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Defensive Transition Process Analysis. Defensive Actions and Behaviors Associated with the Recovery of the Collective Defensive Organisation.

Dissertação elaborado com vista à obtenção
do Grau de Mestre em Treino Desportivo

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Abstract

The overall objective of the study is to identify the defensive behaviours that promote the recovery of defensive balance in the moments following the loss of the ball. The sample consists of 4209 defensive transition processes. All the actions analysed come from the 96 matches played during the group stage of the UEFA Champions League in the 2019/2020 edition. The observation tool is constituted by 15 categories and 88 indicators' performance. All the indicators were analysed by a descriptive and bivariate analysis. Pot A teams have a more aggressive general approach to defensive recovery, with pressure from loss of ball; this may explain, that these teams conclude their defensive recoveries higher on the field. In relation with match status, winning teams lose the ball more regularly through the most offensive lines; and losing teams have a general approach to defensive recovery that is more passive with a passive defense. Ball losses in the central lane, with a team block high on the field and stopping the opposing attacks far from his goal, are all important markers in order to reach the next round.

Key Words: Football, Champions League, performance analysis, notational analysis, observational methodology, performance indicators, defensive phase, defensive transition, opponents' quality, match status.

Resumo

O objetivo geral do estudo é identificar os comportamentos defensivos que promovem a recuperação do equilíbrio defensivo nos momentos posteriores à perda da bola. A amostra consiste em 4209 processos de transição defensiva. Todas as ações analisadas decorrem dos 96 jogos disputados durante a fase de grupos da UEFA Champions League na edição 2019/2020. A ferramenta de observação é constituída por 15 categorias e 88 indicadores de desempenho. Todos os indicadores foram analisados por meio de análise descritiva e bivariada. As equipas do Pote A têm uma abordagem geral mais agressiva para a recuperação defensiva, com pressão pela perda de bola; isto pode explicar, que estas equipas concluam as suas recuperações defensivas mais altas no campo. Em relação ao resultado corrente, as equipas ganhando perdem a bola com mais regularidade através das linhas mais ofensivas; e as equipas perdedoras têm uma abordagem geral mais passiva com uma defesa passiva. As perdas de bola no corredor central, com um bloco equipa alto e impedindo os ataques adversários longe da sua baliza, são marcadores importantes para se chegar à próxima fase.

Palavra-chave: Futebol, Liga dos Campões, análise de rendimento, análise notacional, metodologia observacional, indicadores de rendimento, fase defensiva, transição defensiva, qualidade do adversário, resultado corrente.

Index

List of Tables

List of Figures

List of Appendixes

INTRODUCTION

1. Relevance of the study

The performance of top teams depends on many aspects that coaches seek to optimize day after day, game after game. One of these concerns is the definition of strategies and forms of collective play in relation to the opponent to come. The analysis of the game can contribute to the optimization of the teams, through the collection and analysis of information on the performance of both teams (own and opponent), which allow the improvement of the quality of intervention of the coach in game and in training (McGarry et Franks, 2003).

At high level, the main indicator of success is victory. Thus, the different situations which make possible to achieve a goal have been analysed countless and in diversified contexts (Franks, 2004; Gonzalez-Rodenas et al., 2015, Mclean et al., 2018; Tenga et al., 2010). However, if scoring is the only way to achieve victory, other performance indicators (e.g.: recovering the ball), can encourage offensive action, or the preservation of a favorable result (Barreira et al., 2014; Fernandez-Navarro et al., 2016; Maleki et al., 2016; Santos et al., 2017). Football experts have understood that the ball recovery context influences offensive action which follows. The aim is to take advantage of the imbalance, caused by the loss of the ball, to counterattack the opposing team. Therefore, if recovering the ball and protecting own goal cage are performance indicators the question is - what behaviours are used in reaction to this imbalance? Knowing the ins and outs of this defensive transition phase should influence the players and guide the organisation of the training.

The majority of studies carried out in the field of football game' analysis is focused on the offensive aspect of the change of possession of the ball (Casal et al., 2015; Gesbert, 2014; Hughes et Lovell, 2019 ; Maneiro et al., 2019). These authors are aligned with other (Castelo, 2003 ; Garganta, 1997; Mombaerts, 2000) stating that the recovery of possession of the ball has a fundamental role in the course of play. Their work has identified sets of defensive actions and behaviors: on the one hand, those promoting the recovery of the ball; on the other hand - in the event that it is impossible to regain control of possession immediately - those allowing the team to reorganize, according to the defensive tactics previously developed. Because of the importance of studies on the characterization of offensive play, it would be beneficial for the game of football to seek a balance by contributing to a better understanding of the defensive transition phase.

For the last two decades, literature has focused on the contextual factors that influence the outcome of the match, namely, the location of the match, the quality of the opponent and the scoreboard score variation (Gómez et al., 2012; González-Rodenas et al., 2019; Lago-

Ballesteros et al., 2012; Lago-Peñas et al., 2016; Lago-Peñas et Dellal, 2010; Matos et al., 2020; Taylor et al., 2008). Due to the evidence scarcity, as well as its relevance, this study aims to identify defensive behaviours that promote ball recovery or defensive balance recovery - depending on the priorities of each team - in the moments following the loss of ball possession leading to contexts of counterattack or rapid attacks.

2. Main objective

The overall objective of the study is to explore the patterns of defensive recovery after loss of the ball by elite performance football teams in a variety of competitive contexts (e.g.: strong/weak opponents, home/away games, winning/drawing/losing play moment).

3. Specific objectives

Describe and analyse, objectively, defensive recovery actions using three temporal spectra:

- Team's Quality (before matches).
- Match Status (during matches).
- Final Ranking, that is to say if the team qualifies or not (after matches).

CHAPTER I
LITERATURE REVIEW

1. Phases and moments of play

The game of Football is characterized as belonging to the category of Collective Sports Games (Garganta, 1997; Teodorescu, 2003). As a result, during a football match, an antagonistic relationship is created between two teams (cooperation of one to oppose the other). This relationship is highlighted by two major phases whose objectives are perfectly opposed: the offensive and the defensive phase (Teodorescu, 2003). The offensive phase is defined as “the tactical situation (fundamental phase of the game) in which a team is in possession of the ball, and creates the possibility of carrying out offensive actions to score" (Teodorescu, 2003, p.33), and the defensive phase as "the tactical situation (fundamental phase of the game) in which a team struggles to gain possession of the ball, with a view to taking offensive actions, without committing offenses, and without allowing the opponents to score" (Teodorescu, 2003, p.33). These two definitions demonstrate the interactive and reversible nature of football which, according to Gréhaigne (1992, p.137), "is to be considered in a double dialectical relationship of continuity/rupture".

Indeed, the team in possession of the ball seeks to (1) retain possession of the ball and (2) attack the opposing goal cage, while the team that does not have the ball seeks to (1) defend its goal cage by (2) helping each other to (3) recover the ball (Castelo, 1994; Teodorescu, 2003). Each of the two phases seeks continuity to achieve their objectives, i.e., score, for attack, recover the ball, for defense; and cause the rupture of the current tactical action by (1) adapting to the specificities of the opponent and by (2) forcing the opponent to make mistakes in order to take advantage of them (Castelo, 1994; Teodorescu, 2003). The rupture can be identified by three types of events: (1) the tactical action ends, but the attacking team retains the ball; (2) the tactical action ends, and the defending team recovers the ball through a phase of set-play; and (3) the tactical action ends with a change of possession, allowing new attackers to choose between retaining possession or attacking the opponent's goal cage (Gréhaigne, 1992). Each of these situations requires different behaviours from the players. The second and third situation, although with a similar rupture – one team has lost the ball and the other wins the ball – do not have the same impact and repercussions on the game. The second situation promotes order within the teams and a balance in the organisation of the game. On the contrary, the third situation induces disorder by the reorganisation of the teams which results from it. In the third case, the team that recovery the ball must make a decision on the use of the ball. For Gréhaigne (2007, p.140), the ball carrier must decide between two contradictory aspects: "either take risks to get ahead of the defensive replacement ...", "or privilege security while temporarily preserving a certain defensive stability (to avoid falling behind) ...".

Gréhaigne (2007) states that when one team succeeds in gaining the upper hand over the other, this moment of imbalance is often very brief and may be recovered a few moments later (3 to 4 seconds in general). This moment of imbalance is called in the specific literature, attack/defense transition – when a team loses the ball – and defense/attack transition – when a team wins the ball (Amieiro, 2010; Garganta, 1997; Valdano, 2001). As Mombaerts (2000) pointed out, the game of Football, organised and creative, consists in the constant search for balance between the defensive and offensive aspects. However, in a situation of balance between the offensive and defensive organisations of the two teams, the supremacy of the defense over the attack is notable, since barely 1% of the offensive actions end with the supreme success–score (Garganta, 1997). This defensive advantage can be explained by the fact that defensive techniques are easier to perform, and the search for order and tactical landmarks, as well as the number of procedures, are less.

Knowing that a situation of attack/defense balance contributes very little to the achievement of a goal, it is possible to wonder about the situations favouring the creation of actions bringing a goal.

2. Set plays versus Transitions causing an imbalance

As international competitions bring together the best teams and the best players, they are the subject of many studies. An important part of these studies analyses the representativeness of the set-plays in the total of goals scored, during international competitions. Siegle et Lames (2012), after analysing sixteen German Bundesliga games, averaged 108 interruptions per game (goal kicks, corner kicks, throw-ins, free kicks, substitution, kick-offs, drop balls, penalties and injuries). The most frequent were throw-ins and free kicks, followed by goals kicks, corner kicks, substitution and kick-offs.

Some studies suggest that corners, free kicks and penalties are responsible for 24.6% (1998 Federation Internationale of Football Associations (FIFA) World Cup) to 42% (1994 FIFA World Cup) of goals scored in a Football match (Grant et al., 1999; Sousa et Garganta, 2001, respectively). These data are supported by two other studies. The first verified that 35.6% of the goals of the 2004 European Nations Championship were scored on set-plays, 40% of which come from corners, 30% from free kicks, 25% from penalties and 5% from throw-ins (Armatas et al., 2007). The second study shows that 37% of the goals for the 2006 World Cup are scored on set-plays 16% of which are represented by free kicks (Acar et al., 2009).

However, the following studies moderate the previous statistics. Indeed, Baranda et Borrás (2005), when analysing 50 games from the 2002 FIFA World Cup, noted that 21.8%

of all corners end in a shot, and that barely 2,4% conclude with a goal. Casal et al. (2015) confirm this trend: of the 1139 corners of the 2010 FIFA World Cup, the 2012 European Championship of Nations, and Union of European Football Associations (UEFA) Champions League 2010/2011 edition, only 2.2% of the corners were rewarded with a goal. Casal et al. (2014) have also observed this trend across all free kicks from the 2010 FIFA World Cup, the 2012 European Nations Championship and the UEFA Champions League 2010/2011 edition. To score a goal, the teams need to strike 35 indirect free kicks.

Taking into account the match status (winning or losing), Castellano et al. (2012), after analysing 177 matches from the 2002, 2006 and 2010 FIFA World Cups, highlighted significant differences in the number of faults suffered and committed, as well as the number of corners. However, this is only true for the 2006 edition. Two other studies found no significant differences in set-plays when the team is winning or losing. One is led by Lago-Peñas et al. (2011), on 288 group matches in the UEFA Champions League (in 2007/2008, 2008/2009 and 2009/2010 seasons). The other by Harrop et Nevill (2014) on a team from the English League One championship during the 2012/2013 season.

A study covering 124 games (the 64 of the 2010 FIFA World Cup, the 29 of the 2010/2011 UEFA Champions League, and the 31 of the 2012 European Nations Championship), counts a total of 3775 free kicks for an average of 30 per match. Among the set of free kicks, 783 are considered indirect and have different consequences on the end result, namely: 14% open the score; 18% consolidate the score; 27% allow for equalisation; and 5% contribute to the final victory, while the remaining 36% have no consequences (Casal et al., 2014).

Studies of international competitions have also looked at transition' moments in possession of the ball. Many of these studies focus on the defense/attack transition. Barreira et Garganta (2007) distributed 240 offensive transitions, between four teams from the Portuguese championship during the 2004/2005 season (60 transitions per team, each team having 20 per match status and 10 per period). The authors analyses that in 29% of the cases, the attacking team reaches the offensive zone in controlled form, which allows 17% of the transitions conclude by the realization of a shot. Among these shots, 5% are on target and 0.7% finish on goal.

Two studies carried out on the final stages of the 2008 European Nations Championship (Barreira et al., 2011; Casal, 2011) counted 761 and 743 offensive transitions in 7 games, respectively. Barreira et al. (2011) took advantage of their study to find the average number of offensive transitions per team. Number that rises to 54 per game.

Knowing that this average concerns a team, we can affirm by relying on Casal et al. (2016) that for each offensive transition made, the opposing team will have as many defensive transitions to achieve. In his study on defensive transitions, was found an average of 50 defensive transitions per team and in addition, among the 743 offensive transitions, 35% were successfully completed (Casal, 2011). However, more than half (55%) of the teams, that retrieves the ball, has a tactical intention to counterattack. When we focus on failed offensive transitions, we realize that 53% included a tactical intention to keep the ball after it was won. The author also informs that, in 81.3% of cases, the offensive transition occurs because the team that recovers the ball was defensively organised. In 45% of cases, the gain of the ball is performed in the defensive midfield area (48.9% of the defensive transitions from the study by Casal et al. (2016), start in the offensive zone of the team that loses the ball). Maleki et al. (2016) provided an explanation for this fact assessing the consistency of ball recovery performance. They analysed the seven games played by the four teams that have risen to the semi-finals of the 2014 FIFA World Cup. The results found demonstrated that the use of the principle of concentration (having a compact team) in defensive zones, combined with the disposition of the players and the distribution of spaces between each player makes it possible to stabilize and obtain consistency in the performances of ball recovery.

Maneiro et al. (2019) analysed the final stages of the European Nations Championship in 2008 and 2016 in order to compare them. Over the 14 games analysed, they counted a total of 1533 offensive transitions. The study highlights that the 2016 European Nations Championship has 6.32% more offensive transitions than that of 2008. The predominant tactical intent in 2016 was the counterattack right after the ball was won, while it is possible to observe a balance between the counterattack and the conservation of the ball for 2008. The success rate of offensive transitions was also higher in 2016 (41.4%) compared to 2008 (34.7%). This is similar to the assertion of Casal (2011) who, referring other authors (Garganta, 1997; Gréhaigne, 2001; Hughes, 1990; Mombaerts, 2000), states that 50% of goals occur during a transition (rapid attack and counterattack).

Hughes et Lovell (2019), in their study of the 29 knockout matches in the 2014/2015 UEFA Champions League, counted 3077 offensive transitions. However, this number should be analysed carefully because it includes the gain of set-play in the most offensive zone of the attacking team. The authors observe that 1.10% of the transitions end in goal and that 12.64% of the offensive transitions allow creating scoring opportunities. Almost half (49.45%) were originated in the offensive zone (seven times more than in the defensive zone). Hughes et Lowell (2019) showed that it takes an average of four offensive transitions

to create a scoring opportunity or to score. In addition, the first action after the transition influences the creation of scoring opportunities. When it is a conservation pass, 6.48% of the transitions end in scoring opportunities, and 0.37% in goal. In the case of driving the ball towards the opponent's goal cage, 34.10% of the transitions end in scoring opportunities and 4.55% by a score (Hughes et Lowell, 2019).

The comparison made beforehand, between the set-play and the transitions causing an imbalance in the organisation of the teams, helps to better understand the statement of professional football coach Mourinho: “Everybody says that set plays win most games, but I think it is more about transitions” (Wright et al., 2014, quote José Mourinho, cited in Roxburgh, 2005, p. 716). We notice that these two big events of a football match are similar. Indeed, the studies conducted show that both have their importance and have a weight in the final result. It would seem that the percentage of success of the set-play is higher than that of the transitions, in particular in view of the frequency of appearance. However, with a higher frequency of occurrence (an average of ten corners and thirty free-kicks per match against 100 transitions per match), offensive transitions should be more successful, as long as they are worked on in training. Maneiro et al. (2019) have shown that almost half of the offensive transitions from the final stages of the 2016 European Nations Championship were successful. Earlier, Mombaerts (2000) and Casal (2011) agreed that an effective offensive transition has a sequence of less than 15 seconds, involves 2 to 3 players maximum and, does not exceed 4 passes, with a better frequency of success during sequences with 2 passes (Casal, 2011).

Knowing that approximately 65-70% of attacks transitions are not successful, various authors (Casal et al., 2016; Vogelbein et al., 2014) have questioned the performance indicators of teams in defensive transition trying to establish a performance model in order to promote ball recovery. However, would not it be interesting to question the actions and behaviours used after the loss of the ball, when the opposing team finds itself in a situation of offensive transition favourable to the counterattack or to the rapid attack?

3. Defensive transitions

In today's football, the transitions have a decisive importance because collective organisation is currently very complicated, and its effective resolution will cause the resolution of situations which will decide the outcome of the match (Jones et al., 2004). Lago et Casais (2006) state that the transition phases seem decisive, because this is a moment where the collective organisation is the most difficult and that many of the situations which unbalance the final result derives from its effective resolution. For Amieiro (2010) the secret

of the current game lies in the transitions and good teams take less time between recovering the ball and attacking, but also between losing the ball and defending.

According to Casal (2011), the moment of defensive transition corresponds to the time required for a team to reorganise after losing possession of the ball and adopting a general defensive tactical model (organised or circumstantial defense). For Sellés (2009) the defensive transition is the point of articulation of the game between the offensive moment and the defensive moment, which allows the continuum of the game. In other words, it is inserted in the immediately preceding and immediately following times and is part of the overall understanding of the game. This is the game situation in which possession of the ball is lost and defensive tactical principles must be applied immediately to organise the defense and recover the ball. For Sellés (2009), the tactical principles associated with the defensive transition are the immediate change of role, the lack of tactics as the main element of transition, the adjustment of the lines around the ball loss area, the intensive withdrawal after loss, the delay and/or direct the opponent's attack on less dangerous areas, and the action of the nearest player(s).

Méndez (2009) divides the defensive transition into several phases:

- Circumstantial defense consists of slowing down the game until the defense is established. It is generally organised in two moments or sub-phases:
    - Neutralizing the game by faults, offsides or interceptions, since the team is usually poorly organised or with a negative balance; and
    - Recover defensive balance later and gain time to build a defensive structure (pressing or procrastinating).
- The defensive balance is based on a correct defensive position and can be:
    - Organized: can be done by pressing (partial or total pressure) or by confining themselves (the team withdraws quickly, and the opponent takes the initiative); and
    - Circumstantial: corresponds to emergency defense in the defensive transition phase of the game.

3.1. Change of possession

Castellano et al. (2009) consider that the change of possession – a team moves from the role of team without a ball to the role of team with a ball – begins when:

- the ball is in play: the observed team seizes the ball, recovering it from the opposing team, without any regulatory interruption. Taking the ball from an opponent occurs when: 1) the player makes at least two contacts with the ball or 2) in the case of the goalkeeper performs the action of blocking the ball or 3) when only one player intercepts the ball and a second player, partner of the first player, touches the ball again;
- the ball stopped: when the ball is put into play after a regulatory interruption (goal kicks, corner kicks, throw-ins, free kicks, kick-offs, drop balls and penalties) and therefore the game would have stopped.

The findings of Santos et al. (2017) demonstrated the importance of defining variables and the framework for analysing studies. Furthermore, this study seeks to examine the impact of three distinct operational definitions on the frequency and location of bullet retrievals, in order to provide the basis for selecting the definition which could be most useful for an analysis as provided for in this study on transitions and, consequently, changes in possession of the ball.

The first definition refers to the interpretation of the concept of ball recovery by the performance analysis company Amisco. A team recovers the ball when one of its players comes into contact with the ball after it has previously been in contact with a player of the opposing team. Ball recovery is taken into account even if it is sent off the field or, immediately, if another opponent touches the ball again, carrying out a new ball recovery for his team. With a new contact on the ball, accomplished after a contact made by the opposing team, a new ball recovery occurs, and the team momentarily acquires possession of the ball.

The second definition created is based on Garganta (1997). A team recovers the ball when one of its players comes into contact with the ball in one of the following three situations: (1) made at least three consecutive contacts with the ball, (2) made a positive pass, (3) made a shot. A positive pass is a pass that allows a player on the same team (next player) to shoot at goal (criteria 3), or to retain possession of the ball (criteria 1). A ball recovery is only envisaged if the opposing team has possession of the ball (i.e., they have already recovered the ball according to the same criteria). An exception to the criteria for retrieving the ball appears when the goalkeeper catches the ball because he has effective control over it. A ball retrieval event cannot be considered if the team has not released possession of the ball according to these criteria, that is to say that the opposing team does not retrieve the ball beforehand. The situations of play define the team which has possession of the ball to report on the subsequent recovery.

For the third definition, Santos et al. (2017) have taken up Garganta's (1997) definition and modified the criteria 1. The recovery of the ball is taken into account as soon as the team has made at least two consecutive contacts with the ball. Santos et al. (2017) propose this third definition in order to provide more complete information on the recovery of the ball. This way, the coach reading this study can choose from how many contacts with th ball his team recovered the ball. However, Suzuki et Nishijima (2004) argue that a ball recovery is equivalent to winning the ball followed by a pass, which corresponds to the third definition proposed by Santos et al. (2017).

The results of the study by Santos et al. (2017) show that the ball recovery rate is significantly different between the three definitions. In addition, there is a significant difference in the location of ball recovery between the first definition and the other two The authors conclude that the three definitions have practical value. Nevertheless, they state that the definition should be selected based on the objectives of each study, due to the difference in information provided by the use of one or other of the definitions. Indeed, the first definition provides more complete and general information, while the second definition provides more stringent information, which implies interpretations.

Defensive transitions have the particularity of the defense being prepared from the offensive phase, by applying offensive tactical concepts intended to maintain an adequate rationality of the occupation of the playing field (Restrepo, 2012). Therefore, the change of possession of the ball, when it allows the continuity of the game, and according to the context, can cause an imbalance in the organisation of the two teams due to its unpredictable aspect. As a reminder, according to Gréhaigne (2007), this moment of imbalance is often very brief and may be recovered a few moments later (3 to 4 seconds in general).

3.2. Defensive imbalance

For Conde et Alonso (2006), depending on the offensive tactical models developed by the team, the transition from attack to defense will vary considerably:

- When the team develops an offensive tactical model based on direct attacks, three different purposes are possible:
    - Direct attack during which the opposing defensive line takes possession of the ball and ends the attack. In this case, there is no defensive disorganisation, keeping the three lines behind the ball, therefore, by acting quickly, it is possible to return to defensive positions;

- Direct attack in which the opposing defensive line does not win the ball and the rebound is taken up by the line of opposing midfielders who makes a slow attack. In this case, the team does not suffer from defensive disorganisation, because it always maintains two lines behind the ball; therefore, the defensive transition is easier to achieve;
- Direct attack in which the opposing defensive line does not take possession of the ball and the rebound is caught by the line of opposing midfielders who makes a rapid attack. In other words, a rapid orientation of the game is sought in order to progress and end the attack. In the event of loss of possession of the ball, the defensive disorganisation is greater than in the preceding cases, but, as in the preceding case, there remain two lines, although less numerous; for example, a line of four defenders and two defensive midfielders, who must always play behind the line of the ball;

- If the team develops an offensive tactical model based on counterattacks, the defensive transition depends on the offensive participation of the players (number of players able to establish contact with the ball) and where the ball is lost. This will influence defensive disorganisation; and
- If the team develops an offensive tactical model based on combined attacks, the team's disorganisation is greater than in the previous cases, increasing in the same way if this attack occurs with a large number of combinations. All defensive transitions must be trained, but the most complicated are transitions after a combinatorial attack.

Gréhaigne (1992) analysed the game in motion preceding a goal. For that, his study analysed the 33 goals of the FIFA World Cup 1986, which took place in Mexico. The criterion for including goals was that the action leading to the goal had more than two consecutive sequences. In this way, the author was able to analyse the few seconds before the goal, in order to study the moment in which the defensive imbalance took place. In order to analyse the game in motion, the author sequenced the thirty-three goals second by second, and 182 photographs were obtained. Each photograph presented a different positioning for forwards, defenders and the ball depending on the context and playing intentions at the time of the photograph, and was analysed through a point cloud by software created specifically for the needs of the study. The point cloud, based on the position of the players and the ball on the field, provides guidance on (1) the center of gravity, (2) the main axis of inertia and, (3) the dispersion axis, for both attack and defense. The main axis of inertia corresponds to the direction and main extent of a point cloud, i.e., the strong

dimension of attack and/or defense. The dispersion axis, orthogonal to the main axis, assesses the spread of a point cloud in the other direction. In summary, a point cloud provides the average position of the subsystem in the field, its strong dimension and its degree of spread; all in relation to the two main dimensions of the playing area: width and depth (Gréhaigne 1992).

Gréhaigne (1992) defends the concept of center of gravity by asserting that their reciprocal positions (of attack and defense) make it possible to visualise, objectively, the state of equilibrium or not of the attack/defense system and to determine the notion of ahead and behind in the momentary confrontation. The distance between the centers of gravity of the attack and the defense is a spatial indicator of this essentially temporal notion (lead/lag) (Gréhaigne 1992). The overlapping of these two centers of gravity is a key moment for the attack/defense system (Gréhaigne 1992). Either the attack gains the advantage and its center of gravity shifts ahead of the defense causing a disruption of the state of balance; or it restores the situation and reconstitutes a dam (Gréhaigne 1992). The main axes of inertia provide additional details on the strong and weak dimensions of the systems involved (Gréhaigne 1992). Their changes in dimensions, their pivoting are elements summarising and showing the evolution, the sequences, the successive twists and turns of the game, as well as the attempts at adaptation to find or disrupt the state of balance (Gréhaigne 1992). The change of state in the equilibrium of the system is defined by Gréhaigne (1992) as the moment when the defensive configuration does not allow the team to momentarily block the movement attempted by the opponent's attack. For Gréhaigne (1992) this change of state is a "breaking point" between attack and defense. The study of goals demonstrated that this breaking point can occur at three different times (Gréhaigne, 1992):

- The system has an initial imbalance which predates the action under consideration. The defense lags behind the movements of the attackers, can lead to three types of situations depending on the attitude, position and distribution of the defense at the start of the offensive action:
    - A "pursuit" defense;
    - A "barrage" defense, but outnumbered; and
    - A failure in the defensive organisation.
- The system is initially in equilibrium, meaning that the breaking point occurs during the offensive phase and three cases can be observed:

- The main axis of defense pivots around its center of gravity, while that of attack maintains the same profile. The imbalance is produced by certain characteristic actions of the attackers, in particular of the ball carrier, introducing “disorder” into the defensive system while preserving “order” in the offensive organisation;
- The main axis of the attack pivots around its center of gravity, while that of the defense keeps the same profile. The attack changes its organisation according to the strong dimension of the defense, in particular by alternating play in depth and play in width; and
- Changed the configuration of the axes of attack and defense that are dependent on the sequence of actions of the attack. The change is characterised by the speed and variety of the sequence of actions, allowing a head start on defensive replacement;

- The system is constantly in equilibrium, i.e., the breaking point is reached by a technical feat of the attacker or a defensive error/awkwardness, occurring at T-1, before the goal, or T-0 (causing the goal).

Gréhaigne (1992) studied defensive imbalance from a “scientific” point of view. However, for a more “technical” approach and based on the laws of the game established by the International Football Association Board (IFAB), we can consider the defensive imbalance from a numerical point of view. When we return to Law 3 relating to the number of players, the IFAB (2021, chapter 23, section 34) declares: "A match may not start or continue if either team has fewer than seven players". We therefore hypothesize that the defensive imbalance caused by the numerical inequality, between the two teams, is not favourable to the sporting spectacle of football, unless is momentary, and caused by a chain of offensive and/or defensive actions. This is in line with Lago-Ballesteros et al. (2012) who showed that attacking against less than six opponents increases offensive efficiency (four times more success than against a balanced defense).

3.3. Defensive recovery

Defensive recovery corresponds to the moment immediately after the loss of the ball (interruption of the attack) and just before the organised defense phase (Casáis, 2008). Depending on the type of organised defense, different forms of reorganisation can occur during the defensive transition phase: transition to a pressing defense or to a confinement defense. Sometimes, before reaching an organised defense, a circumstantial defense can occur in unforeseen situations, requiring an adaptive action of defenders, because the defense does not have time to carry out a defensive reorganisation or an optimal occupation

of the defensive spaces (Casáis, 2008). This moment has also been called defensive balance or defensive recovery (Castelo, 1996). It begins after the impossibility of stealing the ball or preventing the progression of the attack. It is also known as the time when the defense is in pursuit, and is characterised by an unfavourable relationship of the defending team, whose basic objective will be to stop the action of the attack and to protect the goal cage, because the conditions of time, space and numerical forces do not allow it otherwise (Gréhaigne, 1992, 2007; Mombaerts, 2000).

Circumstantial defense is generally organized in two moments or sub-phases: (1) neutralization of the offensive action, since the defense situation is generally in deficit due to a numerical inferiority or a bad spatial arrangement (by faults, offsides or interceptions); (2) facilitate-regain the defensive balance, which is altered (gain time to re-establish the defensive structure: by pressure on the ball carrier or by procrastinate), so that as many players as possible can find the defensive positions established for organised defense (Casáis, 2008).

If these two moments are successfully completed, the circumstantial defense ends, and the defensive action is established on the basis of the previously determined organised defense format (Casáis, 2008). When the team loses the ball, and is in a circumstantial defense situation, the defense must choose between two tactical options either to recover the ball or to recover the format of organized defense previously determined. In a recent study, Freitas et al. (2020) state that defensive approach and defensive pressing are two variables positively associated with possession recovery. The authors define the defensive approach as the intention, or lack thereof, on the part of players positioned in the centre of the game to regain possession of the ball as quickly as possible. While defensive pressing is defined as the defensive pressure exerted on different ball carriers of the same offensive transition action, measured by the distance to the nearest opponent when each ball carrier makes their first contact with the ball (Freitas et al. 2020).

Casáis (2008) says that when the team decides to press, this defensive model seeks to limit the rival's ability to act, cutting off his initiative and “attacking” possession of the ball. It is a very aggressive and high defensive risk approach, as it generally seeks an immediate recovery of the ball: in the area where it was lost, or by causing an opponent's error. In reality, what is sought is to reduce the defensive transition phase, seeking to organise defensively while putting pressure on opponents. Different procedures can be used to organise the transition in the sense of pressing (Casáis, 2008):

- The players closest to the ball instantly activate the pressing, while the other defenders complete the pressure by closing the possible pass lines, with a position identical to that which the team had when the ball was lost (it's about not giving the rival time or space to prevent him from starting the offensive action);
- Some of the players available exert pressure on the player with the ball, reducing the quality of the attack and slowing the progression to allow time for a certain defensive withdrawal. The other players fall back and occupy the zones provided to activate collective pressing; and
- Some players put pressure on the ball carrier to regain possession of the ball, while others advance their position to cause players to be offside and tighten the lines with the players who put pressure.

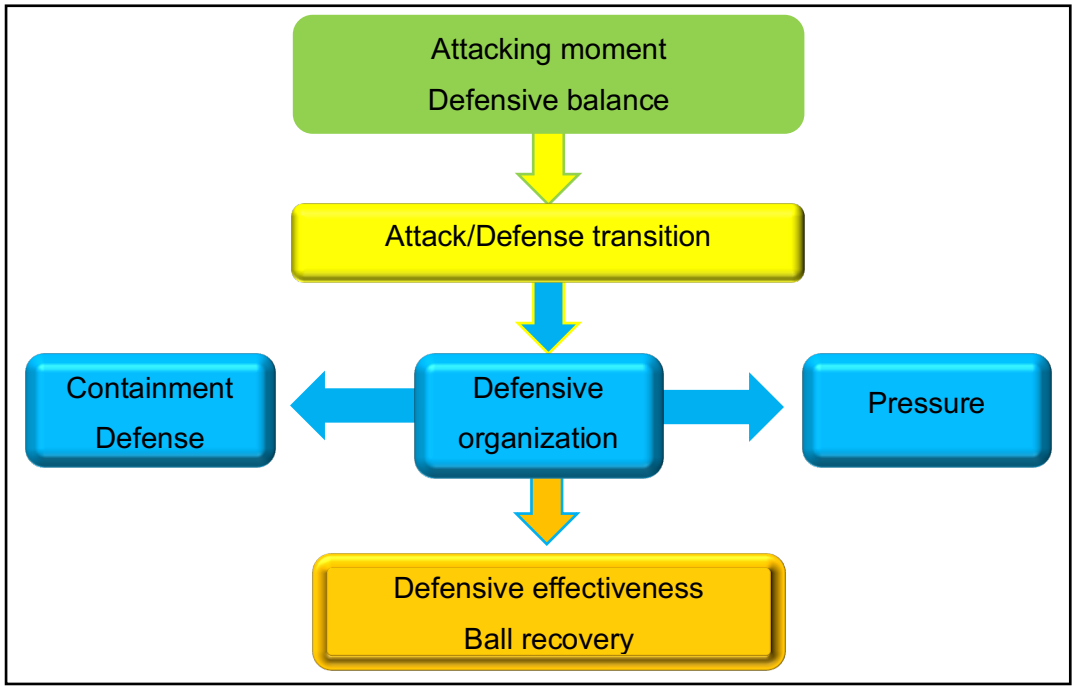
When the team opts for a defensive confinement replacement, will use tactical means which allow, from the start, to slow down or cancel the opposing attack, to quickly reach the areas of greatest defensive engagement, in order to establish a defensive structure with a high density and a number of players between the ball and its goal cage (Casáis, 2008). What is wanted, basically, is to save time for an effective defensive organisation in the areas close to his goal cage. Different procedures can be used to organise the transition to a containment defense (Casáis, 2008):

- The defender closest to the ball carrier tries to abort the attack by committing a tactical fault, the teammates withdrawing or standing behind to reduce the severity of the disciplinary sanction (avoid expulsion); and
- The defender of the player with the ball performs a defensive timeout to impede direct progression while the rest of the team backs up to their goal cage, placing themselves to cover the defender who is making the temporisation.

