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THE OFFENSIVE PATTERNS CAUSING DISEQUILIBRIUM IN THE DEFENSIVE ORGANIZATION OF THE OPPONENT LEADING TO A GOAL SCORED IN SOCCER

Dissertação com vista à obtenção do Grau de Mestre em Treino de Alto Rendimento

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Resumo

Este estudo tem como objetivo compreender e detetar os padrões ofensivos das duas equipas com maior número de golos marcados por jogo nas 5 principais ligas e o efeito na criação de desequilíbrio nas linhas defensivas do adversário. Com isso, torna-se possível identificar as interações dos jogadores entre seus companheiros e adversários. 76 de 99 golos do Bayern de Munique e 67 de 90 golos do Atalanta foram observados e analisados usando o protocolo REOFUT. Algumas semelhanças foram detectadas entre as equipas usando o Teste Qui-Quadrado para descobrir a associação entre diferentes variáveis como comportamento inicial do oponente e tipo de ataque, penúltima ação e penúltima zona invasiva, última ação e penúltima ação com , $X^2 = 15.005$, P=0.05, $X^2 = 31.932$, P=0.006 e $X^2 = 40.920$, P= <0.001, respectivamente para o Bayern Munich e $X^2 = 14.983a$, P=0.045, $X^2 = 24.945a$, P=0.034 e $X^2 = 20.696a$, P=0.015, respectivamente para o Atalanta. Como conclusão, embora a detecção da correlação entre o comportamento da equipa e do adversário, número, pressão e espaço, vários fatores influenciam os padrões e a dinâmica de jogo que não foram mencionados neste estudo.

Palavras-chave: Metodologia de observação, padrões ofensivos, determinantes tácticos, análise do jogo, estado defensivo, marcação de golos, futebol.

Abstract

This study has an interest to understand and detect the offensive patterns of the most 2 teams with highest goal scored per game in the top 5 leagues and the effect on creating disequilibrium on the opponent's defensive lines. Thus, this allows to identify the interactions of the players between their teammates and their opponent. 76 out of 99 goals for Bayern Munich and 67 out of 90 goals for Atalanta were observed and analyzed using REOFUT protocol. Some similarities were detected between both teams using Chi-Square Test to discover the association between different variables like Initial opponent behavior and Type of attack, Penultimate action and Penultimate invasive zone, Last action and Penultimate action with, $X^2=$ 15.005, P=0.05, $X^2=$ 31.932, P=0.006 $X^2=$ 40.920, P= <0.001, respectively for Bayern Munich and $X^2=$ 14.983a, P=0.045, $X^2=$ 24.945a, P=0.034 and $X^2=$ 20.696a, P=0.015, respectively for Atalanta. As a conclusion, although the detection of the correlation between both team and opponent's behavior, number, pressure and space, various factors influence the patterns and playing dynamics which were not mentioned all in this study.

Keywords: Observational methodology, offensive patterns, tactical determinants, game analysis, defensive state, goal scoring, soccer.

Contents

I.   Introduction:

This study has an interest in understanding and detect the offensive patterns and the effect on creating disequilibrium on the opponent's defensive lines. Thus, this permits to identify the interactions of the players between their teammates and their opponent.

According to Matsuoka, disequilibrium in the defensive organization, six items totaling two skills were used to interrupt the opponent's defense phase. There were two items to push the opponent's defensive line skill down, pushing down the defensive line and pushing down midfielder line and four items to disrupt the opponent's defensive line skill, creating space behind the defensive lines, drawing defensive lines, breaking the defensive lines and disrupting the defensive lines (Matsuoka et al., 2022).

The technical report of the 2018 World Cup in Russia asserted the following findings: (1) the defensive formation was compact; (2) the majority of goals were scored from fast attacking play; and (3) the average distance between the defensive line of the defensive team and the frontline players was 26 m (FIFA Technical Study Group, 2018). These research' findings suggest that soccer game tactics have evolved and that the frequency of counterattacks—attacks launched before the defense of the opposing side has had a chance to set up—is rising (Matsuoka et al., 2022). In the 29 final tournament games of the Union of European Football Associations Champions league in 2014–2015, (M. Hughes & Lovell, 2019) examined the offensive transition and found that 20 m runs (20 m), dribbles, and long passes (> 25 m) immediately after ball gain increased the number of goals and scoring opportunities. The ability to make the opponent's defensive forms unbalanced and to interfere with their defensive lines technique is vital with penetrative passes (Matsuoka et al., 2022).

Disrupting the opponent's defensive lines skill is related to the penetration pass skill. The lay off skill is a related skill to the penetrative pass, and there is a sequential causal relationship between the two. One of the main tenets of soccer attacks is to disrupt the defensive shape of the opposing team (Matsuoka et al., 2022). According to the opponent's interaction, the counterattacks had little impact on the opponents' well-balanced defense (Matsuoka et al., 2022).

In the world of football, the coaches and commentators know accurately what they are talking about when mentioning "game style" or "play style". Game style is the identity of the team which is implemented by the coach and can differ according to internal or external aspects (club, country, league, players…etc) (Hewitt et al., 2016). Thus, game patterns differ according to multi-variables like, game status (Daniel Barreira et al., 2011), competition type, time difference between tournaments (Reilly & Korkusuz, 2008a), country's football culture and playing time. Some teams, clubs or managers would impose game styles with colloquiums like Total Football or Tiki-Taka. In which, the fundamental task for sports analyst is to determine and measure the metrics of game play in order to observe and evaluate "game styles"(Hewitt et

al., 2016). In the last decades, literature research has enhanced team sport performance. Thus, to evaluate performance outcome by quantitative and qualitative measurements as used by (González-Rodenas et al., 2019) protocol was applied in this study. All these evaluations and measurements help developing and improving performance.

Performance analysis research has a fundamental aspect regarding key performance indicators of success including passing patterns, possession, team structure and probability of winning (Castellano et al., 2012; Lago-Ballesteros & Lago-Peñas, 2010; Lago, 2009; Lago & Martín, 2007), providing prediction about future performances (Lago-Ballesteros & Lago-Peñas, 2010; Lago, 2007; Lago & Martín, 2007; Pollard & Reep, 1997; Yiannakos & Armatas, 2006)

During the past years, video and computer technology development and application became more attainable and causing the integration of performance analysis with coach-player-sport science link (Drust, 2010; Lago, 2009). Technical and physical aspects of players and the game patterns throughout different leagues (Dellal et al., 2011), competitions (Di Salvo et al., 2010) and time (Barnes et al., 2014), have been investigated in an advanced way through research utilizing technological innovations. Goal patterns can be detected by qualitative (Daniel Barreira et al., 2011) and quantitative (M. Hughes & Franks, 2005) analysis methods. With modern tracking, identifying the position of teammates and opposition at each time instant permits further contextual information and introduces components of strategies and tactics in the play style. These playing styles can be analyzed in details to evaluate the process and promote performance of the team (Frencken et al., 2011; Moura et al., 2014). Game patterns observation grant related information regarding phases and moments by which team manage during the game (Garganta, 2009). Advanced contextual information can be supported regarding relative distances among teammates and opposition players, interactions among the team or group of players, player congestion map and probability of success through various goal zones (Frencken et al., 2012; Moura et al., 2014). Therefore, all these aspects and components can influence the team's game style and allow its quantification to be evaluated.

In soccer, offensive and defensive phases are opposite circumstances that occur simultaneously, thus, creativity and risk is present during offensive phase whereas balance and organization is present along the defensive phase (Méndez Giménez, 2005). In soccer, tactical dimension is a fundamental aspect in the game, where the offensive game patterns are linked with the defensive game patterns and vice versa, thus building a cooperation-opposition context, along the constraints of collective and individual behaviors. As stated by (Garganta, et al., 2001), soccer is associated with the constant change of state of order and disorder, stability and instability. Nevertheless, even with empirical or intuitive experience it is possible to observe and analyze explicit behaviors that occur throughout the game.

Notational analysis refers to the process by which the game's happenings are captured on video to be analyzed (James, 2017), where the main objective of soccer performance analysis is to support and deliver precise and explicit information for the coaches, players and clubs to enhance future team performance (McGarry, 2017). Therefore, new methodological approaches to collect and analyze data have shown growth and abundance during the last years (Sarmento et al., 2017). Methods that offer qualitative analysis on performance-enhancing validity and reliability of the study application are in high demand in soccer. Consequently, a mixed technique that incorporates the gathering, analysis, and interpretation of both qualitative and quantitative aspects is crucial to develop performance and studies frameworks (Anguera et al., 2018). The mix of qualitative and quantitative approaches is not utilized by most of the researchers to optimize analysis, according to (Powell et al., 2008), According to Powell et al. (2008), quantitative tools can benefit from the use of qualitative methods, and vice versa. (Collins et al., 2006). Additionally, the mixed approach (Collins et al., 2006) can be extremely potential, and high reliability instrument, thus, maximizing the pertinence and efficiency of qualitative or quantitative technique (Onwuegbuzie et al., 2009). Although soccer is a Few studies have examined the interaction between a team's offensive success and defensive variables in the context of complex and interdependent game action context of the opponents (Mackenzie & Cushion, 2013a), and according to some authors (Mackenzie & Cushion, 2013b), the future of game analysis in soccer requires more observation, studying the criteria and principles of the opponents and one of the main objectives for coaches whether in professional level or youth ages level is to prepare their players and teams to disequilibrate the opponent's defense to score. Moreover, offensive sequences and patterns leading to a goal may not correspond to the teams' individual playing styles (Caro Muñoz & Caro Muñoz, 2016; James et al., 2017). Therefore, the evaluation of additional performance metrics, such as possessions of the score-box or scoring chances which occur more often and may represent the style of play of a team was investigated (Joaquín González-Ródenas et al., 2015; Albin Tenga et al., 2010a). This instrument where qualitative analysis attributes in events interpretation by the analyst is fundamental for data collection and actions analysis to improve the game (M. D. Hughes & Bartlett, 2002). So, the new established observational a tool from a mixed method viewpoint to assess the tactical qualities of the collective offensive performance, taking into consideration the opponent's behavior and contextual dimensions. In addition, this methodology of observation is highly recommended for researching behavior in soccer (Anguera & Hernández Mendo, 2013). Consequently, even though the analysis of other performance indicators related to the offensive success is very useful for examining how well a soccer team executes its style of play, and by assessing goal-scoring chances, it is possible to identify the tactical elements that help to produce more goals efficacy. Some literature reviews has identified some tactical indicators relevant to scoring goals, such as initiation offensive play in the opposing half, with players from the middle of the field helping the goal scorer (Caro Muñoz & Caro Muñoz, 2016), assisting the goal scorer

from central areas of the field (Smith & Lyons, 2017) finishing the last move or finishing in the penalty area (Mitrotasios & Armatas, 2012) or finishing the final action with one touch (Durlik & Bieniek, 2014).

The first version of REndimiento Ofensivo en FÙtbol (REOFUT; in English: offensive performance in soccer) came to an end when goal achieved and completed (Anguera et al., 2007) where professionals did not find it necessary to update and create new dimensions. Later on, a study was realized by González-Ródenas using the new version of REOFUT (González, 2013) analyzing the offensive performance by the Spanish national soccer squad at the 2010 FIFA World Cup in South Africa. Thus, 852 touches from 7 games were examined.

Through the examination of 20 arbitrarily selected possessions from the Spain-Germany game, reliability was verified. Reliability was confirmed through the analysis of 20 randomly chosen possessions of the Spain-Germany match. During another stage, six professional analysts and researchers analyzed and reviewed the first study's findings to support the validity of the first REOFUT design's criteria and categories. Therefore, remodulation of the criteria was made for a greater comprehension of soccer tactical performance analysis. Additionally, the REOFUT was changed from having 45 dimensions and 3 macro factors into having two macro criteria and 31 dimensions (Aranda et al., 2019). A macro study was implemented to analyze the tactical dimensions related to offensive performance, using a sample of Major League Soccer matches, thus the verification of the reliability of REOFUT took place through the assessment of the agreement between observers (inter-observers) and the analysis of interpretative stability (intra-observer) observers (inter-observers) and the analysis of interpretative stability (intra-observer) (Aranda et al., 2019).

