

STYLES OF PLAY IN ELITE DEVELOPMENT SOCCER:
ANALYSING AND IDENTIFYING ATTACKING STYLES OF
PLAY IN THE PREMIER LEAGUE 2

RACHEL SMITH

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Abstract:

This study looked to analyse previous research on tactical behaviours and patterns and observe the effect different styles of play have on a range of KPIs. The main aim of this study was to investigate the effectiveness of different possession types and observe their association to different KPIs in the Premier League 2. This study analysed 8249 possessions in the Premier League 2, using a range of statistical tests, (X2, Odds Ratio) to measure the effect the styles of play had on different offensive and defensive variables.

Key results from this study include counterattacks as a style of play was the most effective in producing goals (3.7%) and shots (16.5%). The elaborate possession type was the most frequently used style of play but yielded a lower percentage of goals (1.24%) and shots (7.8%) per possession (percentages). There was also found to be significant associations between possession type and variables such as opposition defensive pressure, space utilisation and end-zones.

Research Literature Review – Rachel Smith

History of Notational Analysis

Match analysis in the past decade has played a pivotal role in promoting the success of sports team performances (Carling, 2008). Specifically, in football, match performance can be defined as the tactical and technical factors interacting differently (Sarmiento et al, 2014). These tactical and technical factors are integral to the coaching and analysis process (Lago, 2009). Notation systems are developed to store information about the team, subsidiary unit, and individual players actions during games and training to effectively analyse different aspects of performance, (Hughes and Franks, 1997). In 1950, Charles Reep created the first notational system that illustrated a teams' passing movements, with each action identified in shorthand code (Reep, 1961). Goal scoring in football soon became of interest, specifically how random chance can determine certain outcomes, and this was greater than previously suggested (Reep et al, 1971; Pollard et al., 1977).

Reep and Benjamin's (1968) original work reported that on average it takes 10 shots to score one goal, and that 80% of goals are scored from three or less passes (Bate 1988). Hughes and Franks (2005) analysed the 1990 and 1994 FIFA World Cup games to determine whether the findings from Reep and Benjamin (1968) were still relevant, They reported similar results, however, once the data was normalised (i.e., dividing the number of outcomes by the frequency of occurrence), more goals were scored from longer passing sequences, more shots per long possession,, strike ratio (goals from shots is better from direct play), and successful longer passing teams produced more goals (Hughes and Franks 2005).

The evolution into computerised notation was to solve the problems that occurred during hand notation and improve data processing time that would benefit team sports. The detail, data manipulation and statistical outputs that were available led to more traditional methods of analysis becoming out-dated. The computerised notational information in team sports is useful for several purposes that include databasing, immediate feedback, game evaluation and scouting. Another traditional notational analysis limitation was the time-consuming nature of detailed game observational analysis, (Carling et al. 2008; James 2006), more recently, the demand for quicker and more reliable analysis of a game has increased (Beetz et al. 2005; Carling et al. 2014; Lucey et al. 2013; Wang et al. 2015). The recent surge of instant game analysis has increased further with the emergence of social media and the

amount of data readily available to the public, observational data can be produced easily due to the live broadcast of games, this is something that was popularised in the 1990s, the statistical empirical analysis of in game baseball activity (Lewis, 2004).

Match analysis has previously been defined as the interaction of the different technical, tactical psychological and physiological factors, (Carling, 2009; Drust, et al, 2007). Match analysis also considers contextual variables like game location, quality of opposition and interaction with the opposition to better understand performance and results, (Sarmiento et al, 2014). Match analysis is usually guided by what a coach would like to observe and analyse and from this certain key performance indicators (KPIs) are selected. KPIs can be defined as the combination of selected variables that define certain aspect of a team or an individual's performance (Hughes and Bartlett, 2002). KPIs are therefore used to evaluate the key offensive and defensive success of football teams (Herold et al, 2021).

Performance variables in football and the context surrounding them has been an area of research that has developed (Mackenzie and Cushion 2012). Mackenzie and Cushion (2012) critically analysed a range of studies and found that contextual information such as quality of opposition, venue (i.e., home or away) and pitch geography context was lacking in more than half of the studies (Lago and Martin, 2007; Cullinane 2008; Redwood-Brown 2008; Carling et al. 2010; Clark 2010; Gregson et al. 2010).

Previously, traditional analysis of tactics in soccer relied on the notational analysis providing statistics on averages and totals (Hughes and Bartlett 2002), but there were contextual problems, as the information was often discarded or not included, (Sarmiento et al., 2014; Tenga et al., 2010). Recently, the contextual variables research has used a multivariate approach, bringing together statistics and contextual variables, (Fernandez-Navarro et al., 2016; Kempe et al., 2014), this can be an integral part to an analyst and coach interaction.

Another method of analytical advancement is the use of passing networks and the correlation it has with the passing behaviours of teams, (Watts and Strogatz, 1998). The main use of passing networks is to produce a model that can outline what players are utilised more in different systems. For example, players who complete more passes to each other are symbolised as nodes with larger weighted vertices, and this data can be used for pre-match tactical plans, with potential players and areas most likely to receive the ball being highlighted

(Duarte et al., 2012; Passos et al., 2011; Gama et al., 2014). Another recent development in football analytics is the development of positional data, often through camera tracking, local positioning or global positioning systems. The positional data depicts different predictabilities in individual players movements that contribute to a team's overall organisational structure (Memmert et al., 2017). From this you can observe a team's general structure at different periods and see areas opposition use more frequently when in possession of the ball.

Furthermore, this recent progression of computerised notational systems and data management techniques have allowed the tracking of player movements and the ball. This can be used to analyse team tactical formations with possession regain event data to assess defensive tactical moments like 'compactness' so that their effectiveness can be measured (Grunz et al., 2012). The tracking of individual players has also produced data around team formations and average player positioning (known as the team centroid) and is used to measure the inter-player coordination (Sampaio, 2012). The data processing techniques that use the entropy values can be used to then predict players movement patterns (Richman, 2000). Exploring the tactical behavioural interactions of teams is useful in illustrating the style of play of the team, and the general attacking and defensive flow of the teams and their subsequent characteristics (Walter et al., 2007; Olthof et al., 2015; Frencken et al., 2011; Frencken et al., 2012).

Technological advancements over recent years have allowed teams to integrate different machine learning (ML) algorithms to identify patterns from large datasets obtained from position data and match outputs, (Bialkowski et al., 2014; Haykin, 2009; Jordan and Mitchell 2015). The large data sets and technological advancements has allowed storing event data for entire seasons to be easily stored in Extensive Markup Language (XML), allowing for a greater comparison of games and seasons (Cassimally, 2012; Kasabian, 2014; Lohr, 2012; Medeiros, 2014; Norton, 2014). In addition, technological advancements like automated video annotation systems, (Xue et al., 2017) which extracts metadata from the video to present simple on-screen graphics, and the Piero system (Fischer et al., 2019), it is used in a range of sports to track players semi-automatically, and this is effective for real time analysis. Furthermore, Rein and Memmert (2016) conceptualised a framework illustrating this data acquisition, storage, modelling and visualisation into a data technological stack (Figure 1). Figure 1 illustrates how multiple technological systems can support tactical decision making in football. The exponential development of notational analysis and its uses within these elite environments

have also encouraged an emphasis on improving objectivity and reliability, to provide constant valid feedback.

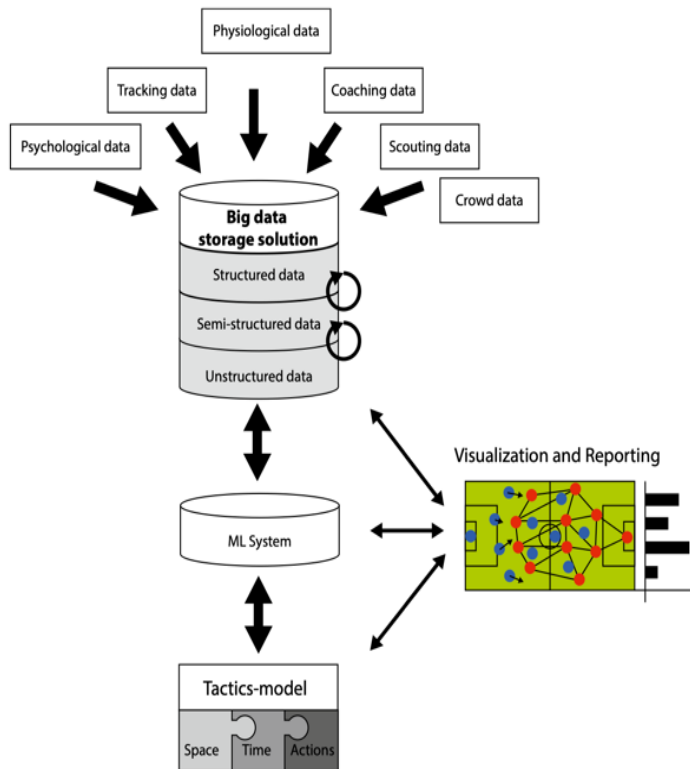


Figure 1 - Big Data technological stack in tactical analysis in elite soccer (Rein and Memmert, 2016)

Objectivity and reliability:

This increase in available video and data created internally and provided by third party companies mean there is a requirement to ensure the accuracy and management before any analysis can be conducted, and insights provided. Therefore, it is important that validity and reliability checks are conducted to ensure the accuracy of the data and the output. The amount of information gathered allows for in depth data analysis, this has become more prevalent in football, and it is a crucial part of the workflow for teams at all different levels. The data can also be collected and shared from companies like OPTA and STATSBOMB, to provide an even more in-depth analysis on teams and individuals, (Cassimally, 2012; Kasabian, 2014; Norton, 2014).

A key factor in the analysis of performance in football and in sports in general is reliable data collection systems, it has been previously defined as the consistency of measurements and reliability using an analysis system over time, (Wilson and Batterham, 1999). Researchers have previously presented analytical systems that were designed specifically for their results, for this to be considered reliable a repeat assessment of the data is conducted after an appropriate time interval between assessments, the result of this should be cohesive, and an acceptable agreement should take place on both occasions, (test-retest analysis).

Reliability and objectivity and its importance is widely discussed in performance analysis (Hughes et al., 2001; Hughes et al., 2004; Bradley et al., 2007; Lames and McGarry, 2007; O'Donoghue, 2007; O'Donoghue, 2010). Reliability refers to intra-observer consistency, meaning that the same observer should be able to produce consistent results when repeating the same analysis under similar conditions. On the other hand, objectivity refers to inter-observer consistency, which implies that different observers should arrive at the same results when analysing the same events using the same criteria. The measurements should be reproducible from different observers, as it allows us to reach conclusions with the measured variables, (Hayen et al., 2007). Defining match actions and variables precisely allows them to have unambiguous meaning, that can be well interpreted by operators who are potential coders, (O'Donoghue, 2007).

Statistical methods presented to assist analysts in assessing reliability need to identify two fundamentals, bias between test and retest data, and the degree of random variation between the test and retest data, (Cooper et al., 2007). The most common form of data analysis in notational studies is recording the frequencies of actions, this can be presented as sums, means or totals. Being able to accurately repeat tests with the same equipment is essential, most papers will have notational systems specific to their experiment, with some previous exceptions (Hughes, Franks and Nagelkerke, 1989; Wilson and Barnes, 1998), however papers presenting new systems should be producing evidence of a systematised testing for reliability and objectivity. For example, Evans (1999) observed and noted the variables after a rally ended, their intra-observer reliability method found a high number of agreements due to their clear definitions and structure. In addition, Wells and Hughes (2001) found that when dealing with

more complex and subjective variables disagreements will occur between observers leading to the need for more observer training or protocols.

Bland and Altman (1986) used a method of comparing the agreements between two observers and two sets of data with a plot of one test against the other. An addition to this test could be a further plot, one which analyses the differences between the measurements against their means to assess the amount of agreement (Nevill, 2000). Hughes et al. (2000) tried to establish and validate normative player profiles, to do this they used independent *t*-tests for each of the players, a method in which the playing patterns could be produced consistently.

Studies that looked at categorical data, illustrated that reliability measures should reflect how the data is analysed, whilst undertaking a gold standard of coding that is representative of a sample of events, (Armitage, 2006; O'Donoghue, 2006; Hughes and Snook, 2006). Laird and Waters (2008) looked at observational accuracy in sports coaches, discovered that an experienced coach develops patterns in their own coaching style, which can influence how they observe performance (Crisfield, 1998). Moreover, this discovery also argued that it is difficult for coaches to be aware of every aspect of the game, especially in team games when more players are on the field of play, (Franks and Miller, 1986). Performance analysis and the constant improvements with objectivity and reliability of data and feedback is increasingly informing applied coaching practices and is becoming an integral part of these daily coaching processes.

The Coaching Process

The coaching process has been previously defined by Borrie and Knowles (2003) as the process of different stages that a coach goes through to help develop a player or teams' skills. It can be thought of as a complex cycle of performance, analysis, feedback and constant reflection, (Franks and Hughes, 2016). Coaches have been known to work without any reference to a coaching process model and look to base their personal processes on their intuition and past experiences. It has also been noted in previous literature that to be effective as a coach they have to adapt and utilise a wide range of different variables that occur within training sessions and games as well as surrounding moments, (Cushion et al., 2003; Jones et al., 2004, Lyle, 2005).

Previous literature has stated there are four commonly used coaching process models; Fairs (1987) a more systematic approach; Sherman et al. (1997) an instructional approach; and Lyle (2005) a cyclical holistic approach that considers contextual factors and external constraints. The approach by Lyle (2005) was built around the concepts of an informational base of knowledge and skills of the coach which then interacts with a player's physical and technical abilities, aided by performance analysis and a range of off pitch preparation to guide learning. A more recent coaching process model (Figure 2) proposed by Maslovat and Franks (2008) had the primary focus of performance analysis to be for observational and objective information regarding a player's performance. This allows the tactical and technical information to be portrayed in a way that supports player learning and development, (Groom, Cushion, and Nelson, 2011).

Performance analysis (PA) has been previously defined as the investigation of performance with the aim of developing a deeper understanding, providing information for coaches in their coaching process, (O'Donoghue, 2009; Hodges and Franks, 2002). In the elite football context PA is largely based on tactical and technical evaluation of performance, this turning into feedback for coaches and players is important in aiding the improvement of the individual and the team's performance (Williams et al., 2005).

Coaches have been increasingly exposed to different forms of PA in football (Blaze et al., 2004). Wright, Atkins and Jones (2015) surveyed how PA was used by a range of professional and semi-professional coaches from rugby, hockey, football and basketball. All sports are team invasion sports with the main goal of scoring more than the opposition. The result demonstrated that the majority of coaches were provided with video, however less than half received live analysis. One of the key findings was around how PA informed coaches planning in the short and long term, and how they choose their KPIs. The role of a coach is to observe and develop players, while being able to recall and analyse events, this is complex, and therefore being able to provide support for a coach is an important area in which PA supports, (Laird and Waters, 2008; O'Donoghue, 2010; Wright et al., 2013).

The application of PA is important in the feedback process to both player and coach, (Groom and Cushion, 2004). This however can depend on the coach's ability to effectively use the clips, statistics, and information to deliver the feedback while keeping player engagement

high to ensure some learning and development (Potrac, Jones and Armer, 2002; Booroff et al., 2015). The delivery of information can also be assisted by the analyst and coach, while considering several contextual factors of the game itself, the group dynamics and age of the players, (Denison, 2010; Jones, 2000; Jones et al., 2002). Most coaches would assume that winning is the team that demonstrates tactical and technical dominance. Considering the above, this approach can be a traditional coaching view, the addition of sport scientists, psychologists, and performance analysts have provided further context to player and team performance, (Grecic and Collins, 2013; Gilbert and Trudel, 2005; Reilly and Williams, 2005).

The accuracy of feedback is important, Maslovat and Franks (2008) observed that feedback solely based on a coach's game observation leads to superficial feedback that could also have developed from an emotional game moment. Additionally, the analysis feedback can prevent some human observation errors, the combination of coach and analysis feedback is now more widely accepted in the coaching process, (Kraak et al., 2018).

The ability for a coach to use video and analysis in player development has been an instrumental addition, and Groom and Cushion (2004) observed that the use of video feedback improved key areas in a player's development. This important visual learning tool allows coaches to provide a range of positive and constructive criticism to help improve a player's understanding as well as potentially illustrating how to change on field behaviours, all of which helps develop a player, (Court, 2004).

Creating video feedback with statistical information for the coaches (Dufour, 1993) allows for individuals within a team to be evaluated in a multitude of ways but specifically, in a tactical and technical way. Using different methods to display the data depending on the type of data and who the data is for is essential, an example is how Gerisch and Reichelt (1993) used graphical illustrations to display how players did in 1v1 situations. Further developments of how we display information to coaches and players has greatly improved with the addition of heatmaps, radar graphs with also shot and pass maps, and passing networks.

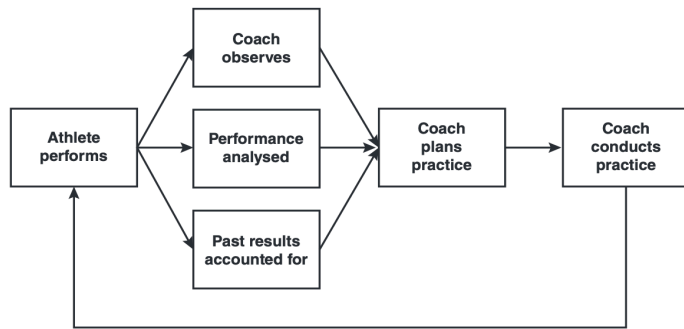


Figure 2 - The coaching process (Adapted from Maslovat and Franks, 2008)

Match analysis has been widely recognised as an important aspect for success, as it usually forms the overall structure of weekly training and match preparation (Carling et al., 2007). The role of the analyst is firstly, providing information which enhances the quality of how a coach observes and recalls and ultimately provides feedback (Wright et al., 2013). Wright et al. (2013) analysed the role of performance analysts in the coaching process found that the majority of analysts surveyed (81.3%) are involved in post-match analytical processes and post-match feedback (70.8%). It was also highlighted that 77.1% of all analysts communicated with the coach to develop a range of KPIs to analyse and evaluate performance. A high number of analysts also said that they converse with the coaching staff before providing the different types of feedback to the players (89.9%).

The increased use of video-based pre- and post-match PA and the development of detailed technology within elite sport, concludes that PA is a big factor within the coaching process (Carling et al., 2007; Jones, Hughes and Franks 2007; Groom et al., 2011). Telestration has been defined as the drawing of annotations over images or videos, (Budrionis et al., 2013), this feedback method allows the illustration of key tactical and technical information. Verbal information alongside telestration can prevent misunderstanding due to the information being interactive and digestible, the effectiveness of this can also develop a player's game understanding, (Budrionis et al., 2013; Laborde et al., 2017, Groom and Cushion, 2004).

A performance analyst and their statistical creation, acquisition, interpretation and evaluation can play an important role in developing a range of players at different levels and

ages, (Memmert and Raabe, 2017). Typical analytical KPIs such as pass number, possession statistics, shot maps and numerous other offensive and defensive variables are examples of data presented at a high elite level, that provide feedback on a data specific level (Memmert et al., 2016). More in depth analysis such as the precise recording of the individual players' and the balls position allows for such positional data like pass maps, heatmaps and pass networks which can be utilised in numerous ways, (Arbués-Sangüesa et al., 2021). Within the coaching process, performance indicators have emerged as a method in quantifying these tactical behaviours and is used to review different aspects of the game in more detail on a consistent basis.

Set Plays:

Previous research has found that between 30% and 40% of goals are scored from set plays (Casal et al., 2015), highlighting the importance in elite football. Set plays include corners, free kicks, penalties and throw ins and the frequency per game can vary. Siegle and Lames (2012) recorded an average of 108 'interruptions' per match, with throw ins (40) and free kicks (33) being the most common, with goal kicks (17), corner kicks (10) being less frequent. The more frequent set plays (throw ins and free kicks) are also viewed as an opportunity to advance quickly and directly into goal scoring areas, (Maneiro et al., 2019). Furthermore, it has also been previously found that teams who were more effective at set pieces with a higher set play to goal ratio were overall more successful than teams with a lower set play to goal ratio, (Carling et al., 2005). Leite (2020) who observed 64 matches and 169 goals in the 2018 World cup, analysed the sequence of actions that occurred before a goal was scored. It was found that while most goals came from an open play sequence the next highest was from set plays, suggesting the increased tactical influence set plays have on the modern game and in training.