Defensive recovery is a response to losing the ball to compensate for the imbalance. It begins as soon as a reaction to the imbalance is observed. A correct defensive transition will allow reach the most appropriate positioning for the interests of the defending team; to be able to organise the team defensively in the desired position, and apply defensive tactical concepts that neutralize the opponent, hinder the progression and completion of the attack and regain possession of the ball. If the defensive transition is not adequate, it is impossible to pretend to position, organise and exert a correct collective pressure which will lead to the recovery of the ball. In this sense, Freitas et al. (2020) state that the defensive transition should be as short as possible, because the longer transition, more the probability of

conceding a shot or a goal increase. The defensive transition moment is summarized in Figure 1.

Figure 1. The defensive transition moment



4. Situational variables

For the past twenty years, studies that analyse the tactical and technical performance of teams/players have gradually considered contextual and environmental variables to explain variations in performance within the same team/player, or between teams/players (Bradley et al., 2014; González-Rodenas et al., 2019; Gréhaigne et al., 1997; Jones et al., 2004; Lago, 2009; Liu et al., 2016; Sasaki et al., 1999). Among the contextual factors which can influence the degree of competitive performance of the teams/players: the match status (winning, drawing or losing), the opponent's quality and, the match location (home or away) are the variables most mentioned in the specialised literature.

4.1. Match Status

Match status is defined as the influence of the current score on team performance at different times during the match (Jones et al., 2004; Lago et Martín, 2007). Depending on the evolution of the score, strategic adaptations can be used to meet the new requirements of the match and the question of possession of the ball is one of the most studied in the literature. Indeed, Jones et al. (2004) analysed the duration of possession of the ball according to the status of the match, watching 24 games by six teams from the English Premier League. They conclude that the majority of the losing teams presented an increase

in the duration of possession of the ball, corroborating other studies (Bradley et al., 2014; Lago, 2009; Lago-Peñas et Dellal, 2010; García-Rubio et al., 2015). The authors observe that the main strategy for possession when the team is losing is to increase possession. The main objective is to take control of the game to increase the probability of equalising.

Bradley et al. (2014) investigated how the situational variables affect the percentage of ball possession, but also, to what extent the variables that discriminate between a high and low percentage of ball possession are different according to the specific positions of the players. This study involved 54 games, from 15 teams in the English Premier League (four to ten games per team). Among the teams, 810 players were analysed (405 who played at home and 405 who played away) with 90 minutes playing time as the main selection criterion. The authors observed that when a team was winning, its low percentage of ball possession decreased more than its high percentage of ball possession. However, the authors did not observe any significant difference between the low and high percentage of ball possession when the teams were equality, or one of the two teams lost.

Lago-Ballesteros et al. (2012) examined the influence of playing tactics, opponent interactions and situational variables on reaching the scoring-box during possession of the ball. The authors followed a team from the Spanish first division during the 2009/2010 season. Of the 12 games observed (seven at home and five away), they analysed 908 possessions by the team. The main conclusion regarding match status is that the probability of reaching the scoring-box decreases when the team wins or is equality. For the authors, this is justified by a more defensive strategic behaviour when the team wins.

The study by Almeida et al. (2014) deals with the independent and interactive effects of the match location, match status and opponent's quality on repossession, analysed according to the type and area of ball recovery. The authors analysed the knockout phase of the 2011/2012 UEFA Champions League, namely the round of 16, quarterfinals and semi-finals (n = 28). No match extensions and penalty shootouts were considered in the analysis for consistent data. Over 28 games, the authors processed 5,457 ball recoveries. Regarding the status of the match, the authors observed that during the defeat, the teams recover more ball on the set-play phases, in particular through the increase in pressure on the opponent. In addition, the losing team opts for more advanced defensive behaviour on the field. The team ventures more regularly into the attacking zones to try to recover the ball.

To achieve the double objective, identify the effects of situational variables (location of the match), the first goal and the opponent's quality by considering the minute of the goal, and analyse the statistics related to the match, García-Rubio et al. (2015) analysed 475

matches from the UEFA Champions League 2009/2010 (n=248), 2010/2011 (n=248), 2011/2012 (n=216) and 2012/2013 (n=240), excluding the finals, which took place in neutral territory. The authors analysed that the variable “score first” is the most powerful predictor of the match result. This statistic is significant in the group phase and in the direct elimination phase. Statistics show that in the group stage, if the away team scores first, they will be victorious in 37.7% of the cases. Against 34.8% of cases during the knockout phase. Regarding the home team, the authors estimate a 60% probability of winning if they score first, regardless of the phase of the competition. In addition, the authors observe that the team, which scores first, has better success in shots, and shots off target and corners discriminate against teams which do not score first. Another variable that discriminates against teams that do not score first, is the number of fouls committed. The need to equalize increases anxiety and therefore increases the level of aggression.

Lago-Peñas et al. (2016) also worked on the importance of scoring the first goal in the match’ final result/outcome, to determine whether this effect depends on the minute of the first goal is scored, and the opponent’s quality. Authors used all the matches in the 2014/2015 season of the English championships (FA Premier League = 380 games), French championships (Ligue 1 = 380 games), Spanish championships (La Liga = 380 games), Italian championships (Serie A = 380 games) and German championships (Bundesliga = 306 games). The results provided by this study complement García-Rubio et al. (2015). Indeed, for Lago-Peñas et al. (2016), scoring first allows the match to end with around 1.88 more goals than the opponent. In addition, the closer the end of the match, the more important it is to score the first goal because the opposing team has less time available to equalize.

After having quantified the relationships of 16 match events and a contextual variable (match location) with the result of the match, Liu et al. (2016) sought to determine how the effects were modified by the forces of the team and the opponent. The 380 La Liga games in the 2012/2013 season allowed the authors to conclude that having more shots and shots on target has a positive effect on the probability of winning. This is in line with the results of García-Rubio et al. (2015), and Gómez et al. (2012).

From a perspective similar Liu et al. (2016) sought to identify the independent and interactive effects of the location of the match and the final result on the statistics linked to football games (goals, shots, fouls committed, loss of the ball, recovery of the ball and crosses) depending on the area of the field where they occurred. For this, the authors selected, at random, four games per season, from the 1900 games played during the first Spanish league from the 2003/2004 season to the 2007/2008 season (360 games per

season). The authors observed that for all the factors, the performance in the victory is superior to the performance in the equality, which is itself superior to the performance in the defeat. In the case of equality, team performance is closer to the performance made during the defeat than in victory. The authors also analysed if the final result is influenced by the goals and the shots made in zone 5.2 (finalization zone). Winning teams demonstrated better performance in ball loss and recovery. They lose the ball less often in zone 5.1 (goal kick zone), which allows them to make more shots and goals in this zone. However, they more often lose the ball in zone 4 (attacking midfielder or pre-offensive zone). However, they recover more ball in zone 2 (defensive midfielder or pre-defensive zone).

4.2. Opponent's Quality

Match conditions represent a set of variables which, among other things, influence the behaviour of teams/players (Gréhaigne et al., 1997). As a result, teams may be forced to change their strategy in response to the actions of the opposing team. This means that the possibilities of applying previously trained strategies and tactics in play are always limited (Mesquita et Marcelino, 2013). In order to prepare for a match, it is essential to know the opponent's quality. However, the literature does not reveal the existence of a consensus, between the various researchers, as to the forms of assessing the competitive level of the teams.

In some studies, teams are classified as "successful" or "unsuccessful" based on their progress within a competition (Grant et al., 1999; Hook et Hughes, 2001; Hughes et Churchill, 2004). In other studies, the categorisation is carried out according to the qualification of the teams for the next phase of the competition (Gómez et al., 2009). For Mesquita and Marcelino (in press), the classification of teams as "strong" and "weak" represents one of the main obstacles in comparing studies, due to the difference in the criteria used by each author. Indeed, in certain competitions such as the World Cups and the European Championships (Nations and Clubs), the format of these competitions can allow teams of so-called lower quality to be closer to the final victory than some teams of so-called higher quality.

Lago (2009) considered the differences obtained by the teams in the final classification, by observing the teams continuously instead of dividing them into groups according to their quality ("strong" and "weak"). Each rank in the final classification induces an increase or decrease of 0.2% in ball possession in comparison with the neighbouring ranks. In addition, the analysis of possession of the ball according to the areas of the field (defensive zone, intermediate zone and offensive zone) was revealed as independent of the

quality of opposition. In the wake of this conclusion, Lago-Ballesteros et al., (2012) concluded that the quality of the opposition is not significant regarding the probability of reaching the scoring-box.

When analysing 170 games in the Spanish first division in the 2003/2004 season, Lago et Martín (2007) sought to relate the variation in possession of the ball to team performance in different situational contexts. For this, they used the champion of the season as a benchmark to differentiate the level of the teams. The authors noted that some teams show differences in possession when compared to the reference team, however, these variations can be explained by the tactics and styles of play. Lago-Peñas et Dellal (2010) returned to the Spanish league and increased the number of observations to examine the effects of situational variables on possession strategies. The authors therefore analysed the 380 games of the 2008/2009 season. The main conclusion regarding the opponent's quality, is that whatever the level of the opponents, the "top" teams have a higher percentage of ball possession. In addition, they impose and maintain their game plan despite the alteration of the variables during the game (evolutionary score) and between games (home/away). Bradley et al. (2014) obtain similar results in their study. Indeed, when the opponent is weaker, it finds himself in difficulty to keep the ball, which has an impact on his percentage of ball possession. As a result, the opponent has a lower percentage of possession.

In their study on defensive strategies to recover possession of the ball, Almeida et al. (2014) observe that at a similar level, the tackle is more effective than against weaker teams. This observation is directly related to the style of play of the teams. A weaker team will tend to play a more direct game while at a similar level, the teams will have an indirect game which favours the conservation of the ball. The authors state that the effectiveness of defensive strategies adopted by stronger, or similar, teams are influenced by the ability to force opponents to play without the intention of retaining possession. In addition, the authors analyse that 81% of the recovered balls are in the defensive midfield area, and that this statistic is influenced by the weaker team which most often opt for a confinement defense. Therefore, pressing on the opposing side is a behaviour that is observed more regularly among stronger teams, but also with a better success rate.

For Liu et al. (2016), at equivalent level, the variables "pass" and "accuracy of the pass" increase the probability of victory. The observation made by the authors concerning the variable "possession of the ball" is the same, because this variable is dependent on the variables "pass" and "precision of the pass". In addition, when two teams of different level oppose ("strong" vs "weak"), the variables "pass" and "precision of the pass" increase the probability of victory only for the strong team. The authors also observe that having an aerial

advantage (size, timing) increases the probability of victory in close matches. However, the aerial advantage is closely linked to the variable “crosses” which has a positive effect within teams (that is, from one match to the next) only in “weak” against “weak” (Liu et al., 2016).

4.3. Match Location

One of the first contextual variables is the assessment of the tactical, technical, and performance differences between playing a game at home or away. As a result, it is a variable that is very well documented in the literature (Bradley et al., 2014; González-Rodenas et al., 2019; Lago, 2009; Lago-Peñas et al., 2016; Nevill et al., 1996; Pollard, 1986; Pollard et Gómez, 2009; Poulter, 2009; Sasaki et al., 1999).

Pollard (1986) defines the advantage of playing at home as the percentage of points earned at home based on the total points earned throughout the competition. In his study, after analysing 2,630 games across the last century (1888-1994), from the English Football League, the author verified that 67.9% of the total matches were won by the home team. This statistic is verified by Nevill et al. (1996) who found approximately 65% of a home victory in the analysis of the English Premier League and the English First Division in the 1992/1993 season. Pollard et Pollard (2005) also addressed the question of the proportionality of home and away wins. Once again, the first English league has been analysed. The data collected come from the 1999 to 2003 seasons. The authors obtained a 61.1% home victory for the period analysed.

In order to diversify and check if the trend observed in England can be generalized to other major European championships, Pollard et Gómez (2009) analysed the first French, Italian, Portuguese and Spanish’ league since the creation of the national championships (around 70 years have been analysed). The authors show that since its beginning and until the 1990s, the percentage of home wins was around 70%. Only since the end of the 1990s, was observable a gradual decrease in this percentage which stagnated around 60% between 2005 and 2009. It is possible to confirm the trend - decrease of the percentage of victory at home, which can be explained in particular through the strengthening of the defense due to the evolution of the strategies, devices of play and styles of play of the teams. Lago-Peñas et al. (2016) agrees with this last statement. The authors were able to analyse that the positive effect of playing at home varied between 56.47% (for the Italian Serie A) and 61.84% (for the German Bundesliga) during the 2014/2015 season. In addition, their study completes the data related to the percentage of home wins, demonstrating that the home team scores first in 57.8% of cases, which allows this team to win 84.85% of the

times it scores first. Therefore, it makes sense to observe a lower percentage when the away team scores first (victory in 76.25% of cases).

Regarding European competitions, Poulter (2009) after analysing 808 UEFA Champions League games in the 2001-2007 season, observes that home teams have a 67.7% chance of winning the match. Playing at home allows for more: shots, shots off target, corners, better percentage of possession and fewer faults and sanctions (yellow and/or red card) than the opponent team.

Sasaki et al.(1999) had already established this observation when they followed a team playing in the English Premier League. When the team was playing at home, it was observable an increase in their total number of shots, shots on target and intercepted shots, but also more success in the crosses in the area. Gómez et al. (2012) consolidates the results of Sasaki et al. (1999) and Poulter (2009). The authors observed that playing at home makes it possible to obtain higher values in all the variables studied (goals, shots, fouls committed, loss of the ball, recovery of the ball and crosses), including those where it means poor performance (e.g.: loss of the ball).

In his study of possession, Lago (2009) analyses that the match location alone does not increase or decrease possession. This goes against Poulter (2009). Lago (2009) defends the results he obtained by saying that one must take into account the status of the match and the quality of the opponent to explain the variations in possession of the ball. For example, playing away against a strong team will likely decrease possession (compared to the home game); On the contrary, playing away against a weak team should surely increase possession. For their part, Lago-Peñas et Dellal (2010) go along the lines of Poulter (2009). Indeed, the authors point out that playing outside induces a 2.43% decrease in the percentage of possession of the ball. Bradley et al. (2014) also argue that an away team observes a decrease in their possession. The authors shows that the decrease is greater in the case of the low percentage in comparison with the high percentage of ball possession (1.13 versus 0.73%). For the authors, this is explained by the fact that in the high percentage of possession of the ball, the teams impose and maintain their pattern of play despite the alteration of the variables between the matches (home/away).

As with the quality of the opponent, Lago-Ballesteros et al. (2012) concludes that the match location is not sufficient to induce a variation on the probability of reaching or not the opponent's scoring-box, during possession of the ball. Almeida et al. (2014) concluded that it is not only strong teams who defend in more advanced zones, but also teams playing at home. This does not mean that all home teams will defend in more advanced zones. This

should be interpreted as the fact that playing at home increases the likelihood of defending in offensive zones, especially under the influence of spectators, but also of strategic behaviour adopted for the game.

The match location seems to be the second predictor of the final result, because it is not significant in the knockout phase of the UEFA Champions League (García-Rubio et al., 2015). The number of goals scored and conceded is the main determinant of this phase, due to the importance accorded to the away goal. Indeed, away goals count double in the event of a tie between the two teams over the whole of the two matches. As a result, psychological and technical-tactical effects are observable, especially at home. The authors also point out that the return match is the match with the biggest difference in score, regardless of the elimination round (round of 16, quarterfinals or semi-finals).

4.4. Interactive effect of contextual variables

The literature review carried out above, in the context of the various contextual variables, demonstrates the importance and influence of these contextual variables in the analysis of team/player performance. Furthermore, we can say that the effect of situational variables can manifest themselves in isolation, but also, interactively with other variables, whether they are contextual or factors of sport performance.

The majority of studies published over the last decade, on contextual variables, considered these interactive effects. Bradley et al. (2014), studying how situational variables affect the percentage of ball possession, independently analyse each one of the variables and then make them interact with each other. Authors observed that when the opponent is weaker, he has less possession of the ball. Further, if the opponent is playing away, his percentage of ball possession also decreases. The authors claim that the opponent loses 3.04% of possession compared to if he played at home.

Almeida et al. (2014) analysed the type and the area of recovery of the ball, and their findings showed that the evolution of the score affects the defensive performances: when the weaker teams are winning, they regroup in defense and wait for the opponent's error. On the contrary, when the strongest teams win, their defensive behaviour is proactive. That is to say, they will use means (interception, tackle) to push the opponent to make a mistake. In addition, the authors claim that there is also an interaction between the location of the match and the quality of the opponent. At home, the stronger teams present more effective defensive methods.

Liu et al. (2016) observe that a greater number of shots and shots on target have a positive effect on the probability of winning. However, in the case of two weak teams of

similar level, the positive effect of the shot on target is retained, but a negative effect for blocked shots is observed. This allowed authors to conclude that, in the case of two weak teams of similar level, the quality of the shots determines the result. In addition, the authors observed a positive effect, at equivalent level, for the location of the match. However, when the authors interact the quality of the opponent with the location of the match, the positive effect diminishes with the increase in the quality of the opponent.

In their study on the importance of scoring the first goal in relation to the final result, Lago-Peñas et al. (2016) argue that the opponents' quality influences the effect of the first goal on the final score. In fact, when the opponent is of better quality and plays away, the probability of victory in the event of the first goal scored is 76.1%, compared to 57.4% if the opponent who plays away is of lower quality. In home team' case, teams of poorer quality than the opponent that who score first, win more games than if they were of better quality than the opponent team.

In a study to investigate the combined effects of match location, team ranking, match status and tactical dimensions on the performance of offensive performance, González-Rodenas et al. (2019) analysed 1860 "open" offensive transitions (without interruption of the game following the recovery of the ball) on the 3520 attacks belonging to twenty randomly selected matches of the Spanish "La Liga" championship. The authors observe that playing at home and/or against stronger opponents achieves better efficiency in offensive penetration. However, there would be no effect on scoring opportunities.

5. Notational analysis

Different authors agree to define notational analysis as a process of identifying and understanding, individual and collective, characteristics, which contribute the most to a better performance in play, and which consideration would be advantageous in the organisation of the training process (Castelo, 1996; Garganta, 1997; Martín Acero et Lago-Peñas, 2005). A second definition is given by Nevill et al. (2002): notational analysis is a systematic observation and recording of data, referring to individual and collective actions in attack and in defense. For Hughes et Franks (2004), this is a performance analysis methodology following a previously defined observation plan, with the objective of providing accurate, precise and objective information on the events involved.

Performance can be described in detail, including the number of occurrences of each action, individual player actions and the location of the actions on the field (Reilly et Williams, 2003). The objectives are: (1) the study of movement during the game, (2) the tactical assessment, (3) the technical assessment, (4) the construction of database and

models of performance and, (5) the use of notational analysis during the training process and in coach training (Reilly et Williams, 2003). The recorded data seek to answer the following questions: the position (where?); the players involved (who?); the action (what?); time (when?) and; the outcome of the action (Carling et al., 2007; Garganta, 2001).

The analysis of performance, in sports games, must consider two dimensions: the process, i.e., description of players' behaviour and its effectiveness over time; and the result - final product of their behaviour (Gréhaigne et Godbout, 1995 as cited in Volossovitch, 2008). Both dimension analysis seeks to ensure the temporal framing of the recorded actions, with a particular emphasis on the balance of the result and the behaviour of the opponent (Volossovitch, 2008).

Studies seek to analyse collective behaviours by considering their variations according to the context of play. In this sense, Gréhaigne et al. (2002) analysed four matches in the FIFA World Cup 1994 (the two semi-finals, third place and the final) with the aim of describing the actions associated with recovering possession of the ball. The main conclusion was the use of the defensive block to recover the ball. This strategy allowed the teams to be in numerical superiority in 90.5%, and in numerical equality in 8.8%, recoveries of possession of the ball.

Of the 1860 offensive transitions that González-Rodenas et al. (2019) analysed, only 9.4% exceeded 31 seconds. This, according to the authors, demonstrates the difficulty of achieving long balls possessions. Despite this difficulty, the results show that increasing the duration of possession, after recovering the ball, allows a higher degree of offensive penetration and scoring opportunities to be obtained. The authors also observed that approximately 75% of offensive transitions are marked by defensive pressing on loss of the ball combined with a first action on the ball which is not penetrating (that is to say, towards the opposing goal). However, the authors point out that when the first action on the ball is penetrating, this action is crucial to achieve both offensive penetrations and scoring opportunities. The authors highlight that penetrating offensive transitions are often those in which the defense did not exert pressure when the ball was lost. However, if this context favours offensive penetration, it does not favour scoring opportunity. When the offensive penetration is successful, neither the initial defensive pressing nor the initial offensive penetration present differences in the creation of scoring opportunities. This means that there is no offensive penetration model that guarantees the creation of scoring opportunities. However, quick attacks and counterattacks, immediately after the ball is recovered, offer a greater chance of scoring opportunities than combined attacks using penetrating possession. The authors demonstrate that their study states that the interactive effect of the

tactical dimensions (initial offensive penetration, type of attack and duration of possession) play an important role in scoring opportunities and offensive penetration.

These conclusions consolidate our questions about the actions and behaviours used after losing the ball when the opposing team finds itself in an offensive transition favourable to the counterattack or rapid attack.

CHAPTER II.

METHODOLOGY

1. Introduction

The methodology presented in this chapter includes the identification of the sample, the observation system to collect the data, the definition of the observation categories and indicators, the validation of the observation tool as well as its reliability, and statistical data processing.

2. Sample

The sample consists of 4209 defensive transition processes during which the non-target team attack towards the opposing goal immediately after the ball is recovered, taking advantage of the defensive disorganisation of the observed team. The analysis of actions ended when one of the following three events occurred: (1) recovery of the ball; (2) recovery of the defensive organisation; and (3) interruption of the game. All the actions analysed come from the 96 matches played during the group stage of the UEFA Champions League in the 2019/2020 edition. On all matches, 45 actions could not be analysed due to the way the match was filmed (slow motion at the wrong time, zoom on the ball carrier…). All teams analysed have played the same number of games at home and away. All the matches took place over the period from September 17, 2019 to December 11, 2019 and were broadcast on television. As a result, free access to all matches was available and it was possible to record them to analyse the data collected. The characteristics of the games analysed are summarized in Table 1.

3. Observation System

For the purposes of the study, it was developed an observation tool to record the events that take place during the defensive transition process. This tool brings together three different and complementary parts: (1) the classification of the different categories allowing to delimit and order the different events according to the information they transmit; (2) a set of indicators (events) classified according to the categories, which may occur during the defensive transition; and (3) a specific abbreviation to each indicator, allowing the software to analyse the results to differentiate them. All 15 categories and 88 indicators, which constitute the observation tool, come from the literature related to the analysis of the game. Table 2 presents the classification of the categories and indicators used in the observation tool.

All of the games were viewed using Apple QuickTime Player Version 10.5, while the results were saved using Microsoft® Excel software for Mac Version 16.36.

Table 1. List of matches analyzed for the study.

	Matchday 1	Matchday 2	Matchday 3	Matchday 4	Matchday 5	Matchday 6
Group A	Club Brugge (**19**) 0 – 0 Galatasaray (**27**)	Real Madrid (**27**) 2 – 2 Club Brugge (**22**)	Club Brugge (**16**) 0 – 5 Paris (**17**)	Real Madrid (**15**) 6 – 0 Galatasaray (**18**)	Galatasaray (**13**) 1 – 1 Club Brugge (**21**)	Club Brugge (**17**) 1 – 3 Real Madrid (**17**)
	Paris (**20**) 3 – 0 Real Madrid (**22**)	Galatasaray (**28**) 0 – 1 Paris (**21**)	Galatasaray (**34**) 0 – 1 Real Madrid (**22**)	Paris (**19**) 1 – 0 Club Brugge (**17**)	Real Madrid (**13**) 2-2 Paris (**22**)	Paris (**16**) 5 – 0 Galatasaray (**9**)
Group B	Olympiacos (**30**) 2 – 2 Tottenham (**24**)	Tottenham (**20**) 2 – 7 Bayern (**22**)	Olympiacos (**21**) 2 – 3 Bayern (**15**)	Bayern (**20**) 2-0 Olympiacos (**17**)	Crvena zvezda (**19**) 0 – 6 Bayern (**17**)	Bayern (**27**) 3 – 1 Tottenham (**9**)
	Bayern (**26**) 3 – 0 Crvena Zvezda (**23**)	Crvena Zvezda (**16**) 3 – 1 Olympiacos (**15**)	Tottenham (**19**) 5 – 0 Crvena Zvezda (**16**)	Crvena Zvezda (**18**) 0 – 4 Tottenham (**19**)	Tottenham (**14**) 4 – 2 Olympiacos (**16**)	Olympiacos (**22**) 1 – 0 Crvena zvezda (**17**)
Group C	Dinamo Zagreb (**22**) 4 – 0 Atalanta (**28**)	Atalanta (**24**) 1 – 2 Shakhtar Donetsk (**21**)	Shakhtar Donetsk (**20**) 2 – 2 Dinamo Zagreb (**22**)	Dinamo Zagreb (**9**) 3 – 3 Shakhtar Donetsk (**10**)	Atalanta (**15**) 2 – 0 Dinamo Zagreb (**20**)	Shakhtar Donetsk (**14**) 0 – 3 Atalanta (**13**)
	Shakhtar Donetsk (**25**) 0 – 3 Man. City (**22**)	Man. City (**34**) 2 – 0 Dinamo Zagreb (**19**)	Man. City (**16**) 5 – 1 Atalanta (**10**)	Atalanta (**11**) 1 – 1 Man. City (**13**)	Man. City (**24**) 1 – 1 Shakhtar Donetsk (**13**)	Dinamo Zagreb (**7**) 1 – 4 Man. City (**28**)
Group D	Atlético (**15**) 2 – 2 Juventus (**22**)	Juventus (**19**) 3 – 0 Leverkusen (**16**)	Atlético (**25**) 1 – 0 Leverkusen (**21**)	Lokomotiv Moskva (**6**) 1 – 2 Juventus (**23**)	Lokomotiv Moskva (**21**) 0 – 2 Leverkusen (**20**)	Leverkusen (**15**) 0 – 2 Juventus (**13**)
	Leverkusen (**37**) 1 – 2 Lokomotiv Moskva (**21**)	Lokomotiv Moskva (**17**) 0 – 2 Atlético (**30**)	Juventus (**23**) 2 – 1 Lokomotiv Moskva (**8**)	Leverkusen (**12**) 2 – 1 Atlético (**21**)	Juventus (**14**) 1 – 0 Atlético (**13**)	Atlético (**16**) 2 – 0 Lokomotiv Moskva (**7**)

Home team (No. of transitions) score - score Away team (No. of transitions).

Test-Retest carried out on the teams in italics.

Table 1 (continued). List of matches analyzed for the study.

	Matchday 1	Matchday 2	Matchday 3	Matchday 4	Matchday 5	Matchday 6
Group E	Salzburg (**27**) 6 – 2 *Genk* (**31**)	Genk (**24**) 0 – 0 Napoli (**29**)	Salzburg (**21**) 2 – 3 Napoli (**21**)	Liverpool (**29**) 2 – 1 Genk (13)	Liverpool (**28**) 1 – 1 Napoli (**13**)	Napoli (**20**) 4 – 0 Genk (**15**)
	Napoli (**23**) 2 – 0 Liverpool (**22**)	Liverpool (**43**) 4 – 3 Salzburg (**19**)	Genk (**12**) 1 – 4 Liverpool (**24**)	Napoli (**20**) 1 – 1 Salzburg (**11**)	Genk (**28**) 1 – 4 Salzburg (**14**)	Salzburg (**20**) 0 – 2 Liverpool (**16**)
Group F	Internazionale (**23**) 1 – 1 Slavia Praha (**15**)	Slavia Praha (**23**) 0 – 2 Dortmund (**26**)	Internazionale (**12**) 2 – 0 Dortmund (**24**)	Barcelona (**25**) 0 – 0 Slavia Praha (**12**)	Barcelona (**12**) 3 – 1 Dortmund (**21**)	Internazionale (**18**) 1 – 2 Barcelona (**17**)
	Dortmund (**15**) 0 – 0 Barcelona (**35**)	Barcelona (**23**) 2 – 1 Internazionale (**15**)	Slavia Praha (**23**) 1 – 2 Barcelona (**20**)	Dortmund (**21**) 3 – 2 Internazionale (**17**)	Slavia Praha (**22**) 1 – 3 Internazionale (**21**)	Dortmund (**15**) 2 -1 Slavia Praha (**22**)
Group G	Lyon (**31**) 1 – 1 Zenith (**20**)	Leipzig (**23**) 0 – 2 Lyon (**16**)	Leipzig (**23**) 2 – 1 Zenith (**24**)	Zenith (**12**) 0 – 2 Leipzig (**25**)	Zenith (**18**) 2 – 0 Lyon (**23**)	Benfica (**17**) 3 – 0 Zenith (**18**)
	Benfica (**25**) 1 – 2 Leipzig (**27**)	Zenith (**30**) 3 – 1 Benfica (**21**)	Benfica (**22**) 2 – 1 Lyon (**26**)	Lyon (**14**) 3 – 1 Benfica (**24**)	Leipzig (**16**) 2 – 2 Benfica (**13**)	Lyon (**18**) 2 – 2 Leipzig (**16**)
Group H	*Ajax* (**28**) 3 – 0 LOSC (**29**)	LOSC (**22**) 1 – 2 Chelsea (**17**)	Ajax (**25**) 0 – 1 Chelsea (**16**)	Valencia (**21**) 4 – 1 LOSC (**15**)	Valencia (**16**) 2 – 2 Chelsea (**13**)	Chelsea (**22**) 2 – 1 LOSC (**17**)
	Chelsea (**21**) 0 – 1 Valencia (**14**)	Valencia (**23**) 0 – 3 Ajax (**17**)	LOSC (**8**) 1 – 1 Valencia (**17**)	Chelsea (**13**) 4 – 4 Ajax (**13**)	LOSC (**18**) 0 – 2 Ajax (**23**)	Ajax (**15**) 0 – 1 Valencia (**23**)

Home team (No. of transitions) score - score Away team (No. of transitions).

3.1. Definition of categories and indicators

Defining categories and indicators consists in limiting their fields of action, so that no indicator can be overlap on another. In addition, the relevance of the choice and definitions of categories and indicators must make it possible to explain the events taking place at a given moment in the match.

Table 2. Categories, indicators and Sigle used in the study.

Categories	Indicators	Sigle
Team's Quality (TQ)	Pot A	TQA
	Pot B	TQB
	Pot C	TQC
	Pot D	TQD
Opponent's Quality (OQ)	Pot A	OQA
	Pot B	OQB
	Pot C	OQC
	Pot D	OQD
Loss of possession zone (ZL)	Zone 1	ZL1
	Zone 2	ZL2
	Zone 3	ZL3
	Zone 4	ZL4
	Zone 5	ZL5
	Zone 6	ZL6
	Zone 7	ZL7
	Zone 8	ZL8
	Zone 9	ZL9
	Zone 10	ZL10
	Zone 11	ZL11
	Zone 12	ZL12
Position of players at start of defensive transition (CEII)	Attacking line recovers ball in front of goalkeeper of team being observed	PA
	Attacking line recovers ball in front of rear line of team being observed	RA
	Attacking line recovers ball in front of middle line of team being observed	MA
	Attacking line recovers ball in front of attacking line of opposing team	AA
	Middle line recovers ball in front of rear line of team being observed	RM
	Middle line recovers ball in front of middle line of team being observed	MM
	Middle line recovers ball in front of attacking line of team being observed	AM
	Rear line recovers ball in front of middle line of team being observed	MR
	Rear line recovers ball in front of attacking line of team being observed	AR
	Goalkeeper recovers ball in front of attacking line of team being observed	AP
Type of loss possession (TLP)	Interception	IL
	Tackle	TL
	Goalkeeper Save	GKL
Period of match (T)	Between minute 0 and minute 15 (inclusive)	T-15
	Between minute 16 and minute 30 (inclusive)	T-30
	Between minute 31 and end of first half	T-45
	Between start of second half and minute 60 (inclusive)	T-60
	Between minute 61 and minute 75 (inclusive)	T-75
	Between minute 76 and end of second half	T-90

Table 2 (continued). Categories, indicators and Sigle used in the study.