Moreover, few studies have taken into account the opponent's positioning or defensive behavior when studying goal scoring sequences because of the tactical complexity of soccer, where interaction with the opponent is essential for understanding the game. (Mackenzie & Cushion, 2013).

1. Game principles and moments in Field-based invasive sports

1.1. Play principles in Field-based invasive sports

The relationship and the interaction between teams where actions must be coordinated to recover, conserve and move the ball efficiently into the scoring zone are the principles of field-based invasion sports (Gréhaigne & Godbout, 1995). Thus, team sports is considered as an interaction of two networks seeking to anticipate opponents attacking and defending movements and planning its own attacking and defending

strategies and tactics. Studies showed that there are a global and fundamental principles of play that are advantageous to a field invasion sports team like soccer (Castellano et al., 2012; Lago-Ballesteros & Lago-Peñas, 2010; Lago, 2007, 2009).

1.2. Offensive and Defensive Principles and moments

Offensive phases of play involve a strategic objective, having players move into zones and positions to receive ball and score (Wade & Football Association (England), 1996). Successful penetration is attained by surpassing defensive opponent through player and ball movements to imbalance the opponent's defensive structure (Launder & Piltz, 2013). The players offered a range of passing options when their team is with ball possession ("Tactical Principles of Soccer Game: Concepts and Application," 2009). In which, these passing options can be given through a short or long distance from the ball carrier depending on zone where the ball is and the defensive opposition (Clemente et al., 2014). These various passing options offered for the ball carrier allow the ball to move quicker thus avoiding possession loss, causing invasion in the defensive structures (Launder & Piltz, 2013). Therefore, frequent success does not occur by chance but implicates high working rate by the whole team, movement anticipation and high team coordination. Olsen et al. (1994) highlighted the movements and dynamics are required for good offensive play, these movements quality can be reinforced by "how, "when" and "where" to be executed, whereas balance is fundamental for good defensive play. During the offensive phase, team should occupy a higher surface area of the field, for this to happen, players must utilize the field's depth and width (Launder & Piltz, 2013; Wade & Football Association (England), 1996). These movements will attract the defensive opposition into less critical zones and therefore liberating spaces for the attacking team to explore the critical zones with reduced player density (Clemente et al., 2015). During the game, it is common for behavior to be involved while change occurs in ball possession moments between both teams. When ball possession is lost or gained, transition phases naturally take place, where both teams strive to take advantage of the moment in time and space, improving individual and collective behaviors to develop the team's organization and unbalance opponent's organization (Daniel Barreira et al., 2011).

Therefore, an initial defensive principle is delaying the opponent's offensive play, blocking passing options and restricting available fragile space through defensive pressure and organization to gain ball possession (Wade & Football Association (England), 1996). For this to be attainable, positioning is fundamental and crucially depends on the offensive players on goal side (Clemente et al., 2015). Higher defensive density in the defensive areas increase the effectiveness of the defensive structures (Launder & Piltz, 2013). Which limits the offensive passing options offered by the opposition, since the available space is reduced which obligates the opponent to play in less critical areas, offering a higher probability to regain possession (Bangsbo & Peitersen, 2002; Clemente et al., 2015).

2. Strategy and Tactics

In general, soccer game is a game between two teams including moments of chaotic offensive actions to create imbalance in players 'numbers and positions against a homeostatic environment of fast reorganization to gain possession and equilibrium. In which these functions keep on reversing along the game among teams (Delgado-bordonau, 2012). According to Oliveira (2004), teams in soccer function as dynamic systems due to the interaction of various agents (players, coaches, strategies, tactics…etc), which involve these agents 'coordination and synergies in order to create equilibrium in an occasional chaotic environment. Romero Cerezo (2000) stated that the transition phase occurs without organization and with chaotic and random behaviors, whereas (Daniel Barreira & Garganta, 2007) stated that this transitional phase can be trained and practiced during training sessions to decrease the uncertainty level and improve playing patterns and players 'attitude-behavior changing.

The movement of the players and the ball, speed of counter-attacks, type of possession and the way to move strategically and create scoring-opportunities and the frequency of offensive and defensive periods to solve game problems. All contribute to form a game style which can differ from one to another. Strategy is characterized as containing all plans, game principles and actions defined before a game to organize the team and player's interaction throughout the game, referred as long-term vision (Grehaigne et al., 1997; Gréhaigne & Godbout, 1995; Launder & Piltz, 2013). The strategies take a part in the coaching philosophy, creating a team identity of play, whether possession-based play, maintaining ball away from the opposition, either with or without offensive passes or counter attacks in order to outnumber the opponent's defense. Whereas tactics include the voluntarily specific actions taken throughout the game to adapt to the opponent's requirement of play. Therefore, tactics can suffer more changes during the game context and regarding opponent's weaknesses and strengths (Grehaigne et al., 1997; Gréhaigne & Godbout, 1995; Launder & Piltz, 2013).

3. Measuring Player and Team Patterns

Successful offensive strategies include tactics forming low player density close to goal, whereas higher player density while in defensive moment to reduce playing zones and increase pressure on team during possession (Wallace & Norton, 2014). As supported by Oliveira (2004), creating situations of low player density during ball possession or offensive transition is fundamental to create offensive space and areas of numerical superiority. Space creation needs rapid dislocation of players and the capacity to anticipate ball movements and plays. Thus, lower density around offensive players causes an increase in scoring chances

(Pollard et al., 2004). On the other hand, higher density while defending can show higher success, involving correspondence with offensive opposition players to intercept plays and regain possession (Vilar et al., 2012).

Tracking technology advancements allow the collection of information regarding players 'position in time instant involving patterns of play, strategies and tactics analysis (Frencken et al., 2011; Reilly & Korkusuz, 2008b). According to Reilly and Korkusuz (2008b), Centroid and Surface area covered by players characterizes the flow between defensive and offensive teams in small sided games. (Wade & Football Association (England), 1996) characterize teams in offensive moments aiming to score goals and creating scoring opportunities inciting penetration, use field's depth and width. Whereas during defensive phase, teams try to restrict the space to delay the opposition's offensive play. Thus, regarding the Centroid of the offensive team, more advanced point is detected than that of the defending team (Frencken et al., 2011), and concerning the Surface area, offensive team occupies higher area whereas the defensive team occupies less area (Moura et al., 2014).

Therefore, understanding game style and patterns of play can have another verdict, like player recruitment to evaluate whether these characteristics match the team's game style and patterns (Gyarmati et al., 2014). Moreover, quantification of game patterns and styles provides detailed information regarding the training methodology used, comparison of training and competition strategies and tactics.

4- Performance Indicators

Analysis of performance indicators like number and type of passes, ball possession… etc have a big influence on quantification and qualification of offensive process and its evaluation. Thus, various studies showed how ball possession can be a determinant of attack efficacy in games and along the season. Moreover, the success of attacking plays and patterns depends also on the ball recovery patterns and the zone where the recovery occurred, accordingly, ball recovery is the main objective of the defensive play and the initial moment of the attacking play (Ali et al., 2007; M. Hughes & Franks, 2005; Kubayi & Toriola, 2020).

As per (Gudmundsson & Horton, 2016) survey, discusses the approach of the area subdivision, identification of field zones of players and teams, mentioning movements and behaviors, measuring offensive and defensive performance through these indicators.

Correlation between pressure, ball events, player's position and distance to the ball was detected as a performance indicator like shots on goal and opportunities (Andrienko et al., 2017).

4.1 Ball Recovery Type and Zone

According to studies, ball recovery, which zone and the way recovered is a strong indicator for success prediction that needs to be well studied and implemented in training sessions and preparations (Franks & Miller, 2007). Since ball recovery patterns and the way recovered has a big impact on the final attacking moment in elite soccer. Ball recovery and the influence of the zone which the ball was recovered and its effect on attacking efficacy was also determined in the study (Lago-Ballesteros et al., 2012). A study of world cup 2002 analysis showed that goals in open play happened due to ball recoveries in the mid-defensive sector, thus reflecting the efficacy of the attack when the ball is recovered in a zone far from the opponent's goal (Carling et al., 2006). The attacking plays and patterns are consequences of ball recovery patterns (*Regaining Possession of the Ball in the Defensive Area in Soccer | 26* ; Turner et al., 2006)

Pressing is a phenomenon that is still unknown and undetermined in football due to few studies and researches, although this topic is growing in modern football studies and tactics. The pressing concept can be applied by the defending team on the team with ball possession, aiming to regain or intercept the ball. Thus, different types of pressing can be applied like counter-press which some big teams use directly after ball loss (Andrienko et al., 2017).

Moreover, analysts and coaches are showing more interest and give importance to the pressing process and its circumstances for effective tactical strategies (Andrienko et al., 2017). In the past, it was difficult to analyze and determine the pressing topic since it requires data collection of ball possession and movement, which was only present and collected recently due to technology (Andrienko et al., 2017).

Pressing and passing sequences became more accessible in the last years due to investigations and research in the domain. According to Hirano and Tsumoto (2005), passing sequences analyses vary in length and time can be related with successful attacks and goal scoring opportunities.

As per some studies, technical dimension related with regaining ball possession has no significant impact on the outcome of the offensive sequences, rather the interactional context from which the ball recovery occurs may impact the offensive sequences (Sarmento et al., 2018).

4.2 Ball Possession and Passing Sequence

As per previous studies (Sarmento et al., 2010; Taylor et al., 2008), the results showed the importance of recovering the ball possession in offensive zones to enhance offensive play efficiency. According to technical behavior executed before the finishing action of the offensive play showed that long balls reduced the effectiveness of offensive plays by 53% compared to short and medium passes (Sarmento et al., 2018). Short possessions were more effective in offensive plays than long possessions and number of passes. Which an additional pass lowered the success of offensive play by 7% and every one second of longer

possession decreased the effectiveness of offensive plays by 2% (Lopez-Bondia et al., 2015; Redwood-Brown, 2008; Taylor et al., 2008). So the most effective offensive play is with short passes in offensive zones with reduced number of passes and possession duration. Thus, it shows that counterattacks and fast attacks are more effective than positional attacks in the offensive plays (Sarmento et al., 2018). Moreover, ball recovery in offensive zones with short passing combinations, passing speed, zones and type of passes showed more effective offensive play (Sarmento et al., 2018).

4.3 Offensive Play

As to some studies, counterattacks originated in the pre offensive zone represented a higher probability of scoring opportunities in comparison with combinative attack from the defensive area. According to Tenga et al. (2010c), the main goal of the counterattack is to explore opponent's defensive disequilibrium. According to Seabra and Dantas (2006), a higher possibility of successful shooting opportunities from received balls and shots initiating from low defensive lines compared with high defensive lines. In addition, according to Mackenzie and Cushion (2013b), higher goals and scoring attempts were recorded from counterattacks originating from a disequilibrated defense than with equilibrated defense. As shown by Tenga et al. (2010c), score-box possession represented more opportunities against imbalanced loose absent cover and backup defense compared to balanced, tight, present cover and backup defense.

According to various studies (Castellano et al., 2012; M. D. Hughes & Bartlett, 2002; Lopez-Bondia et al., 2015), more effective score-box possession was represented more when attack originated from a pre defensive and pre offensive area than in a defensive area (Lopez-Bondia et al., 2015). Studies showed that successful teams did not utilize the direct playing pattern, which implies that there are many factors to consider in the research. According to (M. Hughes & Franks, 2007), successful teams performed significantly more touches per possession than unsuccessful teams (Castellano et al., 2012).

4.4 Interrelation between teams

There is an interrelation between attacking and defensive patterns which is fundamental in tactical soccer. This interrelation varies according to the constraints of the opponent and the proper team's emerging behaviors and circumstantial variables like game location, opponent quality, pitch size, competition (Lago, 2009; Ruiz-Ruiz et al., 2013; Lago-Peñas & Lago-Ballesteros, 2011; Fradua et al., 2013; Lago, 2007). Regarding the opponent interactions, it showed that attacking against less than six defending players enhanced the offensive effectiveness. As shown in the study, the probability of score-box possession was 4.4 times lower compared with that of the attacking against a balanced defense (Albin Tenga et al., 2010c).