Despite the relatively low frequency of corner kicks compared to free kicks and throw ins, they can often be a determining factor in match outcomes. Casal et al, (2015) found that during major tournaments (Champions League 2010/11, World Cup 2010 and Euro 2012) only 26% of all corners led to a shot and only 2.2% led to a goal being scored. This paper also highlighted that 76% of matches were won or drawn when a corner was scored, highlighting its impact. Another study by Kubayi and Larkin (2019) found that 25% of corners led to a shot, with a slightly higher goal conversion rate than previous studies (3.7%). When observing corners in a league format, Beare and Stone (2019) found in the Premier League 2011-2012

season 13.3% of all goals came from corners, while in the Women's Super league in the 2017-2018 season 4.6% of goals came from corners. A more recent study observing corners in the Premier League in the 2015-2016 season, Stafford et al, (2019) noted that only 10% of goal attempts originated from corner kicks, however similar to the findings by Casal et al, (2015) found that matches that ended with a win or draw when a goal was scored from a corner occurred in 67% of cases.

Penalty kicks represent one of the most psychological, pressurised moments in football. Approximately, 70-85% of penalty kicks are scored in professional men's football, (Farina et al., 2013; Almeida et al., 2016; Hughes and Wells, 2002; Lopez-Botella and Palao, 2007). Dalton et al, (2015) who observed tournament football (World Cups, and Euros between 1982-98 and 2002-2008), found penalty kick shootouts success rate was slightly lower at a range of 73-76%, while match play penalty kicks had a wider variation of 68-85%, (McGarry and Franks, 2000). The process of taking a penalty and the situation surrounding it can be complex, with the 'dyadic' interaction between the taker and the goalkeeper taking place, (Almeida et al., 2016). The penalty kick itself is influenced by a range of individual and external variables such as strike end location, run up length, match status and opponent quality, (Jamil et al., 2020; Almeida et al., 2016). The findings around the individual and situational variables suggested the significant effect they have on the outcome of the penalty, and both psychological and contextual components must be considered when analysing penalties.

Free kicks are considered to be the most effective set piece (excluding penalties) for creating goal scoring opportunities, (Carling et al., 2005) especially when the free kick is near the goal from angles square to the goal face. Casal et al, (2014) reported an average of 30-40 free kicks per game, with three indirect free kicks per team aimed at scoring opportunities, 21.8% of these resulted in a shot on goal and 9.3% were found to be on target, while only 2.9% resulted in a goal. This study emphasises the complexity in execution of turning indirect free kicks into goals. Alcock (2010) who analysed the 2007 Women's World Cup, found that there was one free kick goal every 4.6 games, with faster ball flight times being linked to scoring. In a similar study, Link et al, (2016) who analysed the 2013/14 and 2014/15 Bundesliga observed 34.9 free kicks per game, with 5.8 taken within 35m. This study utilised a geostatistical model (Variograms, distance to goal / wall) to build specific spatial profiles. It was found that crosses from indirect free kicks were less effective, suggesting short passes and dribbles could improve efficiency. Corbellini et al, (2013) conducted a smaller study in the Portuguese League using

log linear analysis to examine how different contextual factors influence shot outcomes and free kick strategies. It was found that match status and quality of opposition had a significant impact on team strategy and the outcome. Set plays are one of the most studied areas within football due to its high scoring potential, set plays also have a link to certain styles of play particularly attacking transitions than can follow set plays.

Open Play

There have been a range of studies on goals scored from open play, the majority of studies report that goals are more frequently scored from shorter passing sequences compared to longer passing sequences, although once data was normalised it was highlighted that longer passing sequences are more effective in creating goal scoring opportunities, (Franks, 2005). Time in which goals are scored in games often varies; however, studies have shown that a higher number of goals are scored in the second half of games compared to the first half, (Barreira et al., 2013 Yi et al., 2018). A study by Tenga et al. (2010) who analysed open play possessions (1688 possessions) in the top league in Norway, saw a correlation between score box possessions and final third shots, highlighting that penetrative play rather than just ball retention is critical to attacking success.

Furthermore, open play possessions can be influenced by a range of different contextual factors, studies have found that possession alone is a poor predictor of match outcome once contextual variables such as opposition quality, match location and game status are accounted for, (Gomez et al., 2020; Collet, 2013; Taylor et al., 2008). This further underscores the need for an approach that considers both the qualitative and quantitative aspects of possession while considering match dynamics.

Key Performance Indicators:

Performance analysis provides information primarily to help develop players and understand performance, soccer teams KPIs are used to mainly analyse and observe a team's tactical or technical performance, (Groom et al., 2011; Wright et al., 2012.) KPIs help assess the performance of an individual, a team or different aspects of a team using a selection or combination of variables that the team use to define a successful performance or outcome, (Hughes and Bartlett, 2002).

Goal Scoring:

The art of goal scoring in football is complex and intricate, therefore identifying successful strategies is one of the most researched areas in football (Pratas et al., 2018). Due to scoring being the determinant of success in football, it has received the most literary attention in previous years from a tactical and technical perspective, (Reep and Benjamin, 1968; Olsen, 1998; Jinshan et al, 2003; Garganta, Maia and Basto, 1997). Reep and Benjamin (1968), and Olsen (1998) laid the foundation for tactical analysis in football, specifically around goal scoring, finding that most goals scored came from a low passing sequence (3 or fewer) and that all performance must be understood with context for deeper tactical understanding.

Alberti et al. (2013) examined the goal scoring patterns of top European leagues (i.e., list them here) over three seasons. They observed 10,885 goals, and analysed the match location, possession type and contextual differences. Most goals were scored in the last 15 minutes of the match and attributed this to fatigue, it was also of note that teams playing at home scored more goals and goals were affected by the scoreline with teams more likely to score when losing or drawing. This study analyses a large sample size which provides good analytical scope to goal scoring patterns across the three seasons, however attributing the late goals to fatigue could be a potential simplified explanation. Teams might have adopted a more offensive style of play, made tactical substitutions and have faced psychological challenges.

In addition, goals scored has been measured to assess the successful performance of teams (Barreira et al., 2013; Grant et al., 1998; Yiannakos and Armatas, 2006). These studies indicated that most goals are scored in the second half, and the highest frequency of goals are scored by midfielders and forwards. All authors consistently highlight the importance of tactical adjustments and the influence of game dynamics, however there is no specific explanation of what tactical adjustments were made and how modern game tactics influence the timing of goals. The other finding around positional contributions to goal scoring is an interesting factor that aligns with certain tactical roles we expect with higher positioned midfielders and forwards, however the tactical changes of positions alongside different tactical adjustments and formations like higher full backs, inverted full backs could be something that changes this in the coming years (Sarmiento et al., 2018; Bush et al., 2015; Bradley et al., 2011).

Due to the low scoring nature of football compared to other sports, there is normally a high level of uncertainty which can impact the match outcome. This has reflected the emergence of new footballing metrics, the main one being expected goals (xG). xG assigns a probability between 0 and 1 to each shot taken by an individual, 0 indicating no possibility of the shot turning into a goal and 1 indicating a definite goal, (Mead et al., 2023; Rathke, 2017). Rathke (2017) analysed all games from the Premier League and the Bundesliga during the 2012-2013 season and utilised an xG model that divided the space in front of the goal into 8 zones, and obtained the data for shots for and against each team and calculated a clubs xG from shots per zone multiplied by goal percentage per shot for the entire season. The main findings were the number of variables that can impact a player and teams xG total, and that xG did not perform well when measuring better teams in the league because the team's quality can often lead to scoring a higher number of goals. However, xG is a reliable and potentially valuable measurement in predicting performance but it has not yet been researched to the extent of other KPIs to measure goal scoring.

Shots

Shots have also been measured to evaluate a team's attacking performance, and have included contextual game factors such as shot location, shot distance, shot outcome (on target, off target, saved), and frequency of shots (Ensum, Pollard, and Taylor, 2005; Hughes, Robertson, and Nicholson, 1988; Collet, 2013; Corbellini, et al., 2013, Hughes and Franks, 2005). These studies used a range of shot based metrics to evaluate the attacking effectiveness. For example, Hughes et al. (1988) and Ensum et al. (2005) used simplified notational counts to link contextual variables like location to shot outcome, with both studies highlighting the limitation of using total shots as a standalone metric for success. More recently, Corbellini et al. (2013) examined shot angle and distance from goal to model shot effectiveness, whereas Collet (2013) used a large-scale statistical analysis (6,000 games in top five European Leagues) to explore shot frequency and success. There is general agreement that shots were a strong predictor of success, while exploring the need for contextual information surrounding shots.

Lago-Peñas et al. (2010) found that successful teams from the 2008-2009 Spanish top division had more shots, and higher shots conversions than that of losing or drawing teams, highlighting successful teams were better at creating offensive opportunities. Lago-Peñas et al. (2010) also found successful teams created shooting opportunities from dangerous areas

(inside the penalty box), while illustrating the winning team's superiority in maintaining ball possession. These findings were similar to a study from the Greek top division finding that successful teams created a greater number of shooting opportunities than less successful teams, (Armatas et al., 2009). Armatas et al. (2009) noted that successful teams had higher quality of shots, with more shots in the penalty area and a higher conversion rate. Both these studies examined individual leagues; however, both came to similar conclusions, successful teams have a high quality and efficiency of attacking play while maintaining high shot conversion rates. Conducting a more longitudinal analysis could potentially provide more information on certain tactical and league trends that could further enhance the information on the different leagues.

The study by Ensum et al. (2005) analysed 1099 shots in 48 matches, examined the shot frequency, location and outcome in relation to team success, and found that most shots and goals came from inside the penalty area. This study highlighted that successful teams took more shots from central and close positions, noting location of the shot strongly influences the chances of scoring. Similarly, Pollard and Reep (1997) used a logistical regression framework to analyse scoring chances, showing that shots closer to the goal and under less defensive pressure had a higher probability of a goal. However the use of linear regression assumes a linear relationship between the predictor variables and the outcome, which may oversimplify the complex interactions in football. Both studies suggest that the number and location of shots are key factors contributing to a team's success, with more shots closer to goal being characteristics of a winning team.

Hughes and Franks (2005) utilised contextual variables on shots, the main variable being passing sequences. The study analysed the 1990 and 1994 World Cup tournaments, a total of 116 games were observed and the main result observed 80% (1990) and 77% (1994) of shots occurred in a sequence of 4 passes or less. This suggests that the shooting opportunities in these tournaments came from quicker, direct play rather than a prolonged build up. This study also highlights the importance of efficient ball progression and decisiveness in attacking moments. Potentially increasing the amount of data could have helped establish more of a rounded profile of shots and passing sequence, however it has been suggested a large number of matches is not necessary to get a sufficient understanding of shots and goal scoring, (Hughes et al., 2001, 2003).

Penalty Area Entries/ Score Box Possessions:

This importance of possession in central areas, reflects a common tactical pattern observed in elite football, previous studies (Tenga et al., 2010; Lago-Ballesteros et al., 2012) have shown that successful attacks are often found to be in dangerous central areas, where chances are statistically more likely to be converted. Therefore, penalty area entries have proven to be a valuable performance indicator, distinguishing between winning, losing, and drawing with shooting from inside the penalty area identified as a key variable linked to team success, (Ensum et al., 2005). Lago et al. (2007) reported a direct relationship between penalty area entries and Barcelona's performance during the 2004-2005 season. They found that Barcelona's greater number of entries into the opponent's penalty area, compared to their own, was associated with a higher probability of scoring goals therefore, better performance was defined by their attacking effectiveness rather than just match results. In addition, Lago et al. (2007) identified range of different KPIs such as possession percentage, goal difference, possession percentage, and number of shots that were related to better performance. Furthermore, penalty area entries are used as a proxy for goals and shots, (Tenga et al., 2010), therefore suggesting it directly relates to good performance.

Ruiz-Ruiz et al. (2013) analysed the Germany World Cup (2006) and observed that teams who received more entries into their own penalty area than the opposing team were significantly more likely to concede a goal, due to possession starting in proximity to the goal. Hughes, Robertson and Nicholson (1988) conducted an analysis of the 1984 World Cup in Mexico and analysed the difference between winning and losing teams and found winning teams took their goal shots from inside the penalty area, this was also linked to higher scoring efficiency. Similarly, Olsen (1998) who studied the same tournament and reported that 90% of the goals scored came from inside the penalty area. Fernandez-Navarro et al. (2016) analysed the 2011-2012 La Liga season and highlighted that the penalty area was the focal point for offensive success, with approximately 80% of all goals scored from inside the penalty area.

Moreover, Tenga and colleagues (Tenga et al., 2009; Tenga et al., 2010) measured the effectiveness of score box possessions. Score box possessions were defined as a controlled possession with an entry into the area which includes the penalty area and an extended area from 16m to 30m from the oppositions goal line. The study saw the score box as a high value attacking zone, and they analysed how possession type, start zones, end zones and defensive

context influenced a team's ability to get a score box possession. Tenga and colleagues used score box possessions as a variable to measure the effectiveness of tactics in soccer, and found possessions that reached the score box were far more likely to result in goal scoring opportunities, as this area produced the highest number of shots and goals, and teams that could consistently create controlled entries into this zone were more successful in producing high quality chances. It was also observed that both fast counterattacks and elaborate build up play could be effective methods of reaching the score box, however attacks in which the opposition were defensively disorganised (more often against counter attacks) led to a higher chance of success. This highlights the need for context around styles of play, with factors like execution and control influencing the outcome. Ensum et al. (2005), Lago et al. (2007) and Tenga et al. (2010) all suggested that penalty area entries are an indicator of a team's success, however Tenga et al. (2010) introduced a new tactical layer discussing how the possessions are created, while looking at the quality of each possession in this area.

Possession:

The ability to keep possession of the football for prolonged periods of time has previously been linked to success in football (Hook and Hughes, 2001). Bate (1988) found that the higher number of possessions led to increased chances of progressing into the final third a higher chance of creating goal scoring opportunities. Previous World Cup studies observed that successful teams had longer, and more successful sequences of play compared to teams who were unsuccessful, (Grant et al., 1999; Hook and Hughes, 2001; Hughes and Franks, 2005). Bloomfield et al. (2005) observed that successful teams within the English Premiership tended to obtain increased ball possession when leading or trailing, indicating a more proactive tactic to "controlling" the game via possession.

Maintaining ball possession during games has been associated with winning games, (Bell-Walker et al., 2006; Breen et al., 2006; Carling et al., 2005, Oberstone, 2009; Williams, 2003). Previous studies have suggested that possessing the ball during competition correlates with successful performance (Duarte et al., 2013; Hughes and Franks, 2005). Bartlett et al. (2012) specifically analysed 305 open play attacks in the Champions League using player tracking data to get coordination dynamics. They found that a successful attack was one in which possession was maintained near the oppositions goal, however, one team having more

ball possession than their opposition is not necessarily aligned with creating goal scoring opportunities, (Wright et al., 2011; Collet, 2013).

Hughes and Churchill (2005) analysed the attacking profiles of successful and unsuccessful teams in the 2001 Copa America tournament and suggested that successful teams have more effective possession regain strategies in areas closer to the oppositions goal. Hughes and Churchill (2005) also suggested that possession regains in these areas closer to the opposition goal correlates with increased goal scoring opportunities and therefore success. In addition, Tenga and Sigmundstad (2011) sampled 997 goals from the Top Norwegian league from 2008-2010 and reported a higher proportion of goals originating from possessions regained in areas closer to the oppositions goal. However, both studies lacked the addition of contextual factors, of which could have provided a more complete understanding of possessional regains and attacking strategies.

Moments of Play

Association football is categorised as a goal scoring invasion game (Hughes and Franks, 2005), and the primary objective of football is to score while preventing the opposition from scoring. Previously three main phases were identified in football, defensive play, midfield play, and attacking play, (Wade, 1996). Hewitt et al. (2016) has previously summarised football as a competitive game between teams that has moments of frenzied attacking movements to create instances of imbalance within a team's structure, compared to a team's ability to control a game with possession.

It has been previously suggested that moments of play during a game are established in four repeating phases, an established attack, defensive and attacking transitions and an established defence, however this can be shortened to offensive and defensive phases (Oliveira, 2004; Pinto, 2014). The offensive phase key moments such as the build-up phase and attacking play, are in the possession phases, and the objective is to imbalance the opposition defensive structure to ultimately create a goal scoring opportunity. The defensive phases are linked to the defensive structures and pressing of the opposition (i.e., high-mid-low block), where the main objective is to regain possession and prevent the opposition from scoring, (Bauer et al., 2023). The importance that teams place on any of these key moments may change and adapt based on

success attributed to each moment, and therefore the combination of coaching practice, player attributes and overall game success can characterise a team's playing style, (Hewitt et al., 2016).

A team's strategy, actions and tactics during a football game are often influenced by a range of external and internal variables, as well as in game spatial and temporal factors that players must recognise, (Garganta, 2009; Gréhaigne et al., 1997). Therefore, the occurrence of successful match performance can be dependent on random in game actions by either an individual, unit or the team as whole, (Memmert et al., 2016). Strategy is defined as the plans, or action guidelines that can inform players and the team during the game (Hewitt et al., 2016).

Developing strategies and tactics for specific phases of play is one of the main factors for a structured successful performance, (Carling et al., 2007; Yiannakos and Armatas, 2006). Developing tactics in preparation for a game can assist in predetermining how a team manages the oppositions strengths, while taking advantage of the opposition weaknesses. Tactics can be changed and adapted based on situational and tactical game developments, (Fradua et al., 2013; Garganta, 2009; Rein and Memmert, 2016). The strategy and team tactics that are put in place prior to the game can influence a players decision making before and during the game, and as the game flows players and teams will adapt to the different phases of play and therefore, the tactics and strategy can evolve with it.

An example of an attacking tactical strategy could be positioning players to give them a higher chance of receiving the ball in certain predetermined areas noticed prior to the game. Tactically positioning wingers in spaces would allow full backs to overlap or underlap in wide areas creating 2v1 scenarios to exploit areas of weakness, which could include an opposition player not following runners. Creating a team structure that allows passing lines to be created in all five lanes of the pitch, creating overloads in either central or wide areas are other methods in a tactical strategy. In direct contrast to this, the opposition would put in place defensive strategies to prevent the oppositions attacking options, this could be through compact formations out of possession, pressing structures and creating traps for the opposition to play into that allow a higher chance for regains.

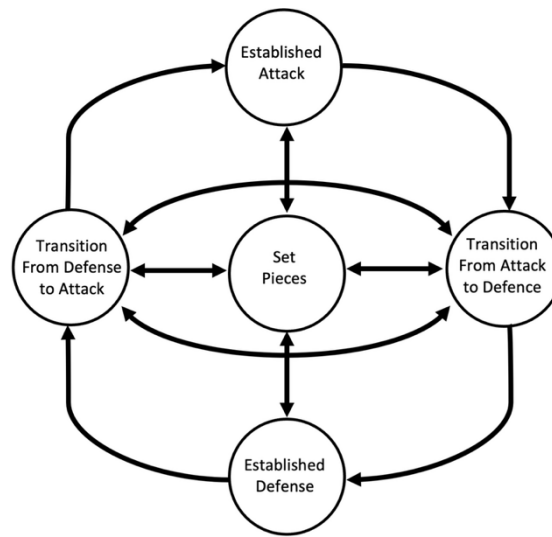


Figure 3 - The five moments of play (Hewitt et al., (2016)

Figure 3 illustrates the four key repeating phases or moments during a game, an Established Attack, Defensive Transition, Established Defence and Offensive Transition (Oliveira, 2004). The fifth key moment of the game is set pieces, research demonstrates that a high amount of goal scoring opportunities come from set piece scenarios (e.g., corners, free kicks and penalties). Ensum et al. (2000) observed that approximately 30% of goals in tournaments and leagues came from set pieces. It is important to note that moments can be considered as discrete periods that are isolated events, however they can interact and effect other moments of play. Defensive tactics in certain formations can affect the opposition when they try to attack certain areas, (Delgado-Bordonau and Mendez-Villanueva, 2012). Dynamical systems theory has been used previously to illustrate the way in which two teams interact, and how this can affect and disturb the flow of the attacking and defensive moments in the game (Gréhaigne et al., 1997; McGarry et al., 2002).

The dynamic team and individual interactions of players during the game are the collective moments that allow a team to achieve a common goal, (Ribeiro et al., 2017; Vilar et al., 2013). A team's strategy will be decided by the coaching staff, and this will include all tactical plans pre-match and predetermined actions to organise the team in possession and out of possession, (Gréhaigne and Godbout, 1995). A teams strategy describes decisions made pre-match in relation to how the team wants to play, whereas the tactics is everchanging throughout the match due to the interaction of the two teams in different moments of the game, (Gréhaigne and Godbout, 1995). The tactics of a team can vary throughout a game, as it can be a response to game contexts and situations, examples include opposition formation and score-line, (Lauder and Piltz, 2013). The importance of choosing tactics that achieve the goal of winning

is crucial for every team's pre-match preparation in a physical training and analytical sense, (Kannekens et al., 2011; Sampaio and Maçãs, 2012; Grunz et al., 2012; Rein and Memmert, 2016).

