/10.5672/apunts.2014-0983.es.(2023/1).151.06

35. Sánchez-López, R., Echeazarra, I. y Castellano, J. (2023b). Validation of an instrument to qualify Football Competence in professional players via WyScout data provider. *Apunts Educación Física y Deportes*, *154*, 83-94. https://doi.org/10.5672/apunts.2014-0983.es.(2023/4).154.08

36. Sánchez-López, R., Echeazarra, I. y Castellano, J. (2023c). Validation of "TesTactico for F7": A tool to analyse Declarative Tactical Knowledge based on a Football Competence Observation System. *Cuadernos de Psicologia del Deporte*, *23*(2), 223-239. https://doi.org/10.6018/cpd.526421

37. Torreblanca-Martínez, S., Torreblanca-Martínez, V., Castellano, J., González-Jurado, J. A. y Otero-Saborido, F. M. (2024). Diseño, validación y análisis de la fiabilidad de una herramienta de codificación para describir los centros al área en fútbol [Design, validation and reliability analysis of a coding tool to describe the crosses into the box in football]. *Cuadernos de Psicología del Deporte*, *24*(2), 208-230. https://doi.org/10.6018/cpd.591601

38. Tyebkhan, G. (2003). Declaration of Helsinki: The ethical cornerstone of human clinical research. *Indian Journal of Dermatology, Venereology and Leprology*, *69*(3).

39. Ugalde-Ramírez, A. y Rodríguez-Porras, L. (2021). Análisis de los patrones de anotación y su asociación con el resultado del partido en la Copa Oro 2019. *SPORT TK-Revista EuroAmericana de Ciencias del Deporte*, *10*(2). https://doi.org/10.6018/sportk.447221