Studies have evaluated both the opponent interactions and the situational variables, and according to Harris and Reilly (2021), the defense against the attack with shots and no shots on target showed a higher attacker

to defender ratio and higher average distance between the closest defender and the attacker in possession. The efficiency and effectiveness of an offensive play that initiates in an interactional context with a pressured numerical equality was 2.3 higher than that when the ball is recovered in absolute numerical superiority (Sarmento et al., 2018).

When recovering ball in absolute numerical superiority in the center of the game, the opponent defensive organization seems balanced since their players are positioned behind the ball's line. Whereas recovering the ball in pressure numerical equality the defensive organization of the opponent seems unbalanced which can be used as an advantage by the attacking team. This type of pressing is an "invited pressing", in which the team invites the opponent into a zone to recover the ball by pressing and then exploring other field zones taking advantage of the superiority there (Taylor et al., 2008; Albin Tenga et al., 2010b; Sarmento et al., 2010).

4.5 Penultimate Action

The last action was a cross the effectiveness of the offensive attack was 2.8 times higher than that when short or medium passes were performed. Thus, and according to various studies, crosses have a huge impact on winning and losing teams (Lago & Martín, 2007; Lago-Peñas & Dellal, 2010; Lago-Peñas & Lago-Ballesteros, 2011). Few studies found a positive link between crosses, and shots on target and goals scored due to few collected data (Sarmento et al., 2010).

4.6 Scoring

The ultimate indicator of offensive effectiveness and efficacy is goal scoring and has been extensively used in match performance studies (Hughes & Franks, 2007). The scored goals in a football match is the main objective indicator measure of offensive effectiveness (Albin Tenga et al., 2010b) and thus the relation between goal scoring and success has received big attention (Hughes & Franks, 2005).

II. Method

5. Design

The method used demonstrates and clarifies the general characteristics and theoretical basis, indicating their objectives and essential information to conclude this study for the two teams. The research's approach is described in this chapter.

6. Procedure

No experimental analysis involving human studies was performed in this work. The type of analysis was systematic and natural observational analysis using REOFUT protocol (see in Instruments section). The

observed games were publicly recorded and broadcasted in which the replays were taken from football games website like "FullMatchReplay.com", "Youtube Channel". These naturalistic observations were done in public places. Simultaneously, the REOFUT framework was installed in Lince Plus program and the observation and data collection took place while analyzing games. After finishing game analysis, data from Lince Plus was exported to Excel Microsoft Office which from there these data were imported selectively regarding variables interest for the study to SPSS for Statistical analysis.

As regarding Intra-Reliability Test, Kappa analysis was made showing the following results in the following table as per each parameter:

Table 1.

Kappa K-Intra-Reliability Test.

		Bayern Munich		Atalanta	
		N	K-intra-reliability	N	K-intra-reliability
Parameters	Possession type	67	0.614	67	0.865
	Start type	67	1.000	67	0.870
	Type of attack	67	0.882	67	0.883
	Possession width	67	0.960	67	0.877
	Penultimate action	67	0.924	67	0.892
	Penultimate Player	67	0.905	67	0.862
	Field Penultimate zone	67	0.927	67	0.843
	Last player	67	0.897	67	0.935
	Last action	67	1.000	67	1.000
	Field last zone	67	0.866	67	0.793
	Opponent initial behavior	67	0.724	67	0.758
	Initial opponent pressure	67	0.865	67	0.681

Initial opponent number	ẑ	1.000	67	0.824
Initial opponent invasive space	ẑ	0.943	67	0.886
Penultimate opponent invasive zone	ẑ	0.914	67	0.924
Last opponent invasive zone	ẑ	1.000	67	0.823
Number of passes	ẑ	1.000	67	1.000

7. Participants and measures

Most two scoring teams per game in Europe in their domestic leagues for season 2020/2021 were Bayern Munich with 99 goals scored in 34 games of an average ratio 2.9 goals/game in the Bundesliga, where out of these 99 goals only 76 goals were analyzed since freekicks, corner kicks and penalty kicks were not considered, and some games were not accessible. Atalanta with 90 goals scored in 38 games of an average ratio 2.36 goals/game in the Serie where only 67 goals were recorded since freekicks, corner kicks and penalty kicks were not considered and observed due to equipment limitations and protocol criteria. In this study some variables were not taken into consideration for both teams like players characteristics, team philosophy, cultural influences, context of the game, such as the venue (home, away, neutral), the immediate outcome (winning, losing, drawing), the team and opponent level (high, medium, or low based on their classification position), and the game's period (first part, second part, extra time).

There was a total number of 72 games of 143 goals, where freekicks, corner kicks and penalties were excluded from the record. All games recorded were domestic league official games *(Bundesliga and Italian League- Serie A)*, since the preparations for the games, opponents and competition rules may cause a change in the team's tactical behavior and their way of play, as for example Champions league games and due to the scoring rule of home and away goals in knockout stage may influence the team's behavior, play style and its preparation. Whereas playing in the domestic league knowing there is no knockout may allow the team to play in its habitual identity. According to some studies that represented the difference of the offensive sequence efficiency between leagues, showed that the efficiency in English, Italian and Spanish leagues are higher than that of the Champions League. These difference of offensive patterns and sequences

between leagues is influenced by culture, philosophy, tactics and skill levels of teams and players depending on the stage also (Sarmento et al., 2018).

8. Technical and tactical variables

The study used the REOFUT theoretical framework (Gonzalez-Rodenas et al., 2018; Joaquín González-Ródenas et al., 2015; González, 2013) that describes how to analyze multiple tactical and technical dimensions and their sequences pertaining to the beginning, progressing, penultimate, and final actions of each team's possessions, as well as their connection to achieving offensive success, thus detecting their playing patterns for scoring goals. Also, the defensive behavior of the opponent is observed and analyzed like initial defensive position, pressure, number of players and invasive zones to perceive the relation between the offensive and defensive sequences.

9. Observational Instrument

Moreover, REOFUT is observational device combines field format and category systems. (Anguera et al., 2007) which includes a qualitative spatial localization criteria along distinct game moments. Therefore, the field format provides a conceptual approach referred as a qualitative dimension, where according on each of these dimensions, when the criteria of having a theoretical framework and a system of qualitative classifications has been created to ensure timelessness. Although other observational instruments such as GAIP-Soccer, TSAP, SOF-5, SOFBAS, FUT-SAT or SoccerEye were found but the criteria of the current study seems to fit more the theoretical framework of REOFUT protocol.

This study focuses on the offensive phase of the observed team after gaining ball possession and on the defensive phase of the opponent team when goals occur. Thus, it helps in the understanding and the analyzing process of a team during its game moments. Within the offensive macro-criterion, four temporary successive moments from each possession are analyzed: start of the possession (List 1), development of the possession (List 2), offensive actions and penultimate action of the possession that took place before scoring a goal (List 3), end of the possession and performance outcome (goal scoring) (List 4). In addition, for the defensive macro-criterion, three temporary successive moments of the game action subsequent to the loss of the ball are analyzed, with dimensions relative to the start (List 1), development (List 2), and the final phase (List 4) (Aranda et al., 2019).

Figure 1.

Zones of the field and "score pentagon." The "score pentagon" is subdivided into different zones to perform a more specific analysis of the dimensions related to goals scored (Aranda et al., 2019)
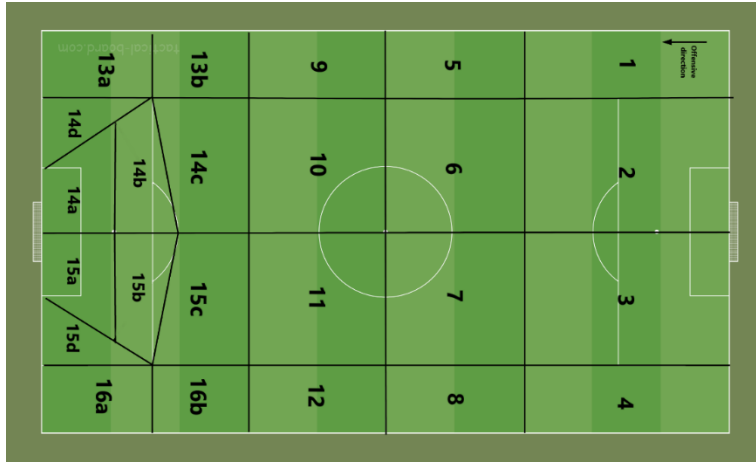

Thus, a When the field is split into four transversal sectors (defensive, pre-defensive, pre-offensive, and offensive) and four longitudinal lanes, formal static space zone, is taken into consideration. (Mombaerts, 2000). This static region is defined by what is known as a "score pentagon" is delimited (Aranda et al., 2019), which is the chosen area where a high shooting angle and a distance from the goal of less than 20 meters are essential elements for the accomplishment of the goals (Pollard & Reep, 1997). Zones 13 (13a and b), 14 (14a, b, c, and d), 15 (15a, b, c, and d), and 16 (16a and b) are created from the completion pentagon in order to conduct a more detailed analysis of the goal categories (Figure 1).

Figure 2.

Space of defensive occupation that define the level of invasion over the opponent (Gréhaigne, 2001; Seabra & Dantas, 2017).These zones are dynamic and change every second depending on the positioning on the opposing players.
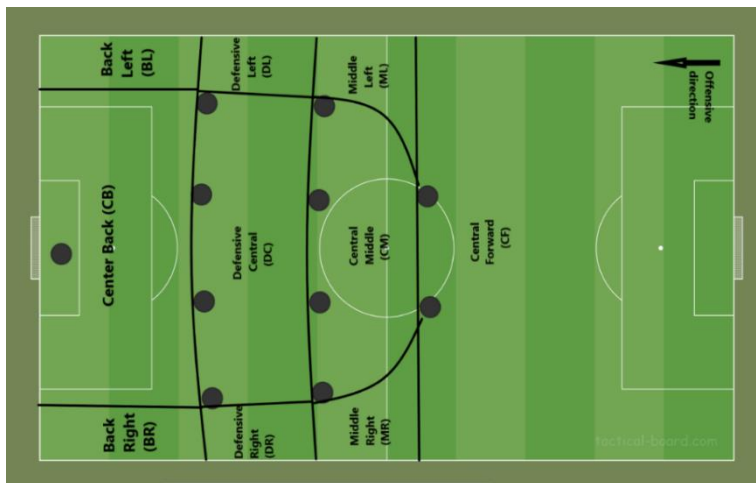
Moreover, the dynamic concept of space of defensive occupation (SDO) of the opponent team is utilized and referred as "Invasive space" (Figure 2), since the location of the player in possession of the ball in relation to the position of the opponents creates a crucial concept in the definition of many criteria reflected by REOFUT. The SDO as defined by (Gréhaigne, 2001) is "the space that is constituted by the positions of the players located, in the periphery of a plating team, except its goalkeeper" as referred in (Figure 4). Therefore, according to previous studies (Seabra & Dantas, 2017), the location of the player with the ball in relation to the SDO of the opposing team during the possession observed was considered based on the subdivisions made where 10 categories were represented in the form of subspaces

that characterized the degree of tactical penetration or invasion of the player in possession of the ball into the SDO created by the opposing team at a given moment, also the situation of that player, which is inside or outside of the adversary SDO (Figure 5).

Figure 3.

Combination of static and dynamic spaces (Joaquin González-Ródenas et al., 2019).
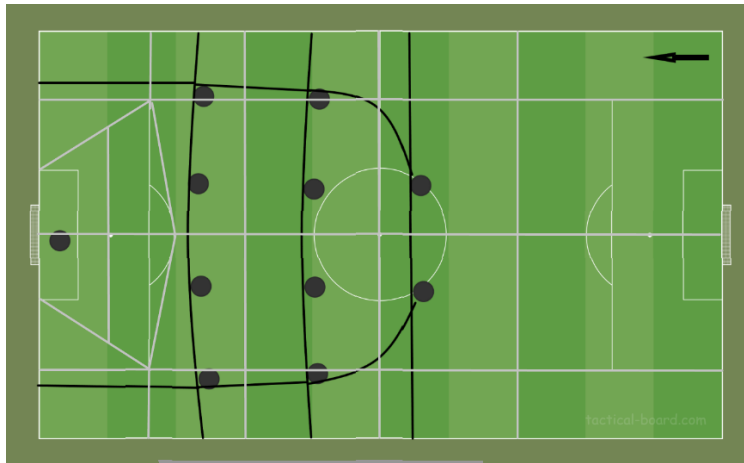
Figure 3 represents the combination of both static and dynamic space of the defensive team, due to the nature of soccer, which is a complex dimension, where the static space depends and interacts with the positioning of the defenders and their dynamic space. Therefore, it is used to determine the spaces where the offensive actions of the observed team took place to score a goal also taking into consideration the defensive behavior and positioning of the opponents.