Styles of Play

Game style is what we observe when we observe a pattern of moments of play in certain structures, with a frequency of occurrence and repeatability from game to game, (Hewitt et al., 2016). A style of play can be defined as the behaviour of the whole team to achieve the attacking and defensive objectives in the game, whereas tactics are defined as the specific attacking and defensive actions that give quick solutions to different strategies and to the ever changing situations influenced by the opposition, (Taylor, Mellalieu, and James, 2005). Strategy has been previously defined as the overall plan devised for a team to achieve a specific aim within a game (Robertson, 2000). Furthermore, strategies and tactics tend to be unique and individualised for different teams (Hughes, 1999). Describing and analytically profiling teams is important to identify patterns and success rates, previously researchers have measured this in many different forms of key performance indicators. Evaluating the effectiveness of some teams defensive and attacking successes can be difficult due to the number of different contextual situations that arise in football.

Defending styles have previously been defined as high pressures and low pressures depending on the specific pitch areas where pressure is applied (Bangsbo and Peitersen, 2000). An example of high pressure is applying pressure in the attacking half, whereas defensive pressure is pressure in the defensive third. Additionally, tactical approaches such as the mid-block and low-block further describe defensive positioning: a mid-block involves maintaining a structured defensive line around the midfield area to control space and disrupt the opponent's build-up play early, while a low-block compresses defensive space closer to the goal, positioning defenders deeper to limit shooting opportunities and protect the penalty area more directly (Bauer et al., 2023). In contrast, attacking styles of play have previously been defined as direct, possession based, counterattacking, and crossing (Bangsbo and Peitersen, 2000; Pollard et al., 1988). Direct styles of play and possession styles of play have been researched to be the most described attacking styles of play (Bate, 1988; Garganta, Maia, and Basto, 1997). For the purposes of this literature review, only these three attacking styles (direct, counterattack and elaborate) will be discussed.

Direct Play:

Direct play, a style of play in which Bate (1988) suggested is a strategy of fewer passes per team possession, and several teams have achieved a measure of success, particularly teams in league one and two of the English League system (Hughes and Franks, 2005). While notably effective in exploiting space, the success of direct play may reflect contextual factors like quality of the opposition and game state, limiting its generalisability to higher level competitions. In addition, Hughes and Franks (2005), analysed the differences between technical performance (i.e., ball possession, possessions per shot, goal and passing sequences) of the successful and unsuccessful teams during two World Cups (1990, 1994). They highlighted that more effective teams utilised fewer passes per possession when creating shots and goals, suggesting direct play was more effective than a more possessional style.

Direct play can be characterised as a possession type with longer distance passes and a low number of passes per possession, it is a more controlled possession compared to counterattacking but a quicker possession than elaborate (Kempe et al., 2014; Fernandez-Navarro et al., 2016). Bate (1988) examined a small sample size of 16 matches from the England national team, proposing that direct play is defined by forward passes, forward runs, and a low number of consecutive passes, however due to the sample focusing on one team it has limited generalisability. Olsen and Larsen (1997) analysis of the Norwegian national team from 1989 to 1997 suggested that direct play involves direct passes over midfield and long passes and noted that this tactic is utilised at both international and league level. Tenga and Larsen (2003) expanded this definition to include direct set plays and attacks involving one long pass, highlighting that direct play can be utilised during different moments of play. Redwood-Brown (2008) analysed 120 matches from the 2004-2005 Premier League season, and characterised direct play as possessions with few passes. However, despite its common occurrence, direct play was not found to be the most effective method for scoring goals, suggesting a high frequency of direct play does not equal high effectiveness. Direct play could therefore be summarised by direct forward passes with a low pass frequency.

Counterattack:

The transitional periods of football, provide both attacking opportunities and defensive vulnerabilities (Turner and Sayers, 2010). Offensive speed, directness and numerical

advantages are key objectives in terms of successful attacking scenarios, whilst the defensive objectives are to quickly reorganise to prevent the attack from being successful (Tenga et al., 2010; Frencken et al., 2012). A team with players that have an advantage in terms of speed will use this to counter the opposition with speed and numbers. These moments can arise during loose ball duels, turnovers and unbalanced defensive structures. Vogelbein et al. (2014) analysis of 306 games in the German Bundesliga reported that 'top teams' were characterised by quicker ball recoveries and transitions, in comparison to teams who were ranked lower.

Sarmento et al, (2018) observed that teams attacking an imbalanced defence, something that occurs mainly during counterattacks, have more balls into the penalty area than elaborate attacks. Similarly, Lago et al (2010) highlighted counterattacks as the most effective style of play for goal scoring due to increased space and the unbalanced defence. These findings are comparable to Tenga et al, (2010) who concluded that counterattacking styles of play were more successful in gaining score box possessions compared to elaborate styles. In addition, Lago Ballesteros et al, (2012) examined the effectiveness of different styles of play and score box possessions during the La Liga 2009-2010 season. They found counterattacks to be the most effective style, highlighting the effectiveness of transitions, however both studies focused on a singular season, but it does illustrate it can be effective tactics in different league settings

Moreover, teams who recover the ball closer to the goal produce seven times more goals in comparison to teams who recovered the ball in defensive zones, however it has been suggested that only 2% of ball recoveries occur in the attacking zones (Vogelbein et al., 2014). This is normally attributed to the high pressing style which can present counterattacking opportunities, which if successful can become a team's style of play. Counterattacking play can be summarised by a team usually regaining the ball close to the oppositions goal, from a defence to attacking transition.

Tenga et al. (2010) suggested that the counterattacking style of play is more effective than elaborate attacks but only when playing against an unbalanced defence, a situation where the defending team is not organised, leading to a numerical or positional disadvantage in the defensive zone. Contrary to this, Hughes, Robertson and Nicholson (1988) reported that successful teams touched the ball more times than unsuccessful, suggesting the elaborate method could be more successful. The elaborate method of ball possession, is a variable that

has been discussed to discriminate between winning, drawing and losing teams (Lago-Penas et al., 2010).

Elaborate:

Elaborate play (also called possession based or build up play) refers to a tactical style of play in which a team maintains control of ball possession, progressing gradually through multiple passes. The aim of elaborate possessional style is to create and exploit defensive imbalances by using patient build up with a higher number of sideways and forward passes to manipulate oppositions defensive structures. This style is in direct contrast to direct and counterattacking styles as it features a higher pass number and is a less direct method (Carling et al., 2005; Tenga et al., 2010; Hughes and Franks, 2005). Previously, Bate (1998) and Stanhope (2001) illustrated that possession was unrelated to success, however both studies analysed tournaments. In contrast, Lago-Peñas et al, (2010) found possession to be one of the more significant factors in relation to winning during the La Liga 2005-2006 season, but the effectiveness of the possessions depends on its strategic application and game context. La Liga matches that were sampled by Lago and Martin (2007) and Lago (2009) included external factors such as venue, opponent and match status. These factors effected the amount of possession the team would have during the game, but they reported that the top teams had a higher average ball retention and maintained this consistently over the season.

These findings align with previous research in English football. Jones et al. (2004) and Carling et al. (2005) identified significant possession differences between 'successful' and 'unsuccessful' teams during the 1996–1997 and 2001-2002 English Premier League seasons. In a similar study of three elite English clubs, Bloomfield et al. (2005) reported variations in possession dynamics. While all three clubs exhibited possession dominance, some became more ball-retentive when winning or losing, while others changed tactics, absorbed pressure and adopted a counterattacking strategy. Furthermore, Jones et al. (2004) and James et al. (2002) demonstrated that ball possession is influenced by external factors such as match location, quality of opposition, scoreline, formations and physical fatigue. Ball possession is one of the most studied areas in relation to comparing a key performance indicator to success. Previous studies state that a team with a higher ball possession percentage were more successful than teams who had a lower percentage, (Castellano et al., 2011; Bradley et al., 2013).

Collet (2013) completed a comparative analysis of ball retention and success in the top five European leagues and illustrated that high ball retention did not equal team success in domestic leagues, however looking at individual games this changed due to considering match quality and home advantage. The 2010 World Cup tournament that Spain won had the highest possession percentage in that tournament (66.3%), also, Germany in the 2014 World Cup won the tournament with the highest average possession percentage (56.7%). However, this KPI in relation to this study can be skewed as Aquino et al. (2018) states that a high percentage of possession does not necessarily mean the team will go on to score or even have goal scoring opportunities.

Possession in games is highly analysed and especially in tournament football as it has in previous years been an indicator of success, however in the 2018 World Cup in France, the hosts won the tournament averaging less than 50%, the role of ball possession in this instance could have been influenced by playing style. Gomez et al. (2018) examined 301 matches from the Greek Super league in the 2013-2014 season, investigated playing styles of the teams, and analysed the effect match location and quality of opposition had on the outcome. Instead of analysing possession percentage in isolation, it was used as an indicator to define a team's playing style. They found the home team had a higher ball possession percentage than the away teams, and the teams that ranked the highest from the previous year had a more possession-based style, with higher possession percentage and passing accuracy. This study illustrates that possession percentage does not fully capture a team's tactical identity, it needs more context such as pass direction, possession duration and team positional structure.

Castellano and Pic (2019) examined ball possession and playing style across 373 matches during the La Liga 2016-2017 season. They found significant variations in how teams controlled possession, such as differences in possession duration, frequency of possession in attacking versus defensive zones, and the tempo of play. These variations in possession patterns and playing styles were shown to influence overall team performance, with certain styles correlating with more successful outcomes. In contrast, Gomes et al. (2018) analysed different variables, including possession in specific field areas, the number of counterattacks, and successful passes. Gomes summarised his findings by stating that teams should be adaptable in their playing styles, and some should develop tactics that align with the technical strengths of key players. The 2015-2016 La Liga Season in which Gollan et al. (2020) evaluated

contextual factors on playing styles saw home teams were more likely to counterattack when against more tactically defensive teams, teams were also more likely to counterattack against teams that were in the top ten and be more elaborate in their style when playing the bottom ten.

Youth Development Football

Elite senior football has been extensively studied, but there is still a lack of research on developmental football. The Premier League 2 (PL2) was established in the 2016-2017 season, evolving from previous U21 formats. The competition aims to provide a competitive environment that mirrors first team football to help youth players transition to senior levels (Premier League, 2016). The league has had many format changes, with the most significant in the 2023-2024 season that resulted in a single division that included all Category 1 Academies, (Premier League, n.d). This decision was made to increase variety of games and competitiveness with the aim of better preparing youth athletes for the demands of senior football. Despite the critical role in developing first team players, there is a lack of data and research analysing performance.

The lack of trackable data compared to the Premier League makes detailed datasets inaccessible; therefore, the alternative method is for manual coding or potential third-party sites that can be unreliable. This shows the importance of studies dedicated to a critical point in developmental football. There have been previous studies looking at the psychological, physical and context around the PL2 but there has been a significant lack of tactical research, (Dowling, 2020; Edwards and Brannagan, 2024; Harley et al., 2010; Doncaster et al., 2024). Previous research that has focused on these areas, like Helsen et al. (2005) examined structural influences like the relative age effect within elite academies, highlighting selection biases linked to an athletes maturation status. Similarly, qualitative work exploring academy environments and player identity development (Dowling, 2020) and analyses of Premier League 2 structures have enhanced understanding of the psychosocial and organisational landscape of youth football. While these contributions are important in contextualising developmental pathways, they offer limited insight into how teams function tactically within competitive match contexts.

In contrast, senior elite football has been extensively researched using notational and event-based data to explore possessional characteristics, transition effectiveness, and attacking performance (Tenga et al., 2010; González-Rodenas et al., 2015). These previous studies demonstrate clear relationships between pass penetration, transition speed, and goal probabilities. However, such tactical-performance frameworks have rarely been applied within elite development competitions such as Premier League 2. As a result, there remains a disconnect between youth development literature, which is largely player-centric, and performance analysis literature, and elite senior football. The present study addresses this gap by applying a systematic possession-based classification framework within an elite development context, thereby extending tactical performance research to a critical transitional stage between academy and first-team football.

The Premier League 2 (PL2), established in the 2016–2017 season as a restructuring of previous U21/23 formats, represents a pivotal transitional stage between academy and first-team football (Premier League, 2016). The Premier League 2 is designed to replicate the competitive and tactical demands of senior football, but the PL2 has undergone several format revisions, most notably the 2023–2024 consolidation into a single division comprising all Category 1 academies (Premier League, n.d.). This structural shift was intended to increase competitive variability and better prepare players for senior-level performance demands. Despite this strategic shift, empirical research analysing match performance within PL2 remains limited in comparison to elite senior football. Existing studies examining the competition have largely centred on contextual, psychological, or organisational factors rather than in-game tactical structures. Consequently, there remains a lack of research on attacking styles of play, their context and their influence on match outcomes in elite developmental football.

A further limitation within developmental football research concerns data accessibility. Unlike the senior Premier League, where comprehensive event and tracking datasets are commercially available, PL2 lacks public accessible high-resolution performance data. This restricts large-scale analytical opportunities and often necessitates manual notational coding or reliance on third-party databases, which may lack transparency and reliability. The absence of quality tactical datasets has likely contributed to the underrepresentation of match-based performance analysis within youth literature. Therefore, the present study addresses a clear gap

by applying systematic notational analysis to a large sample of PL2 possessions, examining attacking styles of play in relation to measurable performance outcomes.

Small-sided games (SSGs) are widely regarded as a valuable tool for player development, as they replicate key technical and tactical elements of in-game situations (Teoldo da Costa *et al.*, 2023). By reducing player numbers and pitch dimensions, SSGs increase the frequency of individual involvement, resulting in more touches of the ball, passes, shots, and decision-making opportunities. This heightened engagement has also been associated with improvements in perceptual-cognitive skills, as players are required to process information and act under time and space constraints (Hill-Haas *et al.*, 2011). From an ecological dynamics perspective, these outcomes can be explained through a constraints-led approach, whereby the manipulation of task and environmental constraints shapes emergent tactical behaviours and supports the development of perception–action coupling.

Previous research, such as Clemente *et al.* (2020), has demonstrated that SSGs can influence tactical behaviours aligned with key principles of play, including penetration, defensive delay, and team compactness. By designing tasks that emphasise specific constraints, coaches are able to guide players towards desired tactical solutions within representative learning environments. However, despite these benefits, contrasting evidence suggests that SSGs may not fully replicate the tactical complexity and spatial organisation observed in full-sided matches. Larger game formats provide greater opportunities for structured positioning, collective organisation, and positional discipline, all of which are critical components of competitive performance but may be underrepresented in smaller formats (Owen *et al.*, 2012).

Similarly, Aguiar *et al.* (2012) suggest that although SSGs increase technical involvement, they may limit opportunities to practise longer passing sequences, positional rotations, and large-scale tactical coordination due to the reduced playing area. This raises important considerations regarding the representativeness of training tasks, as the spatial-temporal constraints present in SSGs may differ from those experienced in full match scenarios. Consequently, while SSGs offer significant developmental benefits, they should not be used in isolation. Instead, a balanced and periodised training approach that integrates both small-sided and full-sided game formats is necessary to ensure players develop both individual technical-tactical skills and a broader understanding of collective team organisation. Furthermore, SSGs can be manipulated to target specific physical and physiological outcomes,

often eliciting high-intensity efforts that contribute to overall conditioning alongside technical and tactical development.

Research examining tactical development in youth football has increasingly focused on how tactical behaviours evolve across the developmental pathway. Tactical behaviour refers to the coordinated actions of players in relation to teammates, opponents, and available space, often expressed through principles such as penetration, width, defensive balance, and organisation (Gréhaigne, Godbout and Bouthier, 2001). Within youth contexts, studies have shown that players typically demonstrate less structured styles of play compared to elite performers, often characterised by more direct attacking behaviours, shorter offensive sequences, and reduced collective coordination (Teoldo *et al.*, 2011).

Despite growing interest in tactical analysis, much of the existing literature has focused on elite adult performance, resulting in a comparatively limited understanding of how tactical behaviours develop in youth football (Sarmiento *et al.*, 2018). This gap is significant, as youth development represents a critical stage in which players acquire the tactical awareness and adaptability required for progression to higher levels of competition. Without a robust evidence base, it remains challenging for coaches and practitioners to design training programmes that effectively support the development of decision-making, positioning, and coordinated team play.

Therefore, further research is required to explore the tactical characteristics of youth players and to better understand how styles of play evolve over time. Advancing this area of research is essential to bridge the gap between theory and practice, enabling the design of developmentally appropriate, evidence-based training environments that reflect the tactical demands of the modern game. The present research looks to focus and develop the youth football research from an individual developmental point of view to a tactical technical aspect, offering both tactical insights and applied relevance for practitioners observing and analysing the critical transition between academy and senior football.

Introduction:

Analysing a team's style of play, tactical behaviours and their subsequent performance has been widely researched and has gained great interest at the elite level (Sarmiento *et al.*,

2014; Rein and Memmert, 2016; Vogelbein et al., 2014). Recent studies have utilised performance indicators (PIs) from positional data to develop the use of match analysis, the range of PIs provide different perspectives on team strategies and styles of play (Rein et al., 2017). Previous performance analysis studies have focused on match event PIs like passes, crosses, shots, and goals (Hughes and Franks, 2005; Ensum et al., 2005). However, the most recent approaches for analysing tactical aspects include match events with attacking and defensive strategies, transitional strategies and set piece PIs.

Football teams develop strategies combining attacking and defensive styles of play, aiming to increase their chances of success. The strategies teams develop can come from the tactical and technical key performance indicators (KPIs) that the team decide. Offensive KPIs such as goals, shots on targets, passes leading to final third entries, progressive passes or xG can provide a framework for how the team would like to play and a method to measure their success. Defensive KPIs such as interceptions, pressing areas, success rate and defensive duels can be used to measure team success out of possession. The transitional and set piece KPIs are developing and form an integral part of a team's strategy that is becoming increasingly important in the modern game, (Groom et al., 2011; Wright et al., 2012; Jones et al., 2004; Ruiz-Ruiz et al., 2013; Kempe et al., 2016).

Acar et al. (2008) observed goals scored, pass number and time prior to the goals being scored as KPIs. Analysis of these KPIs illustrated that a low pass number (1-4) led to the highest number of goals, while the quicker the attack (1-5s) the more goals were scored. This suggests that faster more direct attacks can be more effective in scoring goals compared to a slower possessional play. Lago-Peñas et al. (2010) used a selection of offensive KPIs to predict the champions of the 2008-2009 Spanish first division. Their analysis observed that winnings teams had higher averages in shots on target and crosses, while being more effective defensively with less crosses against. They concluded that the above KPIs effectively differentiate between winning and losing teams. Similarly, Alves et al, (2019) analysed offensive KPIs such as ball possession, shots on target and passing success among other variables during 64 games of the World Cup 2018. They found a difference between winning teams and losing teams at the group stages. Winning teams had a greater rate of success in the attacking KPIs compared to unsuccessful teams, suggesting teams with greater attacking efficiency (possession to shot conversion) tend to perform better. These metrics and findings

can be used by coaches to measure team success and player performance when developing a style of play.

Styles of play are an important factor when measuring team tactical behaviours as they influence the training and in game tactics that teams utilise in competitions. Individual teams utilise unique styles of play (Pollard et al., 1988) that can be observed based on the characteristics of the players and the coach's philosophy. The philosophy of the coach is one of the main influences on a team's style of play (Partington and Cushion 2024; Hewitt et al., 2016). The coaching philosophy and therefore the team's style of play can be adapted in game due to different contextual variables, such as formation changes and player dismissals (Dobson and Goddard, 2010). Furthermore, the team's style of play combined with the coach's philosophy determine a team's actions, an example of this could be a possession-based team that have more passes per possession, compared to a direct team with shorter passing sequence and more direct vertical passes towards the oppositions goal. Understanding how styles of play and subsequent coaching philosophy affect KPIs can provide a greater understanding of successful performance. Additionally, previous research has concluded that styles of play should be investigated when assessing tactical variables in football, (Bradley et al., 2011; Lago-Peñas et al., 2011).

Previous studies that researched the impact contextual variables have on styles of play and therefore team tactics and outcomes, have highlighted the impact they have on each other. An example of this could be in the direct method of play, playing into a striker to hold the ball up or play from, as the strikers characteristics illustrate he will have a high success rate against the opposition. Another example could be a team using a possession-based approach to control the tempo against a low block team, while the low block team could be utilising their counter attacking abilities to exploit the oppositions weaknesses, (Fernández-Navarro et al., 2016).