Categories	Indicators	Sigle
Position of defensive lines (PS)	Deep	RPL
	Middle	PL
	High	AZ
Match status (MS)	Winning	W
	Drawing	D
	Losing	L
Development of the defense / attack transition (TEDA)	Development by ball driving / dribble	BD
	Development by frontal support	FS
	Development by lateral support	LS
	Development by offensive cover	OC
Number of players involved in defense / attack transition development (TEDAP)	1	ETO0
	2	ETO1
	3	ETO2
	4 or +	ETO3
General defensive approach of defensive recovery (PTGD)	Expectant	EXP
	Semi-Persistent	SPT
	Persistent	PT
End of attack zone (ZF)	Zone 1	ZF1
	Zone 2	ZF2
	Zone 3	ZF3
	Zone 4	ZF4
	Zone 5	ZF5
	Zone 6	ZF6
	Zone 7	ZF7
	Zone 8	ZF8
	Zone 9	ZF9
	Zone 10	ZF10
	Zone 11	ZF11
	Zone 12	ZF12
Position of players at end of defensive transition (CEIF)	Goalkeeper of team being observed ends defensive transition in front of attacking line of opposing team	FPA
	Rear line of team being observed ends defensive transition in front of attacking line of opposing team	FRA
	Rear line ends defensive transition in front of middle line of opposing team	FRM
	Middle line ends defensive transition in front of attacking line of opposing team	FMA
	Middle line ends defensive transition in front of middle line of opposing team	FMM
	Middle line ends defensive transition in front of rear line of opposing team	FMR
	Attacking line ends defensive transition in front of middle line of opposing team	FAM
	Attacking line ends defensive transition in front of rear line of opposing team	FAR
	Attacking line ends defensive transition in front of goalkeeper of opposing team	FAØ

Table 2 continued. Categories, indicators and Sigle used in the study.

Categories	Indicators	Sigle
Result of defensive recovery (RR)	Recovery of the ball by interception	I
	Recovery of the ball by tackle	T
	Ball recovery by goalkeeper save	GKS
	Win a Set-Play	WST
	Turnover Won	TW
	Defensive organisation - Ball possession of the opponent	DO
	Lose a Set-play	LST
	Goalkeeper Save with ball possession of the opponent	GKO
	Take a goal	TG
Qualification (Q)	Yes	Y
	No	N

3.1.1. Loss of Possession Zone (ZL)

The first category makes it possible to locate the place where the defensive recovery phase of the observed team begins. The division of the field follows research carried out in the literature. Castelo (1994), Garganta (1997) and Barreira et al. (2014) divide the playing space into twelve zones (Figure 2). Figure 3 and Figure 4 provides a better understanding of the definition of the different zones: Defensive sector / Left corridor for **Zone 1**; Defensive sector / Central corridor for **Zone 2**; Defensive sector / Right corridor for **Zone 3**; Mid-defensive sector / Left corridor for **Zone 4**; Mid-defensive sector / Central corridor for **Zone 5**; Mid-defensive sector / Right corridor for **Zone 6**; Mid-offensive sector / Left corridor for **Zone 7**; Mid-offensive sector / Central corridor for **Zone 8**; Mid-offensive sector / Right corridor for **Zone 9**; Offensive sector / Left corridor for **Zone 10**; Offensive sector / Central corridor for **Zone 11**; and Offensive sector / Right corridor for **Zone 12**.

Figure 2. Play space division.

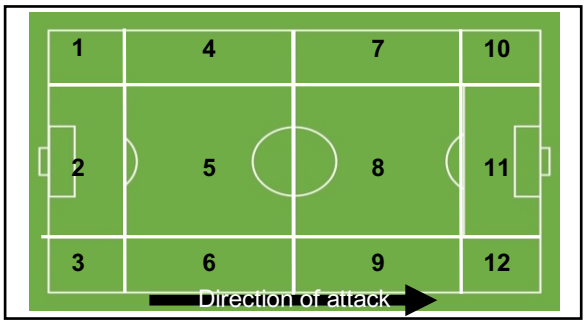


Figure 3. Division of the play space in corridors.

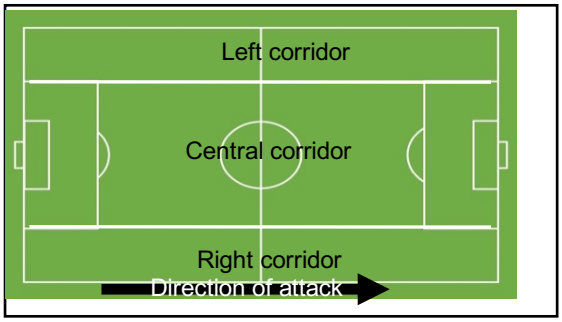
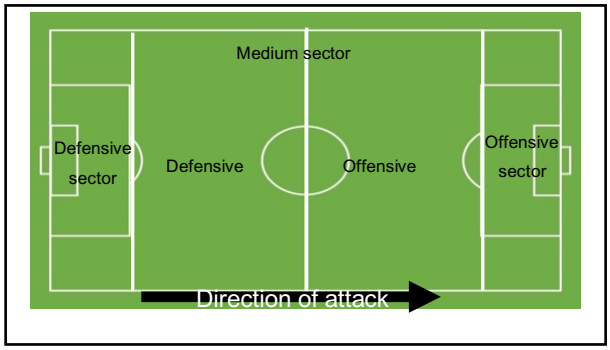


Figure 4. Division of the play space into sectors.



3.1.2. Position of Players at Start of Defensive Transition (CEII)

This category, combined with the ZL category, allows to observe the interaction between the two teams and to contextualize the magnitude of the team imbalance observed at the very beginning of defensive recovery. In short, using this category, it is possible to observe the position of the lines of the two teams when the ball changes possession. All the indicators used are an adaptation, to the study context, of the work carried out by Castellano (2009). Each indicator takes into account a defensive line of the unobserved team and relates it to an offensive line of the observed team (Figure 5 - Figure 14).

Figure 5. Attacking line recovers ball in front of goalkeeper of team being observed.

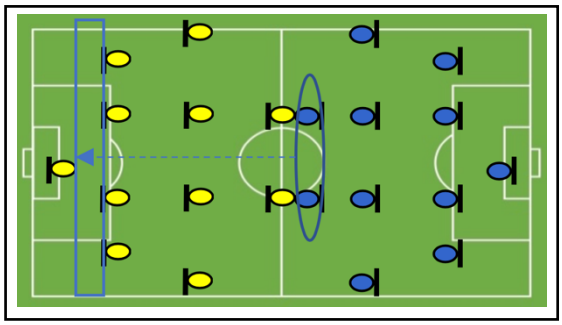


Figure 6. Attacking line recovers ball in front of rear line of team being observed.

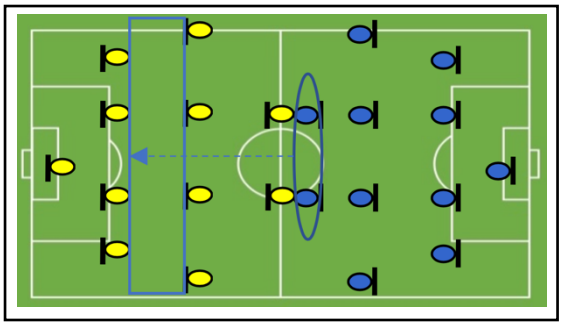


Figure 7. Attacking line recovers ball in front of middle line of team being observed.

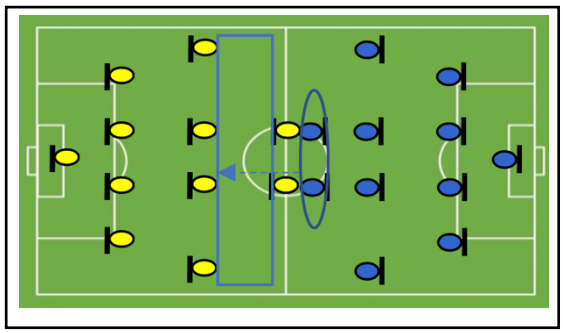


Figure 8. Attacking line recovers ball in front of attacking line of opposing team.

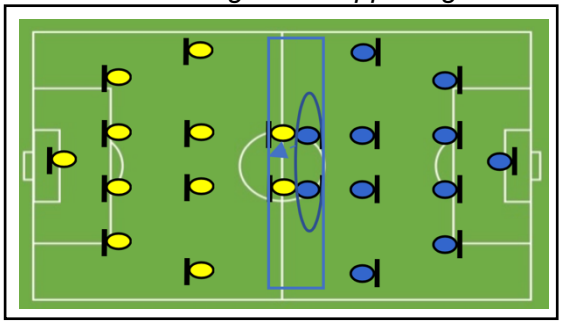


Figure 9. Middle line recovers ball in front of rear line of team being observed.

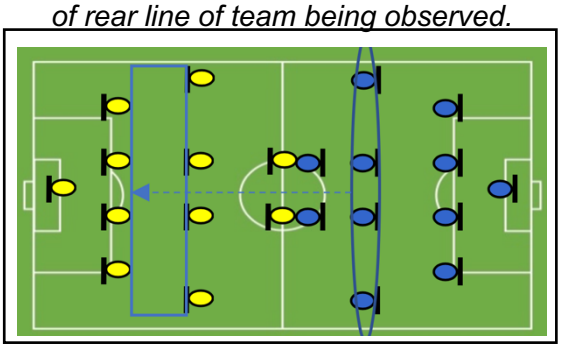


Figure 10. Middle line recovers ball in front of middle line of team being observed.

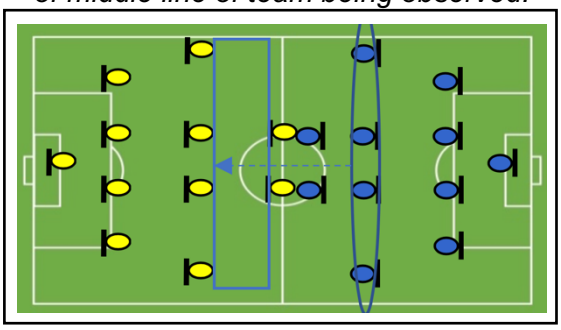


Figure 11. Middle line recovers ball in front of attacking line of team being observed.

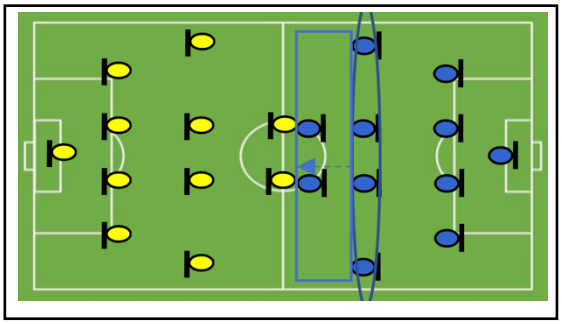


Figure 12. Rear line recovers ball in front of middle line of team being observed.

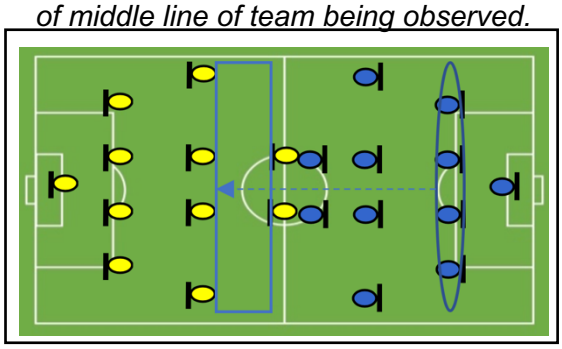


Figure 13. Rear line recovers ball in front of attacking line of team being observed.

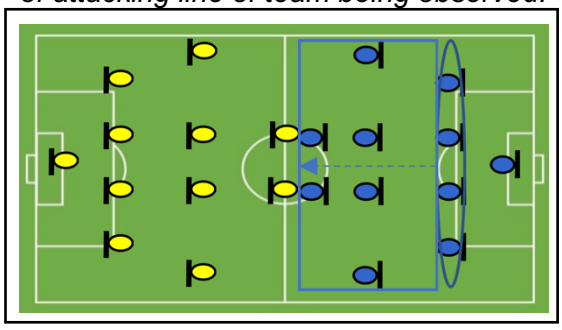
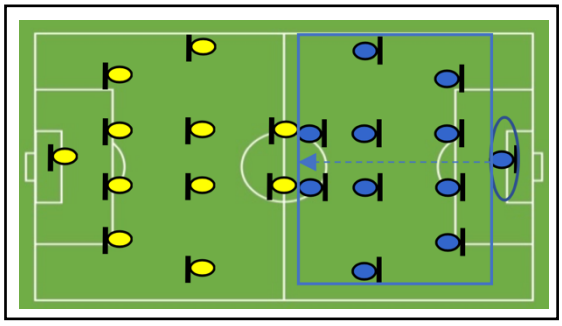


Figure 14. Goalkeeper recovers ball in front of attacking line of team being observed.



3.1.3. Type of Loss Possession (TLP)

This category highlights the action that allows the unobserved team to recover possession of the ball and induces the defensive recovery reaction of the observed team. Among the various events, listed in the literature (Almeida et al., 2014; Garganta, 1997), which make it possible to regain possession of the ball, those which allow the continuity of the game and which offer the possibility of taking advantage of the imbalance of the team observed. The category includes the following three indicators:

1. **Interception** – when the defender prevents a ball transmitted by an opponent from reaching its intended receiver by contacting the ball and keeping his own team in possession of the ball;

2. **Tackle** – when the defender dispossesses the opponent of the ball through a physical challenge or defensive pressure; and
3. **Goalkeeper Save** – when the goalkeeper prevents the opposing team from scoring a goal after any kind of shot, i.e. a kick, a header or any intended deflection of the ball toward a goal.

3.1.4. Period of Match (TM)

The regulations established by The International Football Association Board (IFAB) decree that a football match consists of two 45-minute statutory periods (https://www.theifab.com/laws). As a result, the total duration (statutory) of a football match is 90 minutes. To facilitate the analysis of the game, it is common to see in the scientific literature a breakdown of the total duration of the match in six periods of 15 minutes (Castelo, 1996; Garganta, 1997; Lago et Martín, 2007; Maleki et al., 2016). The cutting is carried out as follows:

1. **Between minute 0 and minute 15** – Start of the first half.
2. **Between minute 16 and minute 30** – Middle of the first half.
3. **Between minute 31 and end of first half** – End of the first half.
4. **Between start of second half and minute 60** – Start of the second half.
5. **Between minute 61 and minute 75** – Middle of the second half.
6. **Between minute 76 and end of second half** – End of the second half.

According to the regulation of IFAB, the referee has the right to add at the end of each period of 45 minutes an “additional” time that varies according to the extent and impact of the different timeouts during each of the two periods (IFAB, chapter 27, section 71). Therefore, all of the defensive recovery phases that occurred during these extra time frames were incorporated into the third time interval - for the first period - and the sixth time interval - for the second period.

3.1.5. Position of Defensive Lines (PS)

This category complements the precision given by ZL and CEII by providing the occupation of the field made by the team observed at the time of loss of possession of the ball. The category includes three indicators which are:

1. **Deep** – all players, from the observed team, are in the defensive sector and mid-defensive sector;

2. **Middle** – all players, from the observed team, are in the mid-defensive sector and mid-offensive sector; and
3. **High** – all players, from the observed team, are in the mid-offensive sector and offensive sector.

3.1.6. Match Status (MS)

The category aims to analyse behaviours according to the evolution of the provisional match result. At the time of loss of possession of the ball, the team observed may be in one of the following three configurations (Barreira et al, 2011; Castelo, 1994):

1. **Winning** – The observed team leads to the score;
2. **Drawing** – The observed team is tied for the score with the opposing team; and
3. **Losing** – The observed team is late for the score.

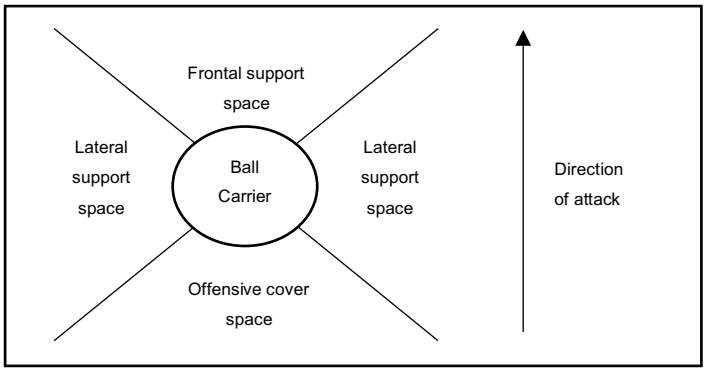
3.1.7. Development of the Defense / Attack Transition (TEDA)

It seems complicated to learn the result of defensive recovery without considering the development of the offensive action of the unobserved team. For this, it seems wise to use the observation tool of Castelo (1994) which sought to analyse the direction of the pass of the ball carrier. However, an adaptation of the tool to the needs of the study was made:

- **Development by ball driving / dribble** – The ball carrier projects himself towards the target;
- **Development by frontal support** – Use of player(s), positioned in front of the ball line, to project the team towards the target;
- **Development by lateral support** – Use of player(s), positioned on the same side-line as the ball, to project the team towards the target; and
- **Development by offensive cover** – Use of player(s), positioned behind the line of the ball, to project the team towards the target.

Figure 15 illustrates the different spaces used for each of the above indicators.

Figure 15. Offensive cover spaces, lateral support and fontal support.



3.1.8. Number of Players Involved in Defense / Attack Transition Development (TEDAP)

This category identifies the number of players involved in the offensive action of the unobserved team. When it comes to analysing a counterattack, the literature has shown that the number of players involved very rarely exceeds four (Casal, 2011; Castelo, 1994; Hughes et Lovell, 2019). The following indicators were therefore retained:

- **1** – No exchange, the ball carrier opts for an individual solution or the ball does not reach the target partner;
- **2** – The development of the defense/attack transition is concluded by having had two different ball carriers;
- **3** – The development of the defense/attack transition ends with three different ball carriers; and
- **4 or more** – The development of the defense/attack transition ends with four, or more, different ball carriers.

3.1.9. General Defensive Approach of Defensive Recovery (PTGD)

The PTGD category assesses the type of reaction, of the team observed, immediately after the loss of possession of the ball. After having experienced this category with the indicators found in the literature (Gonzalez-Rodenas et al., 2016; Tenga et al., 2010), it was decided to adapt the category by adding an intermediate indicator:

1. **Expectant** – When the ball is lost, the observed team is oriented towards its goal and performs replacement races to regain its defensive organisation;
2. **Semi-Persistent** – When the ball is lost, one or two players (those closest to the opponent) orient themselves to contain or tackle the opposing ball carrier, while their teammates perform replacement races to regain their defensive organisation; and

3. **Persistent** – The observed team presses the opponent without immediately worrying about their defensive organisation.

3.1.10. End of Attack Zone (ZF)

This category includes the zones used by ZL and allows you to observe the zone in which the defensive recovery phase ends (Figure 2 – Figure 4). These areas are: Defensive sector / Left corridor for **Zone 1**; Defensive sector / Central corridor for **Zone 2**; Defensive sector / Right corridor for **Zone 3**; Mid-defensive sector / Left corridor for **Zone 4**; Mid-defensive sector / Central corridor for **Zone 5**; Mid-defensive sector / Right corridor for **Zone 6**; Mid-offensive sector / Left corridor for **Zone 7**; Mid-offensive sector / Central corridor for **Zone 8**; Mid-offensive sector / Right corridor for **Zone 9**; Offensive sector / Left corridor for **Zone 10**; Offensive sector / Central corridor for **Zone 11**; and Offensive sector / Right corridor for **Zone 12**.

3.1.11. Position of Players at End of Defensive Transition (CEIF)

This category, like CEII, complements the information provided by the ZF category, by analysing the interaction between the two teams within the area where defensive recovery ends. To achieve this, it provides indications on the position of the lines in direct confrontation with opposite objectives - recover the ball for the observed team, score for the unobserved team (Figure 16 – Figure 24).

Figure 16. Goalkeeper of team being observed ends defensive transition in front of attacking line of opposing team.

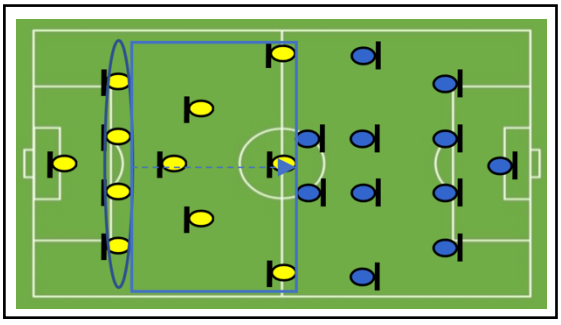


Figure 17. Rear line of team being observed ends defensive transition in front of attacking line of opposing team

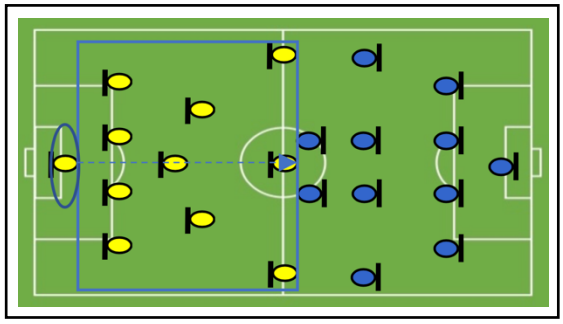


Figure 18. Rear line ends defensive transition in front of middle line of opposing team.

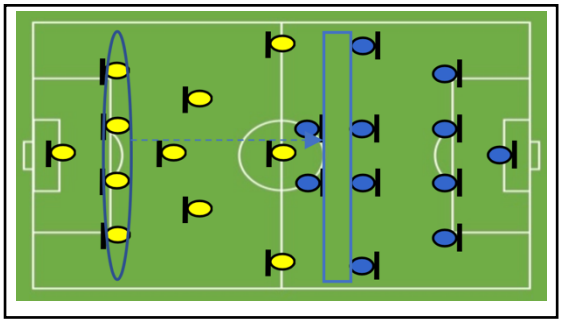


Figure 19. Middle line ends defensive transition in front of attacking line of opposing team.

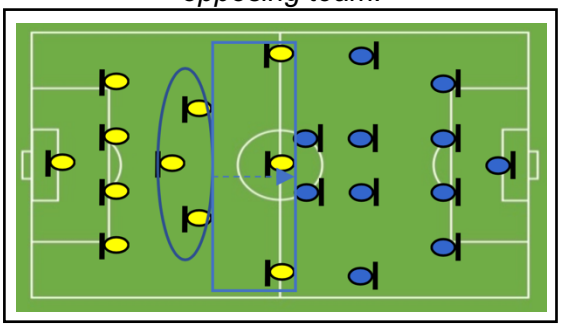


Figure 20. Middle line ends defensive transition in front of middle line of opposing team.

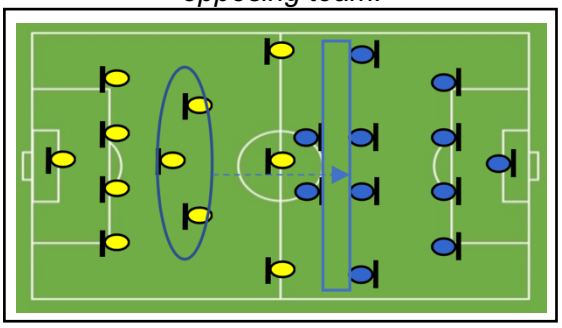


Figure 21. Middle line ends defensive transition in front of rear line of opposing team.

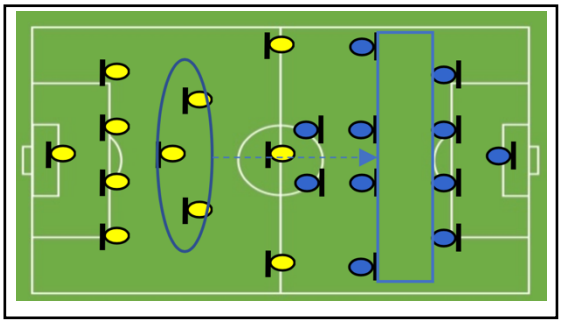


Figure 22. Attacking line ends defensive transition in front of middle line of opposing team.

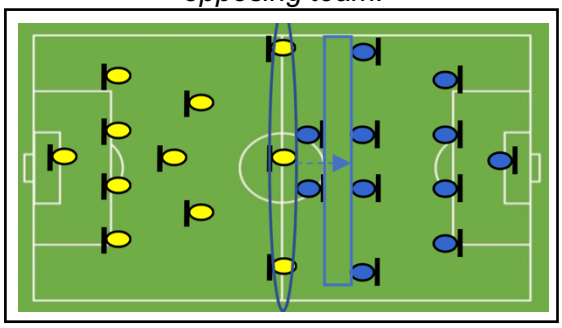


Figure 23. Attacking line ends defensive transition in front of rear line of opposing team

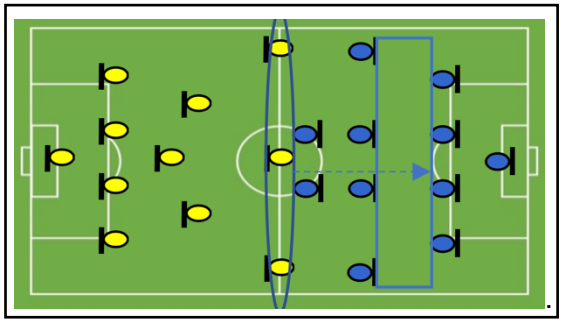
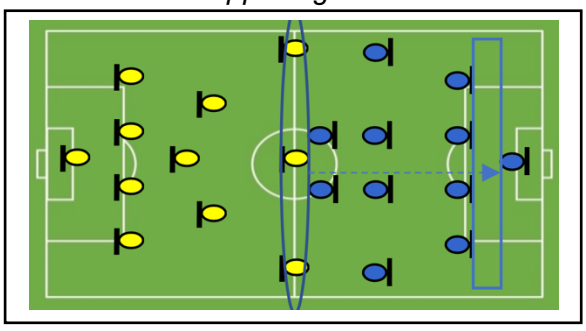


Figure 24. Attacking line ends defensive transition in front of goalkeeper of opposing team.



3.1.12. Result of Defensive Recovery (RR)

This category makes it possible to analyse the type of action used by the observed team to recover the ball or to find a balance thanks to its entry in phase of defensive organisation. This category involves nine indicators that can be found in the literature, in particular through the work of Almeida et al. (2014), but also from Barreira et al. (2007, 2014):

1. **Ball recovery by interception** – when the defender prevents a ball passed by an opponent from reaching its intended receiver by contacting the ball and keeping his own team in possession of the ball;
2. **Ball recovery by tackle** – when the defender dispossesses the opponent of the ball through a physical challenge or defensive pressure;
3. **Ball recovery by goalkeeper save** – when the goalkeeper prevents the opposing team from scoring a goal after any kind of shot (i.e., a kick, a header or any intended deflection of the ball toward a goal);
4. **Win a Set-Play** – static situations deriving from opponents' misses or fouls (goal kicks, thrown-ins, off-sides, and free kicks);
5. **Turnover Won** – when the defender collects, somewhere in the pitch, a ball lost (clearances or missed passes) by the opposing team;
6. **Defensive organisation - Ball possession of the opponent** – when the team regains its defensive organisation but fails to recover possession of the ball;
7. **Lose a Set-play** – static situations resulting from failures or fouls of the observed team (goal kicks, thrown-ins, off-sides, and free kicks);
8. **Goalkeeper Save with ball possession of the opponent** – when the goalkeeper prevents the opposing team from scoring a goal after any type of shot (for example, a kick, a header or any predicted deflection of the ball towards a goal) but the opposing team continues in possession of the ball; and
9. **Take a goal** – The observed team concedes a goal following an opponent's shot or the action of a defender.

3.2. Team's Quality and Opponent's Quality

Knowing that the teams participating in the UEFA Champions League, 2019/2020 edition, come from the different European national championships, it is possible to

hypothesize that the inter-team quality varies according to the national championship in which it evolved. As a result, the study focuses on the observable differences between so-called “different rank” teams. Moreover, when constituting the groups for the first phase of the UEFA Champions League, UEFA (organism in charge of organizing the UEFA Champions League), distributes the teams equally in four Pot according to the position reached in the general classification of their championship in the previous season, as well as the classification of the various Nations in the UEFA ranking. For the 2019/2020 edition, Table 3 presents the four Pot used by UEFA to constitute the eight groups in the first phase, which also corresponds to the distribution of the teams according to their supposed quality, in order to carry out the analyses according to the quality of the opponents - Pot 1 is supposed to correspond to the best teams in Europe, and Pot 4 to the weakest teams qualified for the UEFA Champions League.

Table 3. Ranking of teams according to their quality.

Pot A	Pot B	Pot C	Pot D
Liverpool (ENG)	Real Madrid (ESP)	Lyon (FRA)	Lokomotiv Moskva (RUS)
Chelsea (ENG)	Atlético (ESP)	Leverkusen (GER)	Genk (BEL)
Barcelona (ESP)	Dortmund (GER)	Salzburg (AUT)	Galatasaray (TUR)
Man. City (ENG)	Napoli (ITA)	Olympiacos (GRE)	Leipzig (GER)
Juventus (ITA)	Shaktar Donetsk (UKR)	Club Brugge (BEL)	Slavia Praha (CZE)
Bayern (GER)	Tottenham (ENG)	Valencia (ESP)	Crvena Zvezda (SRB)
Paris (FRA)	Ajax (NED)	Internazionale (ITA)	Atalanta (ITA)
Zenit (RUS)	Benfica (POR)	Dinamo Zagreb (CRO)	LOSC (FRA)

3.3. Validation of the observation tool

The observation system has been validated by experts. As soon as the categories and indicators were chosen and defined, a detailed description of the observation system was presented to three teachers/coaches who have experience in football and who teach the discipline of football in higher education. After receiving expert advice, the initial observation system was reformulated, and it was only completed when experts recognized that the instrument was adequate for the objectives of the study.

3.4. Fidelity of the observation tool

The accuracy of the observation tool is defined as the degree of agreement between two simultaneous observations of the same event, using the same recording system (Hill et Hill, 2008). All the observations made during the study were carried out by the same observer. Therefore, the intra-observer fidelity of the latter has been tested. The intra-

observer fidelity test having to correspond to 10% of the total sample, the observer analysed twice, with an interval of fifteen days between the two observations, all the defensive recovery phases of twenty games of the sample. A comparison followed between the number of agreements and disagreements between the two observations, using Bellack's formula (Van der Mars, 1989):

Fidelity index = (agreements / agreements + disagreements) x 100

Thus, when comparing the two observations, the fidelity indices for all the variables observed were always greater than 90%, which indicates the high fidelity of the observation.

4. Statistical procedures

Statistical processing was performed using Statistical Package on Social Sciences (SPSS), version 26.0 software (IBM, Chicago, U.S.A.).

Firstly, the results were analysed through descriptive statistics of the data allowing the percentage of frequency of occurrence of actions. This first step allows the characterisation of the sample studied, and at the same time to check the data's normality (Shapiro-Wilk test). Secondly, a bivariate analysis of defensive recovery actions and behaviours using one-way ANOVA (Analysis of variance) was performed to analyse the relationship between the indicators of a positive defensive recovery outcome, according to each of the variables analysed. The significance level was set at $p \leq .05$ (Taylor et al., 2005).

CHAPTER III
PRESENTATION AND DISCUSSION OF RESULTS

1. Results

Our goal is to identify the defensive behaviours that promote the recovery of the ball, or the recovery of defensive balance, in the moments following the loss of the ball leading to contexts of counterattacks or fast attacks, by high performance football teams. Data collection was carried out through indirect systemic observation. This observation was made using Apple QuickTime Player software Version 10.5 – for viewing – and Microsoft® Excel for Mac software Version 16.36 – for recording data.

The structure of the presentation and discussion of the results is organized in accordance with the sequence of specific objectives that guides this study. Namely, a descriptive analysis followed by a bivariate analysis of the different categories of indicators linked to defensive recovery actions and behaviours, through three-time ranged which are team's quality (before matches); match status (during matches) and final ranking, that is to say if the team qualifies or not (after matches). The description of defensive recovery actions and behaviours is positioned with the intention of explaining and demonstrating how each category of indicators takes shape within the defensive transition.

The use of bivariate analysis makes it possible to verify whether there is a causal link among defensive recovery actions and behaviours. To do this, all of the data collected is subject to two analyses: (1) an inter-group and (2) an intra-group analysis. The objective of the first analysis is to see whether the different categories of indicators in the study show significant differences between the different contextual factors of team quality and match status. The intra-group analysis is carried out in order to observe whether the contextual factors such as the quality of the teams, the match status and the qualification, or not, in the knockout phase, show significant differences among all indicators in the same category.

The independent variables of the inter-group analysis are (1) the team's quality and (2) the match status. While the dependent variables are the different categories of indicators ("ZL", "CEII", "TLP", "TM", "PS", "TEDA", "TEDAP", "PTGD", "ZF", "CEIF" and "RR"). The independent variables of the intra-group analysis are the different categories of indicators ("ZL", "CEII", "TLP", "TM", "PS", "TEDA", "TEDAP", "PTGD", "ZF", "CEIF" and "RR"). While the dependent variables are (1) the team's quality, (2) the match status and (3) the qualification or not, in the knockout stage. The qualification category cannot be used as independent variables in the inter-group analysis, because when performing an ANOVA test, more than two indicators are required. Being used as a dependent variable in within-group analysis, it is possible to account for the category in the ANOVA test. The ANOVA is

supplemented by a multiple comparison analysis in order to check which groups have differences between them.

Taking into account all the previous remarks, it seemed judicious at first to describe the indicators according to the classification made before the competition (Pots A, B, C and D). A second part is dedicated to the description of the indicators at the time of the competition (Match status). Finally, the umpteenth part focuses on the presentation of indicators after the competition (Qualification or not, in the knockout phase).