Figure 4.

Specific positions within the system of play used by the team to determine the player that performs the action. This characterization depends on the system used by each analyzed team (Aranda et al., 2019).

Figure 5.

Example of different tactical behaviors related to the penetration over the opponent and their tactical performance (Aranda et al., 2019).
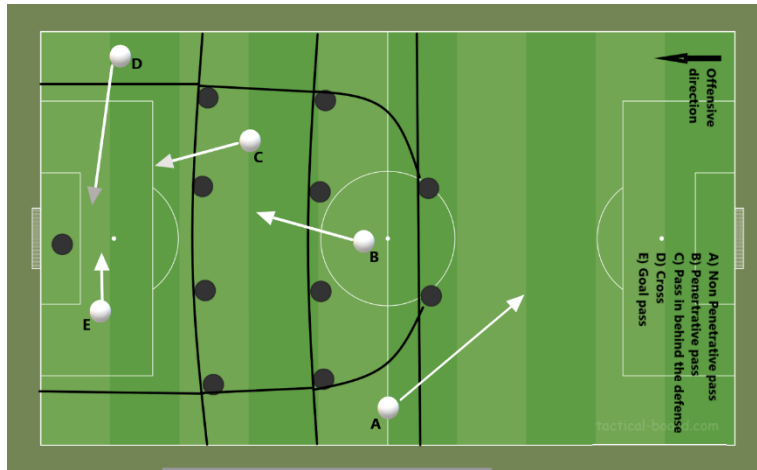
List 1 | Description and categories of the start of the possession aspect.

Observed team (Offensive)

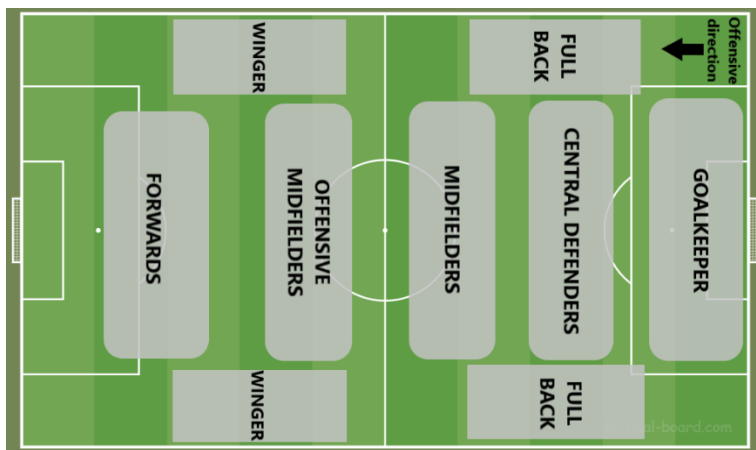**1-** *Possession type:* Three categories mentioned on the way the team starts possession according to the ball whether in play or not:

A) **Recovery:** when team gains possession in any way rather from a player of the same team.

B) **Set-plays:** (1) restart occurs in the opponent's zone, (2) attacking strategy is performed with a shot on goal (3) from a cross or one or two passes, the team has to shoot on goal (penalty and corner kicks and those free kicks with the above characteristics are included in this category).

C) **Re-starts:** the re-start occurs in any part of the pitch, (2) the attacking team is not well prepared to shoot on target from a cross or one or two passes (positions of players do not change) and (3) the team in possession build up and pass the ball. (throw in, goal kicks, free kicks, kick off).

2-_Type of start_: possession starts with individual action, according to studies (Daniel Barreira et al., 2014; Gómez et al., 2012). Two categories and eleven sub-categories were created:

A) **When the ball is not in play:** when the ball is out of play and restarted by an individual action:

A.1 goal kick,

A.2 throw in,

A.3 free kick,

A.4 corner kick,

A.5 kick off,

A.6 penalty kick,

A.7 dropped ball.

B) **When the ball is in play**: when the ball is in play and team with ball possession starts with an individual action:

B.1 **Turnover won:** A turnover is considered won when it is recovered by the team in control (following a clearance or a missed pass by the opposing team) in any area of the field (Gómez et al., 2012).

B.2 **Interception:** An interception occurs when a player from the team that doesn't have the ball approaches the ball, stops it from being delivered to a player on the opposing team, and hands the ball back to his own team. (Daniel Barreira et al., 2014).

B.3 **Steal:** When a player from the side without the ball deprives the opposition of possession of the ball through physical contact or defensive pressure (Daniel Barreira et al., 2014).

B.4 **Possession gained by the goal-keeper:** when the goal-keeper of the team gathers a turnover, intercepts or steal the ball in any zone.

3-_Field starting zone:_ Field zone of play where the possession starts (Figure 1). Four categories and sixteen sub-categories were created:

A) Zones 1, 2, 3, and 4 make up the defensive section.

B) Zones 5, 6, 7, and 8 make up the pre-defensive area.

Zones 9, 10, 11, and 12 make up the pre-offensive area.

D) Zones 13a and 13b, 14a, 14b, 14c, 14d, 15a, 15b, 15c, 15d, and 16a and 16b make up the offensive section.

4-_Starting player:_ particular player position who performs the initial action during possession. Seven categories were created regarding the system of play used by the team (Figure 4):

(A) Goal-keeper,

(B) Central defender,

(C) Full back,

(D) Central defensive-midfielder,

(E) Central offensive-midfielder,

(F) Winger and

(G) Forward.

5-_Initial behavior:_ the level of offensive directness throughout possession of the attacking observed team leading to a goal (Figure 5). Four categories were created:

A) **Non-penetrative action:** any technical action to any direction that does not go past the opponent player (s) achieved during the first three seconds of the ball possession.

B) **Penetrative action:** any technical action performed to the opponent's goal going past the opponent player (s) achieved during the first three seconds of the ball possession.

C) **Long ball:** aerial pass to the opponent's goal without any clear advantage for the attacking team, imposing a duel between a teammate and an opposing player.

D) **Cross:** pass performed from the lateral channels of the pitch in the opposing half to the penalty box (Sarmento et al., 2010) that allows the receiver to have a direct scoring opportunity leading to a goal score.

E) **Other initial behavior:** any other behavior different from the above.

Opponent defensive situation

6-Initial opponent position: opponent's block position on the pitch when the team gains possession (without goalkeeper) (Figure 2). Three categories were created:

A) Low position: the opponents' last player closer to their own goal line than the midline.

B) **Medium position:** the opponents' last player closer to the midline than to their own goal.

C) Advanced position: the opponents' last player in the opposing half.

7-_**Initial opponent pressure:**_ the distance from the player with the ball (first attackers) and the direct pressing opponent player(s) (first defender(s)) during the first three seconds of the ball possession (J et al., 2012; A. Tenga et al., 2009). Two categories were created**:**

A) Pressure: one or more opponent players press the ball holder during the first 3 seconds of the ball possession (defender(s) are always located by 1.5 meters from the first attackers).

B) No pressure: There is no player pressing the ball holder during the first 3 seconds of the possession.

8- _**Initial opponent number:**_ number of defending players positioned between the ball and their own goal when the possession begins (excluding goalkeeper). Three categories were created:

A) Micro-group: 3 or less players defending.

B) Meso-group: 4-6 players defending.

C) Macro-group: 7 or more players defending.

9-_**Initial opponent invasive space:**_ area with the space of defensive occupation (SDO) of the opponent where team possession begins (Figure 2). Four categories and ten sub-categories were created:

A) Non-invasive zone: a.1: CF.

B) Medium-invasive zone: b.1: CM

b.2 MR

b.3 ML.

C) Very-invasive zone: c.1 CD

c.2 DR

d.3 DL.

D) High-invasive zone: d.1: CB

d.2 BR

d.3 BL.

List 2 | Description and categories of the possession development aspects.

POSSESSION DEVELOPMENT

Observed team (offensive)

10-*Type of attack:*** the level of offensive directness and elaboration along the attacking phase (Bangsbo & Peitersen, 2000; J et al., 2012; A. Tenga et al., 2009). Three categories and five sub-categories were created:

A) **Organized attack:** (a) the possession begins by winning the ball whether during play or restarting the game; (b) in this attack, the opposing team is organized defensively or has time to re-organize its defensive system during the possession.

A.1 Combinative attack: this attack to the opponent's goal has high number of non-penetrative and short passes. Ball circulation takes place more in width than in depth (H et al., 2018) and the team's intention is to disequilibrate the opponent's defensive system using a high number of passes and slow tempo (evaluated qualitatively).

A.2 Direct attack: the attack to the opponent's goal has long passes from the back players or goalkeeper to the forward players (evaluated qualitatively); ball circulation takes place more in depth than in width and the team's intention is to take the ball directly to the penalty area creating scoring opportunities by using a reduced number of passes and high tempo.

A.3 Fast attack: the attack to the opponent's goal is fast, using few passes and high percentage of penetrative and short passes; ball circulation takes place in width and in depth (H et al., 2018) and the team's intention is to disequilibrate the opponent's defensive system using few passes and high tempo (evaluated qualitatively).

B) **Counterattack:** the attack begins through winning the ball in play; where the opponent does not shows defensive organization and is not capable to re-organize its defensive system during the team possession; the attack to the goal aims to utilize a level of disequilibrium from the beginning to the end with high tempo (Albin Tenga et al., 2010a); ball circulation uses a lot of penetrative passes and occurs more in depth than

in breadth. The team's intention is to explore the space left by the opponent's defensive system when they were attacking.

C) **Very short attack:** The attack begins by winning the ball in play or restarting the game. Additionally, the team's possession period is too brief, making it impossible for the observer to classify the sort of attack.

11- _**Possession width:**_ four longitudinal lanes of the pitch space during the team's possession. Four categories were created:

A) **One lane:** During attack, the ball moves across one of the four longitudinal lanes.

B) **Two lanes:** During attack, the ball moves through two of the four longitudinal lanes.

C) **Three lanes:** During attack, the ball moves through three of the four longitudinal lanes.

D) **Four lanes:** During attack, the ball moves through four of the four longitudinal lanes.

12- _**Passes per possession:**_ passing number performed by the offensive team during the possession that led into a goal.

13- _**Number of penetrative passes:**_ passing number performed by the offensive team along the possession to the opponent's goal going past opponent player(s) leading to a goal.

14 -_**Duration:**_ time (in seconds) from the beginning until the end of the possession (goal scored).

List 3 | Dimensions associated with the possession's penultimate deed are described and categorized.

PENULTIMATE ACTION (only registered if it is followed by a goal scored)

Observed team (offensive) in the penultimate action

15-_**Penultimate action:**_ technical-tactical action achieved directly before the final action that permits the final player to have a scoring goal occasion. This action may be executed by individual action (the same player that shoots at goal) or collective action (by a teammate that pass the ball to the final player). Two categories and seven sub-categories were created:

A) **Individual action:** the final player receives the ball without having a scoring opportunity and scoring but he creates one by means of an individual action. This category has four sub-categories:

A.1 Dribbling: the last player dribbles the ball past defenders to score.

A.2 Running with the ball: the last player holds the ball to a play leading to a goal.

A.3 Collecting a free ball: the last player gathers a free ball that permits him to score a goal.

A.4 Shot from distance: the last player shoots from outside the score pentagon leading to a scoring goal.

B) **Collective play:** The penultimate player in the attacking team possession achieves a pass that permits the last player to have a direct scoring goal. This category has three sub-categories.

B.1 Pass in behind the defence: pass from central channels of the pitch that penetrates the opposing defensive line and permits the receiver to have a direct scoring opportunity leading to a goal.