Contextual Factors

The influence of venue, a team playing home or away also effects a team's tactical match play and style. For example, Santos et al. (2017) reported that away teams tend to have their defensive line deeper once the ball has been regained, a decrease in the number of passes played into the attacking third of the pitch in comparison to when the team plays at home. The home advantage in football is seen as an important variable in soccer due to its impact on

a team's match play performance. Previous research has also highlighted that playing at home makes the home coach and team more ambitious in their offensive and defensive strategies, this coincides with the home team creating more goals and ultimately winning more games compared to when playing away, (Staufenbiel et al., 2015; Aguilar et al., 2017).

Quality of opposition also has an impact on a team's tactical variables and therefore their style of play. Teams that have a higher previous year ranking have a higher ball possession compared to teams that have previously ranked lower, (Bradley et al., 2014; Lago, 2009). Furthermore, when a team is ranked higher, the lower ranked team usually recovers the ball in deeper areas closer to their own goal, which is also where the defensive line is located. There is therefore an interaction between that of opposition quality and the venue of the match, having the lower ranked team have lower possession percentages compared to when they would play at their home venue (Lago, 2009).

Match status has previously been shown to affect a team's style of play, Fernandez-Navarro et al. (2018) illustrated this during the 2015-2016 English Premier League season, analysing that winning teams looked to be more direct and look to counterattack. The characteristics of the winning teams attacking possessions observed in this study had fewer passes with the possessions starting from deeper areas. Contrastingly, losing teams looked to utilise a higher press for higher regains, looking to recover the ball in advanced areas with also having longer passing sequences.

The study by Almedia et al. (2014) who observed the effect of match status on losing teams in the Champions League, found that teams look to press in higher areas to create more goal scoring opportunities in areas closer to the goal. Furthermore, losing teams look to increase their amount of passing sequences, this is contrasting to winning teams who look to utilise shorter passing sequences, this could highlight a change of style from a more possession based team to a counterattacking team, (Fernandez-Navarro et al., 2018; Gómez et al., 2013).

Similarly, Lago Peñas (2010) found that teams tactically behave more balanced (maintaining tactical equilibrium between attack and defence), when the score is level, unlike losing teams, who press higher, keep the ball for longer periods of time and attempt riskier passes forward. In comparison, the winning team's tactical behaviour shifted, and the defensive

line became deeper and looked to have more low-risk possessions. Additionally, Lago Peñas (2010) when the score was level teams tended to have tactical equilibrium, in which the pressing, possession length and number of passes are all moderate values. This is similar to the findings from Fernandez-Navarro et al. 2018 who found teams that were drawing had a balanced attacking and defensive style.

Success in football can come down to choosing appropriate tactics before every game, (Carling et al., 2005). Tactics can provide information and instruction on an individual and team level, team tactics could be formation and positioning whereas individual tactics could be pressing angles or areas, and pressing a certain individual, (Grunz et al., 2012). Teams can look to utilise more defensive or offensive tactics, a defensive tactic could be areas to regain and therefore counter, offensive tactics could be pressing formation and areas to attack. It has been previously researched that teams who regained the ball quicker than their opponent after losing possession were more successful, (Shafizadehkenari et al., 2014). Tenga et al. (2010) investigated the effect different variables had on achieving score box possessions in the top league in Norway. The findings showed that the team who had long possessions, had attacks that begun in the final third and had penetrative passes increased the odds ratio. Furthermore, Tenga et al. (2010) found that the offensive success was significantly influenced by the structures of the opposition, with more scorebox possession occurring more frequently when teams played against unbalanced defences, particularly effective during counterattacking possessions. It was also found that possession duration and pass type influenced the outcome, with long possessions and penetrative passes proving to be effective. The penetrative passes was a decisive variable; it has the highest odds ratio in both balanced and unbalanced moments. The findings from Tenga et al. (2010) illustrate the importance of teams adapting tactically throughout a game as it can underpin team success.

In addition to the studies previously mentioned, other research has further shown the link between tactical decisions and match success. Gonçalves et al. (2019) observed the impact that high pressing tactics had on scoring opportunities and revealed that teams who excel in forcing turnovers in the opposition's half, had more success in creating these opportunities. Furthermore, Sarmiento et al. (2014) investigated how tactical actions like ball possession, pressing and build up play influence match success, they found teams that maintained possession for longer and had structured movement and passing in build-up were more likely to create scoring chances.

Despite the extensive body of research examining styles of play and performance indicators in football, there remains a need to more clearly understand how these variables interact to influence goal-scoring effectiveness. Previous literature has demonstrated that attacking efficiency is closely linked to key performance indicators such as pass number, possession duration, type of possession, with faster and more direct styles often associated with increased goal-scoring opportunities (Acar *et al.*, 2008; Tenga *et al.*, 2010). Similarly, penetrative actions, including forward passes and final third entries, have been identified as critical determinants of offensive success, particularly when exploiting different unbalanced defensive structures.

Previous studies have explored these variables in isolation, with performance analysis traditionally focusing on discrete indicators such as passes, shots, and possession (Sarmiento *et al.*, 2014; Rein and Memmert, 2016). More recent research, however, has begun to integrate styles of play (e.g., elaborate, direct, and counterattacking) with spatial factors (start and end zones), passing characteristics (penetration, type, and sequence length), and defensive context (pressure and cover) to provide a more holistic understanding of attacking performance (Fernández-Navarro *et al.*, 2016; Tenga *et al.*, 2010). This is particularly important given that goal-scoring is not determined by a single factor, but rather by the interaction between tactical behaviours, spatial positioning, and situational variables during match play, reflecting the complex and diverse nature of football performance (Sarmiento *et al.*, 2014; Tenga *et al.*, 2010).

Counterattacking and more possession-based styles of play have been shown to differ in their tactical characteristics and therefore can influence attacking effectiveness in different ways. Counterattacking styles of play are often associated with exploiting transitional moments and potential defensive imbalance, whereas possession-based approaches may provide greater control of the game and be used to progress into advanced areas (Fernández-Navarro *et al.*, 2016). Similarly, the location in which a possession begins and ends may influence the likelihood of creating an attacking opportunity, with previous research suggesting that possessions initiated or progressed into more advanced areas are associated with a greater chance of an offensive outcome (Tenga *et al.*, 2010). Furthermore, opposition contextual variables such as defensive pressure, defensive organisation have been shown to affect team tactical behaviours and may contribute to the effectiveness of different attacking strategies (Lago-Peñas and Dellal, 2010; Fernández-Navarro *et al.*, 2018). Therefore, examining these

factors together may provide a more complete understanding of how styles of play contribute to successful attacking performance.

This study will look to build upon existing literature by looking to further understand diverse styles of play, while also observing the effectiveness each style of play has on obtaining a score box possession or a shot at goal. This study will also look to further understand the effect of possession start and end zones with passing and spatial analysis and considering defensive context. By having a direct focus on the Premier League 2, and on score box possessions the aim is to contribute some novel insights into an under researched league, considering the implications it has on developing young players for the Premier League. The aim of this research is to analyse the styles of play used by teams in the Premier League 2 and evaluate their effectiveness during match play. There has been a lack of previous research in the Premier League 2 considering this is the highest level of developmental football in English academies. The findings are intended to offer practical insights for coaches, analysts, and practitioners, helping to inform training plans and enhance strategic decision-making to optimise a team's performance.

Methods

Match Sample:

The game-related variables used in this study were collected from 40 matches played during the 2021–2022 season of Premier League 2 (PL2), the top tier of under-21 football in England. Matches were selected to ensure representation across the competition, with one match included from each game week. The sample also ensured that each team was represented by at least two matches, including a minimum of one home fixture per team, in order to account for potential contextual influences such as home advantage.

Where multiple matches met these criteria, fixtures were selected based on the availability of footage with sufficient visual clarity to allow for accurate and reliable coding of tactical behaviours. From the sampled matches, a total of 8,249 team possessions were coded and analysed to investigate tactical patterns and playing styles. Match footage was analysed manually due to the unavailability of tracking data for this competition.

The present study was approved by the Research Ethics Committee at Liverpool John Moores University and adheres to institutional guidelines for research.

Match Performance Analysis Procedure

The video recordings of the games were obtained from TV broadcasts or club recorded footage. The performance analysis software that was used for coding in this study was Hudl Sportscode, (Software Lincoln, Nebraska, USA, Available at <https://www.hudl.com/products/sportscode>). Using Hudl Sportscode for the coding process allowed efficient coding of a team possession using a tailored code window. The measurement of 'a team possession' was the measurement used as the unit of analysis to analyse the match performance. This has previously been defined by Pollard and Reep (1997): 'A team possession starts when a player gains possession of the ball by any means other than from a player of the same team. The player must have enough control over the ball to be able to have a deliberate influence on its subsequent direction. The team possession may continue with a series of passes between players of the same team but ends immediately when one of the following events occurs: a) the ball goes out of play; b) the ball touches a player of the opposing team (e.g. by means of a tackle, an intercepted pass or a shot being saved). A momentary touch that does not significantly change the direction of the ball is excluded; c) an infringement of the rules takes place (e.g. a player is offside, or a foul is committed).

The resulting variables were used in this study: possession outcome (dependent variable); type of possession, zone in which possession starts, pass length, pass number, space utilisation and pass penetration (resulting in 6 independent attacking variables). Two independent defensive variables were also recorded, this included defensive pressure, and defensive cover. Definitions of these variables are included in Table 2..

These ordered categorical variables were selected as the most relevant for the current study from 22 variables presented in an earlier study (Tenga, et al, 2010). The data that was collected was exported and collated into a spreadsheet in Microsoft Excel (Microsoft Corporation, 2018. *Microsoft Excel* (software). New Mexico, USA: Microsoft Corporation. Available at: <https://office.microsoft.com/excel>). The excel spreadsheet allowed the data to be filtered and analysed clearly.

Figure 4 illustrates the code window used during the analysis process. It was utilised to code the 40 games and 8249 possessions. In phase one, two teams were assigned to code buttons, home team being team 1 and away team being team 2. The next 10 phases utilised labels to code the string of events per possession, each phased was labelled 1-11 to maintain the same order per possession. The order of the phases, (possession team, restart type, start zone, pass number, pass penetration, space utilisation, defensive pressure, defensive cover, and outcome) were decided after a trial period, this was the outcome due to the ease the first 4 phases being able to be complete before the possession begins, with the other 7 being seen during and after the possession. Each label was clicked in response to the definitions in table 2. Every coded game took approximately 2 hours to code and review; the xml was then exported into an excel file for data filtering.

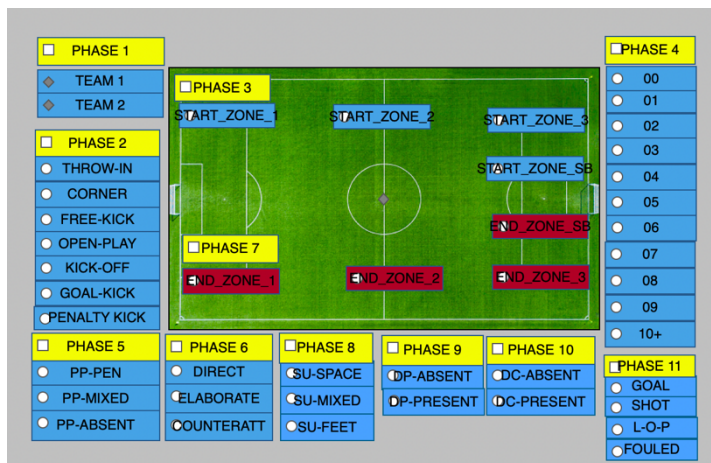


Figure 4 - Code window used in Sportscode during the analysis procedure

Reliability analysis:

To determine the reliability of the data, inter- and intra-rater agreement tests were conducted. To assess inter-rater agreement the principal investigator and an analyst with two years' experience at an elite academy coded a full game and it was compared to a coded game by the principal investigator. A training session was conducted, in which the code window was explained and defined, and the process of which concluded with providing the excel spreadsheet for the analyst to input the data. Cohen's Kappa (κ) was computed and interpreted as follows: <0.20 (poor), 0.20–0.39 (fair), 0.40–0.59 (moderate), 0.60–0.79 (good) and 0.80–1.00 (very good) (Altman,1991).

The k values from the inter-reliability analysis ranged from 0.610 (good) to 1 (very good), with a mean k value for inter-reliability of 0.88 (Very good). To assess intra-rater agreement, the principal investigators analysed a full game and then repeated the analysis of the game after a 4-week interval to avoid bias, the 4-week interval was deemed a long enough interval to prevent practice effects as well as to improve the objectivity, validity and reliability by minimising bias. The k values for intra-rater reliability ranged from 0.859 (very good) to 1 (very good). The mean k value was 0.95 (very good). The inter-reliability analysis of both observers has been shown to be within acceptable limits, with very good reliability (Altman, 1991).

Table 1- Intra-rater and inter-rater agreement tests for different offensive and defensive variables

Variable	Inter Rater Kappa Value	Intra Rater Kappa Value
Possession type	0.960	0.990
Pass penetration	0.897	0.957
Restart type	1.00	1.00
End Zone	0.911	0.976
Defensive cover	0.749	0.859
Pass Number	0.916	0.961
Outcome	1.00	1.00
Defensive Pressure	0.610	0.792
Start Zone	0.885	0.962
Space Utilisation	0.90	0.955

Data analysis:

Descriptive statistics have been utilised in this study to provide a detailed overview of the data which can then be used to analyse and explore the data further, the main descriptive statistics that were utilised were the frequency and percentages of different variables. The Chi-square (χ^2) statistics test of independence was conducted to assess the associations between different categorical variables in relation to an offensive output, all assumptions required of the Chi-square test were met, (Thomas, Nelson and Silverman, 2015). The resulting chi-square (χ^2) statistic and corresponding p-value were used to determine whether the association between variables was statistically significant at the alpha level of 0.05. The chi-square test was applied to examine the associations between possession type and the following variables, Possession Outcome, Restart Type, Start Zone, Pass Number, Defensive Cover, Defensive Pressure, Pass

Penetration, Space Utilisation, and End Zone in relation to the Possession type. Cramer's V was used to calculate the effect sizes. A Cramer's V effect size of $\phi_c \geq 0.1$ was considered a small effect size; an effect size of $\phi_c \geq 0.3$ was considered a medium effect size, while $\phi_c \geq 0.5$ was considered a large effect size (Cohen, 1988).

To examine the relationship between the different variables, chi-square tests of independence were conducted. Mosaic plots were used to visualise the relationship between two categorical variables. In each plot, the width of each section along the horizontal axis represents the relative frequency of a category of the first variable. Within each section, the height of the coloured tiles reflects the conditional proportion of the second variable. Consequently, the area of each tile is proportional to the joint frequency of the corresponding category combination in the dataset. Colour shading indicates the standardised residuals from a Chi-squared test of independence: blue tones represent observed frequencies higher than expected under independence, while red tones indicate frequencies lower than expected.

Standardised residuals quantify how much the observed frequency in each cell differs from the frequency expected under the assumption of independence, relative to the standard error. In other words, they reflect the strength and direction of the deviation from no association. A standardised residual close to 0 suggests that the observed count is close to what would be expected; positive residuals (shaded in blue) indicate higher-than-expected frequencies, and negative residuals (shaded in red) indicate lower-than-expected frequencies. The intensity of the shading corresponds to the magnitude of the residual, with darker colours representing more extreme deviations, which may be statistically significant depending on the size of the residual.

In addition to reporting Cramér's V as a measure of effect size for the Chi-squared tests, odds ratios (ORs) were calculated to provide a more detailed understanding of the associations between specific categories. The odds ratio is a commonly used measure of association for categorical data, particularly in 2×2 tables, expressing how much more (or less) likely an outcome is in one group compared to another. Unlike Cramér's V , which summarises the overall strength of association across the entire contingency table, ORs offer a directional and interpretable estimate of effect size for individual comparisons. For example, an OR greater than 1 indicates that the outcome is more likely in the reference category, whereas an OR less than 1 suggests it is less likely. To assist with the interpretation and assess the precision of

these estimates, 95% confidence intervals were calculated for each odds ratio. These intervals indicate the range within which the true odds ratio is likely to fall and help determine whether the observed association is statistically meaningful.

Statistical analysis was conducted using IBM SPSS Statistics, (IBM Corp. (2017). *IBM SPSS Statistics for Windows*, Version 29.0. Armonk, NY: IBM Corp. Available at: <https://www.ibm.com/products/spss-statistics>) and R (R Core Team, 2023. *R: A language and environment for statistical computing* [software]. Vienna, Austria: R Foundation for Statistical Computing. Available at: <https://www.R-project.org/>) . The use of SPSS and R was to ensure effective data visualisation and in-depth testing. SPSS was used to conduct the Chi-square test of independence and the odds ratios, while R was utilised to generate visual representation of the associations through mosaic plots using the ‘vcd’ package, (Meyer, Zeileis and Hornik, 2006).

Table 2- Definitions of variables measure

Variable	Definition
1. Team Possession Type	The possession type will be analysed when a team completes a pass or passes of the ball that reaches its intended target, the receiving player will have to maintain a high degree of control over the ball. A high degree of control means enough space and time to make it easier to perform the intended actions on the ball.
a. Elaborate	Starts with a possession of the ball from open play and progressing by (a) attempting to utilise a degree of imbalance or (b) creating or attempting to create a degree of imbalance via a penetrative pass or dribble and or (c) progress with a slower attack compared to that of direct and counterattack. Usually has a higher number of passes per attack.
b. Direct	Starts with possession of the ball and progressing by (a) attempting to utilise imbalance by a quick forward pass (b) Creating or attempting to imbalance teams by a longer pass directly into space or feet or (c) progress quickly with a dribble or pass that moves the team up the thirds in one pass. Often has a lower pass number but looks to imbalance defenders via a longer pass.
c. Counterattack	Starts by winning the ball and (a) utilises and attempts to take advantage of the degree of imbalance from the start to the end of the possession or (b) creating or attempting to create a degree of imbalance from start to finish by using an early penetrative pass or dribble. Counterattacks progress relatively quickly, and they utilise a degree of imbalance that prevents the defending team time to regain defensive balance and stability from the start to end of team possession
2. Possession Start Type	The type of restart in which the offensive team has possession of the ball and is attempting to score a goal against the defensive team
a. Throw In	A throw in is awarded to the opponents of the players who last touched the ball when the whole of the ball passes over the touchline, on the ground or in the air, the thrower must have both feet on

the floor, with both hands behind and over their head from the point where it left the field of play. The ball is in play when it has been thrown into the field of play.

- b. Corner A corner kick is awarded when the whole of the ball passes over the goal line, on the ground or in the air, having last touched a player of the defending team, and a goal is not scored. Ball must be placed in the corner area and be stationary before a player kicks it into play.
 - c. Free Kick Direct and indirect free kicks are awarded to the opposing team of a player, substitute, substituted or a sent off player, or team official guilty of an offence. The free kick is taken when the player places the ball at the area of the offence and the ball is stationary. Free kick commences once the player kicks the ball
 - d. Open Play Possession starting from regaining the ball in open play by the defensive team, this could be in any area of the pitch
 - e. Kick Of A method of starting the first or second half or restarting the game after a goal has been scored.
 - f. Goal Kick A goal kick is awarded when the whole of the ball passes over the goal line, on the ground or in the air, having last touched a player of the attacking team and a goal is not scored
 - g. Penalty Kick A penalty kick is awarded if a defending player commits a direct free kick offence inside their penalty area, or off the field of play.
3. Start Zone Areas on the field of play in which the start of the possession begins (see figure 5).
- a. Zone 1 The first third of the playing field from own goal line to the middle third (zone 2)
 - b. Zone 2 The middle third area from end of the first third (zone 1) to the start of the final third (zone 3)

- c. Zone 3 The final third of the playing field from the end of the middle third (zone 2) to the opponent's goal line, excluding the scoreboard
 - d. Score Box The prime scoring area in front of the opponent's goal defined as an imaginary prolongation of the penalty area from an estimated 16m to 30m distance to opponent's goal line
- 4. End Zone The areas across the playing field in which the possession has ended, either via loss of possession, a shot on goal, a goal scored, or a player is fouled (see figure 5).
 - a. Zone 1 The first third of the playing field from own goal line to Zone 2
 - b. Zone 2 The middle third area from end of the first third (Zone 1) to the start of Zone 3
 - c. Zone 3 The final third of the playing field from the end of the middle third (Zone 2) to the opponent's goal line, excluding the scoreboard
 - d. Score Box The prime scoring area in front of the opponent's goal defined as an imaginary prolongation of the penalty area from an estimated 16m to 30m distance to opponent's goal line
- 5. Pass Number Number of successful passes made between players of the attacking team in a single possession sequence.
 - a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. 4
 - f. 5
 - g. 6

- h. 7
- i. 8
- j. 9
- k. 10+

6. Pass Penetration Penetrative passes are line breaking passes that go towards the opponent's goal that go past an opponent player, the team in possession needs to maintain possession, non-penetrative passes do not meet this criterion

Penetrative Only penetrative line breaking passes

- a. Mixed A combination of penetrative line breaking passes and non-penetrative passes
- b. Absent Penetrative line breaking passes were absent in the possession

7. Space Utilisation There are three types of space utilization in a possession, the first is passes into space, passes into feet and a mixture of the two

- a. Space Pass Only passes into space
- b. Mixed Passes into space and into feet in the same possession
- c. Foot Pass Only passes into teammates feet

8. Defensive Pressure The distance between the player with the ball (attacker) and the immediate pressing opposition player (s), excluding the goalkeeper, at each moment of attempting to win possession of the ball

- a. Absent The first defender (s) is not in distance to put pressure on the ball and does not put pressure on the ball.