2. Analysis of indicator categories according to the team's quality

The Appendix 1 highlights that depending on the contextual factor used for ANOVA, the indicator categories do not react in the same way. Indeed, when the ANOVA takes into account the team's quality, we observe that "ZL", "CEII", "PS", "PTGD", "ZF" and "CEIF" display significant differences between the different qualities of the teams (Pot A, Pot B, Pot C and Pot D). These differences are of the order of $F(3, 4205) = 13.662$; $p<.001$ (for "ZL"); $F(3,4205) = 2.93$; $p=.032$ (for "CEII"); $F(3,4205) = 9.377$; $p<.001$ (for "PS"); $F(3,4205) = 11.058$; $p<.001$ (for "PTGD"); $F(3,4205) = 17.688$; $p<.001$ (for "ZF"); and $F(3,4205) = 9.506$; $p<.001$ (for "CEIF").

Concerning the intra-group analysis, the Appendix 2 shows that these are the categories "ZL" ($F(11, 4197) = 5.348$; $p<.001$), "CEII" ($F(8.4200) = 2.067$; $p=.036$), "PS" ($F(2.4206) = 16.197$; $p<.001$), "PTGD" ($F(2.4206) = 8.568$; $p<.001$), "ZF" ($F(11, 4197) = 7.309$; $p<.001$), "CEIF" ($F(8.4117) = 4.002$; $p<.001$) and "RR" ($F(8.4200) = 4.445$; $p<.001$) which show significant differences between each of their indicators. We also observe that the categories "TEDA" ($F(3, 4205) = 2.162$; $p=.09$) and "TEDAP" ($F(3, 4205) = .832$; $p=.476$) are not statistically significant, but it would be enough for one of the Pots to change their approach to the offensive transition for the "TEDA" category to show a significant difference.

Figure 25 shows that about 68% of ball losses occur in the central corridor. Among these 68%, 33.90% are in "ZL8"; 2.34% in "ZL11"; and 13.92% in "ZL5". We can therefore observe that the defensive recoveries are initiated mainly in the central corridor of the offensive sectors. In this sense, Pot A is significantly different ($p<.001$) from the other three Pots with regard to the "ZL" category (Table 4). Indeed, we can see in the Figure 25 that the two offensive zones of the central corridor ("ZL8" and "ZL11") are those which account for the majority (54.24%) of the changes in ball possession. In addition, we realize that the minimum difference is between Pot A and Pot B (8.24%). While the differences between Pot A and Pots C and D are more or less the same (11.35% and 11.10%, respectively). We can add that Pots B, C and D do not show any significant differences between them (Appendix

1), their differences being minimal (3.11% between Pot B and C; 2.86% between Pot B and D; and 0.25% between Pot C and D). When the ball loss is in the lateral corridors, it is mostly in the two middle sectors ("ZL4" to "ZL9"). However, it is possible to note a slightly higher percentage (around 3%) in the offensive midfielder sector ("ZL7" to "ZL9") compared to the defensive midfielder sector ("ZL4" to "ZL6"). Losses in the defensive sector, even if they exist, are events that occur with little frequency.

Figure 25. Descriptive analysis of the ZL category according to team's quality.

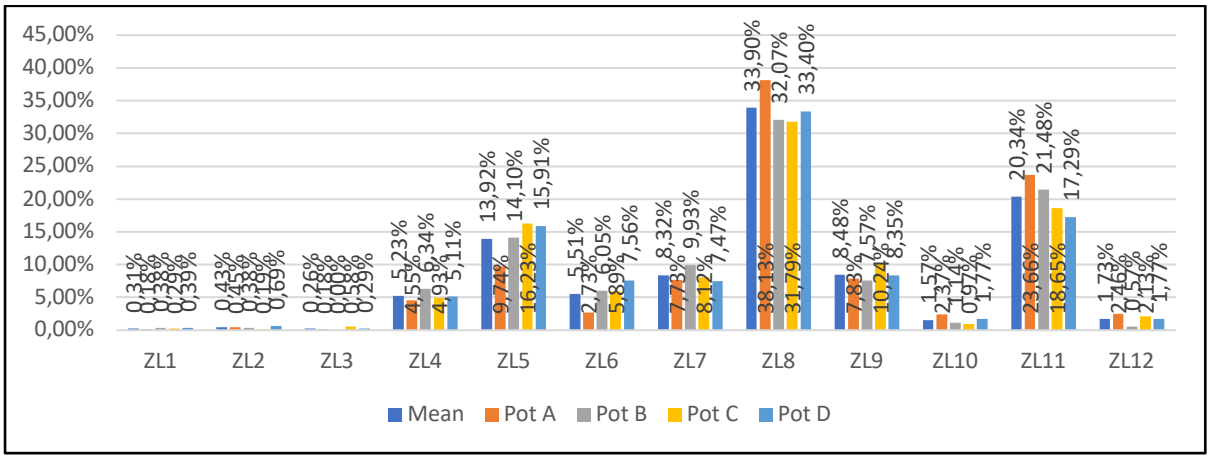


Table 4. Summary of the results of bivariate analysis of the "ZL" category, by Pots.

Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.
ZL	13.662	0	Pot A	Pot B	0
				Pot C	0
				Pot D	0

These results agree with other studies (Casal et al., 2016; Casal, 2011; Maleki et al., 2016). Casal (2011) has shown that offensive transitions start in the defensive midfield 45% of the time. Maleki et al. (2016), after assessing the consistency in the defensive organisation of the four teams that reached the semi-finals of the 2014 World Cup, conclude that the majority of recoveries (of the ball) take place in the two defensive zones. Casal et al. (2016), in their study describing defensive transitions immediately after losing the ball, admits that 48.9% of defensive transitions start in the attacking midfield.

However, Maneiro et al. (2019) sought to understand the differences in regularities and practices in the execution of offensive transitions by comparing two European Nations Championship. The authors were able to highlight that the teams, which participated in the 2016 edition, recovered the ball in more advanced areas of the pitch, namely the central midfielder and the offensive midfielder.

Pot A teams have a higher ball loss occurrence percentage than any other Pot, in the most offensive areas ("ZL8", "ZL10", ZL11" and "ZL12"). Regarding zones "ZL4", "ZL6",

“ZL7” and “ZL9”, it is possible to observe that they were either the teams from Pot B, or those of Pot C, which have the highest percentage of occurrence. Nevertheless, the Pot D teams show values close to the average (except in “ZL6” where the values are higher). The ball loss onset percentages for Pot A teams in these four areas are always below the average for each area. "ZL5" being the third zone with the most ball loss, we observe that the teams of Pots C and D have a higher percentage of ball loss than the teams of Pots A and B. While Pot B is close to the indicator average, we can see that the values of Pot A are clearly those of Pot C and D.

The Appendix 3 allows realizing that it is the two middle sectors and the attacking sector that show the differences. In this sense, "ZL5" is significantly different from "ZL8" (p=.001) and "ZL11" (p<.001). In addition, it is observed that “ZL6”is also different from “ZL7” (p=.006), “ZL8” (p<.001) and “ZL11” (p<.001). We also note that “ZL6” is close to a significant difference with “ZL4” (p=.094) and “ZL10” (p=.065). The indicators showing a significant difference are summarized in the Table 5. Almeida et al. (2014) had already underlined, in their study on possession recovery, that the main area for ball recovery is that of the defensive midfielder (in 81% of cases). The author supplemented this information by saying that the supremacy of this area is influenced by weaker teams defending in more remote areas, closer to their goal cage.

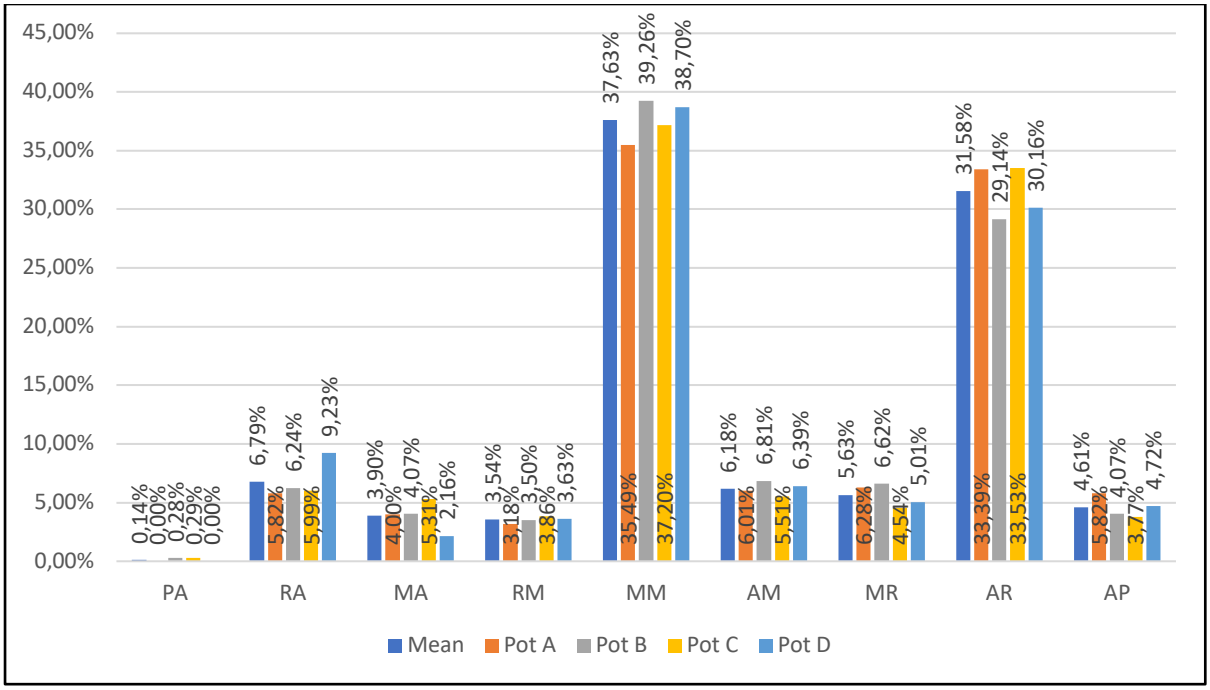
Table 5. Summary of the results of bivariate analysis of the "ZL" indicators, by Pots.

(I) ZL	ZL5		ZL6		
(J) ZL	ZL8	ZL11	ZL7	ZL8	ZL11
Sig.	.001	0	.006	0	0

Figure 26 allows you to see that there are two main game interactions when the ball is lost. Namely, “MM” and “AR” which together represent approximately 69% of interactions between the two teams. The figure also provides information on the fact it is mainly Pots B and D which represent “MM” interaction, while “AR” interaction used with more frequency by Pots A and C. Within the “CEII” category, the only significant difference occurs between Pot A and Pot D (p=.039) (Appendix 1). Indeed, on all the indicators, as shown in Figure 26, only "PA", "RM" and "AM" do not display as large deviations as the other indicators can display ("RA", "MA", "MM", "MR", "AR" and "AP"). However, it is possible to observe that the difference between Pot A and Pot B is close to being significant, certainly due to the two indicators "MM" and "AR", in which the two pots are opposed (Figure 26). When one shows more occurrences, the other shows less. It is quite possible that the percentages of use within the other indicators rebalance the total difference, which does not make it significant.

Other game interactions vary between 3.50% and 6.80%, with an average of around 5% frequency of occurrence. It should be noted that “PA” is a rare interaction (0.14% on average).

Figure 26. Descriptive analysis of the CEII category according to team’s quality.



The results are in line with those presented by Casal et al. (2016) and Maneiro et al. (2019) who, despite a change in the spatial interaction configuration between the 2008 edition and the 2016 edition, assert that the “MM” and “AR” interactions (“RA” in the study by Maneiro et al. (2019) continue to be regular. This is because ball losses usually occur in the middle or in front of the team being observed. Casal et al. (2016) argues that 43.7% of defensive transitions begin with an interaction between the observed team’s attack line and the opponent’s back line.

Two game interactions show significant differences between them (Table 6). These game interactions are “RA” and “MR” (p=.039). "RA" and "MA" do not show significant differences, but their mean difference is close to being significant (p=.096). All the results of the bivariate analysis for the indicators of the "CEII" category are presented in the Appendix 4.

Table 6. Summary of the results of bivariate analysis of the "CEII" indicators, by Pots.

(I) CEII	RA
(J) CEII	MR
Sig.	.039

It is possible to observe that the Pot D undergoes more frequently the interaction "RA" (9.23% against 6.79% on average) in contrast to the interaction "MA" (2.16% against 3.90 %

of average) which is observed mainly among the Pot C teams (5.31%). It is also possible to observe that the Pot C stands out from the others by a lower frequency of appearance concerning the interactions “MR” and “AP”.

Figure 28 shows that more two-thirds of ball losses occur as a result of an interception (“IL”, 69.29%); 28,72% originate from the indicator “TL”; While some loss of the ball was due to the intervention of the goalkeeper (“GKL”, 1.69%). According to Barreira et Garganta (2007), offensive transitions are initiated through interceptions 36% of the time, which is half the results obtained in this study. However, they authors takes into account offensive transitions, which have direct play, but also indirect play. This is not the case with this study. Indeed, in our inclusion criteria, the offensive transition must lead to a counterattack or a fast attack. Which may explain that cutting the pass trajectories is more frequently used, than physical duels, to counterattack. In addition, Almeida et al. (2014) argue that the effectiveness of defensive strategies adopted by stronger or similarly skilled teams is influenced by the ability to force opponents to play without the intention of retaining possession of the ball.

As the “GKL” indicator is infrequent, there are only two types of ball losses allowing the continuity of play: “IL” and “TL”. Because of this, when a Pot loses the ball more regularly through one, the other indicator is therefore less frequent. This finding may explain why the comparison of the “TLP” category through the Pots does not show any significant differences (Appendix 1, Appendix 2 and Appendix 5).

We notice through the Figure 28, that each indicator in the Position Lines category has a different area of percentage of occurrence. Almost two thirds of defensive recoveries take place while the teams are in “PL” (63.41%). Slightly less than a third are located in "AZ" (31.86%), and a low proportion of "RPL" (4.73%). These results follow the logic of the results of Casal (2011), Almeida et al. (2014), Casal et al. (2016), Maleki et al. (2016) and Maneiro et al. (2019). Indeed, these different authors have shown that ball losses are observed in the different sectors of the midfield (PL) and, mainly in the defensive midfield sector.

Figure 27. Descriptive analysis of the TLP category according to team's quality.

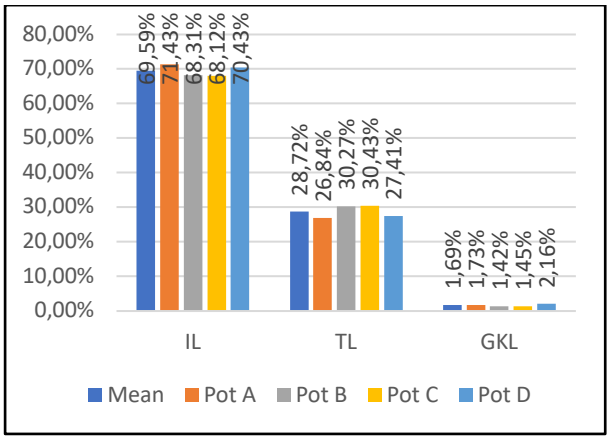
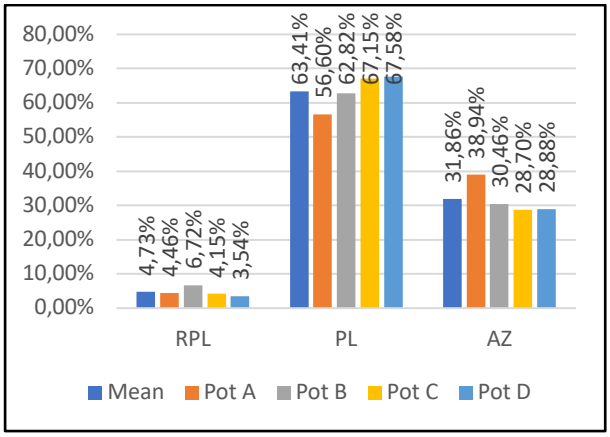


Figure 28. Descriptive analysis of the PS category according to team's quality.



When we look at the results of the ANOVA, we notice that it is again Pot A which is significantly different from the other three Pots (p<.001 for Pot A and Pot B, and p=.001 for Pot D) (Table 7), and that no significant difference is identified between the other Pots (Appendix 1).

Table 7. Summary of the results of bivariate analysis of the "PS" category, by Pots.

Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.
PS	9.377	0	Pot A	Pot B	0
				Pot C	0
				Pot D	.001

In addition, theTable 8 indicates that the "PL" indicator is significantly different from the other two indicators ("RPL", p=.027 and "AZ", p<.001). The Appendix 7 makes it possible to observe all the differences for the various indicators. As indicated earlier, the indicator "PL" groups together the majority of the occurrence percentages (63.41%). This majority, encompassing all the Pots, justifies the fact that the indicator is significantly different from the other indicators. Despite everything, the different Pots have a, more or less, equivalent ratio of "PL" and "AZ". That is, the Pot B is very close to the average percentages displayed

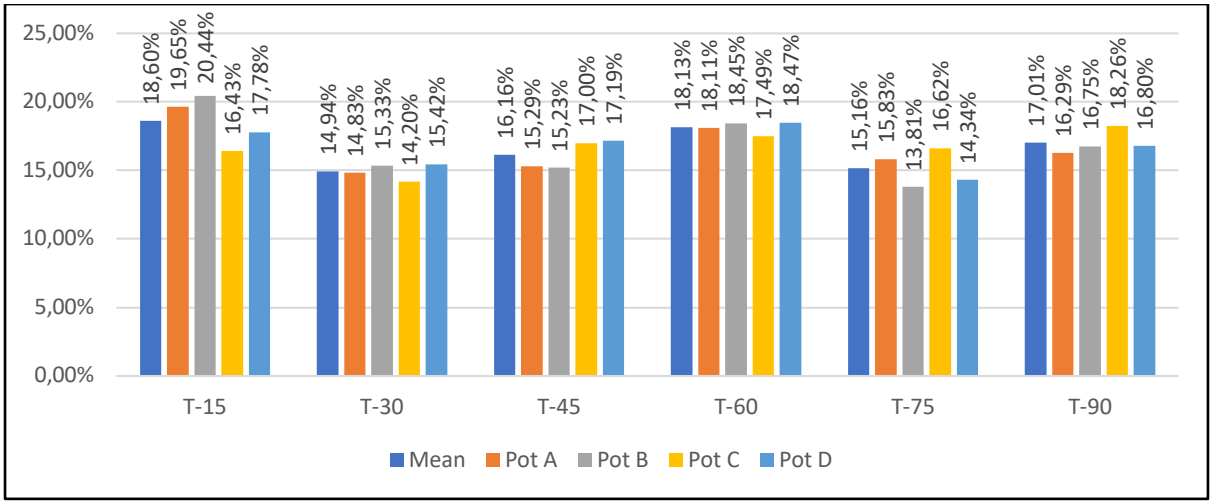
by the two indicators; Pots C and D acts above the average of "PL" and below the average of "AZ"; Pot A is clearly below the average of "PL" and above the average of "AZ" (about 7% less for "PL" and more for "AZ"). Lago-Peñas et Dellal (2010) argue, in their study on the effects of situational variables on ball possession strategies, that the better teams have a higher percentage of ball possession because they dictate the play, impose and maintain their pattern of play despite the alteration of variables during the game and between games. The results of this study seem to underline the idea that the best teams dictate the game, especially because the Pot A teams lose the ball more frequently, than other Pots, in the offensive sector, which seems to indicate that the opponent is gathered in front of his goal cage and is subjected to the play.

Table 8. Summary of the results of bivariate analysis of the "PS" indicators, by Pots.

(I) PS	PL	
(J) PS	RPL	AZ
Sig.	.027	0

What is real for “PL” and “AZ” is not real for “RPL”. Indeed, all the Pots revolve around the average percentage, while the Pot B stands out from the others by being superior.

Figure 29. Descriptive analysis of the TM category according to team’s quality.



Based on the Figure 29, it is possible to observe that the defensive recoveries are more or less evenly distributed over time (between 14.94% for "T-30" and 18.60% for "T-15"). The ANOVA test does not show any significant differences concerning the team’s quality (Appendix 1 and Appendix 2). However, the multiple comparison makes it possible to realize that Pots B and C are those with the greatest probability of being significantly different (Appendix 6).

It looks like a trend is emerging between the two halves. Namely, "T-15" and "T-60" are the two-time ranges with the highest percentages of occurrence; “T-30” and “T-75” are

those with the lowest percentages. The values displayed by “T-45” and “T-90” are positioned in an in-between. The results are consistent with Casal (2011) who asserts that offensive transitions are more frequent in the first quarter of an hour and the last quarter of an hour of each half. However, this trend is not true for all Pots. Indeed, the Pot C achieves more defensive recoveries in “T-45” than in “T-15” (17.00% against 16.43%, respectively), in which it is clearly under the average (16,43% vs. 18.60%, respectively). The finding is identical in the second half of the match (the percentage of defensive recovery in T-90 is higher than the average in T-60). This can be explained by the fact that Pot C achieves the most defensive recovery in the last thirty minutes of the match.

The Figure 30 shows that half of opponents' offensive transitions are initiated through "FS". When not using "FS", opponents favor a lateral solution ("LS") in 25% of cases, while in 20% of transitions the opponent chooses to lead the ball ("BD"). The indicators used to observe the development of the defense/attack transition do not differentiate short play from long play when the opponent opts for “FS”, “LS” or “OC”. However, 75% of tactical intentions are to find a teammate, which agrees with Barreira et Garganta (2007) who admits that the first action after winning the ball is the short pass, so looking for a teammate. Without forgetting that the results are influenced by our inclusion criteria (the opponent must counterattack or make a quick attack), it is possible to justify them with regard to the study of Hughes et Lovell (2019), on offensive transitions, as well as González-Rodenas et al. (2019), on the offensive performance of teams. Indeed, both defend the need to play forward and agree that the first move after the transition significantly influences the number of scoring opportunities created and goals scored. In addition, the results obtained can also be influenced by the philosophy of attacking play. which has prevailed in recent years. This philosophy is highlighted in particular by the study by Maneiro et al. (2019) which compares the tactical intentions, during offensive transitions, of the 2008 edition with that of 2016 of the European Nations Championship. The authors conclude that the tactical intentions, in 2008, defend a certain balance between keeping the ball and counterattacking; while in 2016, the counterattack takes precedence over the conservation of the ball. This change in tactical intent may be due to the fact that keeping the ball does not guarantee successful offensive transitions; While success increases if the team shows an intention to progress towards the opposing goal (Casal et al., 2015).

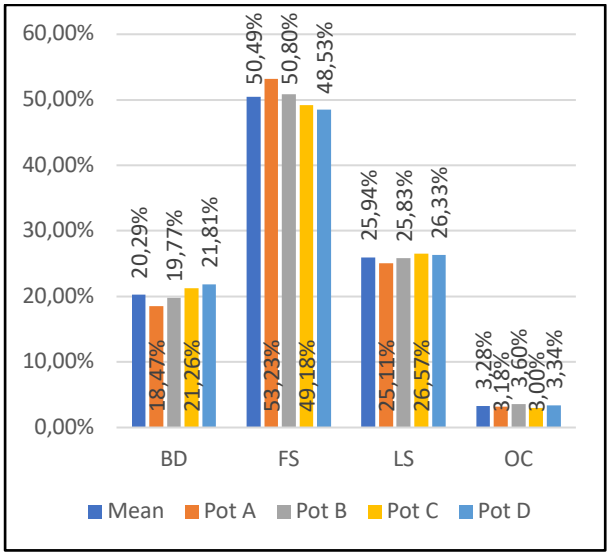
In addition, it is possible to observe that the more the quality of the teams decreases, the more the teams must oppose “BD” and “LS” (18.47% and 25.11% for Pot A; 19.77% and 25.83% for Pot B; 21.26% and 26.57% for Pot C; 21.81% and 26.33% for Pot D, respectively). The trend is reversed when it comes to “FS”. Indeed, during defensive

recovery, Pot A teams have to deal with the "FS" indicator in 53.23% of cases; Pot B teams defend against a FS situation in 50.80% of cases; Pot C teams suffered the FS indicator in 49.18% of cases and Pot D teams, in 48.53% of cases. Analysis of the results shows that the quality of the teams influences the opponent's tactical intention. A similar observation was made by González-Rodenas et al. (2019) in his study on the offensive performance of teams. The author emphasizes that playing against stronger opponents, results in greater efficiency in executing offensive penetration. However, according to the results of his study, the first pass of attacking penetration did not have an effect on creating scoring opportunities.

Regarding the last indicator ("OC"), we noticed that it is a play option in about 3% of the opposing attacks, but also that regardless of the level of the team, the percentages of use of the indicator for the four Pouts revolve around the average percentage of the indicator.

Thus, the two ANOVAs performed do not show any significant differences, either between the pots (Appendix 1) or between the indicators (Appendix 8). Nevertheless, "BD" and "FS" are close to a significant difference (p=.07).

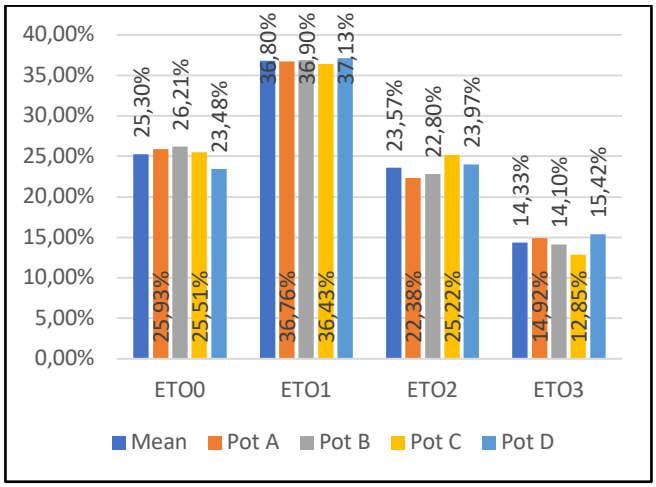
Figure 30. Descriptive analysis of the TEDA category according to team's quality.



The Figure 31 shows that over a third of defensive recoveries involve the opponent attacking using "ETO1" (36.80%). Despite this, we can see that almost 50% of enemy attacks are carried out either through "ETO0" or relying on "ETO2". However, "ETO0" shows a slightly higher percentage of use than "ETO2". With regard to Pots C and D, the displayed values are more or less equivalent. The values of Pot C are closer to those of "ETO0"; While Pot D has percentages closer to "ETO2". The Appendix 1 completes this first observation by indicating that no Pot has significant differences with at least one other Pot.

Finally, the opponent uses "ETO3" in 14.33% of cases. We can see that Pots C and D stand out again. First, Pot D, which uses less “ETO0” and “ETO2” than Pot C, shows a higher percentage of use than Pot C. In addition, Pot C has the lowest percentage of use (12.85%), while the percentage of use of Pot D is the highest (15.42%).

Figure 31. Descriptive analysis of the TEDAP category according to team’s quality.



Gonzalez-Rodenas et al. (2016) argues offensive transitions don’t have to be extremely fast or have very few passing passes to be successful, but the length of possessions should be tailored to the tactical situation created by the opposing team. This point of view is also defended by Casal et al. (2015) who argues that long offensive transitions are more likely to be successful; In particular by the search for attacks placed. In their study Gonzalez-Rodenas et al. (2016) argues that scoring opportunities increase when offensive transitions are played in four or more passes. Paradoxically, the study by Casal (2011) covering the seven matches of the final phase of the European Nations Championship, 2008 edition, shows that 35% of offensive transitions are successful. Of these offensive transitions, 55% were made in counterattacks. The author goes further and points out that successful offensive transitions involve rapid progression to the opposing goal, three or fewer players are involved in the action and, three passes or less are made between the start of the counterattack and its conclusion.

The second ANOVA, carried out to assess the differences in the use of the different indicators, does not display any significant differences (Appendix 9). When constructing the observation tool, the distinction between the different behaviours that teams and/or players may have at the time of loss the ball seemed judicious and essential. During defensive recovery, all teams opt in 53% of cases for a mixed attitude (“SPT”) (Figure 32). While Pots B and D have average usage percentages of "SPT" (53.74% and 52.75%, respectively, vs.

53.08%), Pots A and C stand out. Pot A having a higher percentage of use and Pot C having a lower percentage of use.

In the general analysis of defensive transitions, carried out by Casal et al. (2016), in 57.7% of cases, the teams opt to press when the is lost. However, the authors do not distinguish whether the defensive pressure is carried out by a single player, while the teammates are replacing, or by the whole team. Therefore, the results of our study are in line with those of Casal et al. (2016). Indeed, our indicator "SPT" can be interpreted as the persistent indicator of the study carried out by Casal et al. (2016). Despite the predominance of "SPT", it is observed that "EXP" occurs at 35.66%. This indicator is clearly carried by the pots B, C and D which display percentages higher than the average percentage of “EXP” (37.75%, 36.43% and 38.41%, respectively). Therefore, the Pot A, by its lower percentage of actuation, strongly impacts the average percentage of the indicator “EXP”.

With more sparse appearances, “PT” (11.26%) is mainly used by Pots A (14.65%) and C (12.85%). As demonstrated above, when Pots B, C and D follow a more or less equivalent trend, non-compliance with this trend, on the part of Pot A teams, can explain the significant differences between Pot A and the other Pots ($p<.001$ for Pot B and D, and $p=.024$ for Pot C) (Table 9). Appendix 1 presents all the results of the ANOVA test performed.

The Table 10 shows that "EXP" is significantly different from "SPT" ($p=.015$) and "PT" ($p<.001$) when comparing defensive approaches according to the quality of the teams. In addition, the Appendix 10 allows us to observe that "SPT" and "PT" are close to a significant difference between them ($p=.07$). Gonzalez-Rodenas et al. (2016) says that a defensive reaction to loss of ball is crucial in reducing the opponent’s scoring opportunities. For these authors, executing an initial defensive pressure is the key to reducing scoring opportunities. This decision must be made within the first three seconds of losing the ball. Vogelbein et al. (2014) specifies that the reaction time depends on the team's objectives when the ball is lost. Either it decides to press, or to replace herself. The author claims that the better teams take less time to retrieve the ball. His study leads to the conclusion that the time taken to recover the ball is an indicator of performance. However, in a more recent study, González-Rodenas et al. (2019) points out that offensive transitions without pressing at the loss of the ball promote offensive penetration, but the author says that doesn’t increase the number of scoring opportunities.

Figure 32. Descriptive analysis of the PTGD category according to team's quality.

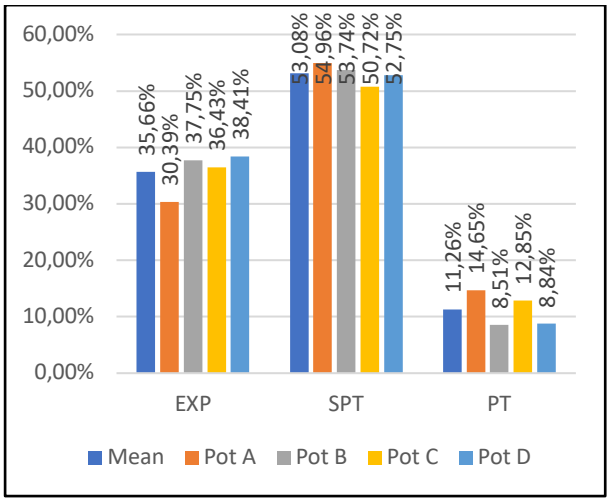


Table 9. Summary of the results of bivariate analysis of the "PTGD" category, by Pots.

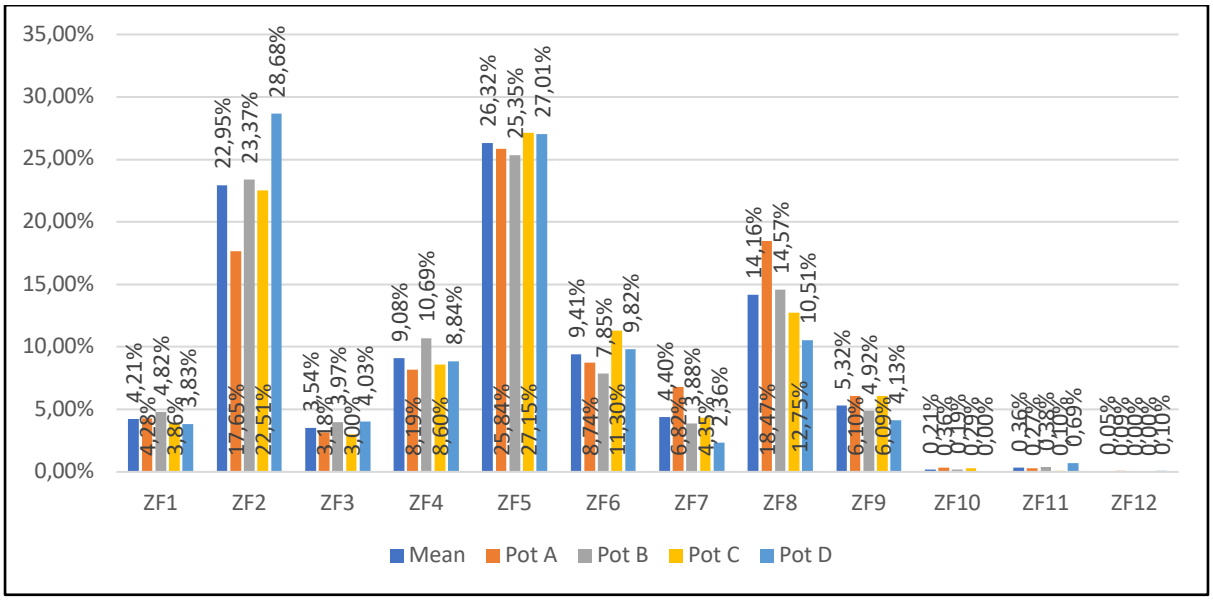
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.
PTGD	11.058	0	Pot A	Pot B	0
				Pot C	.024
				Pot D	0

Table 10. Summary of the results of bivariate analysis of the "PTGD" indicators, by Pots.