B.2 Cross: pass achieved from the lateral channels of the pitch in the opposing half to the penalty box (Sarmento et al., 2010) permitting the receiver to have a direct opportunity leading to a goal score.

B.3 Goal pass: the final player receives an assist through a pass (different from a pass in behind and cross) from a different player that permits him to have a direct scoring opportunity leading to a goal scored.

16- Penultimate Player: Player who takes the penultimate move**.** Seven categories were created depending on the playing style and system used by the team (Figure 4):

A) Goal-keeper

B) Central defender

C) Full back

D) Central midfielder

E) Central offensive-midfielder

F) Winger

G) Forward.

17-Field Penultimate zone: Pitch zone of play where the penultimate action of the possession is made (Figure 2). Four categories and sixteen sub-categories were created (Figure 1).

A) Zones 1, 2, 3, and 4 make up the defensive section.

B) Zones 5, 6, 7, and 8 make up the pre-defensive area.

Zones 9, 10, 11, and 12 make up the pre-offensive area.

D) Zones 13a and 13b, 14a, 14b, 14c, 14d, 15a, 15b, 15c, 15d, and 16a and 16b make up the offensive section.

Opponent defensive situation

18-*Penultimate opponent invasive zone:* the space of defensive occupation (SDO) of the opponent where penultimate action occurs (Figure 2). Four categories and ten sub-categories were created:

A) Non-invasive zone: a.1: CF.

B) Medium-invasive zone: b.1: CM

b.2 MR

b.3 ML.

C) Very-invasive zone: c.1 CD

c.2 DR

d.3 DL.

D) High-invasive zone: d.1: CB

d.2 BR

d.3 BL.

List 4 | Description and categories of the end of possession aspect.

END OF POSSESSION

Observed team (offensive) final action

19-_Last player:_ it refers to the position that the player that the last action has executed in the team attacking style. Seven categories were created (Figure 4).

20- _Last action:_ technical-tactical action achieved by the last player who played the ball in that attack. It considers the spatial situation of the opponent team while the action is being performed (Figure 2). Three categories were created:

A) **Shoot with 1 contact:** the possession ends with a shot on goal by one contact (goal).

B) **Shoot with two or more contacts:** The possession concludes with two or more contacts making a shot on goal.

C) **Header:** the possession ends with a head kick leading to a goal.

D) **Another action:** the possession ends after any other action not categorized into any of the previous categories.

21-_**Field last zone:**_ Pitch zone of play where the last action of the attack is executed (Figure 2). Four categories and sixteen sub-categories were created (Figure 1):

A) Zones 1, 2, 3, and 4 make up the defensive section.

B) Zones 5, 6, 7, and 8 make up the pre-defensive area.

Zones 9, 10, 11, and 12 make up the pre-offensive area.

D) Zones 13a and 13b, 14a, 14b, 14c, 14d, 15a, 15b, 15c, 15d, and 16a and 16b make up the offensive section.

Opponent defensive situation in the final action

22-_Last opponent invasive zone:_ the space of defensive occupation (SDO) of the opponent where last action is performed (Figure 2). Four categories and ten sub-categories were created:

A) Non-invasive zone: a.1: CF.

B) Medium-invasive zone: b.1: CM

b.2 MR

b.3 ML.

C) Very-invasive zone: c.1 CD

c.2 DR

d.3 DL.

D) High-invasive zone: d.1: CB

d.2 BR

d.3 BL.

Lince Plus v1.3.1

The use of *LINCE PLUS v1.3.1-release software* (Soto-Fernández et al., 2022) as an observation tool to collect and record data (Figure 6 and 7), to be exported into *Excel Microsoft office 365 (Figure 8)* to undergo statistical analysis using *IB SPSS Statistics 27 version software* for descriptive analysis.
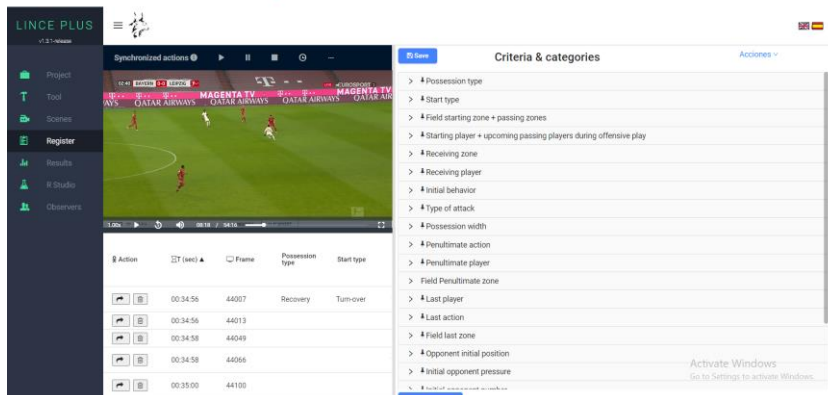
Figure 6.

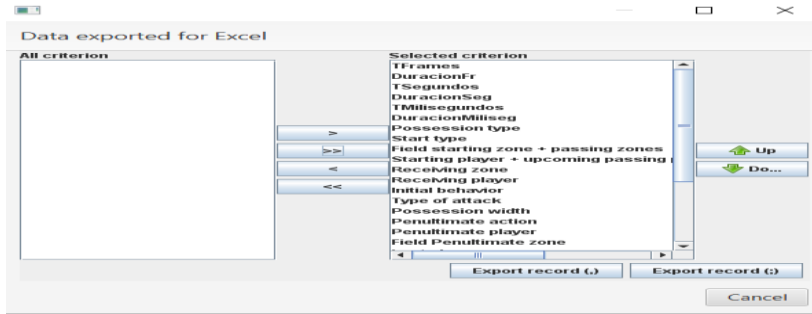LINCE PLUS V1.3.1

Figure 7-

LINCE PLUS V1.3.1 Parameters

Figure 8.

Microsoft Excel Sheet representing collected data

III. Results

10. Statistical analysis

10.1 Bayern Munich

1-Type of Attack and Initial Opponent Pressure

Table 2

Type of Attack and Initial Opponent Pressure Crosstabulation

			Type of attack					
			Counterattack	Organized attack-Combinative attack	Organized attack-Direct attack	Organized attack-Fast attack	Very short attack	Total
Initial opponent pressure	No Pressure	Count	1	7	3	4	3	18
		% within initial opponent pressure	5.6%	38.9%	16.7%	22.2%	16.7%	100%
	Pressure	Count	12	18	7	6	15	58
		% within initial opponent pressure	20.7%	31%	12.1%	10.3%	25.9%	100%
	Total	Count	13	25	10	10	18	76
		% within initial opponent pressure	17.1%	32.9%	13.2%	13.2%	23.7%	100%

According to table 2, a total of 76 attacks were shown referring to 13 Counterattacks (17.1%), 25 Organized attack- Combinative attack (32.9%), 10 Organized attack-Direct attack (13.2%), 10 Organized attack-Fast attack (13.2%) and 18 Very Short attacks (23.7%).

According to this table 3, the association between initial opponent pressure and type of attack does not exist. Where during No Pressure behavior which was represented in 18 occasions, the most attacking play was Organized attack-Combinative attack of 7 plays, representing 38.9% of the attack whereas the lowest occurrence was the Counterattack of 1 play, representing 5.6% of the attacks. However, Organized attack-

Direct attack and Very Short attack represented 16.7% of the attacks with 3 plays and the Organized attack-Fast attack showed 22.2% of the attacks with 4 plays.

Whereas, during the Pressure of the opponent directly after ball loss of a total was 58 occasions, the most attacking play was Organized attack-combinative attack of 18 plays, representing 31% of the attacks while the lowest occurrence was of Organized attack-Fast attack of 6 plays, representing 13.3% of the attacks. Very Short attack was considered the second mostly used attack of 25.9% of the attacks with 15 plays, however, Counterattack showed a value of 20.7% with attack of 12 plays. Moreover, Organized attack-Direct attack showed a value of 12.1% of the attacks with 7 plays.

Table 3.

Chi-Square Test between Initial Opponent Pressure and Type of Attack

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**4.281a**	**4**	**0.369**	**0.394**

a. 4 cells (40%) have expected count less than 5. The minimum expected count is 2.37.

According to table 3, Chi-Square test was applied to detect the association between initial opponent pressure and type of attack. There was no significant association between the two variables, X^2= 4.281, P=0.394.

2-Type of Attack and Initial Opponent Behavior

Table 4.

Type of Attack and Initial Opponent Behavior Crosstabulation

			Type of attack					
			Counterattack	Organized attack-Combinative attack	Organized attack-Direct attack	Organized attack-Fast attack	Very short attack	Total
Initial opponent behavior	Advanced position	Count	2	0	0	0	1	3
		% within initial opponent behavior	66.7%	0.0%	0.0%	0.0%	33.3%	100%
	Low position	Count	4	16	8	7	15	50
		% within initial opponent behavior	8.0%	32.0%	16.0%	14.0%	30.0%	100%
	Medium Position	Count	7	9	2	3	2	23
		% within initial opponent brhavior	30.4%	39.1%	8.7%	13.0%	23.7%	100%
	Total	Count	13	25	10	10	18	76
		% within initial opponent behavior	17.1%	32.9%	13.2%	13.2%	23.7%	100%

According to the table 4, data between opponent initial behavior and type of attack is represented, showing that during the Advanced position of the opponent directly after ball loss, Bayern obtained in total of 3 attacks in which 2 of them were Counterattacks of 66.7% and 1 Very short attack of 33.3%.

Whereas during the Medium position of the opponent 23 total attacks were made of which 9 Organized attack- Combinative attacks of 39.1% as the highest type of attack. Following this attack, Counterattacks were used the most with 7 attacks of 30.4%. After that, Organized attack- Fast attacks occurred 3 times of

13%. However, the least type of attacks occurred were Very Short attacks and Organized attack- Direct attacks of 2 attacks representing 8.7% each.

In Low position, 50 attacking situations leading to a goal occurred, showing Organized attack- Combinative attacks as the highest attacks of 16 plays of 32%, following is Very Short attack of 15 plays of 30%. Whereas both Organized attack- Direct attacks and Organized attack- Fast attacks showed 8 and 7 plays of 16% and 14%, respectively.

Table 5.

Chi-Square Test between Initial Opponent Behavior and Type of Attack

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**15.005a**	**8**	**0.059**	**0.050**

a. 8 cells (53.3%) have expected count less than 5. The minimum expected count is 0.39.

According to table 5, Chi-Square test was applied to detect the association between initial opponent behavior and type of attack. There was a significant association between the two variables, $X^2= 15.005$, P=0.05.

3-Penultimate Action and Penultimate Invasive Zone

Table 6.

Penultimate Action and Penultimate Invasive Zone Crosstabulation

			Penultimate opponent invasive zone				
			CB, BR, BL	CD, DR, DL	CF	CM, MR, ML	Total
Penultimate action	Collective action- Cross	Count	15	4	0	0	19
		% within Penultimate action	78.9%	21.1%	0.0%	0.0%	100%
	Collective action- Goal pass	Count	28	7	0	0	35
		% within Penultimate action	80.0%	20.0%	0.0%	0.0%	100%

		CB, BR, BL	CD, DR, DL	CM, MR, ML	CF	Total
Collective action- Pass in behind the defence	Count	3	5	1	2	11
	% within Penultimate action	27.3%	45.5%	9.1%	18.2%	100%
Individual action- Dribbling	Count	5	2	1	0	8
	% within Penultimate action	62.5%	25.0%	12.5%	0.0%	100%
Individual action- Running with the ball	Count	0	3	0	0	3
	% within Penultimate action	0.0%	100%	0.0%	0.0%	100%
Total	Count	51	21	2	2	76
	% within Penultimate action	67.1%	27.6%	2.6%	2.6%	100%

According to the table 6, the data to understand the association between Penultimate action and Penultimate opponent invasive. Where a total of 19 Collective action- Cross were made, in which 15 of them were from opponent's invasive zone CB, BR, BL of 78.9%. Whereas 4 Collective action- Cross were from opponent's invasive zone CD, DR, DL of 21.1%. However, zero Collective action- Cross were made from both CM, MR, ML and CF.