- b. Present The first defender (s) is in distance to put pressure on the ball and presses attacking player on the ball.
 - 9. Defensive Cover Opposition defensive structure guarding the space away from the ball, a defensive cover is the defending teams' lines of defence, this is excluding the goalkeeper at each moment of trying to win or receive the ball.
 - a. Absent No defensive cover, only first line of defenders present, or none.
 - b. Present Defensive cover, first line of defenders present with a second or third defensive line present
 - 10. Team Possession Outcome The offensive outcome of the attacking team categorised into 4 categories.
 - a. Goal A scoring attempt that ended in a goal approved by the referee
 - b. Shot An attempt on goal by the offensive team
 - c. Loss of Possession The possession has ended due to poor control of the ball, an offside, ball out of play, or team in possession fouling the team out of possession, or the opposition regaining possession of the ball, all resulting in the possession ending
 - d. Fouled The possession has ended due to the offensive team player on the ball being fouled by the defensive team
-

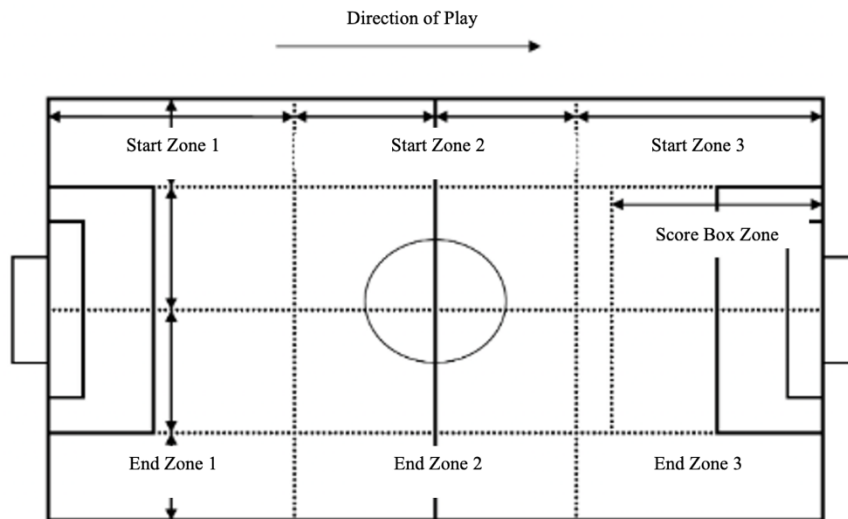


Figure 5- The Start and End Zones with direction of play, (adapted from Tenga 2010)

Results:

Descriptive Statistics:

Overall, from the 8249 possessions, there were 808 shots at goal (9.80%), and 137 goals (1.66%) that occurred in the possessions during the sample of games. As shown in Table 4, most goals scored came from elaborate possessions (n= 52; 38%), followed by direct possessions (n = 47; 34%) and counter attacking situations (n = 38; 28%). Elaborate possessions accounted for 4,201 (51%) of all possessions resulting in a conversion rate of 1.24%. Direct possessions had a frequency of 3,010 (36%) possessions, yielding a higher conversion rate of 1.56%. Counter attacking possessions were the least frequent (n= 1,038; 13%) but had the highest goal conversion rate of 3.66%, (table 4).

Table 3 - The offensive and defensive variables and the respective outcomes N(%)

	Frequency	Goal (%)	Shot (%)	Loss of possession (%)	Fouled (%)
Offensive Variable					
Possession Type					
Counterattack	1038	38 (3.66%)	171 (16.47%)	755 (72.74%)	74 (7.13%)
Direct	3010	47 (1.56%)	309 (10.27%)	2504 (83.19%)	150 (4.98%)
Elaborate	4201	52 (1.24%)	328 (7.81%)	3384 (80.55%)	437 (10.40%)
Start Zone					
Start Zone 1	3313	29 (0.88%)	162 (4.89%)	2825 (85.27%)	297 (8.96%)
Start Zone 2	3447	51 (1.48%)	316 (9.17%)	2775 (80.50%)	305 (8.85%)
Start Zone 3	1289	32(2.48%)	250 (19.40%)	958 (74.32%)	49 (3.80%)
Start Zone SB	200	25 (12.50%)	80 (40.00%)	85 (43.50%)	10 (5.00%)
End Zone					
End Zone 1	616	0 (0%)	0 (0%)	502 (81.50%)	114 (18.50%)
End Zone 2	3086	0 (0%)	6 (0.20%)	2705 (87.65%)	375 (12.15%)
End Zone 3	2269	12 (0.53%)	101 (4.45%)	2043 (90.04%)	113 (4.98%)
End Zone SB	2278	125 (5.49%)	701 (30.77%)	1393 (61.15%)	59 (2.59%)
Pass Penetration					
Present	587	18 (3.07%)	118 (20.10%)	398 (67.80%)	53 (9.03%)
Mixed	3538	81 (2.29%)	430 (12.15%)	2765 (78.15%)	262 (7.41%)
Absent	4124	38 (0.92%)	260 (6.30%)	3480 (84.38%)	346 (8.40%)
Space Utilisation					
Space	1397	27 (1.93%)	166 (11.88%)	1149 (82.25%)	55 (3.94%)
Mixed	2420	58 (2.40%)	305 (12.60%)	1935 (79.96%)	122 (5.04%)
Feet	4432	52 (1.17%)	337 (7.60%)	3559 (80.30%)	484 (10.93%)
Pass Number					
0	1161	23 (1.98%)	95 (8.18%)	957 (82.43%)	86 (7.41%)
1	1652	20 (1.21%)	172 (10.41%)	1289 (78.03%)	171 (10.35%)

2	1261	15 (1.12%)	103 (8.17%)	1048 (83.17%)	95 (7.53%)
3	1022	19 (1.86%)	119 (11.64%)	799 (78.18%)	85 (8.32%)
4	652	4 (0.61%)	57 (8.74%)	551 (84.51%)	40 (6.14%)
5	492	15 (3.05%)	46 (9.35%)	383 (77.85%)	48 (9.75%)
6	431	9 (2.09%)	36 (8.35%)	349 (80.97%)	37 (8.58%)
7	284	5 (1.76%)	27 (9.51%)	242 (85.21%)	10 (3.52%)
8	240	5 (2.08%)	41 (17.08%)	177 (73.75%)	17 (7.08%)
9	191	0 (0%)	15 (7.85%)	164 (85.86%)	12 (6.28%)
10+	863	22 (2.54%)	97 (11.24%)	684 (79.26%)	60 (6.95%)
Restart Type					
Throw-In	1361	11 (0.81%)	82 (6.02%)	1160 (72.05%)	108 (7.94%)
Corner	386	8 (2.07%)	90 (23.32%)	281 (72.78%)	7 (1.81%)
Free Kick	971	16 (1.65%)	126 (12.97%)	780 (80.33%)	49 (5.05%)
Open Play	4746	87 (1.83%)	477 (10.05%)	3729 (78.57%)	453 (9.54%)
Kick Off	215	1 (0.47%)	6 (2.79%)	199 (92.56%)	9 (4.19%)
Goal Kick	559	6 (1.07%)	24 (4.29%)	494 (88.37%)	35 (6.26%)
Penalty Kick	11	8 (72.73%)	3 (27.27%)	0 (0%)	0 (0%)
Defensive Variables					
Defensive Cover					
Absent	3840	104 (2.71%)	428 (11.15%)	3062 (79.74%)	246 (6.41%)
Present	4409	33 (0.75%)	380 (8.62%)	3581 (81.22%)	415 (9.41%)
Defensive Pressure					
Absent	1022	35 (3.42%)	161 (15.75%)	821 (80.33%)	5 (0.49%)
Present	7227	102 (1.41%)	647 (8.95%)	5822 (80.56%)	656 (9.08%)

Table 4 - The different variables and outcomes for each possession type N(%).

Offensive Variable	Frequency (%)	Elaborate (%)	Direct (%)	Counterattack (%)
Goal	137	52 (37.96%)	47 (34.30%)	38 (27.74%)
Shot	808	328 (40.59%)	309 (38.24%)	171 (21.16%)
Loss Of Possession	6643	3384 (50.94%)	2504 (37.70%)	755 (11.37%)
Fouled	661	437 (66.11%)	150 (22.69%)	74 (11.20%)
Start Zone				
Start Zone 1	3313	1597 (48.20%)	1324 (39.96%)	392 (11.83%)
Start Zone 2	3447	1956 (56.74%)	992 (28.78%)	499 (14.48%)
Start Zone 3	1289	597 (46.31%)	573 (44.45%)	119 (9.23%)
Start Zone SB	200	51 (25.50%)	121 (60.50%)	28 (14.00%)
End Zone				
End Zone 1	617	462 (74.88%)	112 (18.15%)	43 (6.97%)
End Zone 2	3085	1622 (52.58%)	1210 (39.22%)	253 (8.20%)
End Zone 3	2269	1137 (50.11%)	789 (34.77%)	343 (15.12%)
End Zone SB	2278	980 (43.02%)	899 (39.46%)	399 (17.52%)
Pass Penetration				
Present	587	37 (6.30%)	290 (49.40%)	260 (44.29%)
Absent	4124	1661 (28.15%)	2009 (48.71%)	424 (10.28%)
Mixed	3538	2503 (70.75%)	711 (20.10%)	324 (9.19%)
Space Utilisation				
Space	1397	71 (5.08%)	1016 (72.73%)	310 (22.19%)
Mixed	2420	1329 (54.92%)	800 (33.06%)	291 (12.02%)
Feet	4432	2801 (63.20%)	1194 (26.94%)	437 (9.86%)
Pass Number				
0	1161	185 (15.93%)	740 (63.74%)	236 (20.33%)
1	1652	406 (24.58%)	943 (57.08%)	303 (18.34%)
2	1261	460 (36.48%)	565 (44.81%)	236 (18.72%)

3	1022	505 (49.41%)	382 (37.34%)	135 (13.21%)
4	652	417 (63.96%)	185 (28.37%)	50 (7.67%)
5	492	373 (75.81%)	85 (17.28%)	34 (6.91%)
6	431	372 (86.31%)	45 (10.44%)	14 (3.25%)
7	284	242 (85.21%)	29 (10.21%)	13 (4.58%)
8	240	224 (93.33%)	12 (5.00%)	4 (1.67%)
9	191	177 (92.67%)	10 (5.24%)	4 (2.09%)
10+	863	840 (97.33%)	14 (1.62%)	9 (1.04%)
Restart Type				
Throw-In	1361	870 (63.92%)	479 (35.19%)	12 (0.88%)
Corner	386	105 (27.20%)	281 (72.80%)	0 (0%)
Free Kick	971	500 (51.50%)	467 (48.09%)	4 (0.41%)
Open Play	4746	2348 (49.47%)	1378 (29.03%)	1020 (21.50%)
Kick Off	215	115 (53.49%)	100 (46.51%)	0 (0%)
Goal Kick	559	263 (47.05%)	294 (52.59%)	2 (0.36%)
Penalty Kick	11	0 (0%)	11 (100%)	0 (0%)
<hr/>				
Defensive Variables				
<hr/>				
Defensive Cover				
Absent	3840	1554 (40.47%)	1673 (43.57%)	613 (15.96%)
Present	4409	2647 (60.04%)	1337 (30.32%)	425 (9.64%)
Defensive Pressure				
Absent	1022	168 (16.44%)	710 (69.47%)	144 (14.09%)
Present	7227	4033 (55.80%)	2300 (31.83%)	894 (12.37%)
<hr/>				

There was a significant weak association observed between the possession type and the possession outcome, ($\chi^2 = 170.49$, $P < 0.001$, $V = 0.102$). Figure 6 shows elaborate possessions had a higher than expected frequency of possessions ending in a foul, whereas direct possessions had a lower than expected frequency of fouls. Counter attacking possessions had a higher than expected frequency of goals, while elaborate possessions had a lower than expected frequency of goals. Similarly, counter-attacking possessions showed a higher than expected frequency of shots, in contrast to elaborate possessions that had a lower than expected frequency of shots. Additionally, counter attacking possession had a lower than expected frequency of possession losses compared to direct and elaborate (see figure 6).

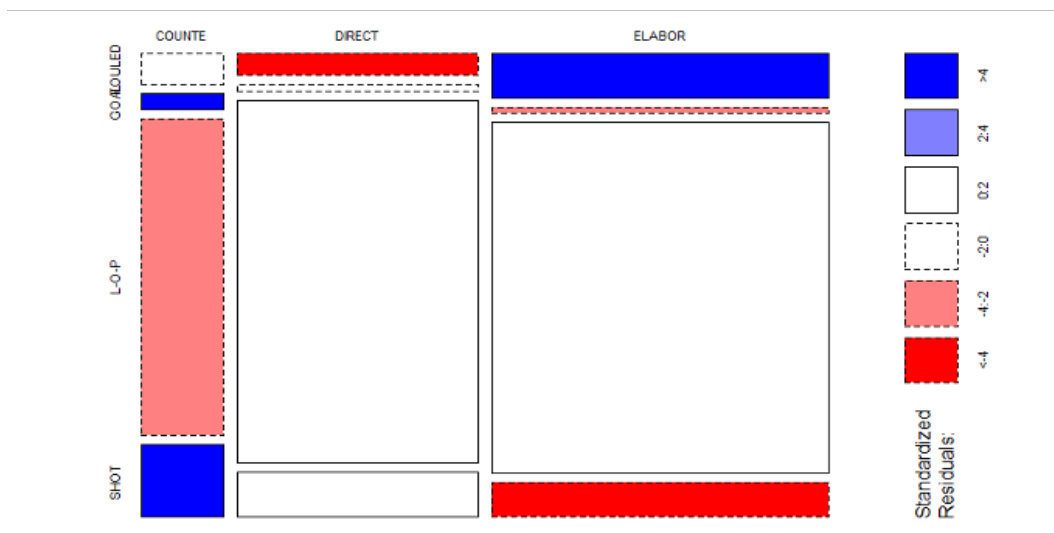


Figure 6 - Association of Possession type and Possession Outcome

As shown in table 5, elaborate and direct possessions had significantly lower odds of resulting in a shot or a goal compared to counterattacks. The odds of producing a shot were 57% lower for elaborate possessions (OR = 0.43, 95% CI: 0.35-0.52) and 42% lower for direct possessions (OR = 0.58, 95% CI: 0.47-0.71). Similarly, the odds of scoring a goal were 67% lower for elaborate possessions (OR = 0.33, 95% CI: 0.22-0.50), and 58% lower for direct possessions (OR = 0.42, 95% CI: 0.27-0.64), in comparison to counterattacks. These results indicate that counterattacks were the most effective possession type for generating shots and goals. Elaborate possessions also had a significantly lower odds of resulting in a loss of possession compared to direct possessions (OR = 0.84, 95% CI: 0.74-0.95). Both elaborate (OR = 1.55, 95% CI: 1.33-1.82) and direct possessions (OR = 1.85, 95% CI 1.57-2.19) had a significantly higher odds of ending in a loss of possessions compared to counterattacking possessions.

Table 5: Type of possession and possession outcome (n(%))

Outcome	Odds Ratios (95% CI)						
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
L-O-P	6643	3384 (50.94)	2504 (37.69)	755 (11.37)	0.84 (0.74-0.95)*	1.55 (1.33-1.82)*	1.85 (1.57-2.19)*
FOULED	661	437 (66.11)	150 (22.69)	74 (11.20)	2.21 (1.83-2.68)*	1.51 (1.17-1.95)*	0.68 (0.51-0.91)*
SHOT	808	328 (40.60)	309 (38.34)	171 (21.16)	0.74 (0.63-0.87)*	0.43 (0.35-0.52)*	0.58 (0.47-0.71)*
GOAL	137	52 (37.96)	47 (34.30)	38 (27.74)	0.79 (0.53-1.18)	0.33 (0.22-0.50)*	0.42 (0.27-0.64)*

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

As shown in table 3, possessions that started in zone 1 (n= 3,313) resulted in 29 goals (0.88% conversion rate) and 162 shots (4.89% possessions in this area led to shot) was the lowest goal and shot percentage of all the starting possession zones. Start zone 2 had a higher number of possessions, (n= 3,447) goals 51 (1.48%) and shots 328 (7.81%) than start zone 1. Start zone 3 (n= 1,298) had a higher frequency than start zone 1 for shots (n= 250, 19.40%) and goals (32, 2.48%) but had a lower frequency count than that of start zone 2. Possessions that started in the score box zone (200) resulted in 25 goals (12.50% conversion) and 80 shots (40% of possessions starting in the score box led to a shot), which was both the highest shot conversion and goal conversion out of all the starting zones.

There was a significant weak association between possession type and start zone, ($\chi^2 = 202.76$, $P=0.001$, $V = 0.111$). Figure 10 illustrates that elaborate possessions had a higher than expected frequency of possessions starting in zone 2 compared to the other start zones. Similarly, direct possessions had a higher than expected frequency of possessions start in the score box zone, compared to that of elaborate and counterattacks, this was also seen in start zone 3. Counterattacks had a slightly higher than expected frequency of possessions starting in zone 2, but less than expected frequency in start zone 3.

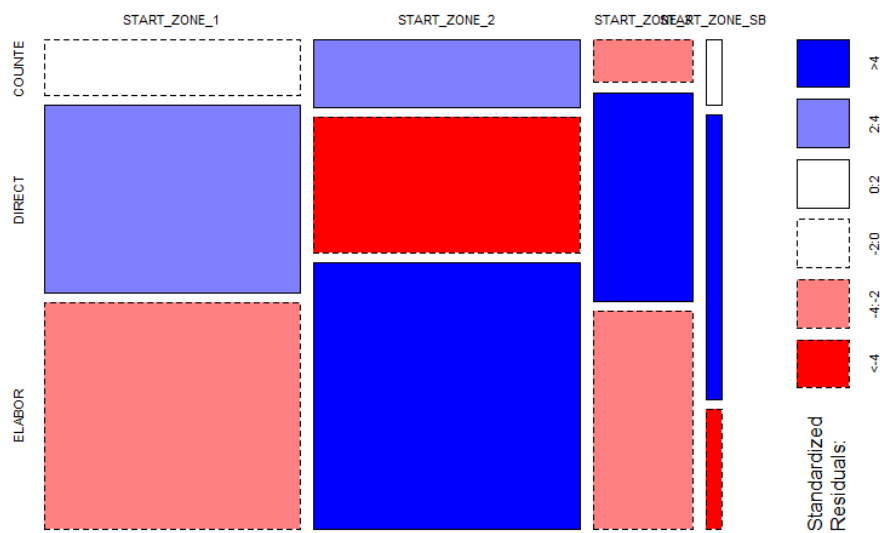


Figure 7 - Association of Start Zone and Possession Type

Table 9 reports elaborate possessions had a higher odds of starting in zone (OR 1.77, 95% CI: 1.61-1.95) but lower odds of starting in zones 1 (OR = 0.78, 95% CI: 0.71-0.86), zone 3 (OR 0.70, 95% CI: 0.62-0.80) and the score box start zone (OR 0.29, 95% CI: 0.21-41),

compared to direct possessions, these differences were not of statistical significance. Direct possessions had a higher odds of starting in zones 1 (OR = 1.29, 95% CI: 0.28-0.71), zone 3 (OR = 1.82, 95% CI: 1.47-2.24) and the score box end zone, (OR = 1.51, 95% CI: 1.00-2.29), but a lower odds in zone 2 (OR 0.53, 95% CI: 0.46-0.61) compared to counterattacks.