(I) PTGD	EXP	
(J) PTGD	SPT	PT
Sig.	.015	0

The defensive recoveries end in the central corridor in 63.43% of cases, where "ZF5" corresponds to the zone (26.32%), "ZF2" is the second zone (22.95%) and "ZF8" as the third zone (14.16%) with the highest average percentage of occurrence (table 33). These results are in line with by Barreira et Garganta (2007). The authors claim that the central corridor has supremacy over the side corridors. In addition, the authors emphasize that the teams reach the attacking sector of controlled form in 29% of cases. This is in line with the results observed in this sector ("ZF1" + "ZF2" + "ZF3" = 3.70%).

Figure 33. Descriptive analysis of the ZF category according to team's quality.



The Table 11 shows that "ZF2" is significantly different from "ZF7" (p<.001), "ZF8" (p<.001) and "ZF10" (p=.024). "ZF3" is significantly different from "ZF7" (p=.025). "ZF4" is significantly different from "ZF7" (p=.011). "ZF5" is significantly different from "ZF7" (p<.001) and "ZF8" (p<.001). Finally, "ZF6" is significantly different from "ZF7" (p<.001) and "ZF8" (p=.001). In addition, the Appendix 11 presents all the results of the ANOVA test which compares the zones at the end of the defensive transition. We also note that "ZF2" is close to a significant difference with "ZF5" (p=.084), "ZF4" is close to a significant difference with "ZF8" (p=.074). Just like Casal et al. (2016) the majority of defensive recoveries occur in "ZF5". However, the authors obtain a higher percentage (37.1%) than that obtained from the analysis of the results. However, this discrepancy seems logical given that the two studies do not observe defensive transitions in the same way. Indeed, the study by Casal et al. (2016) takes into account all the tactical intentions of the opponent to analyse defensive transitions.

Table 11. Summary of the results of bivariate analysis of the "ZF" indicators, by Pots.

(I) ZF	ZF2			ZF3	ZF4	ZF5		ZF6	
(J) ZF	ZF7	ZF8	ZF9	ZF7	ZF7	ZF7	ZF8	ZF7	ZF8
Sig.	0	0	.024	.025	.011	0	0	0	.001

The ANOVA test shows the existence of significant differences between the different Pots. Indeed, Pot A is statistically different from the other three Pots (p<.001 for Pot B and C, and p=.004 for Pot C), but we also observe a significant difference between Pot C and Pot D (p=.001) (Table 12). In addition, the difference is not significant, but Pot B and Pot D are close to a significant difference (p=.07) (Appendix 1).

Table 12. Summary of the results of bivariate analysis of the "ZF" category, by Pots.

Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.
ZF	17.688	0	Pot A	Pot B	0
				Pot C	.004
				Pot D	0
			Pot C	Pot D	.001

The four Pots revolve around the average percentage of "ZF5". However, Pots C and D have a higher percentage of occurrence than the average percentage of indicator, and vice versa for Pots A and B. Pot A is the only Pot with higher defensive recovery percentage in "ZF8" than in "ZF2". Pots B and C, whose trend is identical in "ZF2" and "ZF8", show a percentage of discount close to the average percentage of the two zones. In addition, within these two zones, Pot B is more active than Pot C. Pot D is two one with the most defensive recovery percentage in the same zone, "ZF2". We can also observe that this high percentage in "ZF2" is greater than the various percentages recorded in "ZF5" (zone with the highest average percentage of occurrence). The downside to this concentration of "ZF2", and the opposite of Pot A, is that the percentage of occurrence displayed in "ZF8" is similar to the percentages displayed in the side corridors.

When defensive recovery comes to an end in the side corridors, the teams favour "ZF4" (9.08%) and "ZF6" (9.41%). This trend is observed in particular for Pots B, C and D, which, once added ("ZF4" + "ZF6"), have occurrence percentages greater than "ZF8" and close to "ZF2" (18.54%, 19.9% and 18.66%, respectively). In the offensive midfield, we see that the trend of "ZF7" and "ZF9" is similar to "ZF8". That is, Pot A has a higher defensive recovery percentage than other Pots (12.92%). Pot D is the one with the lowest percentage among the four Pots (6.49%); While Pots B and C revolve around the average percentage of the two zones (8.80% and 10.44%, respectively, against 9.72% on average).

Like the results presented by Maleki et al. (2016) on the defensive organisation of the teams that have reached the semi-finals of the Nations World Cup, 2014 edition, the majority of ball recoveries take place in the two defensive sectors. It can be noted that defensive recoveries that end in the offensive sector ("ZF10", "ZF11" and "ZF12") are extremely rare (0.62%).

Figure 34 highlights the use of two primary play interactions when defensive recovery ends. The first is "FRA" (40.45%), mainly used by Pots B, C and D. The second is "FMM" (31.24%), within which we observe a percentage of use by Pot A (35,32%) slightly lower than that found in "FRA" (36.70%). That is, Pot A teams do not have a preference between "FRA" and "FMM" when it comes to achieving defensive recovery. On the other hand, the

Pot D teams are distinguished by their use of “FMM” which is reflected in the use of “FPA”. Indeed, the percentage of use of “FPA” is higher than that of the average of the indicator (18.28% against 13.86%). “FMA” is the fourth and last “regular” game interaction in terms of average usage percentage (10.01%). We noted that Pot A (11.28%) stands out more than Pot D (8.58%). We notice, through the Table 13 and the Appendix 1, that once again Pot A is statistically different from the other three Pots (p=.013 for Pot B, p=.014 for Pot C, and p<.001 for Pot D). These statistics support the descriptive analysis carried out beforehand.

Figure 34. Descriptive analysis of the CEIF category according to team’s quality.

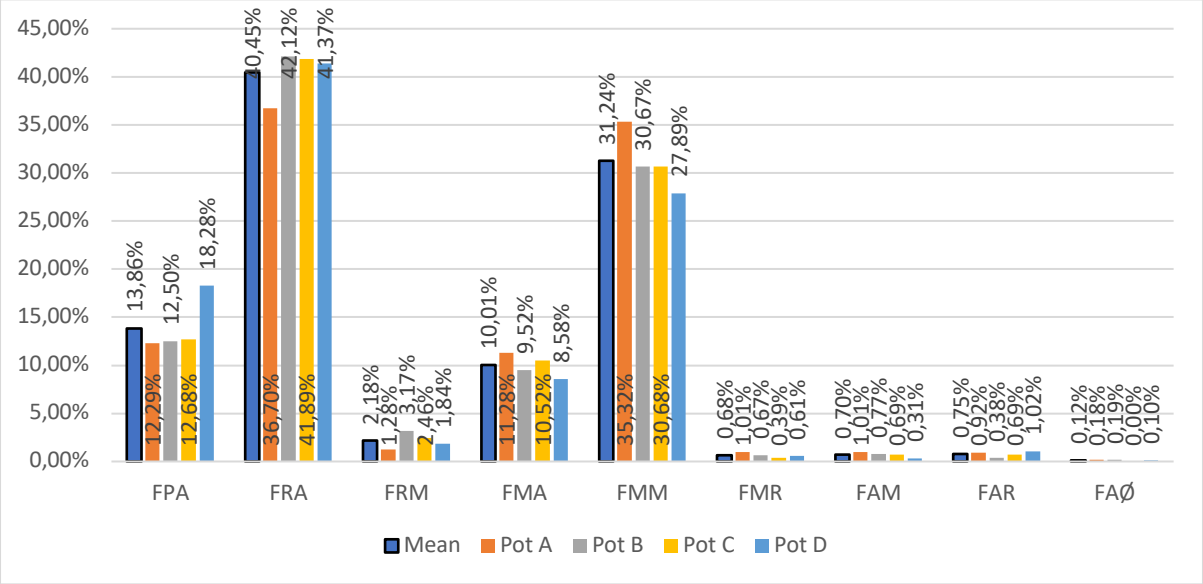


Table 13. Summary of the results of bivariate analysis of the "CEIF" category, by Pots.

Dependent Variable	F	Sig.	(I) Team’s Quality	(J) Team’s Quality	Sig.
CEIF	9.506	0	Pot A	Pot B	.013
				Pot C	.014
				Pot D	0

Regarding the statistical differences that may exist between the different areas, the Appendix 12 and the Table 14 shows the existence of significant differences between “FPA” with “FMA” (p=.016) and “FMM” (p<.001), and between “FRA” and “FMM” (p=.033). Thus, we realize that depending on the quality of the team, the defensive transition will not over in the same areas. Based on Figure 34, as seen above, it is possible to assume that the difference between "FPA" and "FMA" relates to Pot D with the other three Pots, while the difference between “FPA” and “FMM” only concerns Pot D and Pot A. Finally, the difference displayed between "FRA" and "FMM" certainly concerns Pot A and the other three Pots.

Table 14. Summary of the results of bivariate analysis of the "CEIF" indicators, by Pots.

(I) CEIF	FPA		FRA
(J) CEIF	FMA	FMM	FMM
Sig.	.016	0	.033

The other game interactions (“FRM”, “FMR”, “FAM”, “FAR” and “FAØ”) appear occasionally during the match (ranging from 0.12% for “FAØ” up to 2.18% for “FRM”). For the more offensive game interactions (“FMR”, “FAR” and “FAØ”), Pot A stands out a little more than the others do. This is also the reverse in the context of more defensive game interactions (“FRM”) where Pot A is lower than the three Pots. Thus, Pot A teams seem more conducive to defending with a team block positioned high on the field. Pots B and C teams adapt to the situation, that is, these teams can just as easily use a high, middle or low team block depending on the context of the defensive recovery. Pot D teams seem to focus on a defensive recovery with a low team block.

The recent study by Maneiro et al. (2019), on the differences in regularities and practices in the execution of offensive transitions between the 2008 and 2016 editions of the European Nations Championships, demonstrates a 15% increases in “ARF” interaction (“FRA” in this study) coupled with a decrease in “MMF” (“FMM” in this study). The results of this study do not allows us to verify whether the changes observed by Maneiro et al. (2019) are consistent. However, the authors argue that this change in the final interaction context, in the 2016 edition, stems from the change in tactical intentions that pass a balance between conservation and counterattack (which favours “FMM” interaction) to an imbalance in favour of the counterattack. As observed in this study, the final interaction “FRA” is the most exploited to deal with counterattacks. This is in line with other studies (Casal, 2011; Casal et al., 2016; Maneiro et al., 2019). Indeed, Casal (2011) established that offensive transitions ends with the line of midfielders, or attackers, facing the back line and/or midfielders of the opposing team (“FRA”, “FRM” or “FMM”). Casal et al. (2016) when describing defensive transitions, admit that 48.4% of defensive transitions and with the back line facing the opponent’s attacking line. The percentage of occurrence is higher than that observed in this study. However, we note that the main interaction remains “FRA”. Maneiro et al. (2019) also note an increase in the final interactions “AMF” and “AØF” (“FMA” and “FAØ” in this study) for the 2016 edition. However, the percentages of occurrences of these interactions are similar to those observed in this study. Being “offensive” interactions, this is consistent with the point raised about tactical intentions and particularly the intention to counterattack opposing defense is out of balance.

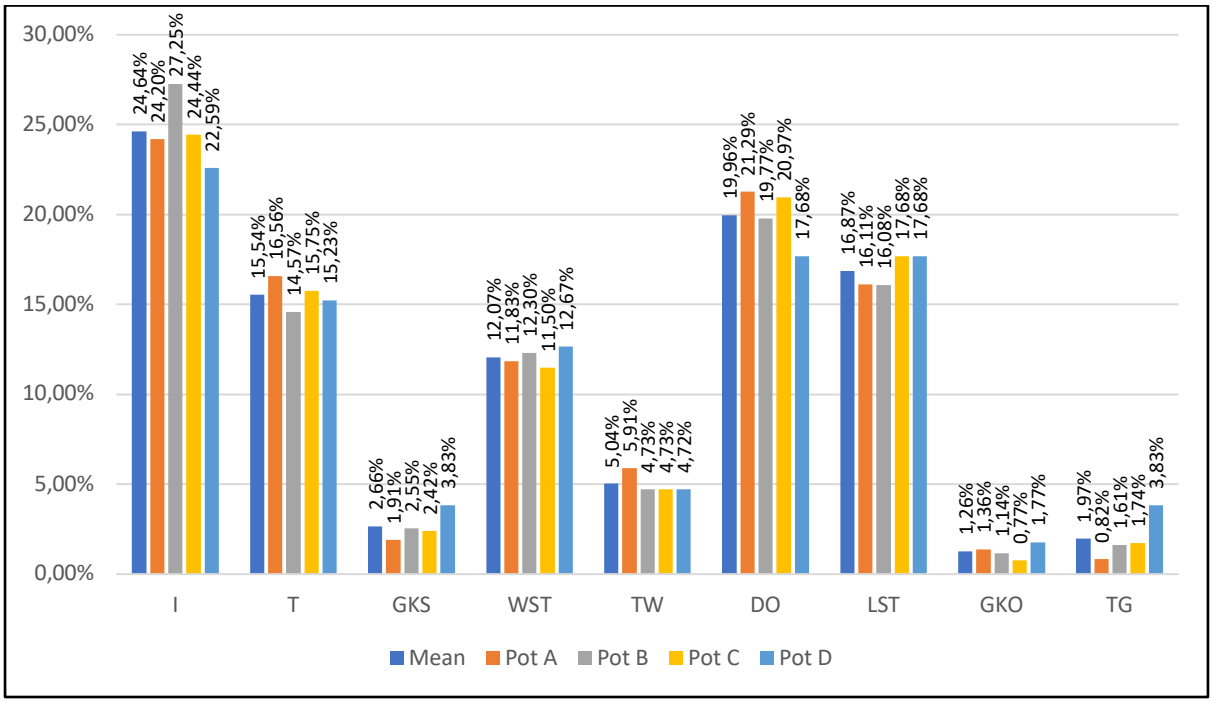
The Figure 35 shows that defensive recoveries mostly end through interceptions (“I”, 24.64%). Indicator in which two Pots stand out: Pot B (27.25%) and Pot D (22.59). In the

range of occurrence going from 15% to 20%, we can note the presence of three indicators. However, each of them transmits different information:

- In 19.96% of cases, teams regain defensive balance but do not recover the ball (“DO”). This indicator is supported by Pots A (21.29%) and C (20.97%), while Pot D is less represented (17.68%);
- In 16,87% of cases, play is stopped, and the ball is not recovered for the next action (“LST”). This happens in particular with Pots C (17.68%) and D (17.68%), unlike Pots A (16.11%) and B (16.08%); and
- In 15.54% of cases, teams recover the ball with a tackle (“T”). Pot A is the one with the most occurrence in this indicator (16.56%) unlike Pot B (14.57%).

Defensive recoveries ending with the ball recovery after an interruption of the game (“WST”) are in the order of 12.07%.

Figure 35. Descriptive analysis of the RR category according to team’s quality.



It should be noted that the ANOVA test does not show a significant difference for the “RR” category (Appendix 1 and Appendix 2). Despite this, when looking at the multiple comparisons (Appendix 1), Pot B and D are close to being statistically different (p=.078). Indeed, the Figure 35 makes it possible to realize that Pots B and D are opposed on the various indicators, which have been previously described. Therefore, it is quite possible that in order to be significantly different, the remaining indicators should be favoured (for example, with more recovery of the ball in "TW" for Pot B) or avoided (less "GKO" for Pot B, like Pot C).

The other indicators constituting the “RR” category have a percentage of use less than or equal to 5%. “TW” is the closest indicator to 5% (5.04%). While Pots B, C and D are below 5% (4.73%, 4.73% and 4.72%, respectively), Pot A recovers “lost” balls on the field in 5.91% of cases. Regarding "GKS", "GKO" and "TG", we observe that the Pot D is systematically above the average percentage of each of the indicators (3.83%, 1.77% and 3.83%, respectively, versus 2.66%, 1.26% and 1.97%, respectively). We can conclude that the goalkeepers of the Pot D teams are called upon more regularly. Despite the fact that Pot A is the second Pot with the most “GKO” occurrences, it remains the one whose goalkeepers are least stressed (4.09% against 5.30% for Pot B, 4.93% for Pot C and 9.43% for Pot D). The results observed for the indicators, directly related to the opportunities to score, follow a dynamic similar to that presented by Hughes et Lovell (2019). However, when these authors conclude that 12.64% of offensive transitions produce scoring opportunities, the results of this study show only 9.43%. The gap is less obvious, and the situation is reversed concerning the percentage of goals scored (1.10% against the 3.83% in this study). It is possible that these differences are influenced by the dimensions, as well as the quality of the samples from each study. Indeed, Hughes et Lovell (2019) studied the knockout phase of the Champions League, which mainly brings together teams from Pots A and B, while the sample of this study has another richness, with the presence of a fair number of teams from the different Pots. Barreira et Garganta (2007) resulted in a total of 17% of shots, out of the 240 offensive transitions analysed. Of this percentage, only 5% of shots are on target and 0.7% end with a goal.

The Appendix 13, dealing with the analysis of multiple comparisons, allows us to admit that there are no other significant differences than those between the different indicators and "TG". However, two exceptions exist: between "TG" and "GKO", as well as between "TG" and "GKS" for which there are no significant differences. These two exceptions are most certainly influenced by the proximity of the two indicators to “TG”. Indeed, all three indicators require the intervention of the goalkeeper. That said, the Appendix 13 and Table 15 shows that the other indicators are significantly different from "TG": $p<.001$ for "I"; $p<.001$ for "T"; $p=.001$ for "WST"; $p<.001$ for "TW"; $p<.001$ for "OD"; and $p=.001$ for "LST".

The results presented do not support the study of Casal et al. (2016) on defensive transitions. Unlike authors who argue that 57.2% of defensive transitions end without recovery of the ball, the results show that 42.43% of the actions analysed end without recovery of the ball or defensive balance (“DO”, “LST”, “GKO” or “TG”). This fact can be explained by the objectives pursued by each of the two studies, as well as the indicators used to analyse the result of each defensive transition.

Table 15. Summary of the results of bivariate analysis of the "RR" indicators, by Pots.

(I) RR	TG					
(J) RR	I	T	WST	TW	DO	LST
Sig.	0	0	.001	0	0	.001

3. Analysis of indicator categories according to the status of the match

When we replace the quality of the teams with the match status factor within the ANOVA (Appendix 1), we see that the categories react differently. Indeed, these are the categories "CEII", "TLP", “TM”, "PS", "PTGD", "ZF" and "CEIF" which show significant differences between the three statuses ("W", "D" and "L"). The differences between the categories are as follows: F(2, 4206) = 11.838; p<.001 (for "CEII"); F(2, 4206) = 3.253; p=.039 (for "TLP"); F(5, 4203) = 3.44; p=.004 (for “TM”); F(2, 4206) = 377.269; p<.001 (for "PS"); F(2, 4206) = 4.196; p=.015 (for "PTGD"); F(2, 4206) = 8.199; p<.001 (for "ZF"); F(2, 4206) = 7.949; p<.001 (for “CEIF”).

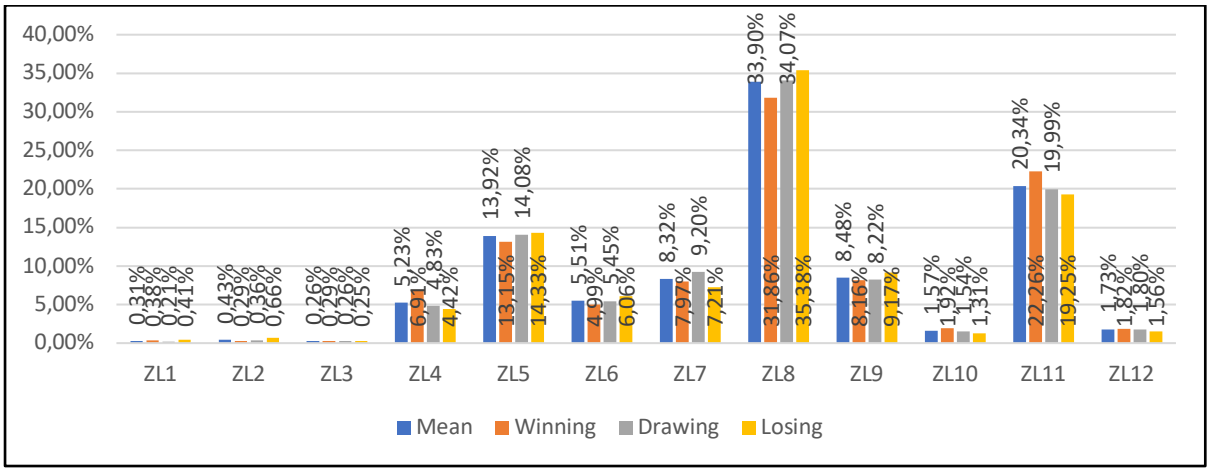
We observe in the column dedicated to the dependent variable Status of the match, in the Appendix 2, that these are the categories “CEII” (F(8, 4200) = 3.58; p<.001), “TLP” (F(2, 4206) = 7.504; p=.001), "TM" (F(5, 4203) = 3.44; p=.004), "PTGD" (F(2, 4206) = 6.998; p=.001), "ZF" (F(11, 4197) = 1.861; p=.04), "CEIF" (F(8, 4117) = 3.144; p=.001) and “RR” (F(8, 4200) = 4.103; p<.001) which display significant differences between each of their indicators. We also note that once again, the "TEDA" category is not significantly different (F(3, 4205) = 2.475; p=.06), but the results obtained are close to showing a significant difference. Finally, the "TEDAP" category does not show a significant difference.

When we observe the zones of loss of ball through the prism of the status of the match (Figure 36), it is possible to note, for all the indicators, that the percentages of occurrence of Drawing are more or less equivalent to the average percentages of each indicator. A slight exception is made in “ZL7”, which is the only zone with a percentage above the indicator average, but also the other two match statutes.

These results support those presented by Gómez et al. (2012), who found that ball recovery performance when the two teams are tied is closer to performance when the team is losing than when the team is winning. However, according to the results, this is mostly true only for the central corridor. Indeed, when we observe the lateral zones (“ZL6”, “ZL7”, “ZL9” and “ZL12”) the trend dissipates. Figure 36 also indicates that the losing teams are dispossessed of the ball, with more frequency than the winning teams, in the central corridor ("ZL5" and "ZL8") and the right corridor ("ZL6" and "ZL9"). Conversely, winning teams initiate

their defensive recoveries more frequently than losing teams, in the left lane ("ZL4" and "ZL7") and the offensive sector ("ZL10", "ZL11" and "ZL12").

Figure 36. Descriptive analysis of the ZL category according to Match Status.

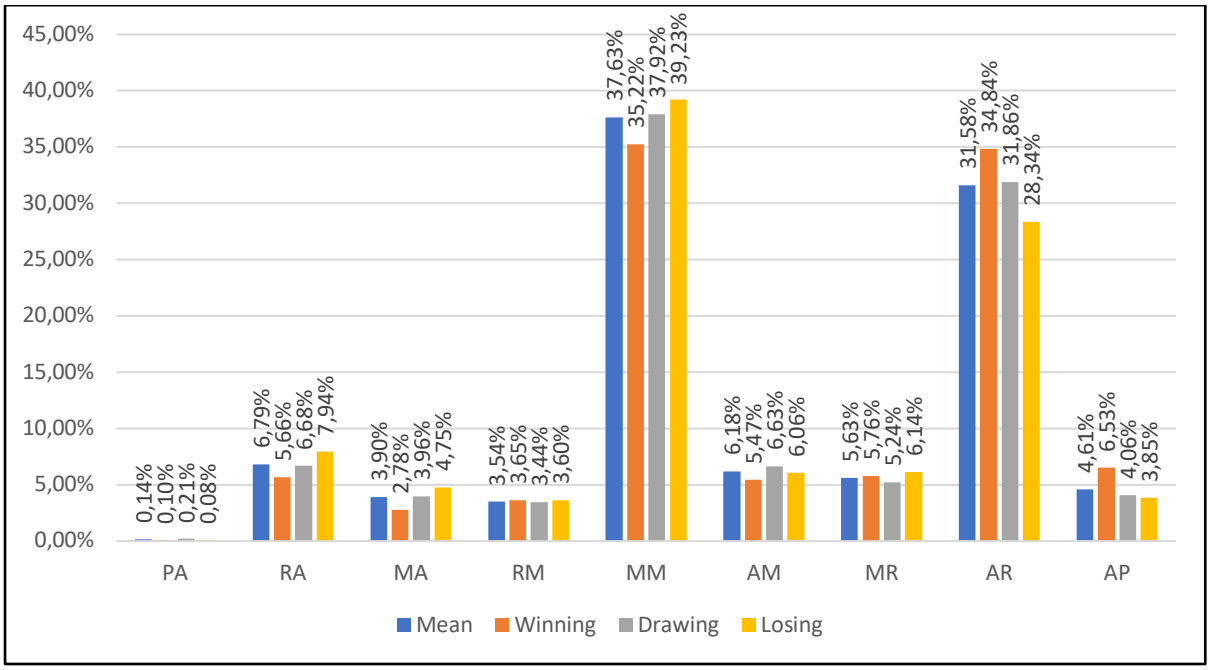


The finding of Almeida et al. (2014) appears in the results of the study. Indeed, according to the authors, losing teams defend in more advanced zones on the field. The results, presented here, show a similar trend, but with offensive transitions that are initiated mostly in the defensive sectors (of the opponent), which suggests that the teams prefer to regroup in defense and collect the ball collectively. However, compared to “ZL5”, “ZL8” and “ZL11”, losing teams are more active in “ZL5” and “ZL8”, while the winning teams are more active in “ZL11”.

The two ANOVA tests (Appendix 1 – Appendix 3) carried out do not show any significant differences between the various match statuses or the various areas where the ball was lost. Indeed, as can be seen in Figure 36, no match status really shines with regard to the ball loss zone.

Figure 37 shows that winning teams lose the ball more frequently in so-called offensive interactions (“AR” and “AP”). On the contrary, when they are losing, the game interactions that lead to a loss of the ball are median and defensive ("RA", "MA", "RM", "MM", "AM" and "MR"). These two observations are perhaps due to the quality of teams. That is to say that the winning teams are of better quality and dictate the game by imposing their game pattern despite the alteration of the variables during the match (evolving score). The losing teams suffer from the opponent’s play, probably because of lower quality (Lago-Peñas et Dellal, 2010).

Figure 37. Descriptive analysis of the CEII category according to Match Status.



The justification given by the two authors takes on a more important dimension in view of the results presented in the Appendix 1 and the Table 16. Indeed, it is observed there that “W” is significantly different from “D” (p=.003) and “L” (p<.001). Therefore, two hypotheses can be put forward. The first assumption is that the winning teams have a better percentage of ball possession and prepare their attacks from the back lines (goalkeeper and defenders) to the front lines of the team (forwards). Ball loss occurs during the transmission to the attacker. The second hypothesis is that the teams in the process of winning, to limit risk taking, use a denser offensive cover, and make an offensive play, which takes advantage of the spaces left free behind the opposing defense.

Table 16. Summary of the results of bivariate analysis of the "CEII" category, by Match Status.

Dependent Variable	F	Sig.	(I) Match Status	(J) Match Status	Sig.
CEII	11.838	0	W	D	.003
				L	0

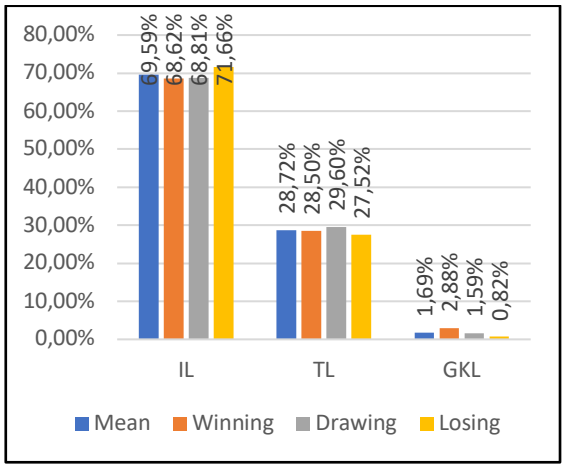
The Appendix 4 and the Table 17 allows to realize that the game interactions that show significant differences are "RA" with "AP" (p=.012); "MA" with "AR" (p=.045) and "AP" (p=.007); as well as “MM” with “AP” (p=.035). We can add that "RA" and "AR" (p=.057) as well as "MM" and "AR" (p=.055) are very close to being significantly different. Figure 37 allows us to highlight that all the differences that exist are certainly, because the losing’ teams lose the ball more regularly than those in the process of winning by "RA", "MA" or "MM", and vice versa for the indicators "AP" and "AR".

Table 17. Summary of the results of bivariate analysis of the "CEII" indicators, by Match Status.

(I) CEII	RA	MA		MM
(J) CEII	AP	AR	AP	AP
Sig.	.012	.045	.007	.035

Figure 38 shows that the teams losing are also the teams that lose ball most through the indicator “IL” (71.66%). This can be explained by the fact that losing teams opt for riskier ball transmissions with the objective of coming back to score. This data influences “TL” indicator, for which we observe that losing teams have less ball loss (27.52%). In addition, it can be noted that it is in a situation of equality that teams use “TL” more frequently (29.60%).

Figure 38. Descriptive analysis of the TLP category according to Match Status.



Based on Appendix 1 and Table 18, we notice that only the "W" status is significantly different from the "L" status (p=.042). This observation can be justified, through Figure 38, by the fact that losing teams more frequently lose the ball through "IL", while within "GKL" it is the winning teams that lose the ball the most.

Table 18. Summary of the results of bivariate analysis of the "TLP" category, by Match Status.

Dependent Variable	F	Sig.	(I) Match Status	(J) Match Status	Sig.
TLP	3.253	.039	W	L	.042

Appendix 5 and Table 18 show that the “TLP” indicators show significant differences only between “GKL” and the other two indicators (“IL”, p<.001; and “TL”, p=.001). The difference between "GKL" and "IL" can be explained by the predominance of losing teams within the "IL" indicator and a very low occurrence of the latter within the "GKL" indicator. Regarding "TL", it is possible that the difference is due to the homogeneity of the occurrence

percentages between the three statuses of the match, while this homogeneity does not exist within "GKL".

Table 19. Summary of the results of bivariate analysis of the "TLP" indicators, by Match Status.

(I) TLP	GKL	
(J) TLP	IL	TL
Sig.	0	.001

In light of previous information, it is not surprising to observe that winning teams use “GKL” 3.5 times more than losing teams (2.88% vs. 0.82%, respectively). Indeed, if losing teams more regularly achieve long balls in depth, on the ground or in the air, it is completely understandable that the goalkeeper is more stressed.

Figure 39 shows that whatever the status of the match, the three statuses follow the same trend. Namely: Around 63% for the "PL" indicator; About 32% for the "AZ" indicator; and About 5% for the "RPL" indicator. This trend explains the lack of significant differences between match statuses and indicators belonging to the “PS” category (Appendix 1, Appendix 2 and Appendix 7).

Figure 39. Descriptive analysis of the PS category according to Match Status.

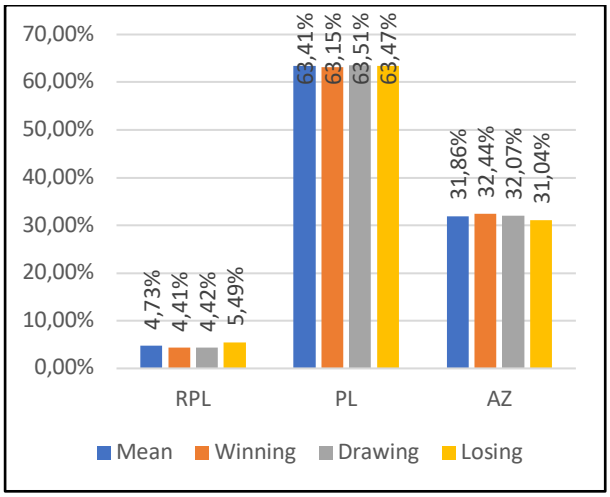


Figure 40 indicates that the percentage of occurrence of the "tied" match status decreases as the match progresses. This means that one of the two teams took a power-play advantage over the other team. Thus, this observation may explain the results presented in the Appendix 1 and the Table 20. The decrease in the Drawing status and the growth in the other two statuses may justify the fact that the “D” status displays significant differences with the other two statuses ($p<.001$ for “W” and “L”). However, it is possible to observe that the defensive recovery percentage in a tie-scoring situation stabilizes at “T-75” and “T-90” (1.07% and 9.92%, respectively). Which may indicate that once entering these two-time indicators, teams lose less of the ball, possibly for the sake of not conceding a goal.

Figure 40. Descriptive analysis of the TM category according to Match Status.