Regarding the Collective action- Goal Pass, a total of 35 actions were made, where 28 plays were executed from CB, BR, BL invasive zone of 80% whereas 7 actions were made from the CD, DR, DL zone of 20%. However, zero actions were made from CM, MR, ML and CF zones.

Referring to the Collective action- Pass behind the defense, a total of 11 actions were executed, where 5 actions were made in the zone CD, DR, DL of 45.5%, whereas 3 actions were made in CB, BR, BL zone of 27.3%. However, 2 actions were made from CM, MR, ML zone and one action was made from CF zone of 18.2% and 9.1% respectively.

Considering the Individual action- Dribbling, a total of 8 actions took place of which 5 occurred in CB, BR, BL zone representing 62.5%. Whereas, 2 actions occurred in the zone CD, DR, DL of 25% and 1 action

from CF zone showing 12.5% of the Individual action- Dribbling. Nevertheless, zero actions were made in the zone CM, MR, ML.

Moreover, Individual action- Running with the ball, occurred in total of 3 plays and only in CD, DR, DL zone of 3 times representing 100% of the actions made regarding the zone. On the other hand, all the rest zones CB, BR, BL and CF and CM, MR, ML showed zero actions.

Table 7.

Chi-Square Test between Penultimate Action and Penultimate Invasive Zone

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**31.932a**	**12**	**0.001**	**0.006**

a. 14 cells (70%) have expected count less than 5. The minimum expected count is 0.08.

According to table 7, Chi-Square test was applied to detect the association between Penultimate action and Penultimate opponent invasive zone. There was a significant association between the two variables, X^2= 31.932, P=0.006.

4-Last Action and Penultimate Action

Table 8.

Last Action and Penultimate Action Crosstabulation

			Penultimate action					
			Collective action- Cross	Collective action- Goal pass	Collective action- Pass in behind the defence	Individual action- Dribbling	Individual action- Running with the ball	Total
Last action	Header	Count	10	2	1	0	0	13
		% within Last action	76.9%	15.4%	7.7%			
	Shoot with 1 contact	Count	6	21	3	0.0%	0.0%	100%
		% within Last action	20.0%	70.0%	10.0%	0	0	30
	Shoot with 2 or more contacts	Count	3	12	7	0.0%	0.0%	100%
		% within Last action	9.1%	36.4%	21.2%			
	Total	Count	19	35	11	8	3	33
						24.2%	9.1%	100%
		% within Last action	25.0%	46.1%	14.5%	8	3	76
						10.5%	3.9%	100%

According to the table 8, data was collected to associate between Last action and Penultimate action. Headers occurred in total 13 times as a final action in which 10 headers occurred from a Collective action- Cross as a Penultimate action representing 76.9%. Whereas Header occurred also 2 times from Collective action- Goal Pass representing 15.4%, however, 1 Header occurred from Collective action- Pass in behind the defense with 7.7%. The rest of the actions Individual action- Dribbling and Individual action- Running with the ball did not represent any play to score from Header.

Shooting with 1 contact occurred in total of 30 times, 21 of these actions took place with Collective action-Goal Pass with 70%. Whereas 6 actions occurred with Collective action- Cross representing 20% and 3 actions occurred through Collective action- Pass in behind the defense of 10%. On the other hand, zero actions occurred through Individual action- Dribbling and Running with the ball.

Shooting with 2 or more contacts occurred with a total of 33 times, 12 actions occurred with Collective action- Goal Pass with 36.4%. Through Individual action- Dribbling, 8 actions occurred representing 24.2% and 7 actions were analyzed during Collective action- Pass in behind the defense showing 21.2%. However, in both Individual action- Running with the ball and Collective action- Cross, 3 actions were made representing 25%.

Table 9.

Chi-Square Test between Last Action and Penultimate Action

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**40.920a**	**8**	**<0.001**	**<0.001**

a. 10 cells (66.7%) have expected count less than 5. The minimum expected count is 0.51.

According to table 9, Chi-Square test was applied to detect the association between Penultimate action and Last action. There was a significant association between the two variables, $X^2 = 40.920$, $P = <0.001$.

5-Initial Opponent Number and Possession Width

Table 10.

Possession Width and Initial Opponent Number Crosstabulation

			Initial opponent number			
			Macro-group	Meso-group	Micro-group	Total
Possession width	Four lanes	Count	17	1	0	18
		% within possession width	94.4%	5.6%	0.0%	100%
	Three lanes	Count	16	10	1	17
		% within possession width	25.0%	37.5%	37.5%	100%

Two lanes	Count	20	10	1	31
	% within possession width	64.5%	32.3%	3.2%	100%
Total	Count	53	21	2	76
	% within possession width	69.7%	27.6%	2.6%	100%

According to table 10, data was collected to identify the association between Possession width and Initial opponent number. Regarding the Possession width of Four lanes a total of 18 cases were shown at which 17 plays occurred while opponent's initial number was Macro-group representing 94.4%. 1 case occurred linked with Meso-group representing 5.6%. Whereas zero situations occurred in a Micro-group.

Regarding Three lanes, a total of 27 plays were observed, in which 16 plays occurred against a Macro-group representing 59.3%, whereas 10 plays were observed against Meso-group, representing 37%. However, 1 play was observed against a Micro-group of 3.7%.

Two lanes occurred in a total of 31 plays, where 20 plays occurred against Macro-group representing 64.5% and 10 plays were observed against Meso-group representing 8.6%, moreover, 1 play occurred against Micro-group representing 3.2%.

Table 11.

Chi-Square Test between Possession Width and Initial Opponent Number

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**7.034a**	**4**	**0.134**	**0.119**

a. 4 cells (44.4%) have expected count less than 5. The minimum expected count is 0.47.

According to table 11, Chi-Square test was applied to detect the association between Initial opponent number and Possession width. There was no significant association between the two variables, $X^2= 7.034$, P=0.119.

6- Last Player and Penultimate Player

Table 12.

Last Player and Penultimate Player Crosstabulation

			Penultimate player								
			Central defensive-midfielder-L	Central defensive-midfielder-R	Central offensive midfielder	Forward	Full back-L	Full back-R	Left winger	Right winger	Total
Last player	Central defender LCD	Count	0	0	0	0	0	0	0	1	1
		% within Last player	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%	100%
	Central defensive-midfielder-L	Count	0	1	3	0	0	0	1	1	6
		% within Last player	0.0%	16.7%	50.0%	0.0%	0.0%	0.0%	16.7%	16.7%	100%
	Central defensive-midfielder-R	Count	0	0	1	0	0	0	0	1	2
		% within Last player	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	50.0%	100%
	Central offensive midfielder	Count	0	1	1	5	0	0	2	2	11
		% within Last player	0.0%	9.1%	9.1%	45.5%	0.0%	0.0%	18.2%	18.2%	100%
	Forward	Count	7	1	8	1	2	1	5	4	29
		% within Last player	24.1%	3.4%	27.6%	3.4%	6.9%	3.4%	17.2%	13.8%	100%
	Full Back- L	Count	0	0	0	0	0	0	0	1	1
		% within Last player	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%	100%
	Full Back- R	Count	0	0	0	1	0	0	0	0	1

	% within Last player	0.0%	0.0%	0.0%	100%	0.0%	0.0%	0.0%	0.0%	100%
Left winger	Count	0	3	2	0	1	0	3	4	13
	% within Last player	0.0%	23.1%	15.4%	0.0%	7.7%	0.0%	23.1%	30.8%	100%
Right winger	Count	1	2	0	1	0	0	3	5	12
	% within Last player	8.3%	16.7%	0.0%	8.3%	0.0%	0.0%	25.0%	41.7%	100%
Total	Count	8	8	15	8	3	1	14	19	76
	% within Last player	10.5%	10.5%	19.7%	10.5%	3.9%	1.3%	18.4%	25.0%	100%

According to table 12, data collected to detect the association between last player and penultimate player. Central defender LCD showed 1 play as a total which was played by Right winger representing a 100%.

Central defensive-midfielder-L as the last player was involved 6 times at which 3 of them the penultimate player was Central offensive-midfielder with 50%. On the other hand, 1 play was shown when penultimate players were Left winger, Right winger and Central defensive-midfielder-R with 16.7% each. The rest of the players represented zero participation in the play.

Central defensive-midfielder-L as the last player participated in 2 plays in total in which 1 was linked with the involvement of the Right winger and the other with the Central offensive-midfielder representing 50% each. The rest of the players represented zero involvement.

Central offensive-midfielder as the last player participated in a total of 11 plays at which the highest link was with the Forward with 5 plays referring to 45.5%. On the other hand, 2 plays were linked with the Right winger and Left winger representing 18.2% each. However, 1 play was involved with the Central defensive-midfielder-R and Central offensive-midfielder representing 9.1% each. The rest of the players did not show any involvement with the Central offensive-midfielder.

Forward participated in 29 plays as the last player in which 8 plays were linked with the Central offensive-midfielder as a penultimate player with 27.6%. Moreover, 7 plays were represented with the involvement of the Central defensive-midfielder-L showing 24.1%. Also, 5 plays were involved with the Left winger

and 4 with the Right winger showing respectively 17.2% and 13.8%. In addition, 2 plays were shown with the participation of the Full Back-L of 6.9%. However, Central defensive-Midfielder-R, Forward and Full Back-R showed 1 play with 3.4%. The rest of the players did not represent any participation.

Full Back-L player participated as the last player in 1 play which is linked with the Right winger with 100%. Whereas the rest of the players did not participate in any play.

Full Back-R participated in 1 play as last player which represented the linkage of Forward player as penultimate player with 100%. Whereas the rest of the players did not participate in any other play.

Left winger represented a total of 13 plays as the last player with the linkage of Right winger with 4 plays as penultimate player with 30.8%. Moreover, 3 plays were represented with Left winger as the proper player and Central defensive-midfielder-R of 23.1%. In addition, 2 plays occurred with the presence of the Central offensive-midfielder showing 15.4%. On the other hand, 1 play was represented with the Full Back-L as the penultimate player with 7.7%. The rest of the players did not show any plays.

The Right winger participated as the last player with 12 plays, at which 5 were from the proper player representing 41.7% whereas 3 plays were represented with the presence of the Left winger with 25%. However, 2 plays were presented with the Central defensive-midfielder-R as the penultimate player of 16.7%. On the other hand, 1 play was done by Central defensive-midfielder-L and Forward players with 12.5% each. The rest of the players did not perform in any play.

Table 13.

Chi-Square Test between Last Player and Penultimate Player

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	59.943a	56	0.335	-

a. 69 cells (95.8%) have expected count less than 5. The minimum expected count is 0.01.

According to table 13, Chi-Square test was applied to detect the association between the Last player and Penultimate player. There was no significant association between the two variables, X^2= 59.943a, P=0.335.

7-Last Player and Field Last Zone

Table 14.

Last Player and Field Last Zone Crosstabulation

			Field last zone							
			14a	14b	14c	15a	15b	15c	Total	
Last player	Central defender LCD	Count	0	0	1	0	0	0	1	
		% within Last player	0.0%	0.0%	100%	0.0%	0.0%	0.0%	100%	
	Central defensive-midfielder-L	Count	0	4	0	1	0	1	6	
		% within Last player	0.0%	66.7%	0.0%	16.7%	0.0%	16.7%	100%	
	Central defensive-midfielder-R	Count	0	0	1	0	0	1	2	
		% within Last player	0.0%	0.0%	50.0%	0.0%	0.0%	50.0%	100%	
	Central offensive midfielder	Count	2	1	0	6	1	1	11	
		% within Last player	18.2%	9.1%	0.0%	54.5%	9.1%	9.1%	100%	
	Forward	Count	9	5	1	10	4	0	29	
		% within	31.0%	17.2%	3.4%	34.5%	13.8%	0.0%	100%	

								Total
	Last player							
Full Back- L	Count	0	0	0	0	1	0	1
	% within Last player	0.0%	0.0%	0.0%	0.0%	100%	0.0%	100%
Full Back- R	Count	1	0	0	0	0	0	1
	% within Last player	100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Left winger	Count	1	0	0	9	3	0	13
	% within Last player	7.7%	0.0%	0.0%	69.2%	23.1%	0.0%	100%
Right winger	Count	1	6	2	2	1	0	12
	% within Last player	8.3%	50.0%	16.7%	16.7%	8.3%	0.0%	100%
Total	Count	14	16	5	28	10	3	76
	% within Last player	18.4%	21.1%	6.6%	36.8%	13.2%	3.9%	100%

As per table 14, data collected to identify the association between Last player and Last attacking zone. Where Central defender LCD represented a total of 1 play as the last player to finish appeared in the zone 14c showing 100%.