Table 9: Type of possession and the start zone of the possession

Start Zone	Odds Ratios (95% CI)						
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
SZ 1	3313	1597 (48.20)	1324 (39.96)	392 (11.83)	0.78 (0.71–0.86)	1.01 (0.88–1.16)	1.29 (1.12–1.50)
SZ 2	3447	1956 (56.75)	992 (28.78)	499 (14.48)	1.77 (1.61–1.95)	0.94 (0.82–1.08)	0.53 (0.46–0.61)
SZ 3	1289	597 (46.32)	573 (44.45)	119 (9.23)	0.70 (0.62–0.80)	1.28 (1.04–1.58)	1.82 (1.47–2.24)
SZ SB	200	51 (25.50)	121 (60.50)	28 (14)	0.29 (0.21–0.41)	0.44 (0.28–0.71)	1.51 (1.00–2.29)

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

Furthermore, table 3 shows possessions that ended in zone 1 and 2 (n = 616, n= 3086) resulted in 0 goals, and only zone 2 had 6 shots (0.20%). Comparatively, zone 3 (n= 2269) resulted in 12 goals (0.53%) and 101 shots (4.45%), and the score box end zone (n = 2278) had the highest conversion, 125 goals (5.49%) and 701 shots (30.77%) out of all four zones. Possessions in which all passes were penetrative (n = 587) resulted in the lowest frequency of 18 goals (3.07%) and in 118 shots (20.10%), but highest conversion rate compared to possessions that use a mix of penetrative passes and not, and those possessions without penetrative passes. A mixed approach had the second highest frequency (n = 3538) and resulted in the highest frequency of goals (n = 81; 2.29%) and shots (n = 430; 12.15%). Absent penetrative passes (n = 4,124) led to 38 goals (0.92%) and 260 shots (6.30%), the lowest conversion rates.

There was a significant weak association observed between the possession type and end zone, ($\chi^2 = 288.09, P < 0.001, V = 0.132$). Elaborate possessions were statistically more likely to end in zone 1, whereas counterattacks were more likely to end in the score box end zone. Figure 11 shows that elaborate possessions had a higher than expected frequency of possessions ending in end zone 1, and a lower than expected frequency ending in the score box end zone. Direct possessions had a lower expected frequency of possessions ending in end zone 1, this was similar to counterattacks who had a lower than expected frequency in zones 1 and 2. Counterattacks had a higher than expected frequency of possessions ending in the scoreboard, compared to both direct and elaborate.

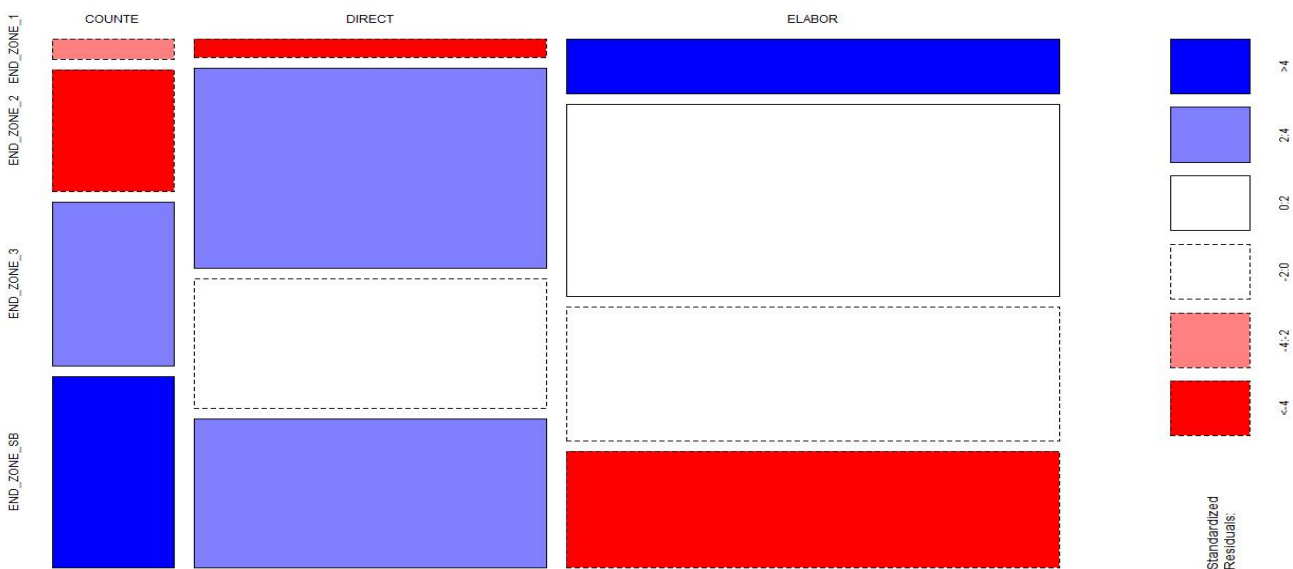


Figure 8- Association of end zone and possession type

There was a significant weak association between outcome and endzone zone, ($\chi^2 = 2131.49$, $P < 0.001$, $V = 0.293$). Figure 13 visualises that there was a higher than expected frequency of goals in the score box, and there was a higher than expected frequency of shots in the score box end zone. There was a higher than expected frequency of possession losses in both end zone 2 and zone 3. There was also a lower than expected frequency of both shots and goals in end zone 3, and a lower than expected frequency of possession losses in the score box end zone.

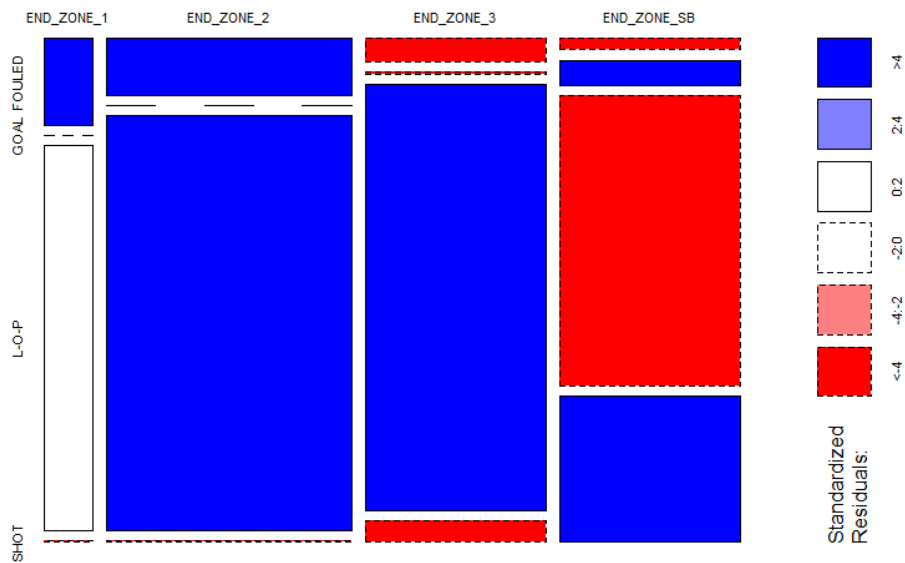


Figure 9 - Association of end zone and possession outcome

Table 10 outlines that elaborate possessions had significantly higher odds of ending in end zone 1 compared to direct possessions (OR = 3.20, 95% CI: 2.59-3.95), and significantly lower odds of ending in the scorebox (OR 0.71, 95% CI: 0.64-0.79). There were no significant differences observed in endzones 2 and 3 when comparing elaborate and direct. Elaborate possessions also showed significantly higher odds of ending in end zone 1 (OR = 2.86, 95% CI: 2.08-3.94), and 2 (OR = 1.95, 95% CI: 1.67-2.28), and significantly lower odds of ending in end zone 3 (OR = 0.75, 95% CI: 0.65-0.87) and the scorebox end zone (OR = 0.49, 95% CI 0.42-0.56), compared to counterattacks. Direct possessions had significantly higher odds of ending in end zone 2 compared to counterattacks (OR = 2.09, 95% CI: 1.78-2.45), and significantly lower odds of ending in zone 3 (OR = 0.72, 95% CI: 0.62-0.84) and scorebox end zone (OR = 0.68, 95% CI: 0.59-0.79).

Table 13 highlights possessions ending in end zone 1 were significantly less likely to result in a loss of possession compared to end zone 2 (OR = 0.61, 95% CI: 0.49–0.77) and end

zone 3 (OR = 0.48, 95% CI: 0.38–0.62), but were more likely to result in fouls than both end zone 2 (OR = 1.64, 95% CI: 1.30–2.06) and end zone 3 (OR = 4.32, 95% CI: 3.28–5.71). When compared to the score box end zone, possessions ending in end zone 1 had significantly higher odds of a loss of possession (OR = 2.77, 95% CI: 2.23–3.45) a foul (OR = 8.52, 95% CI: 6.13–11.84), and significantly lower odds a shot (OR = 0.00, 95% CI: 0.00–0.03) or a goal (OR = 0.01, 95% CI: 0.00–0.22).

Possessions ending in end zone 2 also had significantly lower odds of a loss of possession (OR = 0.79, 95% CI: 0.66–0.94) but higher odds of a foul (OR = 2.64, 95% CI: 2.12–3.28) compared to end zone 3 (Table 13). End zone 2 had significantly higher odds of loss of possession (OR = 4.52, 95% CI: 3.95–5.18) and fouls (OR = 5.20, 95% CI: 3.93–6.89), and lower odds of both shots (OR = 0.00, 95% CI: 0.00–0.01) and goals (OR = 0.00, 95% CI: 0.00–0.04) compared to the score box end zone. Table 13 also highlighted that possessions ending in end zone 3 were significantly more likely to result in a loss of possession (OR = 5.74, 95% CI: 4.89–6.75) or a foul (OR = 1.97, 95% CI: 1.43–2.72), but significantly less likely to produce a shot (OR = 0.10, 95% CI: 0.08–0.13) or a goal (OR = 0.09, 95% CI: 0.05–0.17) compared to the score box end zone .

Table 10: Type of possession and the end zone of the possession

End Zone	Odds Ratios (95% CI)						
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
EZ 1	617	462 (74.96)	112 (18.15)	43 (6.97)	3.20 (2.59 – 3.95)*	2.86 (2.08 – 3.94)*	0.89 (0.62 – 1.28)
EZ 2	3085	1622 (52.57)	1210 (39.23)	253 (8.20)	0.94 (0.85 – 1.03)	1.95 (1.67 – 2.28)*	2.09 (1.78 – 2.45)*
EZ 3	2269	1137 (50.11)	789 (34.77)	343 (15.12)	1.04 (0.94 – 1.16)	0.75 (0.65 – 0.87)*	0.72 (0.62 – 0.84)*
EZ SB	2278	980 (43.02)	899 (39.47)	399 (15.71)	0.71 (0.64 – 0.79)*	0.49 (0.42 – 0.56)*	0.68 (0.59 – 0.79)*

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

Table 13: End zone and possession outcome (n(%))

Outcome						Odds Ratios (95% CI)					
	N	EZ1 (n %)	EZ2 (n %)	EZ3 (n %)	EZ SB (n %)	EZ1 vs EZ2 (OR 95 % CI)	EZ1 vs EZ3 (OR 95 % CI)	EZ1 vs EZ SB (OR 95 % CI)	EZ2 vs EZ3 (OR 95 % CI)	EZ2 vs EZ SB (OR 95 % CI)	EZ3 vs EZ SB (OR 95 % CI)
L-O-P	6643	502 (7.56 %)	2 705 (40.72 %)	2 043 (30.75 %)	1 393 (20.97 %)	0.61 (0.49 – 0.77)*	0.48 (0.38 – 0.62)*	2.77 (2.23 – 3.45)*	0.79 (0.66 – 0.94)*	4.52 (3.95 – 5.18)*	5.74 (4.89 – 6.75)*
FOULED	661	114 (17.25 %)	375 (56.73 %)	113 (17.10 %)	59 (8.93 %)	1.64 (1.30 – 2.06)*	4.32 (3.28 – 5.71)*	8.52 (6.13 – 11.84)*	2.64 (2.12 – 3.28)*	5.20 (3.93 – 6.89)*	1.97 (1.43 – 2.72)*
SHOT	808	1 (0.12 %)	5 (0.62 %)	101 (12.50 %)	701 (86.76 %)	1.00 (0.12 – 8.57)	0.03 (0.00 – 0.25)*	0.00 (0.00 – 0.03)*	0.03 (0.01 – 0.09)*	0.00 (0.00 – 0.01)*	0.10 (0.08 – 0.13)*
GOAL	137	0 (0.00 %)	0 (0.00 %)	12 (8.76 %)	125 (91.24 %)	– (no data)	0.15 (0.01 – 2.58)	0.01 (0.00 – 0.22)*	0.03 (0.00 – 0.52)*	0.00 (0.00 – 0.04)*	0.09 (0.05 – 0.17)*

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

Possessions in which spatial passes were solely used (n = 1397) resulted in the lowest number of goals (n = 27; 1.93%) and number of shots (n = 166; 11.88%), whereas possessions that used only feet passes (n = 4432) had a higher number of goals scored (n = 52; 1.17%) and number of shots (n = 337; 7.60), however, had the smallest conversion rate for both shots and goals. Possessions using both spatial and feet passes (n = 2,420) resulted in the highest number of goals (n = 58; 2.40%) and shot conversion (n= 305; 12.60%).

There was a significant weak association between possession type and space utilisation ($\chi^2 = 1465.67$, $P=0.001$, $V = 0.298$). Figure 9 indicates that counter attacking and direct possessional types were statistically more likely to use space passes compared to that of elaborate, shown by the blue tiles compared to the small red tile in the elaborate possession highlighting a lower than expected utilisation of spatial passes. Contrastingly, elaborate possessions had a higher than expected utilisation of passes to feet compared to a lower utilisation in both direct and counter attacking possession types.

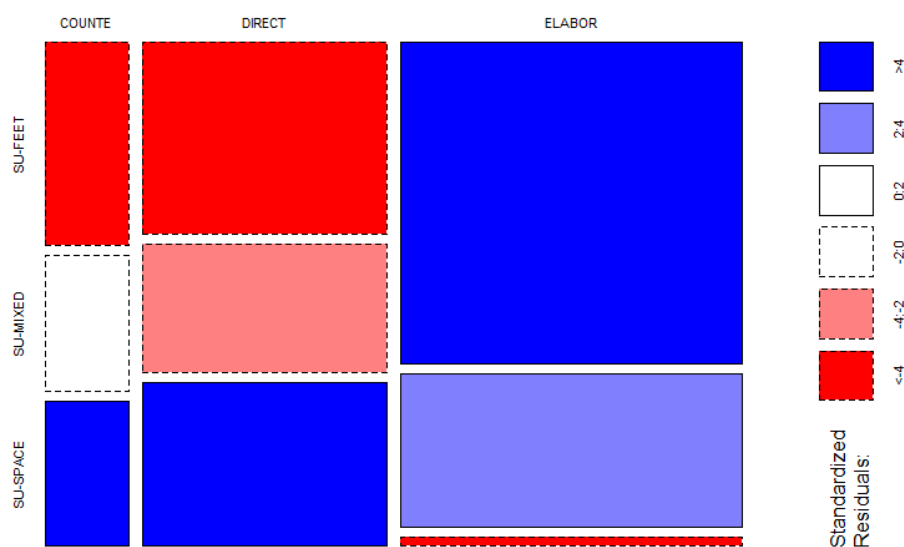


Figure 10- Association of Space Utilisation and Possession Type

Elaborate possessions as shown in table 6, had lower odds of utilising space passes compared to both direct (OR = 0.03, 95% CI: 0.03-0.04) and counterattacking possessions (OR = 0.04, 95% CI: 0.03-0.05). In contrast, elaborate possessions had significantly higher odds of using feet passes relative to direct (OR = 3.04, 95% CI: 2.76-3.35) and counterattacks (OR = 2.75, 95% CI: 2.39-3.16). Mixed passes also had higher odds in elaborate possession types

compared to direct (OR = 1.28, (95% CI: 1.15-1.42) and counterattacks (OR = 1.19, 95% CI: 1.02-1.38). Direct possessions had a significantly higher odds of using space passes compared to counterattacking possessions (OR = 1.20, 95% CI:1.03-1.39).

Table 6: Type of space utilisation and possession type (n(%))

Space Utilisation	Odds Ratios (95% CI)						
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
Space	1397	71 (5.08)	1016 (72.73)	310 (22.19)	0.03 (0.03 – 0.04)*	0.04 (0.03 – 0.05)*	1.20 (1.03 – 1.39)*
Feet	4432	2801 (63.20)	1194 (26.94)	437 (9.86)	3.04 (2.76 – 3.35)*	2.75 (2.39 – 3.16)*	0.90 (0.78 – 1.04)
Mixed	2420	1329 (54.92)	800 (33.06)	291 (12.02)	1.28 (1.15 – 1.42)*	1.19 (1.02 – 1.38)*	0.93 (0.79 – 1.09)

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

Defensive cover being present was more frequent (n = 4409) than absent (n = 3840). With more goals being scored when defensive cover was absent (n = 104; 2.71%) than present (n = 33; 0.75%). Similarly, more shots were recorded during absent defensive cover (n = 428; 11.15%) compared to present (n = 380; 8.62%). Comparably, defensive pressure was more frequent (n = 7227) than absent pressure (1022). A higher number of goals were scored when defensive pressure was present (n = 102; 1.41%) than when defensive pressure was absent (n = 35; 3.42%) however a higher percentage of goals were scored when pressure was absent. Similarly, more shots were conducted when defensive pressure was present (n = 647; 8.95%) compared to when defensive pressure was absent, (n = 161; 15.75%) but a higher shot conversion percentage was seen under absent defensive pressure.

There was a significant weak association noted between possession type and defensive cover, ($\chi^2 = 318.20$, $P=0.001$, $V = 0.196$). Figure 7 illustrates that absent defensive cover had a higher than expected frequency in both direct and counterattacking possessions, and a lower than expected frequency in elaborate possessions. Contrastingly, elaborate possessions showed a higher than expected frequency of defensive cover being present, while defensive cover had a less than expected frequency in both direct and counter attacking possessions.

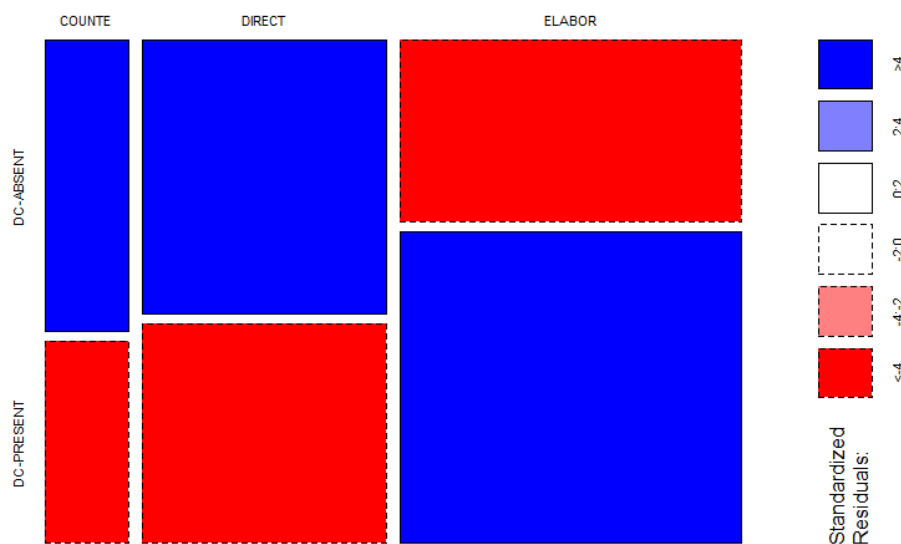


Figure 11 - Association of defensive cover and possession type

Table 8 shows elaborate possessions had a significantly higher odds of facing defensive cover compared to direct possessions (OR = 2.13, 95% CI: 1.94-2.34), and had significantly lower odds of facing absent defensive cover (OR = 0.47, 95% CI: 0.43-0.53). Elaborate possessions also had higher odds of facing defensive cover compared to counterattacks (OR =

2.46, 95% CI: 2.14-2.82). Direct possessions showed slightly higher odds of occurring under defensive cover compared to counterattacks (OR = 1.15, 95% CI: 1.00-1.33), but the odds of occurring with absent defensive cover did not differ significantly between direct and counterattacks, (OR = 0.87, 95% CI: 0.75-1.00).

Table 8: Possession type and the defensive cover of the possession

Defensive Cover				Odds Ratios (95% CI)			
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
Present	4409	2647 (60.04)	1337 (30.32)	425 (9.64)	2.13 (1.94– 2.34)*	2.46 (2.14– 2.82)*	1.15 (1.00– 1.33)
Absent	3840	1554 (40.47)	1673 (43.57)	613 (15.96)	0.47 (0.43– 0.52)*	0.41 (0.35– 0.47)*	0.87 (0.75– 1.00)

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

There was a significant weak association between possession type and defensive pressure ($\chi^2 = 622.34, P=0.001, V = 0.275$). Defensive pressure was observed the most when against an elaborate possession type, and the least against direct possessions. Figure 8 visualises that elaborate possessions had a higher than expected frequency of defensive pressure compared to direct and counterattacking possessions. Direct play had a significantly lower than expected frequency of defensive pressure compared to elaborate and counterattacking possessions. In contrast direct play had a significantly higher frequency of facing absent defensive pressure, compared to both elaborate and counterattacks. Counterattacking possessions had neither defensive pressure present nor absent conditions deviating from the expected frequencies.