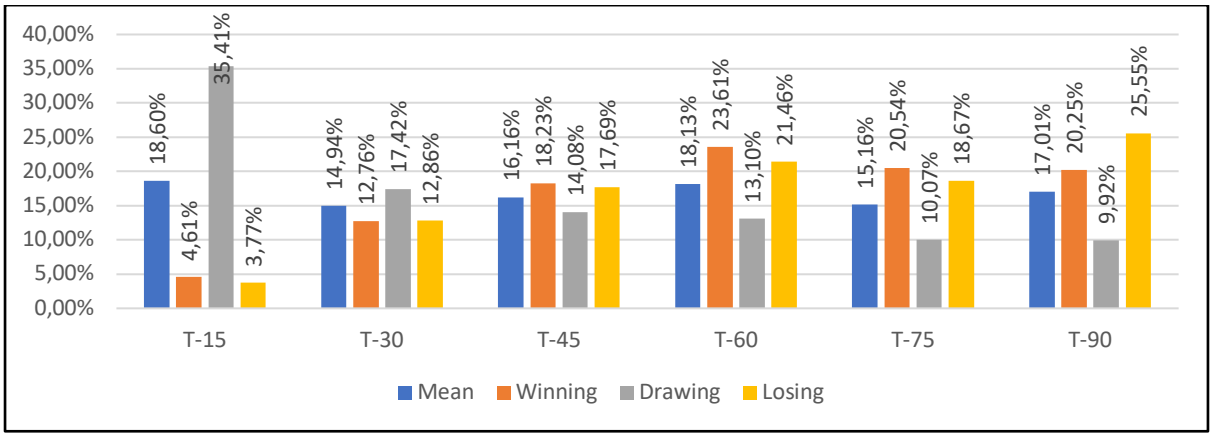


Table 20. Summary of the results of bivariate analysis of the "TM" category, by Match Status.

Dependent Variable	F	Sig.	(I) Match Status	(J) Match Status	Sig.
TM	377.269	0	D	W	0
				L	0

Conversely to the decrease in the “tie” match status, there is an increase in defensive recoveries when teams are winning, but also losing. In addition, the distribution is somewhat balanced over the first half. This leads to the assumption that this balance is due to the time available to stay ahead of the score, or come back, during the second half. It is also possible to argue that the earlier the scoring imbalance appears in the game, the longer winning team will have to defend their lead. Conversely, the losing team will have more time available to come back to score (García-Rubio et al., 2015).

However, the results show that this balance is broken as early as "T-60" with the increase in the percentage of occurrence of defensive recoveries for winning teams compared to losing ones. In addition, this imbalance is maintained in “T-75” (difference of 2.15% in “T-60” and, of 1.87% in “T-75”). This finding can be explained by the fact that losing teams are more active in recovery the ball and therefore more frequently encourage winning teams to make a mistake.

Appendix 6 and Table 21 show that "T-90" is significantly different from "T-15" (p=.002), "T-60" (p=.02) and "T-75" (p=.033). For "T-15", it is more than likely that the difference is due to a very low proportion of scoring imbalance and a very high proportion of equality in scoring, when compared to "T-90". However, this justification cannot be used for "T-65" and "T-70". Indeed, the difference is most certainly linked to the fact that the imbalance is completely reversed (in "T-90") with a strong increase in the losses of balls when the teams are losing, while winning teams maintain more or less the same percentages as in "T-75". The gap goes to 5.30% in favour of losing teams. This can be

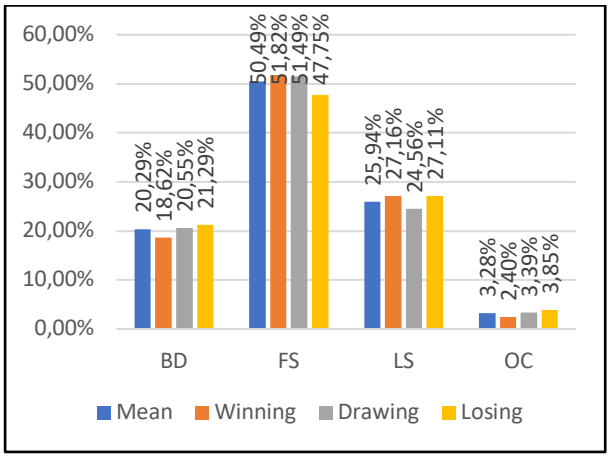
explained by the implementation of more defensive tactics on the part of the winning teams due to the proximity of the end of the match, combined with an increase in risk-taking by losing teams to try to come back to the score. In addition, Lago-Peñas et Dellal (2010) explain in their study that losing teams have superior ball possession compared to when the “Drawing” status predominated. This also provides a rationale for increasing the frequency of occurrence of "T-90" defensive recoveries for losing teams.

Table 21. Summary of the results of bivariate analysis of the "TM" indicators, by Match Status.

(I) TM		T-90	
(J) TM	T-15	T-60	T-75
Sig.	.002	.02	.033

Figure 41 highlights that winning teams, but also in the event of a tie between the two teams, suffer “FS” more frequently than losing teams. This finding suggests that the losing status favours the "FS" option, in particular to take advantage of the effect to imbalance caused by the loss of the ball. For their part, losing teams must react more frequently than winning to “BD”. In a tie situation, the frequency of occurrence of “BD” does not differ from other match statuses. It is in the middle of the two, and close to the average of the indicator. This finding reappears for the “OC” indicator.

Figure 41. Descriptive analysis of the TEDA category according to Match Status.

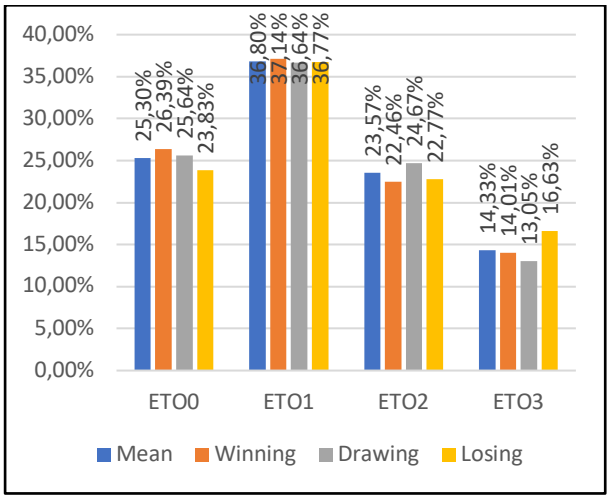


Ultimately, whether teams win or lose, they use the “LS” indicator with more or less the same frequency. This observation is less true for the drawing status. This leads to the assumption that a (dis)advantage in the score causes the teams to keep the ball, either to defend with the ball by depriving the opponent of the ball so that he cannot attack, or to keep the ball looking for an imbalance in another field’s zone. Despite the details and description given in Figure 41, neither of the two ANOVA tests found a significant difference between match statuses or indicators in the "TEDA" category (Appendix 1, Appendix 2 and Appendix 8).

Figure 42 shows that teams mostly opt for “ETO1” with more or less equivalent use percentages regardless of match status. It may be noted that winning teams must react, more frequently than losing teams, to “ETO0”. This finding can be explained in two ways. The first concerns the losing team. When the player recovers the ball, he chooses an individual solution. While in the second case, the player who collects the ball chooses to pass the ball, but it does not reach its target, either because of the density in the bale recovery area, either because the pass performed is imprecise or its high level of difficulty.

Conversely, with "ETO3", we observe that the losing teams - more frequently than winning teams or in the case of a tie in score, must implement more complex defensive tactics due to number of players involved in the opposing attack. This fact can be explained by the desire of winning teams or in a tie, to hold the ball or to seek imbalance in a zone with less density. When we focus on “ETO2”, we notice that teams use this indicator mainly when the match status is “Drawing”. Again, neither of the two ANOVA tests found a significant difference between match statuses or indicators in the “TEDAP” category (Appendix 1, Appendix 2 and Appendix 8).

Figure 42. Descriptive analysis of the TEDAP category according to Match Status.



The comparison of defensive approaches according to match statuses, allows us to note that the only significant difference is located between "EXP" and "SPT" (p=.001) (Appendix 10 and Table 22).

Table 22. Summary of the results of bivariate analysis of the "PTGD" indicators, by Match Status.

(I) PTGD	EXP
(J) PTGD	SPT
Sig.	.001

The Figure 43 highlights that winning teams more regularly opt for “SPT” (56.72%) than losing teams (49.39%). In the event of a tie, the percentage of use “SPT” is close to the average percentage of the indicator. The trend is reversed when looking at “EXP” indicator. Indeed, the teams in the process of winning choose less for this indicator (32.63%) than the teams in the process of losing (39.72%). Again, being tied with the opponent creates a balance between the two teams in the percentage of use “EXP”. Analysis of "PT" shows that the percentages of each match status are more or less equivalent to each other and, therefore with average percentage of the indicator: 11.26% average; 10.65% when winning; 11.82% in case of a tie; and 10.89% when losing.

Almeida et al. (2014) argue that evolution of the score affects defensive performance. According to their study, when a so-called “weak” team is winning, that team decide to wait for the opponent’s mistake to get the ball back. In contrast, so-called “strong” teams are proactive in ball recovery. That is, they push the opponent to make mistakes. This study can serve as a complement to the results pointed out by these authors. Indeed, "L" indicator is statistically different from "W" at p=.03, but also from "D" with p=.031 (Appendix 1 and Table 23). When a losing team suffers a fast counterattack or attack, it more often opts for a defensive retreat and the search for density between the ball and the goal cage to defend. On the other hand, winning teams divide defensive tasks. That is, the player closest to the opponent's ball carrier is pressing, probably to push the opponent into error, while his teammates reposition themselves according to the game context.

Figure 43. Descriptive analysis of the PTGD category according to Match Status.

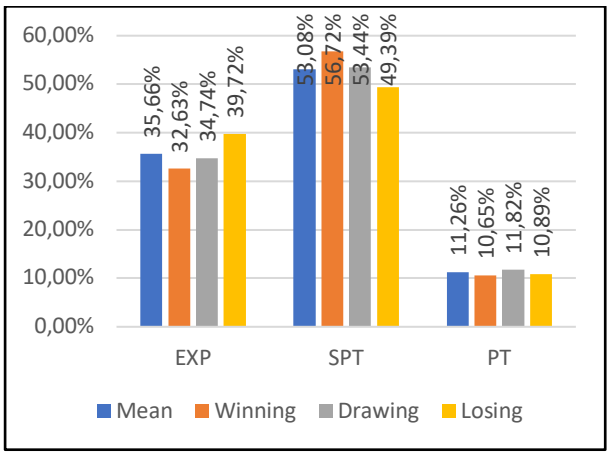


Table 23. Summary of the results of bivariate analysis of the "PTGD" category, by Match Status.

Dependent Variable	F	Sig.	(I) Match Status	(J) Match Status	Sig.
PTGD	4.196	.015	L	W	.03
				D	.031

We can see, in Figure 44, that it is possible to divide the central corridor into two sectors. When teams are losing, their defensive recoveries mostly take place in the defensive sectors (26.70% in “ZF2” and, 27.52% in “ZF5”). The observation is the same for teams in the process of winning, or in tie, but with lower percentages of occurrence in "ZF2" and "ZF5": (21.40% and 25.72%, for the “Winning” status, respectively, and 21.43% and 25.90% for the “Drawing” status, respectively), while the trend is reversed in "ZF8" (14.40% when the team is winning, 15.67% if the score is tied, and 11.55% when the team is losing). The fact that losing teams have such a high percentage of occurrence in the defensive sectors may explain the evolution of score during the match. In addition, this may explain the results, presented by the Appendix 1 and the Table 24. Which show "L" indicator which is significantly different from the other two indicators (p=.031 for "W" and p<.001 for "D"). Indeed, if the teams defend regularly in “ZF2”, it is possible to imagine that not all defensive recoveries end positively for losing teams.

Figure 44. Descriptive analysis of the ZF category according to Match Status.

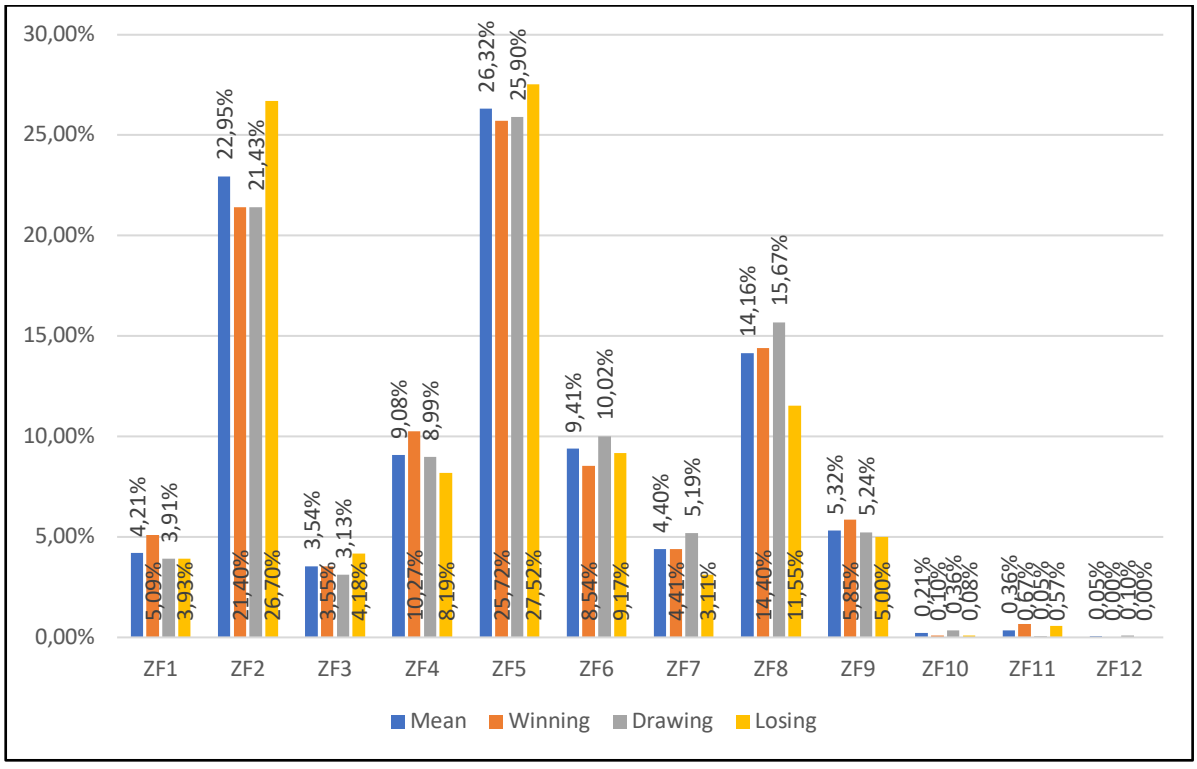


Table 24. Summary of the results of bivariate analysis of the "ZF" category, by Match Status.

Dependent Variable	F	Sig.	(I) Match Status	(J) Match Status	Sig.
ZF	8.199	0	L	W	.031
				D	0

We observe that defensives zones of left corridor (“ZF1” and “ZF4”) are zones in which winning teams end defensive recovery with a higher percentage of occurrence than other statuses. "ZF7" and "ZF9" are zones with a percentage of occurrence of defensive end recovery mostly in favour of winning teams and when both teams are tied (10.26% and 10.43%, respectively, versus 8.11% for losing teams). In “ZF3”, the trend is in favour of losing teams. While in “ZF6”, the highest defensive end recovery percentage reverts to “Drawing” status. It turns out that the Figure 44 provides several details and information, which added to the ANOVA test allows to justify the results displayed in Appendix 2. Indeed, ANOVA shows that the indicators in the "ZF" category have differences between them (F (11, 4197) = 1.861; p=.04). However, multiple comparisons do not show any significant differences. The two areas closest to showing a significant difference are "ZF2" and "ZF8" (p=.063) (Appendix 11).

Figure 45. Descriptive analysis of the CEIF category according to Match Status.

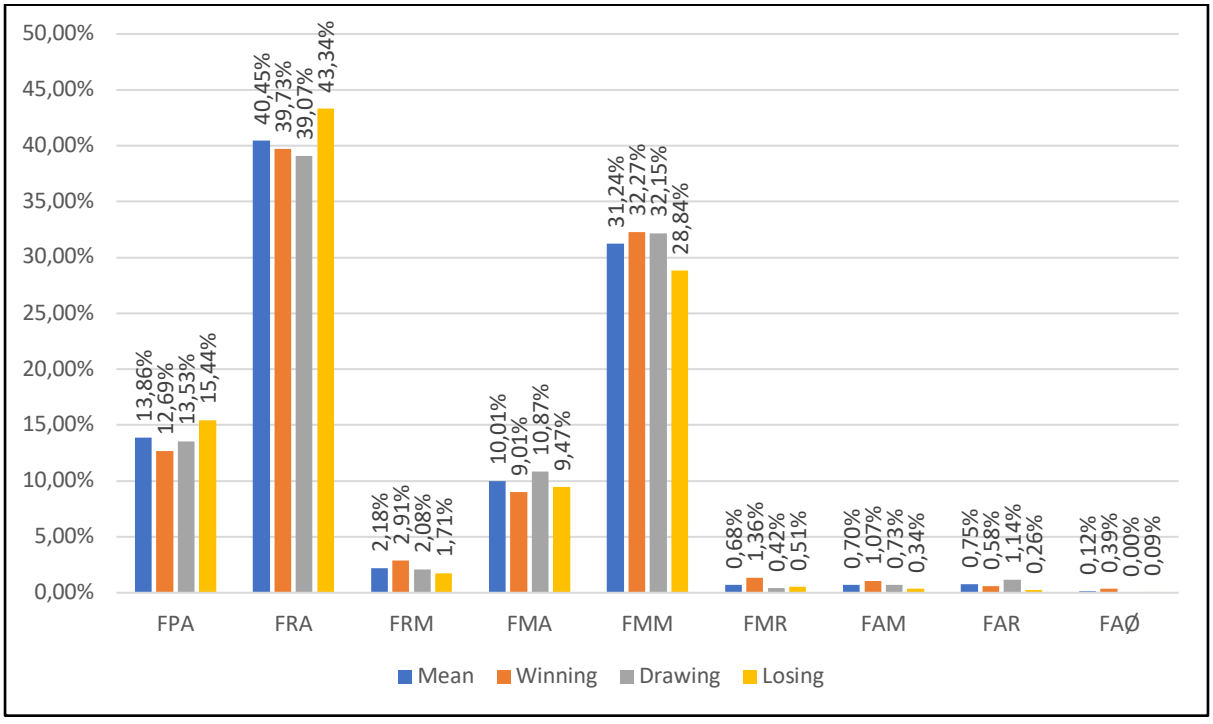


Figure 45 demonstrates that most defensive game interactions have a stronger connection to losing teams when it comes to ending defensive recovery (“FPA” and “FRA”). Conversely, more offensive game’ interactions have a closer connection to winning teams ("FRM", "FMR", "FAM" and "FAØ"). These two observations are likely to reflect the playing

intentions of teams in confrontation. That is, winning teams seek to impose their game, while losing teams suffer the game. In addition, "L" indicator shows significant differences with the other indicators (p=.001 for "W" and "D") (Appendix 1 and Table 25). “FMM” interaction, which can be seen as a balance between two teams, is found as much in winning teams as in the status quo between two teams. Losing teams show some difficulty regaining defensive balance after losing the ball. Despite everything, it is possible that the difference between "L" status and other statuses is linked to the fact that the statuses "W" and "D" follow a more or less equivalent trend, while “L” status stands out from this trend.

Table 25. Summary of the results of bivariate analysis of the "CEIF" category, by Match Status.

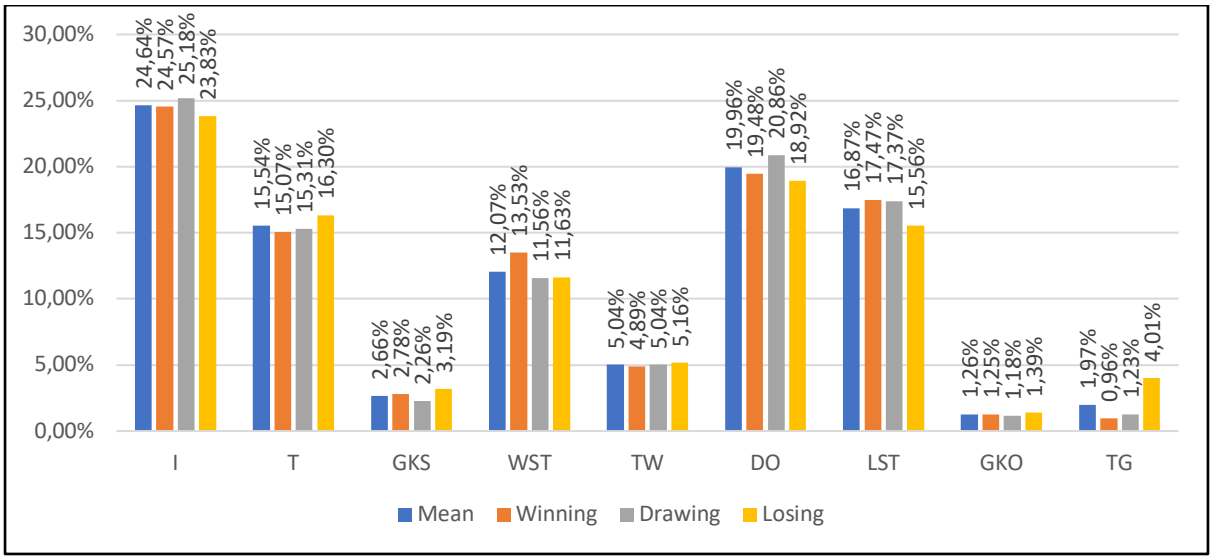
Dependent Variable	F	Sig.	(I) Match Status	(J) Match Status	Sig.
CEIF	7.949	0	L	W	.001
				D	.001

However, two exceptions exist. One in defensive play interactions ("FMA") and the other in offensive play interactions ("FAR"). In fact, these two interactions are found more frequently in event of a tie score rather than in event of score’s inequality. The exception for "FMA" interaction can originate from either an offensive transition with objective of retaining the ball, allowing the middle line to fall; Either the team which lost the ball is not in attacking phase involving risk taking towards the opposing goal cage. In case of "FAR" interaction, being a rare game setup in the context of a counterattack or a fast attack, it is likely that it is due to some particular playing context which is mostly found in the event of a tie.

Again, ANOVA test shows that the indicators in the "ZF" category have differences between them (F (8, 4117) = 3.144; p=.001) (Appendix 2). However, multiple comparisons do not show any significant differences (Appendix 12). Of the two indicators that characterize a ball recovery in play (“I” and “T”), regardless match status, teams more frequently opt for indicator “I” (Figure 46). However, we observe that this indicator is used more in event of a tie score than in case of score’s inequality. Regarding indicator “T”, we note that it is mainly losing teams that choose this option. This may be because teams/players are active and put pressure on opponent while retrieving the ball.

Winning teams are observed to end defensive recovery more frequently through stoppage of play ("WST" and "LST") than losing teams. This can be explained by an increased number of faults, but also an increase in the number of corners suffered, or throw-in by the goalkeeper. However, in situation of “LST” indicator and a tie score, the dynamics appear to be equivalent to that winning teams.

Figure 46. Descriptive analysis of the RR category according to Match Status.



Note than “DO” indicator, which is the second most frequent indicator when it comes to ending defensive recovery, has a dynamic similar to that “I” indicator. That is, defensive recovery is observed more in event of a tie score than a score’s inequality. Whatever match status, goalkeeper has an important role, in particular through the solicitation in case of winning or losing statuses. In addition, we note that losing teams concede four times more goals than winning teams (4.01% vs. 0.96%, respectively).

As can be seen from the descriptive analysis done above, no match status seems to stand out above the rest. In line with Appendix 1, it therefore seems logical that the ANOVA test does not show a significant difference between the different match statuses. However, while the match statuses do not show any differences, this is not the case for the different indicators of the "RR" category. Indeed, all the indicators are significantly different from “TG” (Appendix 13 and Table 26): p<.001 for "I", p<.001 for "T", p=.001 for "GKS", p<.001 for "WST", p<.001 for "TW", p<.001 for "DO", and p<.001 for "LST". An exception exists with "GKO" which does not present a significant difference with "TG".

Table 26. Summary of the results of bivariate analysis of the "RR" indicators, by Match Status.

(I) RR	TG						
(J) RR	I	T	GKS	WST	TW	DO	LST
Sig.	0	0	.01	0	0	0	0

4. Analysis of the categories of indicators according to the final ranking

The third ANOVA, which allows the comparison between the teams that qualify and those that do not, as a dependent variable of each of the categories of indicators, highlights that the categories that show significant differences are (Appendix 2): "ZL" (F(11, 4196) =

3.993; p<.001), "PS" (F(2, 4205) = 21.534; p<.001), "TEDA" (F(3.4204) = 7.471; p<.001), "PTGD" (F(2, 4205) = 2.471; p<.001), ZF (F(11, 4196) = 6.355; p<.001), "CEIF" (F(8, 4116) = 4.385; p<.001) and "RR" (F(8, 4199) = 2.14; p=.029). Again, the "TEDAP" category does not show a significant difference between its indicators. However, we observe that the mean value of the differences in the "TEDAP" category is close to being significant (F(3, 4204) = 2.269; p=.078).

Figure 47 shows that the unqualified teams lose the ball as much in "ZL5" (16.16%) as in "ZL11" (17.87%), while the gap is twice as high for the qualified teams (11.69% against 22.81% for "ZL11"). It is therefore not surprising that Appendix 3 and Table 27 illustrate a significant difference between these two zones (p<.001). It is likely that distinction between a qualified team and an unqualified team is played in zones of losing ball. Indeed, when we know that 50% of the scoring opportunities come from a loss of ball in the defensive zone ("ZL1" to "ZL6" in our study), the probability of conceding a goal is therefore greater for unqualified teams than for qualified teams. Once again, through Appendix 3 and the Table 27, it is possible to note that "ZL5" (defensive sector) presents a significant difference with "ZL8" (offensive sector) (p=.001). In addition, Hughes et Lovell (2019) states that this probability is seven times higher compared to a loss of ball in offensive zone. The authors defend that 8% of scoring opportunities resulting from a losing ball in defensive zone end in goal, which corresponds to eleven times more goals compared to a losing ball in attacking zone.

Figure 47. Descriptive analysis of the ZL category according to qualification.

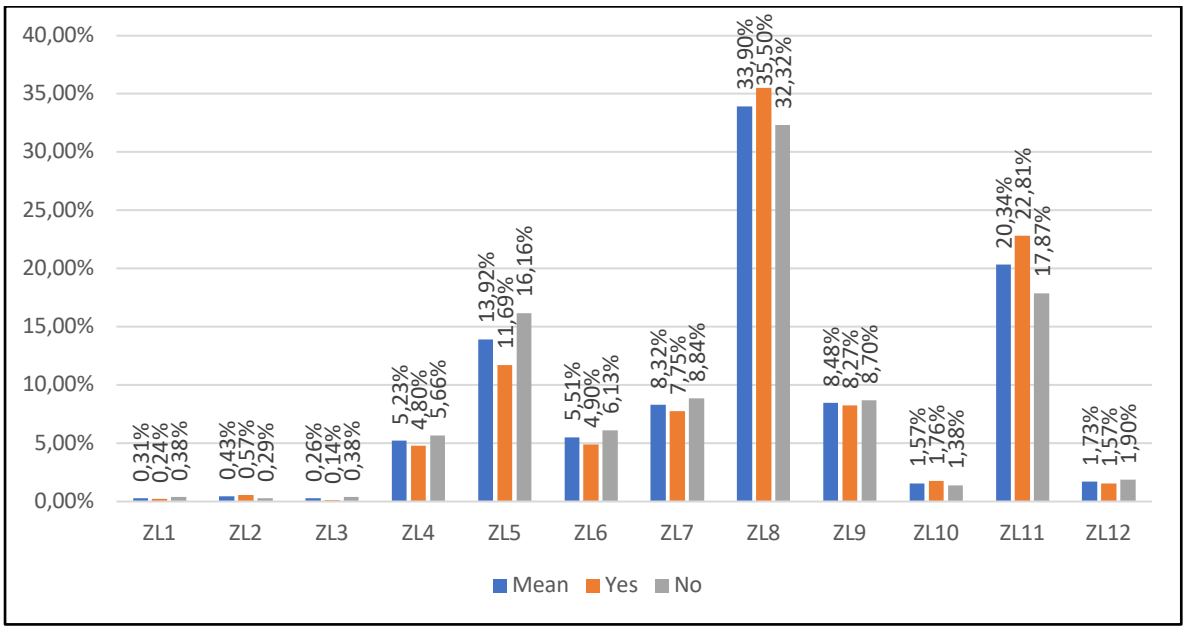


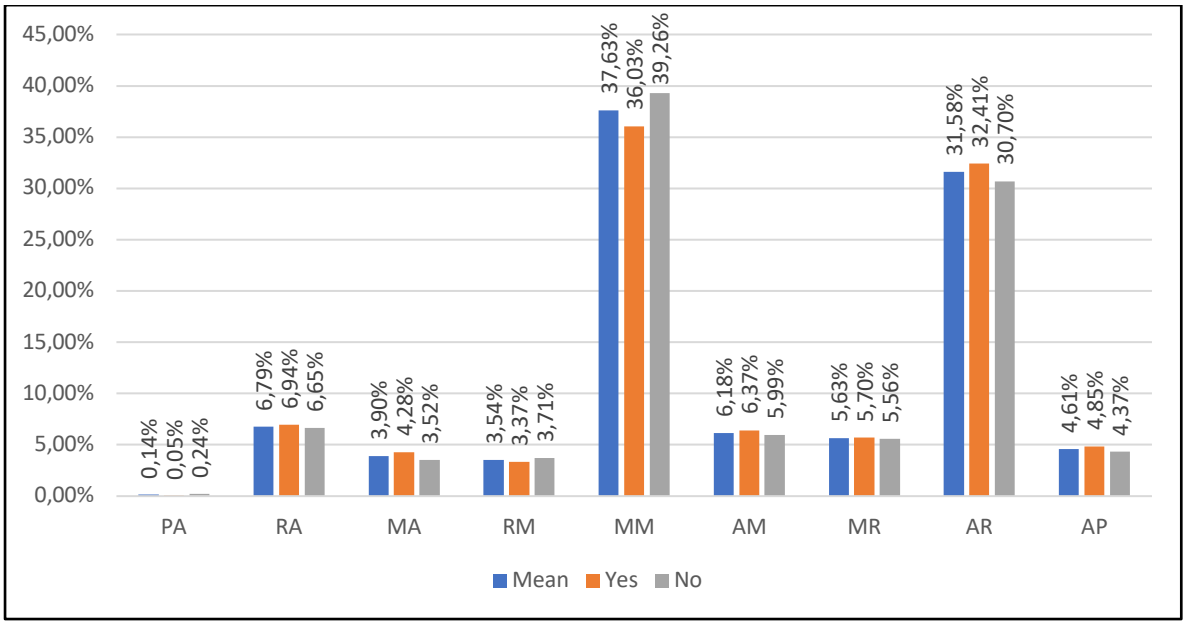
Table 27. Summary of the results of bivariate analysis of the "ZL" indicators, by Qualification.

(I) ZL	ZL5	
(J) ZL	ZL8	ZL11
Sig.	.001	0

Apart from "ZL8", "ZL10" and "ZL11", all other zones, defensive/offensive sectors and lateral/central corridor(s), show a higher percentage of occurrence of ball loss for unqualified teams. From point of view of qualified teams, “ZL8” and “ZL11” are zones in which opponents put most density to protect their goal. Therefore, this density can explain a higher percentage of losing ball.

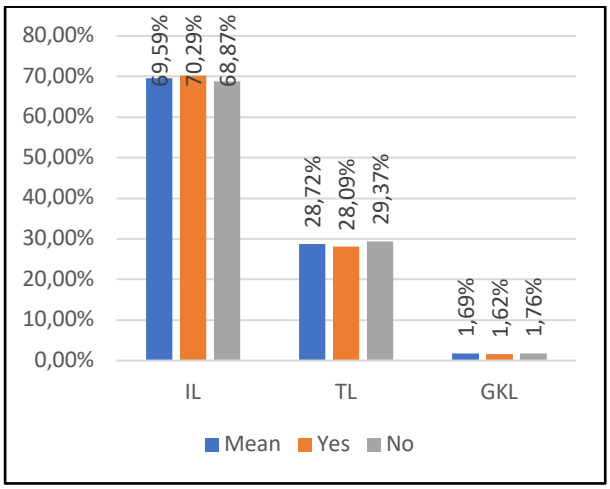
Figure 48 shows that the two game interactions “MM” (most used) and “RM” (less used) are those that are most closely related to unqualified teams. All other game interactions, with different degrees of difference, have a stronger link with qualified teams, whether they are offensive (“AM”, “MR”, “AR” and “AP”) or defensive (“RA”, “MA”) game interactions. Despite the differences, pointed out by Figure 48, between qualified and unqualified teams, we observe in Appendix 4 that no game interaction is significantly different from at least one other game interaction. Assuming that the qualified teams are those who win the match in the majority of cases, it is possible to assume that the conclusion of García-Rubio et al. (2015) applies to the interaction contexts of this study. Namely, when teams win, they have little ball possession because they choose for less risky playing choices, coupled with a well-structured defensive strategy. It has already been proven that the best teams do not change their style of play with the evolution of situational variables such as match status (evolving score) or the location of the match (home or away) (Hughes et Churchill, 2004; Lago-Peñas et Dellal, 2010; Vogelbein et al., 2014). However, Bradley et al. (2014) note a slight decrease in ball possession when teams play away (around 3% compared to the home team) but also when the team is winning. These different conclusions from previous studies help to understand why the gap is greater in “AR” than for other game interactions. Indeed, if the teams take less risk, the "line" of the forwards is that which represents the least danger in the event of loss of ball, moreover, if the loss of the ball occurs at the defensive "line" of the opposing team. Additionally, when attacking “line” loses the ball, the other lines are organized defensively to respond to losing ball. As a result, the defensive strategy and the imbalance are not the same when the loss of the ball occurs in front of the effective playing space, in the middle of the effective playing space or at the rear of the effective playing space.