Central defensive-midfielder-L represented 6 plays as the last player to finish at which 4 of the plays were in zone 14b representing 66.7% and 1 play in zones 15a and 15c representing 16.7% each.

Central defensive-midfielder-R represented 1 in each zone 15c and 14c of 50% each.

Central offensive-midfielder participated in 11 plays as the last player to finish at which 6 plays occurred in the 15a zone with 54.5% and 2 plays in 14a zone representing 18.2% and 1 play occurred in each of the following zones 14b, 15b and 15c representing 9.1%.

Forward participated in 29 plays as the last player in which 10 plays took place in zone 15a representing 34.5% and 9 plays from 14a representing 31% and 5 plays from 14b zone representing 17.2% and 4 plays from 14b zone representing 13.8% and 1 play from the zone 14c representing 3.4%.

Full Back-L participated in 1 play as the last player to finish from zone 15b representing 100%.

Full Back-R participated in 1 play as the last player to finish from zone 14a representing 100%.

Left winger participated in 13 plays at which 9 plays occurred in zone 15a representing 69.2%, 3 plays occurred in the zone 15b representing 23.1% and 1 play from 14a zone referring to 7.7%.

Right winger participated in 12 plays at which 6 plays occurred in zone 14b representing 50%, 2 plays occurred in 14c and 15a zones representing 16.7% each. 1 play occurred in zones 14a and 15b each representing 8.3% each.

Table 15.

Chi-Square Test between Last Player and Field Last Zone

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**81.352a**	**40**	**<0.001**	**-**

a. 51 cells (94.4%) have expected count less than 5. The minimum expected count is 0.04.

According to table 15, Chi-Square test was applied to detect the association between the Last player and Last zone. There was a significant association between the two variables, X^2= 81.352a, P=<0.001.

10.2. Atalanta

1-Type of Attack and Initial Opponent Pressure

Table 16.

Type of Attack and Initial Opponent Pressure Crosstabulation

			Type of attack					
			Counterattack	Organized attack-Combinative attack	Organized attack-Direct attack	Organized attack-Fast attack	Very short attack	Total
Initial opponent pressure	No Pressure	Count	0	7	1	0	2	
		% within initial opponent pressure	0.0%	70.0%	10.0%	0.0%	20.0%	10
	Pressure	Count	11	13	4	14	15	100%
		% within initial opponent pressure	19.3%	22.0%	7.0%	24.6%	26.3%	57
								100%
	Total	Count	11	20	5	14	17	
		% within initial opponent pressure	16.4%	29.9%	7.5%	20.9%	25.4%	67
								100%

As per table 16, data was collected to distinguish the relation between Initial opponent pressure and type of attack. When the opponent applied no pressure, Atalanta 10 attacks at which the highest attack was Organized attack- Combinative attack with 7 plays referring to 70%. On the other hand, only 2 attacks occurred with in Very short attack referring to 20%. Moreover, 1 Organized attack- Direct attack occurred representing 10%. Zero Counterattack and Organized attack- Fast attack occurred when the opponent showed no pressure after ball possession loss.

When the opponent executed pressure, which is showed in 57 occasions. 15 plays showed Very short attack referring to 26.3%. Organized attack- Fast attack occurred in 14 plays showing 24.6% and 13 Organized attack- Combinative attack representing 22.8%. Whereas, Counterattack occurred in 11 plays representing 19.3%. Moreover, 4 Organized attack- Direct attack took place referring to 7% of the plays.

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Table 17.

Chi-Square Test between Initial Opponent Pressure and Type of Attack

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	10.969a	4	0.027	0.025

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 0.75.

According to table 17, Chi-Square test was applied to detect the association between the Initial opponent pressure and type of attack. There was a significant association between the two variables, X^2= 10.969a, P=0.025.

2-Type of Attack and Initial Opponent Behavior

Table 18.

Type of Attack and Initial Opponent Behavior Crosstabulation

			Type of attack					Total
			Counterattack	Organized attack-Combinative attack	Organized attack-Direct attack	Organized attack-Fast attack	Very short attack	
Initial opponent behavior	Advanced position	Count	0	1	1	0	0	2
		% within initial opponent behavior	0.0%	50.0%	50.0%	0.0%	0.0%	100%
	Low position	Count	3	9	1	10	12	35
		% within initial opponent behavior	8.6%	25.7%	2.9%	28.6%	34.3%	100%
	Medium Position	Count	8	10	3	4	5	30
		% within initial opponent behavior	26.7%	33.3%	10.0%	13.3%	16.7%	100%
	Total	Count	11	20	5	14	18	76
		% within initial opponent behavior	16.4%	29.9%	7.5%	20.9%	25.4%	100%

According to table 18, data was collected to identify the association between the 2 variables type of attack and opponent initial behavior. A total of 2 attacks during Advanced position of the opponent after possession loss at which 1 Organized attack- Combinative attack and Organized attack- Direct attack representing 50% each.

Whereas during the low position, a total of 35 attacks occurred the most, at which the highest type of attack that was applied is Very short attack of 12 plays representing 34.3%, then, Organized attack- Fast attack of 10 plays representing 28.6%. Moreover, 9 Organized attack- Combinative attack referring to 25.7%. regarding Counterattack, 3 plays were made representing 8.6% and 1 play from Organized attack- Direct attack of 2.9%.

As to medium position, a total of 30 attacks occurred, at which a highest of 10 Organized attack- Combinative attack took place representing 33.3%. 8 Counterattacks showing 26.7%. Whereas 5 Very short attacks occurred representing 16.7% and 4 Organized attack- Fast attack showing 13.3%. Moreover 3 Organized attack- Direct attack occurred showing 10%.

Table 19.

Chi-Square Test between Initial Opponent Behavior and Type of Attack

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**14.983a**	**8**	**0.059**	**0.045**

a. 8 cells (53.3%) have expected count less than 5. The minimum expected count is 0.15.

According to table 19, Chi-Square test was applied to detect the association between the Initial opponent behavior and type of attack. There was a significant association between the two variables, X^2= 14.983a, P=0.045.

3-Penultimate Action and Penultimate Invasive Zone

Table 20.

Penultimate Action and Penultimate Invasive Zone Crosstabulation

	Penultimate opponent invasive zone				
	CB, BR, BL	CD, DR, DL	CF	CM, MR, ML	Total

Penultimate action	Collective action-Cross	Count	6	0	0	0	6
		% within Penultimate action	100%	0.0%	0.0%	0.0%	100%
	Collective action-Goal pass	Count	20	12	0	1	33
		% within Penultimate action	60.6%	14.8%	0.0%	3.0%	100%
	Collective action- Pass in behind the defence	Count	2	11	1	1	15
		% within Penultimate action	13.3%	73.3%	6.7%	6.7%	100%
	Individual action-Dribbling	Count	5	4	0	0	9
		% within Penultimate action	55.6%	44.4%	0.0%	0.0%	100%
	Individual action-Running with the ball	Count	0	3	0	1	4
		% within Penultimate action	0.0%	75.0%	0.0%	25.0%	100%
	Total	Count	33	30	1	3	67
		% within Penultimate action	49.3%	44.8%	1.5%	4.5%	100%

According to table 20, the data to understand the association between Penultimate action and Penultimate opponent invasive. Where a total of 6 Collective action- Cross were made, in which the 6 of them were from opponent's invasive zone CB, BR, BL of 100%. Whereas zero Collective action- Cross were from opponent's invasive zone CD, DR, DL and CM, MR, ML and CF.

Regarding the Collective action- Goal Pass, a total of 33 actions were made, where 20 plays were executed from CB, BR, BL invasive zone of 60.6% whereas 12 actions were made from the CD, DR, DL zone of 36.4%. However, 1 action was made from CM, MR, ML of 3% and zero action in CF zones.

Referring to the Collective action- Pass behind the defense, a total of 15 actions were executed, where 11 actions were made in the zone CD, DR, DL of 73.3%, whereas 2 actions were made in CB, BR, BL zone of 13.3%. However, 1 action was made from CM, MR, ML zone and CF zone of 6.7%.

Considering the Individual action- Dribbling, a total of 9 actions took place of which 5 occurred in CB, BR, BL zone representing 55.6%. Whereas, 4 actions occurred in the zone CD, DR, DL of 44.4%. However, zero action from CF and CM, MR, ML zones.

Moreover, Individual action- Running with the ball, occurred in total of 4 plays and only in CD, DR, DL zone of 3 times representing 75% of the actions made regarding the zone and 1 action in zone CM, MR, ML representing 25%. On the other hand, all the rest zones CB, BR, BL and CF showed zero actions.

Table 1.

Chi-Square Test between Penultimate Action and Penultimate Invasive Zone

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	24.945a	12	0.015	0.034

a. 16 cells (80.0%) have expected count less than 5. The minimum expected count is 0.06.

According to table 21, Chi-Square test was applied to detect the association between the Penultimate opponent invasive zone and Penultimate action. There was a significant association between the two variables, X^2= 24.945a, P=0.034.

4-Last Action and Penultimate Action

Table 22.

Last Action and Penultimate Action Crosstabulation

			Penultimate action					
			Collective action- Cross	Collective action- Goal pass	Collective action- Pass in behind the defence	Individual action- Dribbling	Individual action- Running with the ball	Total
Last action	Header	Count	2	1	0	0	0	3
		% within Last action	66.7%	33.3%	0.0%	0.0%	0.0%	100%
	Shoot with 1 contact	Count	3	12	7	1	0	23
		% within Last action	13.0%	52.2%	30.4%	4.3%	0.0%	100%
	Shoot with 2 or more contacts	Count	1	20	8	8	4	15
		% within Last action	2.4%	48.8%	19.5%	19.5%	9.8%	100%
	Total	Count	6	33	15	9	4	67
		% within Last action	9.0%	49.3%	22.4%	13.4%	6.0%	100%

According to table 22, data was collected to associate between Last action and Penultimate action. Headers occurred in total 3 times as a final action in which 2 headers occurred from a Collective action- Cross as a Penultimate action representing 66.7%. Whereas Header occurred also 1 time from Collective action- Goal Pass representing 33.3%. The rest of the actions Collective action- Pass in behind the defense, Individual action- Dribbling and Individual action- Running with the ball did not represent any play to score from Header.

Shooting with 1 contact occurred in total of 23 times, 12 of these actions took place with Collective action-Goal Pass with 52.2%. Whereas 7 actions occurred with Collective action- Pass in behind the defense representing 30.4% and 3 actions occurred through Collective action- Cross of 13%. 1 action occurred with Individual action- Dribbling representing 4.3%. On the other hand, zero actions occurred through Individual action- Running with the ball.

Shooting with 2 or more contacts occurred with a total of 41 times, 20 actions occurred with Collective action- Goal Pass with 48.8%. Through Individual action- Dribbling and Collective action- Pass in behind the defence, 8 actions occurred representing 19.5% and 4 actions were analyzed during Individual action- Running with the ball showing 6%. However, 1 Collective action- Cross was made representing 2.4%.

Table 23.

Chi-Square Test between Last Action and Penultimate Action

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	**20.696a**	**8**	**0.008**	**0.015**

a. 10 cells (66.7%) have expected count less than 5. The minimum expected count is 0.18.

According to table 23, Chi-Square test was applied to detect the association between the Last action and Penultimate action. There was a significant association between the two variables, $X^2 = 20.696a$, $P = 0.015$.

5- *Initial Opponent Number and Possession Width*

Table 24.