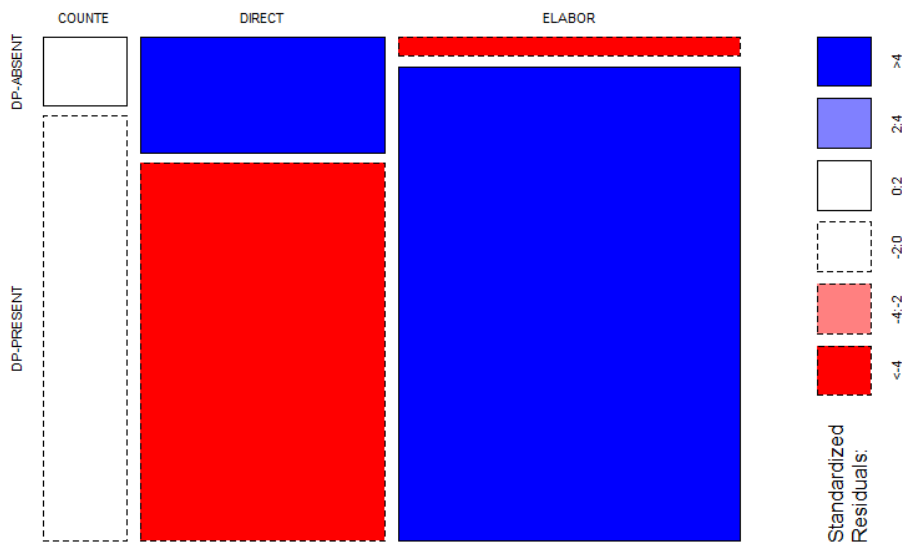


Figure 12 - Association of defensive pressure and possession type

Elaborate possessions as presented in table 7, had a significantly higher odds of occurring under defensive pressure compared to direct possessions (OR = 7.41, 95% CI: 6.22-8.83), while the odds of occurring under absent defensive pressure were significantly lower (OR = 0.13, 95% CI: 0.11-0.16). Elaborate possessions also had a higher odds of facing defensive pressure compared to counterattacks (OR = 3.87, 95% CI: 3.06-4.89) and lower odds when defensive pressure was absent (OR = 0.26, 95% CI: 0,20-0.33). In contrast, direct possessions had a significantly lower odds of occurring under defensive pressure compared to

counterattacks (OR = 0.52, 95% CI: 0.43-0.63), but significantly higher odds without defensive pressure (OR = 1.92, 95% CI: 1.58-2.33).

Table 7: Possession type and defensive pressure of the possession (n(%))

Defensive Pressure	Odds Ratios (95% CI)						
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
Present	7227	4033 (55.80)	2300 (31.83)	894 (12.37)	7.41 (6.22 – 8.83)*	3.87 (3.06 – 4.89)*	0.52 (0.43 – 0.63)*
Absent	1022	168 (16.44)	710 (69.47)	144 (14.09)	0.13 (0.11 – 0.16)*	0.26 (0.20 – 0.33)*	1.92 (1.58 – 2.33)*

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05).

There was a significant moderate association between possession type and pass penetration ($\chi^2 = 1560.76$, $P=0.001$, $V = 0.308$). Figure 12 indicates that the elaborate possession type had a higher than expected frequency of mixed penetrative passes compared to that of direct and counter attacking. Contrastingly, counter attacking and direct possession had a higher than expected number of penetrative passes compared to that of elaborate. Direct possessions also had a higher than expected frequency of absent penetrative passes compared to that of counterattacks and elaborate attacks.

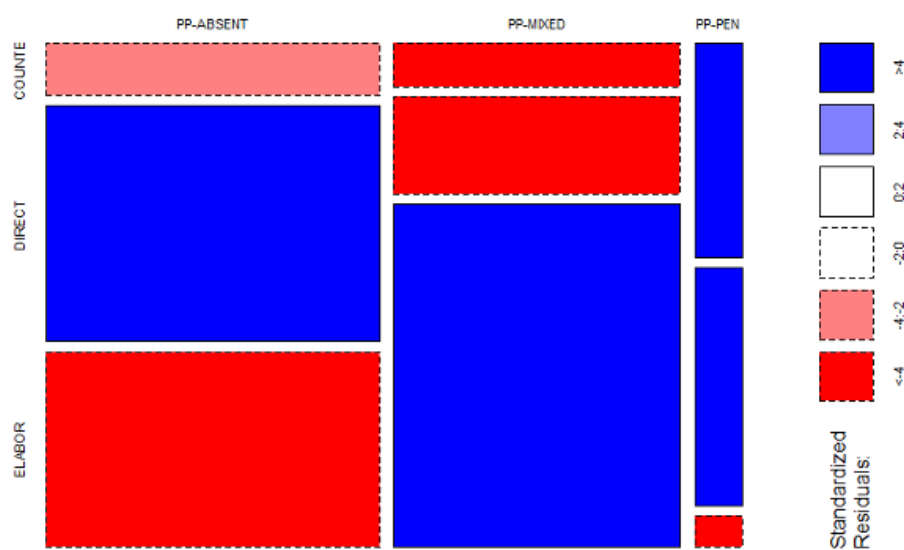


Figure 13- Association of Pass Penetration and Possession type

There was a significant weak association between outcome and pass penetration, ($\chi^2 = 189.05$, $P < 0.001$, $V = 0.107$). Figure 14 shows that pass penetration where there is a mix of penetrative passes has a higher than expected shot outcome compared to absent penetrative passes. Similarly, just penetrative passes also lead to a higher than expected shot outcome compared to absent penetrative passes. When there was possession with absent penetrative passes there was a higher than expected count of possession losses, and a lower than expected count of goals and shots.

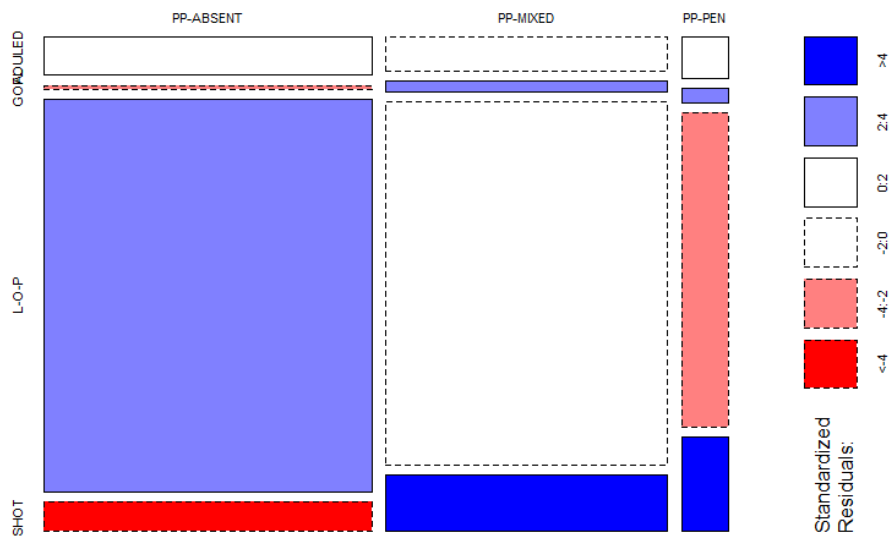


Figure 14- Association of Pass Penetration and Possession Outcome

Table 11 shows elaborate possessions had a significantly lower odds of absent pass penetration compared to direct possessions (OR = 0.33, 95% CI: 0.30-0.36), and significantly higher odds of mixed pass penetration (OR = 2.58, 95% CI: 2.31-2.88). Elaborate possessions also had a significantly low odds of penetrative passes compared to direct possessions (OR = 0.08, 95% CI: 0.06-0.12). Compared to counterattacks, elaborate possessions had significantly lower odds of absent (OR = 0.84, 95% CI: 0.73-0.97) penetrative passes (OR = 0.03, 95% CI: 0.02-0.04), but significantly higher odds of mixed pass penetration (OR = 1.22, 95% CI: 1.04-1.44). Direct possessions had significantly higher odds of absent pass penetration compared to counterattacks (OR = 2.58, 95% CI: 2.24-2.98), but significantly lower odds of mixed (OR = 0.68, 95% CI: 0.58-0.80) and penetrative passes (OR = 0.32, 95% CI: 0.27-0.38).

Table 12 shows that possessions with absent penetration had significantly higher odds of a loss of possession (OR = 1.51, 95% CI: 1.35-1.70), and lower odds of a shot (OR = 0.49,

95% CI: 0.41-0.57) or a goal (OR = 0.40, 95% CI: 0.27-0.59) compared to mixed penetration possessions. Similarly, possessions with absent penetration had significantly greater odds of a loss of possession (OR = 2.57, 95% CI: 2.13-3.11), and significantly lower odds of producing a shot (OR = 0.27, 95% CI = 0.21-0.34) or a goal (OR = 0.29, 95% CI: 0.17-0.52) in comparison with penetrative passes. When comparing mixed and penetrative passes, mixed penetration had a significantly higher odds of a loss of possession (OR = 1.70, 95% CI: 1.40-2.06) and a significantly lower odds of a shot (OR = 0.55, 95% CI: 0.44-0.69) and a lower odds of a goal (OR = 0.74, 95% CI: 0.44-1.24), in comparison to penetrative possessions.

Table 11: Type of possession and the pass penetration of the possession

Pass Penetration	Odds Ratios (95% CI)						
	N	Elaborate	Direct	Counterattack	Elaborate vs Direct	Elaborate vs Counterattack	Direct vs Counterattack
Absent	4124	1661 (40.28)	2009 (48.71)	454 (11.01)	0.33 (0.30– 0.36)*	0.84 (0.73– 0.97)*	2.58 (2.24– 2.98)*
Mixed	3538	2503 (70.75)	711 (20.09)	324 (9.16)	2.58 (2.31– 2.88)*	1.22 (1.04– 1.44)*	0.68 (0.58– 0.80)*
Penetrative	587	37 (6.30)	290 (49.40)	260 (44.29)	0.08 (0.06– 0.12)*	0.03 (0.02– 0.04)*	0.32 (0.27– 0.38)*

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

Table 12: Pass penetration and possession outcome (n(%))

Outcome	Odds Ratios (95% CI)						
	N	Absent (n %)	Mixed (n %)	Penetrative (n %)	Absent vs Mixed (OR 95 % CI)	Absent vs Penetrative (OR 95 % CI)	Mixed vs Penetrative (OR 95 % CI)
L-O-P	6643	3 480 (52.39 %)	2 765 (41.62 %)	398 (5.99 %)	1.51 (1.35 – 1.70)*	2.57 (2.12 – 3.11)*	1.70 (1.40 – 2.06)*
FOULED	661	346 (52.34 %)	262 (39.64 %)	53 (8.02 %)	1.15 (0.97 – 1.35)	0.92 (0.68 – 1.25)	0.81 (0.59 – 1.10)
SHOT	808	260 (32.18 %)	430 (53.22 %)	118 (14.60 %)	0.49 (0.41 – 0.57)*	0.27 (0.21 – 0.34)*	0.55 (0.44 – 0.69)*
GOAL	137	38 (27.74 %)	81 (59.12 %)	18 (13.14 %)	0.40 (0.27 – 0.59)*	0.29 (0.17 – 0.52)*	0.74 (0.44 – 1.24)

Odds Ratio Calculation; CI: 95% Confidence Interval. *significant difference (P<0.05)

Discussion

The main aim of this study was to investigate the effectiveness of different possession types and their association with start zone, end zone, defensive pressure, defensive cover, pass penetration, pass number, space utilisation and outcomes in the Premier League 2. The main observed outcome of this study was that counterattacks were found to be the most effective form of possession type in terms of goal-scoring efficiency (3.7% of counterattacks resulted in goals) and shot creation as 16.5% of counterattacks ended in a shot. The results showed counterattacks were 3.03 and 2.38 times more likely to end in a goal in comparison to elaborate and direct possessions, and 2.32 and 1.72 times more likely to end in a shot.

Counterattacks utilised 25 times more spatial passes in comparison to elaborate possessions, but 0.83 times less than direct possessions. Counterattacks were also 33.33 and 3.13 times more likely than both elaborate and direct possessions of utilising penetrative passes. Counterattacking possessions were 2.44 and 1.15 times more likely to occur with absent defensive cover compared to elaborate and direct possessions, and 3.85 times less likely to face defensive pressure compared to elaborate possessions. Counterattacks were found to be 2.04 and 1.47 times more likely to have the possession end in the score box compared to elaborate and direct, with 38.44% of all counterattacking possessions ending in the score box.

This suggests that teams benefit from quickly transitioning from defence to attack, catching opponents unbalanced and capitalising on space left open during transitions from attack to defence (Tenga, 2010; Hewitt et al., 2016; Lago-Ballesteros et al., 2012; Gollan et al., 2018). These moments of unbalanced defence and quick attacks become periods of uncertainty due to the lack of structure of both the attacking and defensive teams. Potential structural and tactical strategies put in place during these counterattacking scenarios could be seen as beneficial due to the success at getting the ball into more progressive and goal scoring areas quicker.

A number of key findings emerge from the present study that provide both academic and practical value. Most notably, the superior efficiency of counterattacking possessions, the contrast between possession frequency and effectiveness, and the importance of the score box as the primary goal-scoring zone represent central themes within the results. Collectively, these

findings highlight that attacking success is not solely dependent on the volume of possession, but rather on how effectively teams exploit space, time, and defensive organisation to generate high-quality opportunities.

From a theoretical perspective, these findings can be further interpreted through the dynamical systems theory, which views football as a complex system shaped by the interaction of players, space, and time under different environmental changes and constraints. Within this framework, counterattacking situations can be understood as moments of instability, where the defensive system of the opposition is disrupted and has not yet reorganised into a compact shape. These transitional phases create offensive opportunities for attacking players to exploit the large spaces and numerical advantages that can be present during these transitional moments.

Therefore, the effectiveness of counterattacks observed in this study may not reflect only the style of play, but also the timing of the attack within these unstable phases of play, before a team's defensive reorganisation can occur. In contrast, the elaborate possessions tend to occur in more stable system states, where defensive structures are compact and organised, reducing available space and limiting attacking opportunities, while offensive structures are expansive and look to get players in spaces to exploit spaces in between and beyond.

Despite being the most frequently used possession type, elaborate play often leads to a loss of possession (1.19 times less likely than direct but 1.55 times more likely than counterattacks), and results in fewer goals (a goal is 3.03 and 2.38 times less likely compared to direct and counterattacking possessions), relative to its high usage. This is particularly evident in the Scorebox (End Zone SB), which emerges as the most critical area for scoring, emphasizing the importance of teams prioritising this zone for greater goal-scoring opportunities. The relationship between possession type and defensive pressure highlights the tactical challenges faced by teams using the elaborate possessional style. While this approach is effective in maintaining prolonged possession, its slower tempo and predictability often allow opposing teams to reorganise defensively and give the opportunity for opposition to launch counterattacks. Hughes and Franks (2005) found that longer possessions (6 or more passes) created more scoring opportunities, which is in direct contrast with the current study which found fewer passes created more goals and shots. Furthermore, elaborate possessions (associated with a high pass number), while more frequent did not have better odds of goals and shots compared to counterattacks and direct possessions. The contrast in results could be

due to the type of teams analysed one being elite international teams and one being a youth development league.

Possession-based teams therefore, need to develop tactical strategies capable of breaking down well-structured defensive setups. Elaborate possessions were found to be 2.58 and 1.22 times more likely to use mixed pass penetration compared to both direct and counterattacks. These findings suggest this style is versatile in terms of pass penetration, but it may require greater tactical refinement in terms of timing and spatial exploitation to convert more elaborate possessions into shots and goals.

An important observation within the findings is the distinction between possession frequency and attacking effectiveness. While elaborate possessions accounted for the majority of overall possessions, they were less effective in producing goals and shots compared to counterattacking and direct play. This reinforces the notion that maintaining possession does not inherently lead to attacking success. Instead, the effectiveness of possession appears to be more closely linked to its intent, tempo, and ability to disrupt defensive organisation.

It was highlighted that penetrative passes were the most effective method in the outcome being a shot or a goal (3.07% of all penetrative possessions ended in a goal, in comparison to 2.29% of all mixed possessions, and 0.92% of absent possessions). Pass penetration was 3.70 and 1.82 times more likely to end in a shot in comparison to absent and mixed penetration, and 3.45 and 1.35 times more likely to end in a goal. Furthermore, counter attacking possessions were 33.3 and 3.13 times more likely than elaborate and direct possessions respectively, to use only penetrative passes. This suggests that to break down defensive structures, teams could create imbalance by either more penetrative passes to create a numerical advantage and move the ball with an increased tempo to create space. Previous research has highlighted that penetrative passing opportunities are therefore shaped by spatial temporal interactions.

Passos et al. (2020) demonstrated this using heat maps and landscape models, that penetrative passing opportunities appear due to the dynamic player interactions, especially in the midfield area, and by the sidelines, comparing to the present study, most counterattacks starting in zone 2 or the midfield area (48% of counterattacks started in zone 2, and was 1.06 and 1.89 times more likely than elaborate and direct to start in zone 2) utilised the most pass penetration (33.13 and 3.13 times more than elaborate and direct).

Similarly, Travassos et al. (2022) emphasised that successful penetrative passes are created with lower width values of the attacking team and higher values of the width of the defending team in comparison with unsuccessful passes. Other defensive variables such as defensive pressure analysed by Gómez-Jordana et al. (2021) suggested that penetrative passes were available for shorter amounts of time (in comparison to support and backwards passes), further emphasising the urgency in which defenders attempt to close players attempting penetrative passes. In the current study the elaborate possession type faced the most defensive pressure (7.41 and 3.87 times more likely to face defensive pressure than direct and counterattack possessions) and was 2.58 and 1.22 times more likely to use mixed pass penetration. This metric (pass penetration) could be a future consideration in analysing pass penetration in relation to styles as well as spatial temporal aspects to analyse how it can create more shots and potentially goals.

The findings relating to pass penetration further reinforce its importance as a key performance indicator in attacking play. Possessions involving penetrative passing actions were more likely to result in both shots and goals, highlighting the role of forward and line-breaking passes in disrupting defensive structures. From a practical standpoint, this suggests that training interventions should focus on developing players' ability to identify and execute penetrative passing opportunities, particularly under time and space constraints.

In contrast, counterattacking styles are typically more direct and often occur against imbalanced defensive structure or balls into areas to create numerical advantages, making them more difficult to defend against and often more effective at creating goal-scoring opportunities. The choice between high or low-pressure defensive styles is frequently influenced by the opponent's approach; for example, applying high pressure against a possession-based team can disrupt their rhythm by denying time and space, increasing the likelihood of turnovers and potential counter attacks and scoring chances (Cotta et al., 2013).

Mixed pass penetration and space utilisation strategies are also prevalent, highlighting the variability in how teams approach breaking down defences and generating offensive chances. Additionally, teams initiating possession from Start Zone 2 are involved in the most possessions with 41.79 % of possessions starting in this zone suggesting that disrupting play in this zone could be crucial for defensive strategies. The current findings highlighted that 48% of counterattacks started in zone 2 and was found to be 1.06 and 1.89 times more likely than elaborate and direct to start in this zone. These findings align with Lago-Ballesteros and Lago-

Peñas (2010), who noted that counterattacks, being more direct and unpredictable, typically result in higher scoring opportunities and disrupting the play in the zones where counterattacks are more likely to start could be a crucial strategy for defensive teams.

This further supports the current study's finding that counterattacks yield the highest goal conversion and shot creation rates compared to other possession types. In addition, Olsen and Larsen (1997) and Tenga (2010) found that more goal scoring opportunities and goals occurred from counterattacks compared to elaborate attacks. Effective counterattacking strategies in elite football can start from a team's ability to maintain a compact and well-structured defensive shape during its own attacking phases. This concept, known as rest defence, allows teams the structure to be able to quickly regain possession and exploit potential transitional moments. Key counterattacking strategies include maintaining numerical superiority in defensive areas, positioning central defenders with sufficient depth to control space in behind and in front, and assigning specific roles to players inside the structure, (Anzer and Bauer, 2021; Gréhaigine et al., 2002; Forcher et al., 2022).

An example of specific roles could be a winger joining in the press and the opposite winger coming inside to potentially drive at the goal centrally on ball regains. Additionally, teams in a defensive shape employ trigger-based cues, such as backward passes, errors, and the ball entering specific areas to initiate immediate pressing and therefore potential fast attacking transitions. Such compact and anticipatory setups have been shown to significantly improve the success rate of counterattacks (Forcher et al., 2023). Additionally, the strong association seen between the possession types and space utilisation emphasises the importance of different strategic attacking movement, positioning and formations in offensive possessions. Teams that effectively use the space on the pitch efficiently are more likely to create meaningful opportunities and break down defensive structures (Martens et al., 2021; Ric et al., 2017).