Figure 48. Descriptive analysis of the CEII category according to qualification.



We can see in the Figure 49 that despite small gaps, the qualified teams lose the ball through the indicator "IL"; While unqualified teams lose the ball through the "TL" indicator. These data may underline the fact that qualified teams, in order not to take risks while carrying ball, opt for a passing game while opponents wait for error. For their part, unqualified teams face physical duels more regularly, either because ball carrier is trying to drive ball or dribble an opponent, or because opposing team is pressing effectively.Appendix 5 shows that the indicators in the "TLP" category do not show any significant difference between them. It is possible to enhance this result through Figure 49, which shows that the three indicators follow a more or less equivalent trend.

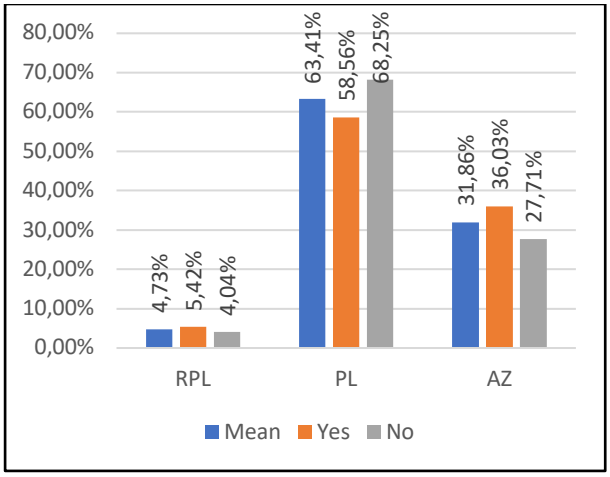
Figure 49. Descriptive analysis of the TLP category according to qualification.



The Figure 50 shows that defensive recoveries are initiated mainly in “PL”. In this game configuration, it is possible to observe that teams that do not qualify, have a stronger

connection with this indicator. In addition, we observe, in Appendix 7 and Table 28, that "PL" indicator is the only one to be significantly different from the other indicators (p=.027 for "RPL" and p<.001 for "AZ").

Figure 50. Descriptive analysis of the PS category according to qualification.

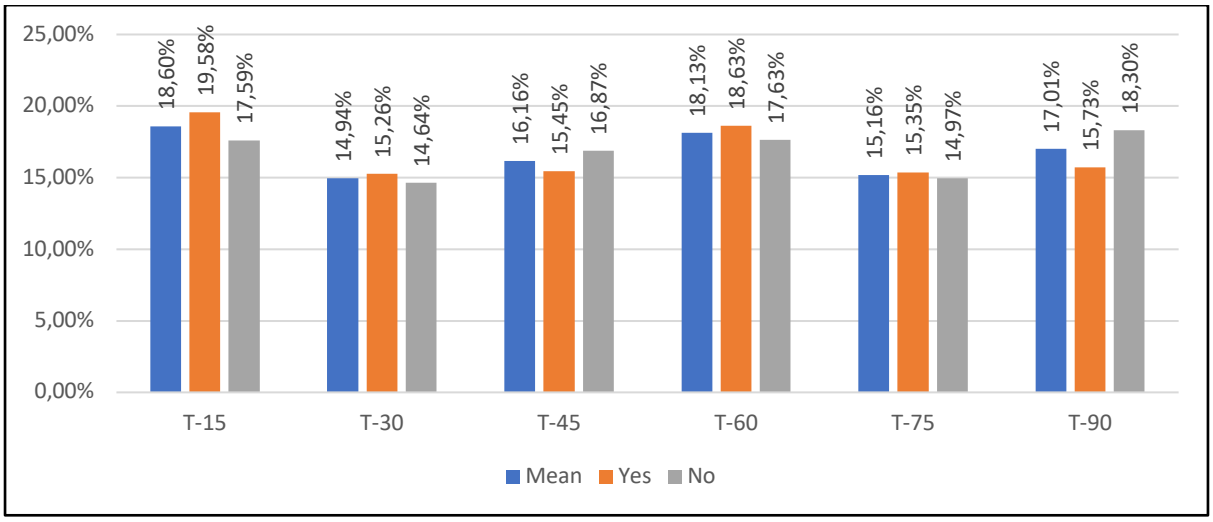


The teams that qualify have a closer link, with the “AZ” game configuration. Hypothetically, teams that qualify are the ones that win matches, which may imply that the team control and impose their game. If we follow this assumption, it seems consistent that the teams, which qualify lose the ball more frequently in a game configuration such as "AZ" because the opponent suffers the play and folds in front of his goal to defend it by being compact and dense. The teams that qualify do not have possession of the ball, and since they impose their game, these teams are able to defend in more advanced positions and initiate offensive transitions in a playing configuration such as "AZ". The percentage of defensive recovery that begins depending on the “RPL” game configuration is more or less similar whether you qualify or not. From Figure 51 teams that qualify have more defensive recoveries in the first two-thirds of each half (“T-15”, “T-30”, “T-60” and “T-75”), that teams which do not qualify.

Table 28. Summary of the results of bivariate analysis of the "PS" indicators, by Qualification.

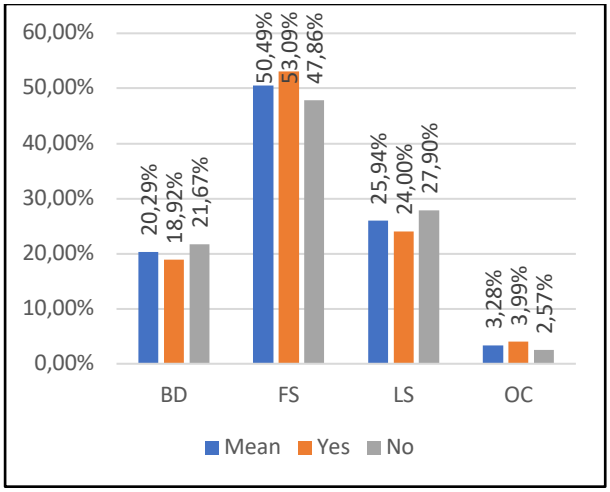
(I) PS	PL	
(J) PS	RPL	AZ
Sig.	.007	0

Figure 51. Descriptive analysis of the TM category according to qualification.



Trend is reversed in last quarter of each halves (“T-45” and “T-90”). That is, teams that do not qualify have more defensive recoveries than those that do. Despite these two observations, we realize that there is no significant difference between the different periods of the match, independently if the team qualifies or not (Appendix 6). It is possible to suppose that these two observations are linked to the degree of risk-taking to score a goal. In "T-45" and "T-90", the non-qualifying teams are most certainly down, or tied, and are looking to come out on top to score. Likewise, qualifying teams take less risk to stay ahead of a favourable result.

Figure 52. Descriptive analysis of the TEDA category according to qualification.



We observe, in Figure 52, that the teams which do not qualify more frequently seek vertical solutions ("FS" and "OC") than the teams which qualify. Teams that qualify are faced with more varied game options such as “LS” and “BD” indicators. Appendix 8 provides information that of the three-multiple comparison analyses, only the third analysis shows significant differences between the indicators, namely the qualification of the teams. In this

sense, Appendix 8 and Table 29 indicate that "BD" is significantly different from "FS" (p=.016) and "OC" (p=.01); that "FS" is significantly different from "LS" (p=.004); and that "LS" is significantly different from "OC" (p=.007).

Table 29. Summary of the results of bivariate analysis of the "TEDA" indicators, by Qualification.

(I) TEDA	BD		FS	LS
(J) TEDA	FS	OC	LS	OC
Sig.	.016	.01	.004	.007

Thus, the hypothesis is the probable existence of a difference in offensive organisation before losing ball. That is, teams that do not qualify less often, or with less success, cover the ball carrier in ball/goal cage corridor to defend. This hypothesis arises from the fact that qualified' teams have more regularly the possibility of making a direct play towards the opposing goal. Teams that do not qualify should bypass the opposing defensive block, most certainly because of the density that is in the ball/goal cage corridor to defend, when the player collecting the ball does not opt for a penetrating ball line.

Figure 53 shows that the fact of qualifying or not does not influence the percentage of use "ETO1" and "ETO3" indicators. However, it is possible note that teams that qualify use indicator "ETO0" more frequently than "ETO2". Conversely, teams that do not qualify more frequently opt for indicator "ETO2" than "ETO0". In addition, it is observed that teams that do not qualify must oppose collective attacks more frequently than teams that qualify ("ETO2"). Trend is reversed at the level of "ETO0". Thus, it is not surprising to observe that "ETO0" is significantly different from "ETO2" (p=.05) (Appendix 9 and Table 30).

Figure 53. Descriptive analysis of the TEDAP category according to qualification.

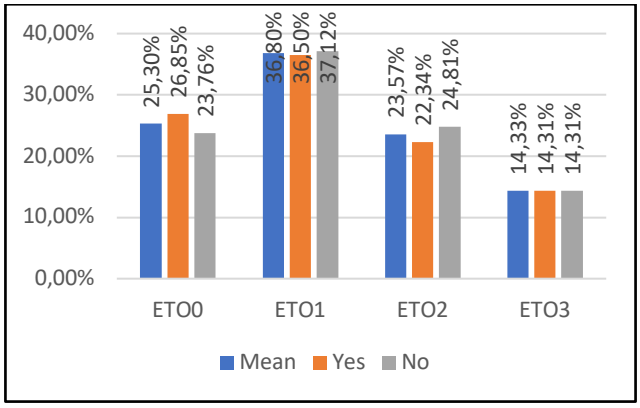


Table 30. Summary of the results of bivariate analysis of the "TEDAP" indicators, by Qualification.

(I) TEDAP	ETO0
(J) TEDAP	ETO2
Sig.	.05

The first observation is that regardless of qualification or not, teams frequently build their counterattacks around two players. Decrease in the number of offensive transitions using more than two players (“ETO2” and “ETO3”) may be due to two factors: (1) the loss of the ball allowing the continuation (new moment of transition) or not of play (stoppage of play by the referee or to take a throw-in); and (2) defensive recovery allowing to find an organized defensive block. Similarly, two factors can explain "ETO0": (1) the ball carrier chooses to take an individual action which results in a positive conclusion (goal or a throw-in for his team), or negative (loss of the ball); and (2) the ball carrier attempts to reach a partner with a pass that is intercepted before reaching the partner.

Figure 54 shows that each indicator has a different percentage point area than other indicators area. Teams which qualify use “SPT” and “PT” indicators more frequently than teams which do not qualify. Whereas teams that do not qualify have a higher percentage of use indicator “EXP” than teams qualify. However, it is important to emphasize that indicator “SPT” is the one that used most, most certainly because it allows to reconcile a defensive withdrawal and a pressing on opponent ball carrier. In contrast, “PT” indicator is infrequent. It is assumed that its use requires a great deal of confidence in the ability to retrieve the ball because this tactical choice requires defensive risk-taking by discovering deep spaces of the defense, often because it is used in the opponent’s half. It is probably for these tactical reasons that it is mainly used by tams which qualify, and which hypothetically are the ones who impose their rhythm and their game on the opponent. All differences shown in Figure 54, between the different indicators in the "PTGD" category, and which were presented above, are reinforced by Appendix 10 and Table 31. Which indicate that all the indicators are significantly different from each other ($p<.001$ for "EXP" with "SPT" and "PT", and $p=.001$ for "SPT" with "PT").

Figure 54. Descriptive analysis of the PTGD category according to qualification.

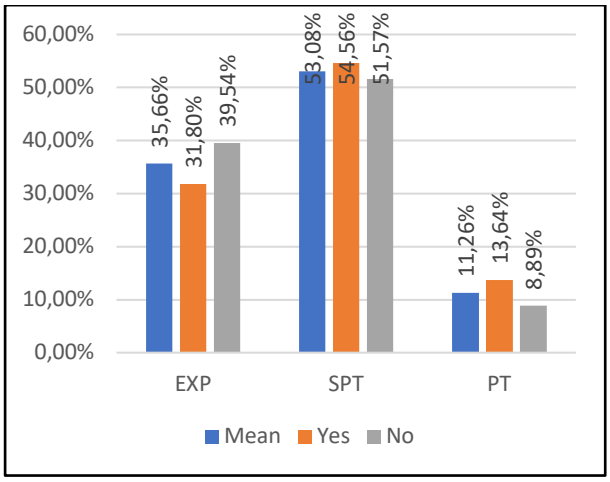


Table 31. Summary of the results of bivariate analysis of the "PTGD" indicators, by Qualification.

(I) PTGD	EXP		SPT
(J) PTGD	SPT	PT	PT
Sig.	0	0	.001

The results demonstrate the existence of several disparities between teams that qualify and those that do not. Indeed, according to the Figure 55, the teams which qualify put an end, more frequently, to the defensive recoveries in the sector of the attacking medium ("ZF7", "ZF8" and "ZF9"), in comparison with the teams which do not qualify. In addition, Appendix 11 and Table 32 highlight that these three areas are significantly different from "ZF2" ($p<.001$ for "ZF7", $p<.001$ for "ZF8" and $p=.009$ for "ZF9") and “ZF5” ($p=.024$ for “ZF7” and $p<.001$ for “ZF8”).

When focusing on the central corridor, it is possible to observe that the defensive recovery percentages fluctuate wildly depending on whether the team qualifies or not. In “ZF5”, zone with highest average occurrence, there is a relatively small gap between teams qualify and those that do not. However, this finding does not apply to other two zones (“ZF2” and “ZF8”. Indeed, while the percentage of occurrence in "ZF2" for the teams that do not qualify is almost equivalent to that observed in "ZF5" (approximately .3% lower). The percentage (in “ZF2”) of qualified teams is slightly higher than the percentage observed in “ZF8” (approximately 2% higher). It appears that ability to end the opposing offensive transition, in more advanced zones of the field, is an important and priority part of defensive recovery. The results make it possible to highlight a distinction between teams which qualify and those which do not. Indeed, it takes place at the level of the attacking midfield, in which the teams that qualify are 10% more effective (28.42% vs. 19.34%); but also, in the central corridor of the two defensive sectors, again with a gap of 10% (44.49% against 54.04%).

Figure 55. Descriptive analysis of the ZF category according to qualification.

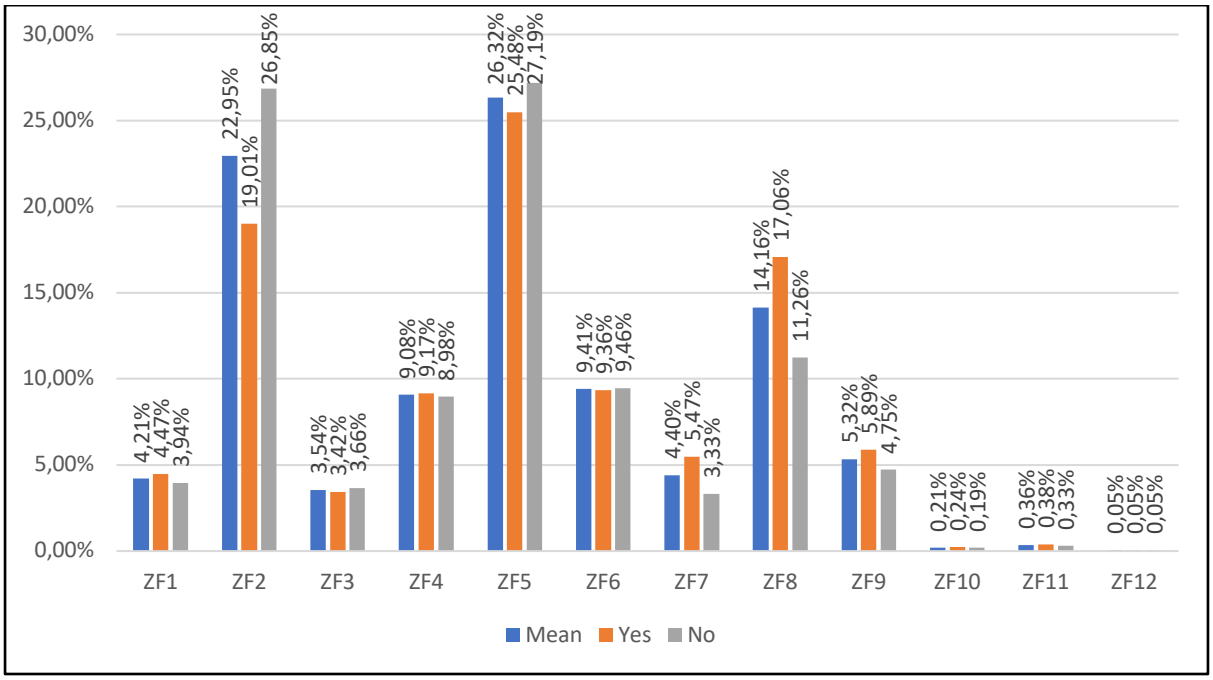


Table 32. Summary of the results of bivariate analysis of the "ZF" indicators, by Qualification.

(I) ZF		ZF2			ZF5
(J) ZF	ZF7	ZF8	ZF9	ZF7	ZF8
Sig.	0	0	.009	.024	0

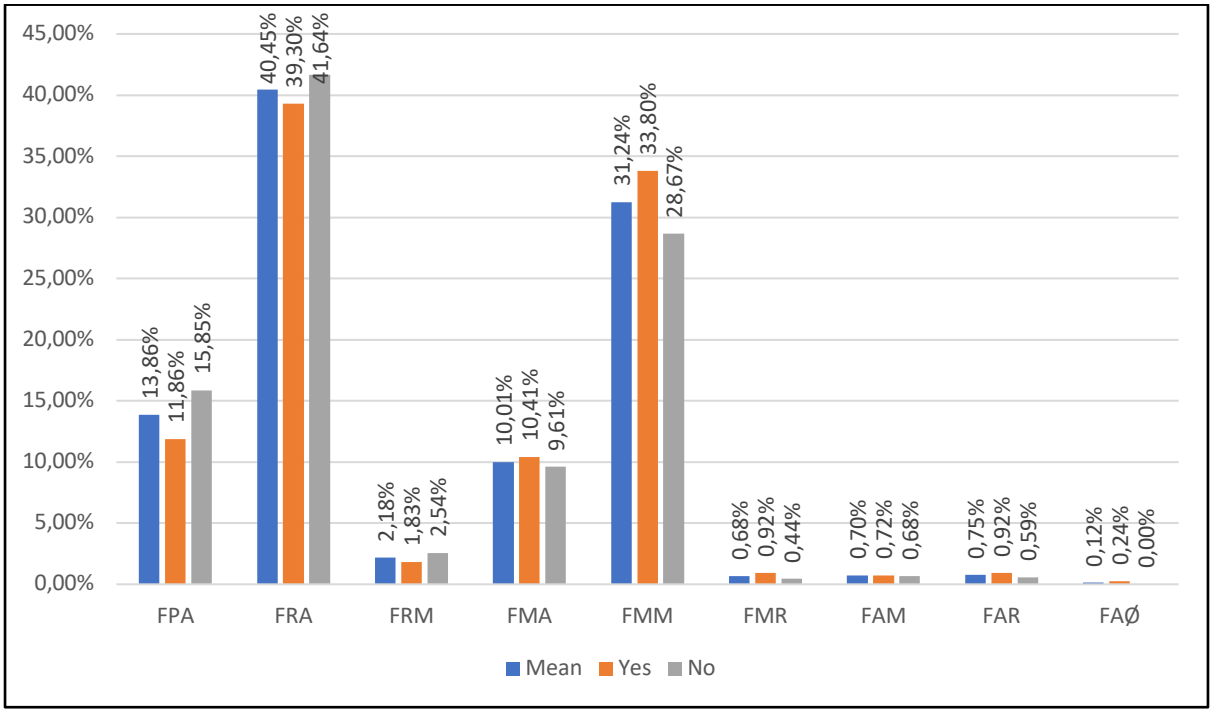
Despite these disparities, some zones show equivalent percentages of occurrences, whether teams qualify or not. Indeed, there is no contrast for the zones which refer to two corridors of the two defensive sectors ("ZF1", "ZF3", "ZF4" and "ZF6"), but also for the three zones of the offensive sector ("ZF10", "ZF11" and "ZF12"). We can suppose that these results are due, for the offensive sector, the distance between the said zones and the goal cage to be defended; for the corridors of two defensive sectors, their position on the periphery of the goal, which is located in the central corridor. Figure 56 highlights the existence of three different percentage points of action for three different types of game interactions:

- Defensive game interactions (“FPA”, “FRA”, “FMA” and “FAM”) provide several pieces of information. First observation is that these interactions represent more than 60% of final configurations. Second finding is based on gaps, within each indicator, between teams qualify and those do not. Indeed, when we look at “FPA” and “FRA” indicators, we notice that teams do not qualify, more regularly find themselves in this type of final configuration when defensive recovery ends. On other hand, difference is reduced for “FMA” and “FAM” indicators. In addition, we observe that teams qualify, end the opposing offensive

transition more frequently through these two indicators, in comparison with teams that do not qualify.

- Being the second final game interaction with the highest average percentage of occurrence, we observe with "FMM" (balance play interaction) that it is teams qualify that are more successful in ending defensive recovery through this play setup. It is also found that it is the only game interaction to show a significant difference from another game interaction ("FPA", p<.001) (Appendix 12 and Table 33).
- We note, concerning offensive game interactions ("FRM", "FMR", "FAR" and "FAØ"), seldom apply in context of defensive recovery to end opposing offensive transition.

Figure 56. Descriptive analysis of the CEIF category according to qualification.



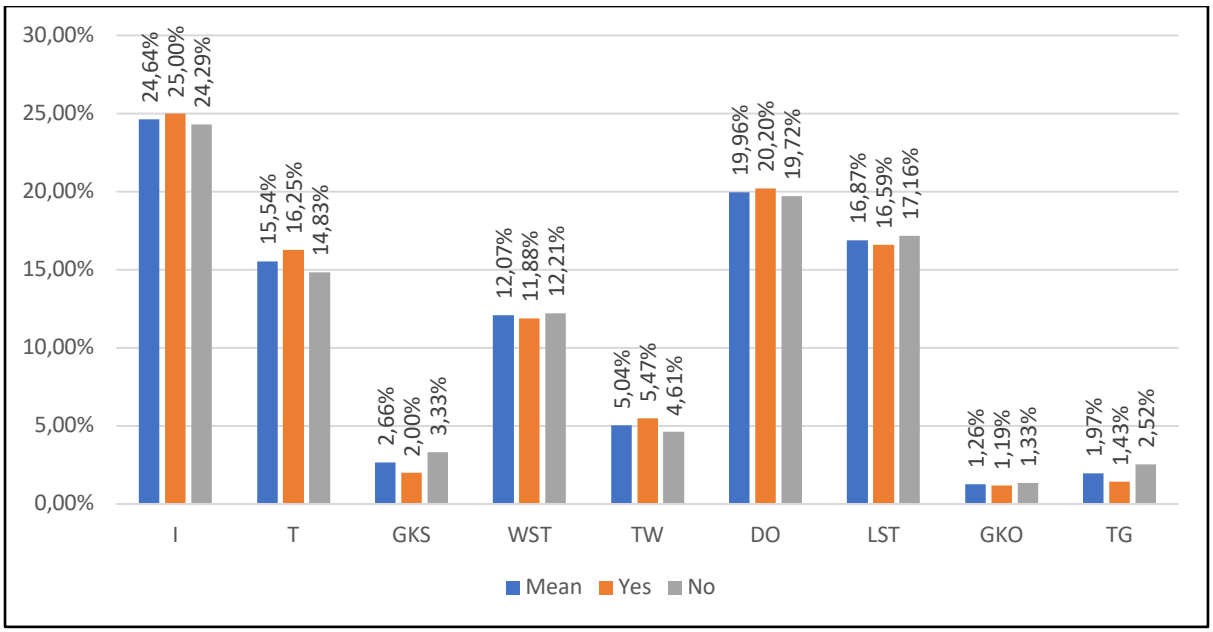
These results can be justified as follows: The criteria for including actions greatly influence the final interactions. By this we mean that counterattack, when winning ball, and defensive imbalance necessary to include the action, make so-called offensive game interactions rarely enter the final game configurations; Favour defensive play interactions because inclusion criteria are to advantage of attacking team.

Table 33. Summary of the results of bivariate analysis of the "CEIF" indicators, by Qualification.

(I) CEIF	FPA
(J) CEIF	FMM
Sig.	0

In this way, it seems important to point out that teams do not qualify, more frequently find themselves on a more defensive end-game configurations compared to teams that do. This observation, by itself, cannot explain why when two teams end opposing offensive transition through the "FRA" interaction (for example), one qualifies, and other does not. Indeed, as demonstrated earlier, a football match is not played only on moments of counterattacks. However, in view of these results, it seems crucial to give importance to different contexts of final interactions, keeping in mind that less defensive final game configuration, more beneficial for the team.

Figure 57. Descriptive analysis of the RR category according to qualification.



Among two indicators, which characterize a recovery of ball while allowing continuity of the game ("I" and "T"), we note that teams that qualify are more successful in their achievement, in comparison with teams that do not qualify (Figure 57). Results are in line with Hughes et Lovell (2019), who claims that tackling action is most prolific in creating opportunities to score. When defensive recovery ends through interruption of play ("WST" and "LST"), gaps observed are small. However, teams that do not qualify have a slightly higher percentage than teams that qualify. This paradox is explained by fact that teams do not qualify get more time out than teams qualify.

Although the "DO" indicator does not allow the ball to be recovered or the game to be interrupted, we can see that its dynamic is a compound of the four previous indicators ("I", "T", "WST" and "LST"). Indeed, “DO” indicator represents the second most used action to end opponent’s offensive transition. In addition, the gap, between teams qualify and those

that so not, is tiny. However, unlike “WST” and “LST” indicators, it is the teams qualify who defend more regularly using this indicator (“DO”).

There is also a greater demand on goalkeeper (“GKS”, “GKO” and “TG”) for teams that do not qualify compared to teams qualify. Obviously, lesser stress on goalkeeper, lower the probability of conceding a goal. Based on this principle, teams with less demanded goalkeepers increase their likelihood of securing a qualification for knockout stage of Champions League. The ANOVA test (Appendix 2) indicates that there are one or more significant differences between the various indicators in the "RR" category. Despite the information and description provided by the Figure 57, when we observe with more attention (Appendix 13), we realize that there is no significant difference when the analysis focuses on the qualification of the teams. Only "GKS" is close to a significant difference with "T" (p=.09) and "TW" (p=.096).

CONCLUSION

In this chapter will be presented our conclusions according to the objectives established. The overall goal was to explore and describe the patterns of defensive recovery after ball loss by high performance football teams in a variety of competitive contexts. In short, it is about describing and analysing, objectively, defensive recovery actions using three-time ranges: Team's Quality (before matches); Match Status (during matches), and Final ranking, that is to say if the team qualifies or not (after matches).

Distinguishing the differences in the achievement of defensive recoveries, depending on team's quality, offers two possibilities. The first is the characterization of defensive recoveries according to team's quality. And the second is obtaining benchmarks that allow comparison with the values of other contextual variables (match status and final ranking, in this study).

1. Thus, the results obtained allow to conclude that the Pot A teams lose the ball in more advanced areas of the field ("ZL"), which also influences the fact that the team block is higher on the field at the moment of the loss of ball ("SP").
2. We can add that the Pot D teams lose the ball more regularly when it is their back line and the opponent's front line, compared to the Pot A teams who lose it more regularly when it is between their centre line and the opponent's back line ("CEII").
3. In addition, Pot A teams have a more aggressive general approach to defensive recovery, compared to all other Pots, with pressure from loss of ball ("PTGD"); this may explain, in addition to losing the ball higher up the field, that these teams conclude their defensive recoveries higher on the field ("ZF") with more "offensive" final game interactions ("CEIF"), because they allow attacking again as soon as the ball is recovered.

Regarding the relationship between defensive recoveries and match status, it can be concluded that changing the status of the teams, during the match, modifies the impact of different categories of indicators on the performance of defensive recoveries. Indeed, the following categories are gaining in importance: "CEII", "TLP" and "TM", while the following categories are losing their importance compared to the pre-match (distinction of teams according to their level): "ZL", "PS", "ZF" and "CEIF".

1. As a result, winning teams lose the ball more regularly through the most offensive lines of their team block ("CEII"), but also by the intervention of the opposing goalkeeper ("TLP").

2. Further, defensive recoveries, when teams are tied, are strongly impacted by the match period (“TM”). Indeed, they achieve more defensive recoveries in the first quarter of the match, and less defensive recoveries throughout the second half.
3. Finally, losing teams have a general approach to defensive recovery that is more passive with a containment defense ("PTGD").

The sample used in this study has an undeniable strength: the performance of teams is not judged before each match (team quality) or during a match (match status), but on the ability to qualify for the next round (knockout stage). Therefore, it is possible to conclude that anything that differentiates defensive recovery based on the quality of the teams, or the status of the match, does not necessarily have an impact on the qualification of the teams.

1. As no key-variables, in defensive recovery leading to a qualification for the next round, were identified the following: loss of ball in the side corridors (“ZL”), “offensive” game interactions at the time of loss of ball (“CEII”), losing the ball by the intervention of the opposing goalkeeper ("TLP"), the period of the match during which the defensive recovery occurs ("TM"), and stopping opposing attacks in the side corridors ("ZF").
2. Conversely, ball losses in the central lane ("ZL"), with a team block high on the field ("PS"), a general approach to more aggressive defensive recovery ("PTGD"), stopping the opposing attacks far from his goal ("ZF") and a so-called "offensive" final game interaction ("CEIF"), are all important markers of defensive recovery in order to reach the next round.
3. It should be added to the scorers already present whether or not the opponent’s playing intentions immediately after the ball has been recovered favour defensive recovery ("TEDA" and "TEDAP"). Indeed, the less the opposing play is oriented towards the goal net that the observed team must defend, and the more opposing players there are who touch the ball, the easier the defensive recovery will be to achieve.

1. Suggestions for future studies

It has been emphasized throughout this study that the scientific corpus dedicated to defensive transitions is really lower than that dedicated to offensive transitions, or even that of stopped phases. Therefore, in order to broaden knowledge about the timing of the defensive transition, further studies are needed. Thus, the recommendations and/or modifications that can be considered are as follows:

- The temporal assessment of defensive recovery, i.e., the creation of a category "Defensive Recovery Duration" to supplement the information provided by the General Defensive Recovery Approach ("PTGD").
- A modification of the definitions of certain categories of indicators (e.g., the number of players involved in a pressing) or even of the inclusion criteria (e.g., the number of touches of the ball from which the change of possession is considered). In order to complete the corpus, different forms of evaluation for the same variable seem relevant in order to compare them with each other, and choose the best suited for future studies or to facilitate analysis of the game by coaches.
- Evaluating the space used during defensive recovery. Considering the number of zones occupied at the time of the loss of the ball and the end of the defensive recovery, can supplement the information provided by the general approach of the defensive recovery ("PTGD"), but also by the positioning of the lines ("PS").
- Analysis of defensive recovery behaviours based on the number of opposing player (s) involved in the defensive transition. As indicated previously, the opponent's playing intentions seem to influence defensive recovery. It is therefore possible that differences in the actions of the ball carrier appear depending on the number of players touching the ball.
- Assessment of the match venue on defensive recovery behaviours, and the comparison between the two qualifying phases specific to the Champions League (Group Stage and Knockout Stage). This would establish the differences that may exist due to the importance of the away goal (Knockout Stage).
- The evaluation of the evolution of players' positioning according to the centre of the game and the goal cage to be defended. That is, the comparison between the starting point of each player, actively involved in the defensive recovery action, and his end point, as well as the analysis of his movement. Taking these variables into account should make it possible to complete the information provided by the general approach to defensive recovery ("PTGD"), but also on the relations and the distances between each player (pressing and covering).
- Assessment of defensive recovery behaviours in young football players. Notably by watching the UEFA Youth League. Thus, it would be possible to characterize the differences between players in training and seasoned players.

2. Recommendations for coaches

In order to give a "practical" dimension to this study, some recommendations on the defensive recovery phase can be advised to coaches:

- Include on a regular basis different contexts of ball loss, and allow the reversibility of behaviours, within the training process. The aim is to develop an active defense style ("SPT" or "PT") which promotes the recovery of the ball as quickly as possible, or which repels the construction of the opponent's attack.
- Pay particular attention to the development of behaviours related to reversibility (concentration, rapid reaction to loss of ball).
- When working on other offensive phases of play, try to find yourself in situations with a team block high on the pitch ("AZ"). This will mean, during the opponent's offensive transition, having more time and space to retrieve the ball or the previously defined defensive structure.
- Set up an offensive cover system, in order to reduce the uncertainty caused by the loss of ball, and to be able to react quickly to the loss of ball by having a player facing the opposing ball carrier.
- Perform an analysis of the opposing team, focusing on its offensive transition behaviours (fast counterattack or attack, short or long game, number of players involved) in order to define and systematize, before each match, the behaviours and objectives to be achieved when the ball is lost.