Possession Width and Initial Opponent Number Crosstabulation

			Initial opponent number			
			Macro-group	Meso-group	Micro-group	Total
Possession width	Four lanes	Count	17	1	0	18
		% within possession width	94.4%	5.6%	0.0%	100%
	One lane	Count	2	3	3	8
		% within possession width	25.0%	37.5%	37.5%	100%
	Three lanes	Count	9	8	0	17
		% within possession width	52.9%	47.1%	0.0%	100%
	Two lanes	Count	17	5	2	24
		% within possession width	70.8%	20.8%	8.3%	100%
	Total	Count	45	17	5	67
		% within possession width	67.2%	25.4%	7.5%	100%

According to table 24, data was collected to identify the association between Possession width and Initial opponent number. Regarding the Possession width of Four lanes a total of 18 cases were shown at which 17 plays occurred while opponent's initial number was Macro-group representing 94.4%. 1 case occurred linked with Meso-group representing 5.6%. Whereas zero situations occurred in a Micro-group.

Regarding one lane, a total of 8 cases were shown at which 2 plays occurred while opponent's initial number was Macro-group representing 25%. 3 cases occurred linked with Meso-group and Macro-group representing 37.5% each.

Regarding Three lanes, a total of 17 plays were observed, in which 9 plays occurred against a Macro-group representing 52.9%, whereas 8 plays were observed against Meso-group, representing 47.1%. However, zero plays were observed against a Micro-group.

Two lanes occurred in a total of 24 plays, where 17 plays occurred against Macro-group representing 70.8% and 5 plays were observed against Meso-group representing 20.8%, moreover, 2 plays occurred against Micro-group representing 8.3%.

Table 25.

Chi-Square Test between Possession Width and Initial Opponent Number

	Value	df	Asymptotic Significance (2-sided)	Exact Sig, (2-sided)
Pearson Chi Square	23.576a	6	<0.001	<0.001

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is 0.60.

According to table 25, Chi-Square test was applied to detect the association between Initial opponent number and Possession width. There is a significant association between the two variables, $X^2= 23.576$, P=<0.001.

IV. Discussion

The purpose of the study was to investigate the goal scoring patterns of the most 2 teams with the highest ratio of goals scored per game and the association between the offensive moment of the team and the defensive moment of the opponent.

1) Type of Attack:

Therefore, regarding type of attack for Bayern, out of 76 goals, 45 goals were scored from Organized attack (complex attack) of 59.3% and 13 goals were scored in a Counterattack situation of 17.1%, whereas for Atalanta, out of 67, 39 goals were scored from an Organized attack of 58.3%, whereas 11 goals were scored in a Counterattack situation of 16.4%. As per Kubayi, 85 goals (82.5%) were the result of complex attacks, while 18 goals (17.5%) were the consequence of counterattacks in the 2018 FIFA World Cup (Kubayi,

2020). The findings show that, no significant association between Initial opponent number and Possession width, Last player and Penultimate player.

1.1)Initial opponent behavior and Type of attack

Against Medium and Low line of the opponent after ball loss, Bayern showed Organized attack-Combinative attack of 39.1% and 32% respectively. Whereas, against Advanced line, Counterattack with 66.7% was contributed to their playing style, which does not agree with Matsuoka, where according to the opponent's interaction, the counterattacks had little impact on the opponents' well-balanced defense (Matsuoka et al., 2022)

With Medium and Advanced line of the opponent after ball loss, Atalanta showed Organized attack-Combinative attack of 33.3% and 50% respectively. Whereas, with low line, very short attack with 34.3%, which agrees with Papadopoulos study, referring to the tendency was for the Italian teams to employ direct attacks more frequently (58% to 42%) (Papadopoulos et al., 2021). Italian teams played with shorter offensive sequences, according to the results of a recent study on goal-scoring possibilities (Papadopoulos et al., 2021). As per Kubayi, regarding the starting zone, the final, first, and middle thirds, respectively, contributed to 35, 33, and 32% of goals (p > 0.05) (Kubayi, 2020).

1.2)Initial opponent pressure and type of attack

With no pressure applied by the opponent after ball loss, Atalanta used to have an Organized attack-Combinative attack of a high link of 70%. Whereas with pressure applied, the most type of attack used was Very Short attack with 26.3%. With no pressure and pressure applied by the opponent after ball loss, Bayern used to have an Organized attack- Combinative attack of a high link of 38.9% and 31% respectively, which shows the capacity to circulate the ball with vertical, horizontal and diagonal passes until finding the opportunity to explore the opponent's fragile spaces. In comparison to deep defense (n = 31; 1.43 passes per minute), players made more penetrative passes when playing against a high press (n = 43; 2.72 passes per minute) (Low et al., 2021). High-press defense resulted in more penetrative passes being allowed, especially after trial duration normalization. When faced with high-press defense, in instance, more passes were made to the centre midfielders and the offensive midfielder, helping to explain why their betweenness scores were greater (Low et al., 2021).

2) Penultimate action against defensive structure

According to Gonzalez's findings, 14.3% of all goals and 27.7% of goals scored during collective plays were scored following a cross from a wide channel of the field (González-Ródenas et al., 2020). As a pattern for the penultimate actions, out of 76 plays, Bayern had 19 Collective actions- Cross of 25%, 35 Collective

actions- Goal pass of 46.1% and 11 Collective actions- Pass in behind defense of 14.5%. Whereas 8 Individual actions- Dribbling of 10.5%, 3 Individual actions- Running with the ball of 3.9%. As per Atalanta, out of 67 plays, 6 Collective actions- Cross of 9%, 33 Collective action- Goal pass of 49.3% and 15 Collective actions- Pass in behind the defense of 22.4%. Whereas 9 Individual actions- Dribbling of 13.4% and 4 Individual actions- Running with the ball of 6%. These results do not show an agreement with Gonzalez's study, with regards to the penultimate action, crosses were more common against organized defenses, whereas passes behind the defense, or moves like dribbling or running with the ball, had a higher percentage of goals versus circumstantial defenses (González-Ródenas et al., 2020).

According to Bayern, 85.6% of collective actions were represented, whereas 14.4% of individual actions were observed. Moreover, Atalanta showed 80.7% of collective actions and 19.3% of individual actions. These numbers can be confirmed according to Gonzalez, where 51.6% of the total goals were accomplished through collective actions, whereas, 10.5% of goals were achieved through individual actions (González-Ródenas et al., 2020).

This type of play requires the passer to anticipate the best time to deliver the ball based on offensive and defensive actions and to not only transmit the ball with the objective of breaking the defensive line but also to put the receiver in an immediate goal-scoring opportunity (González-Ródenas et al., 2020).

3) Penultimate action and Penultimate opponent invasive zone

Regarding Penultimate action, Bayern Penultimate action Collective action-Cross, Collective action- Goal Pass, Individual action- Dribbling showed a high link with the penultimate opponent zone CB, BR, BL with 78.9%, 80% and 62.5% respectively and Collective action- Pass in behind the defense and Individual action- Running with the ball showed a high link with the zone CD, DR, DL with 45.5% and 100% respectively. Atalanta Penultimate action Collective action- Goal Pass showed a high link with the penultimate opponent zone CB, BR, BL with 60.6% and Collective action- Pass in behind the defense showed a high link with the zone CD, DR, DL with 73.3%. The most pertinent area to aid the goal scorer was the invasion toward the "box triangle" in wide and penetrating opponent subspaces, which also made up the most frequent spatial pattern of interaction between the penultimate and last action (González-Ródenas et al., 2020).

4) Last action and Penultimate action

Regarding Last action, for Bayern, Shot from 1 touch and from 2 or more contacts were mainly linked to the Collective action- Goal Pass as a Penultimate action with 70% and 36.4% respectively, whereas Header showed a link with Collective action- Cross with 76.9%. Likely, Atalanta, Shot from 1 touch and from 2 or more contacts were mainly linked to the Collective action- Goal Pass as a Penultimate action with 52.2%

and 48.8% respectively. In the last action, organized defense conceded 70.1% of goals 1 touch, compared to circumstantial defenses (González-Ródenas et al., 2020). The majority of goals—63,69%—were scored in organized offense (open play) and one-touch goals (72,61%) (Çobanoğlu, 2019).

The assists from wide dynamic and static areas, as well as crossing, heading, volleying, and shooting by one contact to the ball, were more common when the opposition side had a well-organized defense than when they had a circumstantial one (González-Ródenas et al., 2020). Whereas Actions like passing behind the defense, dribbling, and shooting after two or more contacts with the ball were crucial when teams attacked a circumstantial defense (González-Ródenas et al., 2020).

The results represented can give us a specific patterns for each team and also in globality of attacking-defending association. Therefore, the patterns that were detected in this study are the type of attack mainly through Organized attack which was represented by Bayern with 59.3% and Atalanta with 58.3%.

Organized attack and specifically Combinative attack was a pattern for both teams and specially against a Medium block team.

Penultimate collective actions represents higher influence for a successful and frequent attack than Penultimate individual actions. The penultimate collective action and specifically the Goal pass action represented a high pattern in both teams.

Last action represented a Header, 1 touch finishing against organised teams and in a zone close to the goal with an association of Collective penultimate action- Cross and Goal pass respectively. Whereas 2 touch finishing was also related to be more efficient against a circumstantial defense and with association to a Penultimate collective action- Goal pass.

More penetrative passes were made when team was under pressure leading to a fast and direct attacking style.

V.   Conclusion

The results represented can give us a specific patterns for each team and also in globality of attacking-defending association.

The importance of understanding teams 'dynamics and playing patterns to create a global knowledge of the multiple factors that influence the game idea and the way of playing. Also, to try and detect the most repeated scenarios that occurred in the analyzed team game and how they were able to score these amounts of goals in the season. Thus, observational analysis was performed to identify different variables.. The main focus of the study is to observe the offensive patterns and actions of the highest scoring teams per game

and evaluate qualitatively and quantitatively their offensive playing style and the correlation of the opponent's defensive state and moment in the game.

Present performance analysis studies have provided inconclusive information regarding the relationship between ball possession and competition success (Hughes & Bartlett, 2002). One of the writers hypothesized that successful and unsuccessful teams exhibit different ball possession patterns during their respective games. (Hughes & Franks, 2005).

Limitations of the study due to the fact that some variables were not taken into consideration for both teams like players characteristics, team philosophy, cultural influences, context of the game, such as the venue (home, away, neutral), the immediate outcome (winning, losing, drawing), the team and opponent level (high, medium, or low based on their classification position), and the game's period (first part, second part, extra time). Some authors also stated that the likelihood of scoring first increased with improving ranking position. The aforementioned studies, however, were restricted to a domestic league competition, and earlier research has shown that playing styles vary between competitions (for instance, domestic vs. international competitions) (Kubayi & Larkin, 2019) may influence the way this article is applied on a practical case. Also, this study the examined scored goals is a small sample which may not be sufficient to have a strong and reliable associations. This study is not regarding any specific league or team rank, rather it focuses on the best teams with more goals and their offensive pattens, moreover due to the protocol used, obstacles were encountered to identify the defensive state of the opponent in a specific and detailed manner.

Future studies regarding correlation between variables is needed in order to detect the relation between different phases in organizational play and disequilibrating the opponent's defensive lines.

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Appendix

Figures

Figure 1. Zones of the field and "score pentagon." The "score pentagon" is subdivided into different zones to perform a more specific analysis of the dimensions related to goals scored (Aranda et al., 2019).

Figure 2. Space of defensive occupation that define the level of invasion over the opponent (Gréhaigne, 2001; Seabra & Dantas, 2017).These zones are dynamic and change every second depending on the positioning on the opposing players.

Figure 3. Combination of static and dynamic spaces (Joaquin González-Ródenas et al., 2019)

Figure 4. Specific positions within the system of play used by the team to determine the player that performs the action. This characterization depends on the system used by each analyzed team (Aranda et al., 2019).

Figure 5. Example of different tactical behaviors related to the penetration over the opponent and their tactical performance (Aranda et al., 2019)

Figure 6. LINCE PLUS V1.3.1

Figure 7. LINCE PLUS V1.3.1 Parameters

Figure 8. Microsoft Excel Sheet representing collected data

Tables

List

List 1-Description and categories of the start of the possession aspect.

List 2- Description and categories of the possession development aspects.

List 3- Description and categories for the dimensions related to the penultimate action of the possession.

List 4- Description and categories of the end of possession aspect.