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Appendix

Appendix 1. Results of the bivariate analysis of indicators categories, according to Team's Quality and Match Status.

Independent Variable	Pots					Match Status				
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.	F	Sig.	(I) Match Status	(J) Match Status	Sig.
ZL	13.662	0	Pot A	**Pot B**	**0**	.32	.726	W	D	.923
				Pot C	**0**					
				Pot D	**0**				L	.708
				Pot A	**0**					
			Pot B	Pot C	1			D	W	.923
				Pot D	.723					
				Pot A	**0**				L	.864
			Pot C	Pot B	1					
				Pot D	.709				W	.708
				Pot A	**0**			L		
			Pot D	Pot B	.723				D	.864
				Pot C	.709					
CEII	2.93	.032	Pot A	Pot B	.083	11.838	0	W	**D**	**.003**
				Pot C	.191					
				Pot D	**.039**				**L**	**0**
			Pot B	Pot A	.083			D	**W**	**.003**
				Pot C	.984					
				Pot D	.989				L	.072
			Pot C	Pot A	.191					
				Pot B	.984				**W**	**0**
				Pot D	.909			L		
			Pot D	**Pot A**	**.039**				D	.072
				Pot B	.989					
				Pot C	.909					

Appendix 1 (cont.). Results of the bivariate analysis of indicators categories, according to Team's Quality and Match Status.

Independent Variable	Pots					Match Status				
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.
TLP	.842	.471	Pot A	Pot B	.562	3.253	.039	W	D	.724
				Pot C	.502				**L**	**.042**
				Pot D	.914			D	W	.724
			Pot B	Pot A	.562				L	.117
				Pot C	1			L	**W**	**.042**
				Pot D	.923				D	.117
			Pot C	Pot A	.502					
				Pot B	1					
				Pot D	.887					
			Pot D	Pot A	.914					
				Pot B	.923					
				Pot C	.887					
TM	2.149	.092	Pot A	Pot B	.936	377.269	0	W	**D**	**0**
				Pot C	.243				L	.194
				Pot D	.993			D	**W**	**0**
			Pot B	Pot A	.936				**L**	**0**
				Pot C	.072			L	W	.194
				Pot D	.831				**D**	**0**
			Pot C	Pot A	.243					
				Pot B	.072					
				Pot D	.402					
			Pot D	Pot A	.993					
				Pot B	.831					
				Pot C	.402					

Appendix 1 (cont). Results of the bivariate analysis of indicators categories, according to Team's Quality and Match Status.

Independent Variable			Pots					Match Status		
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.	F	Sig.	(I) Match Status	(J) Match Status	Sig.
PS	9.377	0	Pot A	**Pot B**	**0**	.75	.472	W	D	.982
				Pot C	**0**				L	.525
				Pot D	**.001**				W	.982
			Pot B	**Pot A**	**0**			D	L	.539
				Pot C	.987				W	.525
				Pot D	.987				D	.539
			Pot C	**Pot A**	**.001**			L	W	.525
				Pot B	.987				D	.539
				Pot D	.907					
			Pot D	**Pot A**	**0**					
				Pot B	.907					
				Pot C	.987					
TEDA	.215	.886	Pot A	Pot B	1	.632	.531	W	D	.658
				Pot C	.955				L	.998
				Pot D	.947				W	.658
			Pot B	Pot A	1			D	L	.59
				Pot C	.937				W	.998
				Pot D	.928				D	.59
			Pot C	Pot A	.955			L		
				Pot B	.937					
				Pot D	1					
			Pot D	Pot A	.947					
				Pot B	.928					
				Pot C	1					

Appendix 1 (cont). Results of the bivariate analysis of indicators categories, according to Team's Quality and Match Status.

Independent Variable	Pots					Match Status				
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.	F	Sig.	(I) Match Status	(J) Match Status	Sig.
TEDAP	.924	.428	Pot A	Pot B	.985	2.451	.086	W	D	.96
				Pot C	.997				L	.13
				Pot D	.649			D	W	.96
			Pot B	Pot A	.985				L	.127
				Pot C	.999			L	W	.13
				Pot D	.438				D	.127
			Pot C	Pot A	.997					
				Pot B	.999					
				Pot D	.531					
			Pot D	Pot A	.649					
				Pot B	.438					
				Pot C	.531					
PTGD	11.058	0	Pot A	**Pot B**	**0**	4.196	.015	W	D	.922
				Pot C	**.024**				**L**	**.03**
				Pot D	**0**			D	W	.922
				Pot A	**0**				**L**	**.031**
			Pot B	Pot C	.178			L	**W**	**.03**
				Pot D	.999				**D**	**.031**
				Pot A	**.024**					
			Pot C	Pot B	.178					
				Pot D	.144					
				Pot A	**0**					
			Pot D	Pot B	.999					
				Pot C	.144					

Appendix 1 (cont). Results of the bivariate analysis of indicators categories, according to Team's Quality and Match Status.

Independent Variable	Pots					Match Status				
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.	F	Sig.	(I) Match Status	(J) Match Status	Sig.
ZF	17.688	0	Pot A	**Pot B**	**0**	8.199	0	W	D	.545
				Pot C	**.004**				**L**	**.031**
				Pot D	**0**			D	W	.545
				Pot A	**0**				**L**	**0**
			Pot B	Pot C	.59			L	**W**	**.031**
				Pot D	.07				**D**	**0**
				Pot A	**.004**					
			Pot C	Pot B	.59					
				Pot D	**.001**					
				Pot A	**0**					
			Pot D	Pot B	.07					
				Pot C	**.001**					
CEIF	9.506	0	Pot A	**Pot B**	**.013**	7.949	0	W	D	.879
				Pot C	**.014**				**L**	**.001**
				Pot D	**0**			D	W	.879
				Pot A	**.013**				**L**	**.001**
			Pot B	Pot C	1			L	**W**	**.001**
				Pot D	.099				**D**	**.001**
				Pot A	**.014**					
			Pot C	Pot B	1					
				Pot D	.1					
				Pot A	**0**					
			Pot D	Pot B	.099					
				Pot C	.1					

Appendix 1 (cont). Results of the bivariate analysis of indicators categories, according to Team's Quality and Match Status.

Independent Variable	Pots					Match Status				
Dependent Variable	F	Sig.	(I) Team's Quality	(J) Team's Quality	Sig.	F	Sig.	(I) Match Status	(J) Match Status	Sig.
RR	2.054	.104	Pot A	Pot B	.907	.417	.659	W	D	.977
				Pot C	.953				L	.68
				Pot D	.296				W	.977
			Pot B	Pot A	.907			D	L	.732
				Pot C	.638				W	.68
				Pot D	.078				D	.732
			Pot C	Pot A	.953			L		
				Pot B	.638					
				Pot D	.618					
			Pot D	Pot A	.296					
				Pot B	.078					
				Pot C	.618					

Appendix 2. Results of the intra-category bivariate analysis, according to Team's Quality, Match Status and Qualification.

Dependent Variable	Pots		Match Status		Qualification	
Independent Variable	F	Sig.	F	Sig.	F	Sig.
ZL	**5,348**	**0**	1,571	.1	**3,993**	**0**
CEII	**2,067**	**.036**	**3,58**	**0**	1,172	.312
TLP	.344	.709	**7,504**	**.001**	.518	.596
TM	.974	.432	**3,44**	**.004**	1,721	.126
PS	**16,197**	**0**	.92	.399	**21,534**	**0**
TEDA	2,162	.09	2,475	.06	**7,471**	**0**
TEDAP	.832	.476	1,524	.206	2,269	.078
PTGD	**8,568**	**0**	**6,998**	**.001**	**2.471**	**0**
ZF	**7,309**	**0**	**1,861**	**.04**	**6,355**	**0**
CEIF	**4,002**	**0**	**3,144**	**.001**	**4,385**	**0**
RR	**4,445**	**0**	**4,103**	**0**	**2,14**	**.029**

Appendix 3. Multiple comparison results for "ZL" category, according to Team's Quality, Match Status and Qualification.

(I) ZL						ZL1					
(J) ZL	ZL2	ZL3	ZL4	ZL5	ZL6	ZL7	ZL8	ZL9	ZL10	ZL11	ZL12
Sig. Pots	1	1	1	1	1	1	.999	1	.992	.992	1
Sig. Match Status	1	1	1	1	1	1	1	1	1	1	1
Sig. Qualif.	.925	1	1	1	1	1	.998	1	.991	.983	1
(I) ZL						ZL 2					
(J) Z	ZL 1	ZL 3	ZL 4	ZL 5	ZL 6	ZL 7	ZL 8	ZL 9	ZL 10	ZL 11	ZL 12
Sig. Pots	1	1	1	1	1	1	1	1	.997	.997	1
Sig. Match Status	1	.998	.69	.988	.997	.944	.989	.993	.85	.918	.955
Sig. Qualif.	.925	.647	.869	.644	.803	.887	.988	.944	1	.999	.895
(I) ZL						ZL 3					
(J) ZL	ZL 1	ZL 2	ZL 4	ZL 5	ZL 6	ZL 7	ZL 8	ZL 9	ZL 10	ZL 11	ZL 12
Sig. Pots	1	1	.984	1	1	.964	.949	.995	.882	.867	.973
Sig. Match Status	1	.998	1	1	1	1	1	1	1	1	1
Sig. Qualif.	1	.647	.988	.998	.994	.982	.885	.962	.832	.756	.994
(I) ZL						ZL 4					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 5	ZL 6	ZL 7	ZL 8	ZL 9	ZL 10	ZL 11	ZL 12
Sig. Pots	1	1	.984	.666	.094	1	1	1	.994	.862	1
Sig. Match Status	1	.69	1	.318	.3	.933	.153	.333	1	.929	1
Sig. Qualif.	1	.869	.988	.998	1	1	.827	1	.953	.226	1
(I) ZL						ZL 5					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	ZL 6	ZL 7	**ZL 8**	ZL 9	ZL 10	**ZL 11**	ZL 12
Sig. Pots	1	1	1	.666	.9	.11	**.001**	.883	.374	**0**	.877
Sig. Match Status	1	.988	1	.318	1	.997	1	1	.977	.922	1
Sig. Qualif.	1	.644	.998	.998	1	.963	**.001**	.679	.566	**0**	1

Appendix 3 (cont). Multiple comparison results for "ZL" category, according to Team's Quality, Match Status and Qualification.

(I) ZL						ZL 6					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	ZL 5	**ZL 7**	**ZL 8**	ZL 9	ZL 10	**ZL 11**	ZL 12
Sig. Pots	1	1	1	.094	.9	**.006**	**0**	.171	.065	**0**	.344
Sig. Match Status	1	.997	1	.3	1	.979	1	1	.934	.875	.998
Sig. Qualif.	1	.803	.994	1	1	1	.509	.997	.878	.068	1
(I) ZL						ZL 7					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	ZL 5	**ZL 6**	ZL 8	ZL 9	ZL 10	ZL 11	ZL 12
Sig. Pots	1	1	.964	1	.11	**.006**	1	.989	.999	.965	1
Sig. Match Status	1	.944	1	.933	.997	.979	.982	.994	1	1	1
Sig. Qualif.	1	.887	.982	1	.963	1	.761	1	.964	.12	1
(I) ZL						ZL 8					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	**ZL 5**	**ZL 6**	ZL 7	ZL 9	ZL 10	ZL 11	ZL 12
Sig. Pots	.999	1	.949	1	**.001**	**0**	1	.818	1	.881	1
Sig. Match Status	1	989	1	.153	1	1	.982	1	.96	.619	1
Sig. Qualif.	.998	.988	.885	.827	**.001**	.509	.761	.987	1	.854	.989
(I) ZL						ZL 9					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	ZL 5	ZL 6	ZL 7	ZL 8	ZL 10	ZL 11	ZL 12
Sig. Pots	1	1	.995	1	.883	.171	.989	.818	.931	.164	1
Sig. Match Status	1	.993	1	.333	1	1	.994	1	.966	.922	1
Sig. Qualif.	1	.944	.962	1	.679	.997	1	.987	.995	.45	1

Appendix 3 (cont). Multiple comparison results for "ZL" category, according to Team's Quality, Match Status and Qualification.

(I) ZL						ZL 10					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	ZL 5	ZL 6	ZL 7	ZL 8	ZL 9	ZL 11	ZL 12
Sig. Pots	.992	.997	.882	.994	.374	.065	.999	1	.931	1	1
Sig. Match Status	1	.85	1	1	.977	.934	1	.96	.966	1	1
Sig. Qualif.	.991	1	.832	.953	.566	.878	.964	1	.995	1	.981
(I) ZL						ZL 11					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	**ZL 5**	**ZL 6**	ZL 7	ZL 8	ZL 9	ZL 10	ZL 12
Sig. Pots	.992	.997	.867	.862	**0**	**0**	.965	.881	.164	1	1
Sig. Match Status	1	.918	1	.929	.922	.875	1	.619	.922	1	1
Sig. Qualif.	.983	.999	.756	.226	**0**	.068	.12	.854	.45	1	.824
(I) ZL						ZL 12					
(J) ZL	ZL 1	ZL 2	ZL 3	ZL 4	ZL 5	ZL 6	ZL 7	ZL 8	ZL 9	ZL 10	ZL 11
Sig. Pots	1	1	.973	1	.877	.344	1	1	1	1	1
Sig. Match Status	1	.955	1	1	1	.998	1	1	1	1	1
Sig. Qualif.	1	.895	.994	1	1	1	1	.989	1	.981	.824

Appendix 4. Multiple comparison results for "CEII" category, according to Team's Quality, Match Status and Qualification.

(I) CEII					PA			
(J) CEII	RA	MA	RM	MM	AM	MR	AR	AP
Sig. Pots	1	1	1	1	1	1	1	1
Sig. Match Status	1	1	1	1	1	1	1	1
Sig. Qualif.	.767	.656	.861	.844	.753	.781	.749	.726
(I) CEII					RA			
(J) CEII	PA	MA	RM	MM	AM	**MR**	AR	**AP**
Sig. Pots	1	.096	.979	.426	.594	**.039**	.119	.137
Sig. Match Status	1	1	.944	.924	.977	.977	.057	**.012**
Sig. Qualif.	.767	.997	.999	.986	1	1	1	1
(I) CEII					MA			
(J) CEII	PA	RA	RM	MM	AM	MR	**AR**	**AP**
Sig. Pots	1	.096	.838	.727	.964	1	.956	1
Sig. Match Status	1	1	.776	.701	.841	.841	**.045**	**.007**
Sig. Qualif.	.656	.997	.938	.739	.999	.996	.995	1
(I) CEII					RM			
(J) CEII	PA	RA	MA	MM	AM	MR	AR	AP
Sig. Pots	1	.979	.838	1	1	.779	.995	.917
Sig. Match Status	1	.944	.776	1	1	1	.996	.637
Sig. Qualif.	.861	.999	.938	1	.998	1	.995	.993
(I) CEII					MM			
(J) CEII	PA	RA	MA	RM	AM	MR	AR	**AP**
Sig. Pots	1	.426	.727	1	1	.536	.969	.852
Sig. Match Status	1	.924	.701	1	1	1	.055	**.035**
Sig. Qualif.	.844	.986	.739	1	.974	.997	.626	.947
(I) CEII					AM			
(J) CEII	PA	RA	MA	RM	MM	MR	AR	AP
Sig. Pots	1	.594	.964	1	1	.94	1	.991
Sig. Match Status	1	.977	.841	1	1	1	.817	.229
Sig. Qualif.	.753	1	.999	.998	.974	1	1	1

Appendix 4 (cont). Multiple comparison results for "CEII" category, according to Team's Quality, Match Status and Qualification.

(I) CEII					MR			
(J) CEII	PA	**RA**	MA	RM	MM	AM	AR	AP
Sig. Pots	1	**.039**	1	.779	.536	.94	.903	1
Sig. Match Status	1	.977	.841	1	1	1	.866	.27
Sig. Qualif.	.781	1	.996	1	.997	1	1	1
(I) CEII					AR			
(J) CEII	PA	RA	**MA**	RM	MM	AM	MR	AP
Sig. Pots	1	.119	.956	.995	.969	1	.903	.991
Sig. Match Status	1	.057	**.045**	.996	.055	.817	.866	.746
Sig. Qualif.	.749	1	.995	.995	.626	1	1	1
(I) CEII					AP			
(J) CEII	PA	**RA**	**MA**	RM	**MM**	AM	MR	AR
Sig. Pots	1	.137	1	.917	.852	.991	1	.991
Sig. Match Status	1	**.012**	**.007**	.637	**.035**	.229	.27	.746
Sig. Qualif.	.726	1	1	.993	.947	1	1	1

Appendix 5. Multiple comparison results for "TLP" category, according to Team's Quality, Match Status and Qualification.

(I) TLP	(J) TLP	Sig. Pots	Sig. Match Status	Sig. Qualification
IL	TL	.91	.643	.607
	GKL	.733	**0**	.9
TL	IL	.91	.643	.607
	GKL	.807	**.001**	.985
GKL	**IL**	.733	**0**	.9
	TL	.807	**.001**	.985

Appendix 6. Multiple comparison results for "TM" category, according to Team's Quality, Match Status and Qualification.

(I) TM			T-15		
(J) TM	T-30	T-45	T-60	T-75	**T-90**
Sig. Pots	.851	.291	.86	.957	.652
Sig. Match Status	.904	.895	.989	.989	**.002**
Sig. Qualif.	.99	.423	.996	.972	.125
(I) TM			T-30		
(J) TM	T-15	T-45	T-60	T-75	T-90
Sig. Pots	.851	.958	1	1	1
Sig. Match Status	.904	1	.998	.999	.103
Sig. Qualif.	.99	.851	1	1	.493
(I) TM			T-45		
(J) TM	T-15	T-30	T-60	T-75	T-90
Sig. Pots	.291	.958	.928	.854	.992
Sig. Match Status	.895	1	.998	.999	.091
Sig. Qualif.	.423	.851	.752	.909	.992
(I) TM			T-60		
(J) TM	T-15	T-30	T-45	T-75	**T-90**
Sig. Pots	.86	1	.928	1	.999
Sig. Match Status	.989	.998	.998	1	**.02**
Sig. Qualif.	.996	1	.752	1	.355
(I) TM			T-75		
(J) TM	T-15	T-30	T-45	T-60	**T-90**
Sig. Pots	.957	1	.854	1	.991
Sig. Match Status	.989	.999	.999	1	**.033**
Sig. Qualif.	.972	1	.909	1	.588
(I) TM			T-90		
(J) TM	**T-15**	T-30	T-45	**T-60**	**T-75**
Sig. Pots	.652	1	.992	.999	.991
Sig. Match Status	**.002**	.103	.091	**.02**	**.033**
Sig. Qualif.	.125	.493	.992	.355	.588

Appendix 7. Multiple comparison results for "PS" category, according to Team's Quality, Match Status and Qualification.

(I) PS	(J) PS	Sig. Pots	Sig. Match Status	Sig. Qualification
RPL	**PL**	**.027**	.485	**.007**
	AZ	.994	.369	.978
PL	**RPL**	**.027**	.485	**.007**
	AZ	**0**	.851	**0**
AZ	RPL	.994	.369	.978
	PL	**0**	.851	**0**

Appendix 8. Multiple comparison results for "TEDA" category, according to Team's Quality, Match Status and Qualification.

(I) TEDA	(J) TEDA	Sig. Pots	Sig. Match Status	Sig. Qualification
BD	**FS**	.07	.218	**.016**
	LS	.764	.751	.999
	OC	.881	.612	**.01**
FS	**BD**	.07	.218	**.016**
	LS	.464	.82	**.004**
	OC	.985	.133	.233
LS	BD	.764	.751	.999
	FS	.464	.82	**.004**
	OC	.994	.3	**.007**
OC	**BD**	.881	.612	**.01**
	FS	.985	.133	.233
	LS	.994	.3	**.007**

Appendix 9. Multiple comparison results for "TEDAP" category, according to Team's Quality, Match Status and Qualification.

(I) TEDAP	(J) TEDAP	Sig. Pots	Sig. Match Status	Sig. Qualif.
ETO0	ETO1	.788	.826	.301
	ETO2	.392	.801	**.05**
	ETO3	.895	.143	.629
ETO1	ETO0	.788	.826	.301
	ETO2	.855	.999	.7
	ETO3	1	.407	.998
ETO2	**ETO0**	.392	.801	**.05**
	ETO1	.855	.999	.7
	ETO3	.915	.545	.741
ETO3	ETO0	.895	.143	.629
	ETO1	1	.407	.998
	ETO2	.915	.545	.741

Appendix 10. Multiple comparison results for "PTGD" category, according to Team's Quality, Match Status and Qualification.

(I) PTGD	(J) PTGD	Sig. Pots	Sig. Match Status	Sig. Qualif.
EXP	**SPT**	**.015**	**.001**	**0**
	PT	**0**	.394	**0**
SPT	**EXP**	**.015**	**.001**	**0**
	PT	.07	.508	**.001**
PT	**EXP**	**0**	.394	**0**
	SPT	.07	.508	**.001**

Appendix 11. Multiple comparison results for "ZF" category, according to Team's Quality, Match Status and Qualification.

(I) ZF						ZF1					
(J) ZF	ZF2	ZF3	ZF4	ZF5	ZF6	ZF7	ZF8	ZF9	ZF10	ZF11	ZF12
Sig. Pots	.235	.998	1	.997	.922	.28	.871	1	.972	.975	1
Sig. Match Status	.509	.94	1	.937	.979	1	1	1	1	1	1
Sig. Qualif.	.152	.999	1	.991	1	.852	.879	1	1	1	1
(I) ZF						ZF2					
(J) ZF	ZF1	ZF3	ZF4	ZF5	ZF6	**ZF7**	**ZF8**	**ZF9**	ZF10	ZF11	ZF12
Sig. Pots	.235	.986	.265	.084	.978	**0**	**0**	**.024**	.672	1	1
Sig. Match Status	.509	1	.169	.963	.994	.307	.063	.717	1	1	1
Sig. Qualif.	.152	.919	.102	.068	.18	**0**	**0**	**.009**	1	.999	1
(I) ZF						ZF3					
(J) ZF	ZF1	ZF2	ZF4	ZF5	ZF6	**ZF7**	ZF8	ZF9	ZF10	ZF11	ZF12
Sig. Pots	.998	.986	1	1	1	**.025**	.186	.961	.885	.999	1
Sig. Match Status	.94	1	.913	1	1	.867	.899	.988	1	1	1
Sig. Qualif.	.999	.919	1	1	1	.32	.269	.974	1	1	1

Appendix 11 (con). Multiple comparison results for "ZF" category, according to Team's Quality, Match Status and Qualification.

(I) ZF	ZF4										
(J) ZF	ZF1	ZF2	ZF3	ZF5	ZF6	**ZF7**	ZF8	ZF9	ZF10	ZF11	ZF12
Sig. Pots	1	.265	1	1	.994	**.011**	.074	.99	.927	.993	1
Sig. Match Status	1	.169	.913	.798	.952	1	1	1	1	1	1
Sig. Qualif.	1	.102	1	1	1	.27	.114	.992	1	1	1
(I) ZF	ZF5										
(J) ZF	ZF1	ZF2	ZF3	ZF4	ZF6	**ZF7**	**ZF8**	ZF9	ZF10	ZF11	ZF12
Sig. Pots	.997	.084	1	1	.998	**0**	**0**	.879	.9	.996	1
Sig. Match Status	.937	.963	1	.798	1	.818	.653	.993	1	1	1
Sig. Qualif.	.991	.068	1	1	1	**.024**	**0**	.747	1	1	1
(I) ZF	ZF6										
(J) ZF	ZF1	ZF2	ZF3	ZF4	ZF5	**ZF7**	**ZF8**	ZF9	ZF10	ZF11	ZF12
Sig. Pots	.922	.978	1	.994	.998	**0**	**.001**	.577	.826	1	1
Sig. Match Status	.979	.994	1	.952	1	.924	.928	.999	1	1	1
Sig. Qualif.	1	.18	1	1	1	.177	.052	.972	1	1	1
(I) ZF	ZF7										
(J) ZF	ZF1	**ZF2**	**ZF3**	**ZF4**	**ZF5**	**ZF6**	ZF8	ZF9	ZF10	ZF11	ZF12
Sig. Pots	.28	**0**	**.025**	**.011**	**0**	**0**	.934	.438	1	.437	1
Sig. Match Status	1	.307	.867	1	.818	.924	1	1	1	1	1
Sig. Qualif.	.852	**0**	.32	.27	**.024**	.177	1	.968	1	1	1

Appendix 11 (cont). Multiple comparison results for "ZF" category, according to Team's Quality, Match Status and Qualification.

(I) ZF					ZF8						
(J) ZF	ZF1	**ZF2**	ZF3	ZF4	**ZF5**	**ZF6**	ZF7	ZF9	ZF10	ZF11	ZF12
Sig. Pots	.871	**0**	.186	.074	**0**	**.001**	.934	.973	.999	.742	1
Sig. Match Status	1	.063	.899	1	.653	.928	1	1	1	1	1
Sig. Qualif.	.879	**0**	.269	.114	**0**	.052	1	.984	1	1	1
(I) ZF					ZF9						
(J) ZF	ZF1	**ZF2**	ZF3	ZF4	ZF5	ZF6	ZF7	ZF8	ZF10	ZF11	ZF12
Sig. Pots	1	**.024**	.961	.99	.879	.577	.438	.973	.986	.942	1
Sig. Match Status	1	.717	.988	1	.993	.999	1	1	1	1	1
Sig. Qualif.	1	**.009**	.974	.992	.747	.972	.968	.984	1	1	1
(I) ZF					ZF10						
(J) ZF	ZF1	ZF2	ZF3	ZF4	ZF5	ZF6	ZF7	ZF8	ZF9	ZF11	ZF12
Sig. Pots	.972	.672	.885	.927	.9	.826	1	.999	.986	.731	1
Sig. Match Status	1	1	1	1	1	1	1	1	1	1	1
Sig. Qualif.	1	1	1	1	1	1	1	1	1	1	1
(I) ZF					ZF11						
(J) ZF	ZF1	ZF2	ZF3	ZF4	ZF5	ZF6	ZF7	ZF8	ZF9	ZF10	ZF12
Sig. Pots	.975	1	.999	.993	.996	1	.437	.742	.942	.731	1
Sig. Match Status	1	1	1	1	1	1	1	1	1	1	1
Sig. Qualif.	1	.999	1	1	1	1	1	1	1	1	1
(I) ZF					ZF12						
(J) ZF	ZF1	ZF2	ZF3	ZF4	ZF5	ZF6	ZF7	ZF8	ZF9	ZF10	ZF11
Sig. Pots	1	1	1	1	1	1	1	1	1	1	1
Sig. Match Status	1	1	1	1	1	1	1	1	1	1	1
Sig. Qualif.	1	1	1	1	1	1	1	1	1	1	1

Appendix 12. Multiple comparison results for "CEIF" category, according to Team's Quality, Match Status and Qualification.

(I) CEIF				FPA				
(J) CEIF	FRA	FRM	**FMA**	**FMM**	FMR	FAM	FAR	FAØ
Sig. Pots	.439	.998	**.016**	**0**	.521	.194	1	.95
Sig. Match Status	.997	.283	.991	.353	.168	.3	.909	.473
Sig. Qualif.	.296	1	.098	**0**	.2	.992	.557	.212
(I) CEIF				FRA				
(J) CEIF	FPA	FRM	FMA	**FMM**	FMR	FAM	FAR	FAØ
Sig. Pots	.439	1	.427	**.033**	.848	.496	1	.986
Sig. Match Status	.997	.437	1	.523	.242	.406	.961	.53
Sig. Qualif.	.296	.951	.941	.067	.541	1	.906	.347
(I) CEIF				FRM				
(J) CEIF	FPA	FRA	FMA	FMM	FMR	FAM	FAR	FAØ
Sig. Pots	.998	1	.959	.938	.889	.612	1	.984
Sig. Match Status	.283	.437	.665	.879	.973	.996	1	.874
Sig. Qualif.	1	.951	.723	.381	.297	.993	.657	.221
(I) CEIF				FMA				
(J) CEIF	**FPA**	FRA	FRM	FMM	FMR	FAM	FAR	FAØ
Sig. Pots	**.016**	.427	.959	1	.994	.9	.995	.998
Sig. Match Status	.991	1	.665	.989	.334	.518	.983	.569
Sig. Qualif.	.098	.941	.723	.998	.806	1	.989	.455
(I) CEIF				FMM				
(J) CEIF	**FPA**	**FRA**	FRM	FMA	FMR	FAM	FAR	FAØ
Sig. Pots	**0**	**.033**	.938	1	.994	.889	.993	.998
Sig. Match Status	.353	.523	.879	.989	.487	.687	.998	.649
Sig. Qualif.	**0**	.067	.381	.998	.892	1	.998	.513

Appendix 12 (cont). Multiple comparison results for "CEIF" category, according to Team's Quality, Match Status and Qualification.

(I) CEIF					FMR			
(J) CEIF	FPA	FRA	FRM	FMA	FMM	FAM	FAR	FAØ
Sig. Pots	.521	.848	.889	.994	.994	1	.94	1
Sig. Match Status	.168	.242	.973	.334	.487	1	.986	.994
Sig. Qualif.	.2	.541	.297	.806	.892	.952	1	.923
(I) CEIF					FAM			
(J) CEIF	FPA	FRA	FRM	FMA	FMM	FMR	FAR	FAØ
Sig. Pots	.194	.496	.612	.9	.889	1	.769	1
Sig. Match Status	.3	.406	.996	.518	.687	1	.998	.984
Sig. Qualif.	.992	1	.993	1	1	.952	.998	.543
(I) CEIF					FAR			
(J) CEIF	FPA	FRA	FRM	FMA	FMM	FMR	FAM	FAØ
Sig. Pots	1	1	1	.995	.993	.94	.769	.984
Sig. Match Status	.909	.961	1	.983	.998	.986	.998	.885
Sig. Qualif.	.557	.906	.657	.989	.998	1	.998	.799
(I) CEIF					FAØ			
(J) CEIF	FPA	FRA	FRM	FMA	FMM	FMR	FAM	FAR
Sig. Pots	.95	.986	.984	.998	.998	1	1	.984
Sig. Match Status	.473	.53	.874	.569	.649	.994	.984	.885
Sig. Qualif.	.212	.347	.221	.455	.513	.923	.543	.799

Appendix 13. Multiple comparison results for "RR" category, according to Team's Quality, Match Status and Qualification.

(I) RR					I			
(J) RR	T	GKS	WST	TW	DO	LST	GKO	**TG**
Sig. Pots	1	.144	.992	.999	1	.83	.998	**0**
Sig. Match Status	.996	.998	.997	1	1	.999	1	**0**
Sig. Qualif.	.999	.162	1	.991	1	.999	1	.205
(I) RR					T			
(J) RR	I	GKS	WST	TW	DO	LST	GKO	**TG**
Sig. Pots	1	.225	.999	.998	.999	.964	.999	**0**
Sig. Match Status	.996	1	.881	1	.997	.92	1	**0**
Sig. Qualif.	.999	.09	.985	1	.999	.965	.999	.123
(I) RR					GKS			
(J) RR	I	T	WST	TW	DO	LST	GKO	**TG**
Sig. Pots	.144	.225	.467	.141	.093	.608	.987	.576
Sig. Match Status	.998	1	.967	1	.998	.981	1	**.01**
Sig. Qualif.	.162	.09	.364	.096	.184	.345	.964	1
(I) RR					WST			
(J) RR	I	T	GKS	TW	DO	LST	GKO	**TG**
Sig. Pots	.992	.999	.467	.958	.947	1	1	**.001**
Sig. Match Status	.997	.881	.967	.992	.998	1	.999	**0**
Sig. Qualif.	1	.985	.364	.955	1	1	1	.389
(I) RR					TW			
(J) RR	I	T	GKS	WST	DO	LST	GKO	**TG**
Sig. Pots	.999	.998	.141	.958	1	.816	.987	**0**
Sig. Match Status	1	1	1	.992	1	.997	1	**0**
Sig. Qualif.	.991	1	.096	.955	.99	.931	.992	.116

Appendix 13 (cont). Multiple comparison results for "RR" category, according to Team's Quality, Match Status and Qualification.

(I) RR					DO			
(J) RR	I	T	GKS	WST	TW	LST	GKO	**TG**
Sig. Pots	1	.999	.093	.947	1	.626	.994	**0**
Sig. Match Status	1	.997	.998	.998	1	1	1	**0**
Sig. Qualif.	1	.999	.184	1	.99	1	1	.225
(I) RR					LST			
(J) RR	I	T	GKS	WST	TW	DO	GKO	**TG**
Sig. Pots	.83	.964	.608	1	.816	.626	1	**.001**
Sig. Match Status	.999	.92	.981	1	.997	1	1	**0**
Sig. Qualif.	.999	.965	.345	1	.931	1	1	.376
(I) RR					GKO			
(J) RR	I	T	GKS	WST	TW	DO	LST	TG
Sig. Pots	.998	.999	.987	1	.987	.994	1	.208
Sig. Match Status	1	1	1	.999	1	1	1	.055
Sig. Qualif.	1	.999	.964	1	.992	1	1	.944