Defensive cover was a defensive variable that was less present during counterattacks, most likely because counterattacks usually occur during attacking transitions when the defending team is not yet fully organised, and the attacking team could have a numerical or spatial advantage. This could be one explanation for the higher success rate of counterattacks compared to elaborate and direct, as attackers exploit spaces that are left unprotected by the defensive line, as the speed and directness of counterattacks against unbalanced defences make

counterattacking an effective method in creating goal scoring opportunities (Olsen and Larsen, 1997; Tenga, 2010, Gonzalez-Rodenas et al., 2020).

The significant association between elaborate possessions and defensive pressure suggests that teams using an elaborate style of play, which focuses on maintaining possession and building from the back are more likely to face intense defensive pressure. This could be because defensive teams often employ mid-block strategies designed to disrupt elaborate possession, such as pressing specific passes (backwards or square passes), or applying pressure in central or wide areas depending on player positioning or numbers. Therefore, the defensive team might decide not to press immediately, instead recovering into this tactical defensive mid-block shape. This shape allows them to set up a pressing trap in the next phase of play, effectively trapping the attacking team in a vulnerable position.

Furthermore, as the attacking team progresses the ball into advanced areas, the defensive team will be in a compact defensive shape. The defensive positioning of certain players within a defensive shape is a method to potentially regain possession and initiate a counterattack. The defensive cover variable in the present study was 2.13 and 2.46 times more likely in elaborate possessions compared to direct and counterattacks. Previous studies suggest that these defensive strategies are common in teams employing a high defensive press against elaborate possession (Tenga, 2010, Cotta et al., 2013, Fernandez-Navarro et al., 2016). Similarly, this study found that elaborate possessions had statistically higher odds of facing defensive pressure than both direct and counterattacking possessions (7.41 times higher and 3.87 times higher).

Bauer et al. (2023) highlight the tactical contrast between mid-block and low-block defensive strategies, noting that mid-blocks focus on maintaining structured defence in the midfield area, while low-blocks compress space near the goal to limit shooting opportunities. The transition from a mid-block to a low-block often reflects a team's response to increased offensive pressure, aiming to reduce space for attackers and limit goal-scoring chances. To counteract offensive systems effectively, teams benefit from organised defensive structures, particularly through mid- and low-block formations, teams therefore try to get out of these structures to form transitional opportunities, this is encouraged by pressing moments that are started by coordinated pressing triggers like that stated above, (Nunes et al., 2021; Casal et al., 2019).

The present data illustrates that most goals (91.2%) were scored from within the Scorebox end-zone, reinforcing the critical importance of advancing the possessions into high-probability scoring areas. This aligns with the Expected Goals (xG) model, which quantifies the scoring likelihood based on variables such as shot location, distance, angle, shot type, and speed (Bertin and Riley, 2014). Rathke (2017) further highlighted that shot distance is particularly influential, with 83% and 86% of goals in the 2012–2013 Premier League and Bundesliga, respectively, originating within the penalty box area. Bandara et al. (2024) also found that shot proximity—particularly within the opponent’s penalty box—markedly increases the likelihood of scoring. This is consistent with the present study's findings, where the Scorebox area (slightly larger than the penalty area) yielded most goals.

This importance of possession in central, close-range scoring positions reflects a common tactical pattern observed in elite football. Previous studies have shown that successful attacks are often found to be in dangerous central areas, where chances are statistically more likely to be converted (Hughes et al., 1988; Tenga et al., 2010; Lago-Ballesteros et al., 2012). Memmert et al. (2017) and Rein et al. (2017) similarly observe that central possession and penetration in the final third leads to higher-quality scoring opportunities, with attacking centrally being both the most direct and most efficient path to goal. Additionally, possession regains in the final third can exploit disorganised opposition structures, increasing the probability of scoring, as previously found by Bate (1988), Hughes (1990), and Hughes and Snook (2006).

The dominance of the score box as the primary goal-scoring zone further reinforces the importance of spatial factors in attacking success. The findings indicate that the likelihood of scoring is strongly dependent on a team’s ability to progress possession into the central, high-value areas close to goal. From a dynamical systems perspective, these zones can be considered areas where task constraints and player interactions occur to increase scoring probability, particularly when defensive organisation is disrupted. This suggests that successful attacking strategies are not solely defined by possession type, but by the ability to consistently access and exploit these high-value spatial zones.

Elaborate possession types accounted for the majority of all possessions (50.93%); however, the style of play showed a lower effectiveness in terms of goal conversion compared to that of counterattacks and direct play. Teams may need to reassess the balance between

controlled elaborate ball possessions and direct, more opportunistic play. While elaborate possessions may help maintain control and tempo of games, direct and counterattacking styles may result in better offensive outcomes. This could be due to the amount of space available in the types of possessions, an elaborate possessional style allows teams to be tactically and structurally organised more so than that in direct and counterattacking scenarios (Casal et al., 2019; Fernández-Navarro et al., 2016). Counterattacking and direct styles of play bypass oppositions press either with regains or going over the press, removing some of the structural balance oppositions would have. Therefore, attacking during unbalanced moments where teams can not set a press and condense spaces centrally while forcing teams to become trapped and more predictable in their play can potentially provide better offensive outcomes.

In contrast to counterattacking possessions, elaborate possessions—despite being the most frequent style of play at 50.93%—was the least effective in converting possession into goals (1.2%) or shots at goal (7.8%). Similarly, Tenga et al (2010) analysed 1891 team possessions found that the proportion of counterattacks (52%) that led to a goal had a higher percentage than that of elaborate attacks (48%). This reflects previous findings that while elaborate play allows teams to control the tempo of the game and dominate possession, it often lacks the directness needed to break down structurally compact and tactically defensive units, (Lago-Ballesteros et al., 2012).

Defensive units aim to apply more pressure and cover against this elaborate possessional style as it can further reduce its effectiveness in the final third, as the defensive team will have a compact and high numerical number around the ball and the goal they are defending (Fernandes et al., 2021; Tenga et al., 201; Da Costa et al., 2009). Previous studies by Hughes and Franks (2005) and Redwood-Brown (2008) found that while maintaining possession through elaborate play helps teams control the tempo of the game, it does not always necessarily lead to more scoring opportunities. This aligns with the current findings that elaborate play, while the most common possession type, it is less effective at producing goals.

Direct play was the second most frequent (36.49%) and had a moderate effectiveness for goal scoring (1.6% of all direct possessions resulted in a goal but was 3.03 times more likely to end in a goal than elaborate but 2.38 times less than counterattacks). Direct play was also found to be 1.35 times more likely to end in a shot compared to elaborate possessions, but 1.72 times less than counterattacks. Previous research by Ensum et al. (2005) and Rein et al. (2017)

corroborates that direct play, while less controlled than elaborate play, often leads to quicker scoring opportunities due to its focus on moving the ball forward quickly with more attacking purpose. (Bate, 1988; Olsen and Larsen, 1997; Reep and Benjamin, 1968).

There was also a weak association between defensive pressure and possession type, with the most defensive pressures applied against the elaborate possession type. The defensive cover variable was most common against the elaborate possession type, with defensive cover being present in 60.04% of all elaborate possessions, compared to 30.32% for direct and 9.64% for counterattacks. Elaborate possessions were 7.41 and 3.87 times more likely to face defensive pressure in comparison to direct and counterattacking possessions, this could provide reason why elaborate possessions had less possessions ending in goals and shots in comparison to direct and counterattacking possessions, with elaborate possessions being 1.35 and 2.33 times less likely to end in a shot, and 3.03 and 2.38 times less likely to end in a goal. Elaborate possessions also had significantly lower odds of the possession ending in the scorebox, with elaborate being 29% less likely than direct, and 51% less likely than counterattacks. This could suggest that in this study defensive cover strategies were effective against elaborate possessions, especially for preventing goals, shots and scorebox possessions.

Previous research by Almeida et al. (2014) and Vogelbein et al. (2014) observed defensive strategies found that teams often focus on disrupting elaborate possessional styles by applying different tactical strategies regarding pressing and spatial cover. The above previous studies support the current findings, indicating that defensive pressure is often used to counteract the elaborate style of play, as it relies heavily on maintaining possession. The associations between possession type, defensive cover, defensive pressure, and space utilization highlight the reactive ever-changing nature of football tactics. Elaborate possession, being the most controlled and predictable style, often encounters more opposing defensive pressure and cover, whereas counterattacking play takes advantage of the spaces left by unorganised defensive structures. Defensive cover was most prevalent against elaborate possessions, illustrating opposition teams' strategic adjustments to reduce the potential threats of possessional football.

Direct play has a moderate effectiveness both in goal-scoring (1.6%) and in shot creation (10.3%), direct play was 1.27 times more likely to result in a goal compared to elaborate attacks but 0.42 times less likely than counterattacks. The current findings illustrated

that of all possessions that reached the Scorebox, 43% followed an elaborate possession type, while 39.5% were of a direct possession type. However, when viewed in terms of overall possession types, only 23.33% of elaborate possessions reached the scorebox, compared to 29.86% of direct possessions. This suggests that direct possession was more effective at progressing play into dangerous scoring areas. Similarly, Lago-Ballesteros et al. (2012) observed direct play to be more effective at producing a score box possession than elaborate possessions. The direct possession type benefits from a balance between the controlled build-up of elaborate play and the opportunistic directness of counterattacks. It allows for quicker attacking transitions than elaborate play but without the same reliance on defensive disorganisation that characterises counterattacking.

Tenga (2010) found that long possessions of five passes, or more were more effective than possessions deemed short (2 or less), for scoring goals, this has also been illustrated by other previous studies, (Hughes and Churchill 2004; Hughes and Franks, 2005; Hughes, Robertson and Nicholson, 1988). Contrastingly, in the current study it was found that a higher number of goals (77, 56.20%) and shots (489, 60.52 %) came from a lower pass number (3 or less). This contrast could be due to difference in league, and quality of player with the league being analysed focusing more on youth development, it could also be due to the evolution of football and the change in tactics with more direct and counterattacking football being more effective in this study. Observed data from the study by Reep and Benjamin (1968), demonstrated that more goals were scored from shorter passing sequences compared to longer passing sequences. It was also highlighted that there were more shorter passing sequences than longer passing sequences, this is similar in the present study as there were more shorter passing sequences and goals (0-3) than that of longer passing sequences (7-10). However, there was also a slight increase in goals scored from possessions with more than 10 passes (22), this could also highlight that teams use a combination of each possession type, this coincides with the findings from Hughes and Franks (2005).

These findings also highlight the need for continued research into the contextual factors that surround and influence the success of different possessional styles, including the defensive strategies employed by opposing teams, game context, and individual teams' strengths and weaknesses. What is authentic about this conclusion is it illustrates specific, data-driven insights drawn directly from the analysis of football possession types in a league that has not had a wide range of analytical focus. The data collected could also be replicated and used to

compare to senior level leagues and competitions, to evaluate the differences between a developmental league and a competitive league. Insights into tactical approaches and player development and general team styles and behaviours can be analysed to compare key performance trends and evaluate effective styles of play at different league levels. The data could also be used to inform further trend analysis, to assess trends over time. Mackenzie and Cushion (2013) found that trend analysis should analyse present performance, but also account for different contexts including tactical shifts, developmental progressions, and individual players. Comparing data between developmental and senior levels can be useful in illustrating and analysing long term trends, and therefore the generalisability of the findings should be evaluated.

In addition, all the team possessions included were taken from a large sample of random matches in the Premier League 2 a development league for players U21, which potentially represents a lower standard of play than the top leagues in Europe. The main limitation from this study sample is the generalisation, there was no specific focus on a team or the collection of teams as metrics, however it was generalised for the reason of variation, both with the players and the teams in this league (Carling et al., 2005; Cushion and Nelson, 2011). The sampling of the data could also be a limitation, only one season was observed, whereas a collection of a range of seasons could give more of an overview on the styles of play, and the differences and factors that come with different seasons, and challenges (Mackenzie and Cushion, 2013).

The current findings have practical implications, firstly, the information around in possession offensive styles of play in the Premier League 2 is unique information. The information includes regarding the most effective methods of goal scoring and the variables surrounding it, while also observing the methods used to prevent goal scoring. The most effective use of the above information could be utilised during pre-match analysis or on grass coaching around different in possession methods to take advantage of opposition styles and tactics. Other effective uses of the information could be used in recruitment section; this may be looking at players who are successful in specific playing styles which relate to the current team or even recruiting coaches and managers who utilise a certain playing style or styles that coincide with the club's beliefs.

Furthermore, match outcome (e.g., winning, losing, or drawing) was not included in the analysis, despite previous research demonstrating its influence on tactical behaviour and styles of play. This limits the ability to fully contextualise the effectiveness of different possession types. Also, the definition of spatial zones (e.g., start zones, end zones, and score box) introduces a level of subjectivity. While these classifications provide a structured framework for analysis, they may not fully capture the continuous and dynamic nature of space in football.

The categorisation of variables such as pass penetration, defensive pressure, and defensive cover into discrete groups represents a simplification of complex tactical behaviours. These actions can occur on a continuum, and the use of categorical classifications may reduce sensitivity to subtle differences in high level performance. Additionally, the study was limited to a single season of Premier League 2, which may restrict the generalisability of the findings to other leagues, competitive levels, or time periods. Finally, the absence of tracking data and multilevel modelling approaches limits the ability to analyse player interactions, team structures, and nested contextual effects in greater detail. Future research incorporating these methods could provide a more comprehensive understanding of the dynamics underpinning attacking performance.

This research could also provide information for clubs in the Premier League 2, utilising the information to analyse what playing styles were effective, and effective against various other variables, and teams in the league. Finally, the findings presented highlighted similar trends with elite level football, when looking at possession types and outcomes, while there was variation in some of the variables this information has provided new insight into the trends and patterns in youth development football (Premier League 2).

Practical implication and Future Research:

Implications for future research includes being able to adapt to different match strategies and coaching and training these different strategies. Coaches can use these insights to develop flexible game plans that adjust depending on the phase of play and the oppositions' defensive structure and plan. Understanding when to implement counterattacking strategies and when to utilise more elaborate possession-based approaches could potentially optimise and increase a team's goal-scoring opportunities. Additionally, the effectiveness of counterattacking football, which was found to be 3.03 and 2.38 times more likely to end in a

goal in comparison to elaborate and direct possessions (and 2.32 and 1.72 times more likely to end in a shot), could provide another layer of information on the importance of counterattacks. Coaches could then look to prioritise training that enhances the team's ability to exploit defensive disorganisation quickly and effectively.

This study also emphasises the importance of utilizing the scoreboard endzone, accounting for 91.24% of all goals. Coaches could also prioritise tactics that look to penetrate this area more, looking to find effective patterns of play that funnel possessions into this central zone. Contrastingly, you could also look to utilise out of possession strategies that look to regain possession in this area more effectively or look to regain in an area before the ball reaches the central zone.

The findings of this study carry significant implications for both tactical analysis and applied coaching in football. The results indicate that teams can enhance performance by adapting match strategies in response to game context and opposition defensive structures.

The study also highlights the strategic importance of the scoreboard endzone, which accounted for over 90% of goals. From a practical perspective, this suggests that offensive training should emphasise patterns of play that penetrate this central area, while defensive preparation should focus on regaining possession before the ball reaches this critical zone, and if the ball reaches this area the importance of defending this area with quick reactions to regain the ball. Such targeted approaches can refine both attacking efficiency and defensive resilience. Furthermore, the findings support the use of data-informed match preparation, enabling coaches to exploit specific opposition tendencies. For instance, teams facing opponents vulnerable to counterattacks may emphasise rapid transitional strategies, while teams that have strong defensive structures may adopt a more direct or possession-based approach to bypass these compact structures. By aligning tactical planning with evidence from match outcomes, coaches can make decisions that can directly influence performance.

From a research perspective, future studies could expand on these findings by integrating positional and tracking data to capture off-the-ball movements and spatial patterns that highlight a team's tactical execution and shape. The application of expected goals (xG) models could provide a detailed assessment of a team or styles offensive efficiency, quantifying the quality of scoring opportunities generated. Analytical approaches such as multilevel or

hierarchical modelling would allow researchers to account for team-level clustering and separate these effects from individual or match-level variability, improving the generalisability of results. Longitudinal investigations across multiple seasons and leagues could examine whether tactical patterns, such as the efficiency of counterattacks or direct play, are consistent over time and across competitive contexts. Similarly, longitudinal developmental analyses in youth or lower-tier leagues could explain how tactical competencies evolve, informing interventions to assist with player and team development. Additionally, focusing on key performance indicators such as ball progression and defensive recovery locations could further clarify the methods through which tactical decisions convert into successful outcomes.

Finally, these directions offer a pathway for future research that bridges analytical methods with practical coaching applications, which can support evidence-based strategies that enhance team performance and player development in real-world competitive contexts.

Coaches can structure training sessions around specific outcomes, such as improving efficiency in direct play or counterattacking. By focusing on what the data highlights—such as quick transitions or exploiting specific end zones—the training sessions can look to be more targeted and effective especially when you have opposition information and structures. This further illustrates how the information could be used to observe and prepare for the defensive tendencies of the opposition and choose the most effective style of play. For example, if an opponent struggles against counterattacks, coaches can emphasize that strategy in their game plan. Conversely, if the opponent excels at defensive cover, the team may need to rely on quicker, more direct play to bypass those defences. Contrastingly, teams could focus on their ability to apply pressure more effectively against elaborate possession without leaving themselves vulnerable to counterattacks or direct play. These findings help coaches and analysts fine-tune their tactical approaches, making decisions based on evidence from match data that directly correlate to performance outcomes. In future, it could be worth focusing on certain variables and KPIs such as pass penetration as this was one indicator that had a correlation with success (goals and shots). Using positional data could also provide further context and expand on the findings further, however positional data can be difficult to access in lower leagues and youth development football. Further inclusion of this data could improve the overall research around football tactics in lower tiered leagues.

Table 14 - Main Findings and Practical Values

Factor	Key Findings	Practical Value / Coaching Implication
Possession Type	Counterattacks highest goal conversion (3.66%)	Prioritise quick transitions
Possession Type	Elaborate most common (51%) but least efficient (1.24%) at goalscoring	Use for control, not final output
Possession Type	Direct moderate success (1.56%) goal scoring	Balance between speed & structure
Start Zone	Score box starts: 12.5% goals, 40% shots	High regains are highly valuable
Start Zone	Zone 1 lowest output (0.88%)	Deep build-up least threatening
End Zone	Score box: 5.49% goals, 30.77% shots	Final third access in this area is critical
Pass Penetration	Penetrative passes increase shots/goals	Break defensive lines as often as possible
Pass Type	Mixed passing highest success rate (2.40%)	Use variety in passing during build up
Pass Number	5 passes highest conversion (3.05%)	Optimal balance in build-up
Defensive Cover	More goals when absent cover (2.71%)	Exploit disorganisation
Defensive Pressure	Higher success when pressure absent	More time and space improves decision making

Conclusion:

The present study highlights and illustrates the strategic differences between the three possession types, counterattacks while less frequent was the most effective method in producing goals and shots compared to direct and elaborate possessional styles. Opposition defensive tactics and strategies will be more effectively prepared and organised against slower more controlled build ups, due to defensive structures and pre match plans. The present study illustrates this with defensive cover being most common against the elaborate possession type, with defensive cover being present in 60.04% of all elaborate possessions, and elaborate possessions having less possessions ending in goals (1.2% compared to 1.6% direct possessions and 3.7% counterattacking possessions). Elaborate possessions also had significantly lower odds of the possession ending in the scoreboard, with elaborate being 29% less likely than direct, and 51% less likely than counterattacks. Counterattacks offer a different defensive plan that is hard to defend due to the transitional nature that looks to exploit the disorganisation and spatial gaps in the oppositions structure.

The current findings also suggests that teams might benefit from adopting more dynamic and varied approaches to games and possessions, particularly focusing on exploiting counterattacking opportunities while also tactically refining their ability to maintain defensive cover during transitions. The analysis of possession types in the Premier League 2 has provided critical insights into how different tactical approaches impact game outcomes, especially in terms of goal-scoring, opposition defensive structures and tactics, and overall performance. The results suggest that styles of play such as counterattacking football, direct play, and elaborate possessions each have unique strengths and weaknesses that influence their effectiveness in a match. Counterattacking play was found to be the most effective possession type for goal-scoring, as it was found to be 3.03 and 2.38 times more likely to end in a goal in comparison to elaborate and direct possessions (and 2.32 and 1.72 times more likely to end in a shot). This main finding illustrates the effectiveness of rapid transitions and exploiting disorganised opposition defensive structures. This is a tactic that has been widely recognised in football literature as a highly efficient and effective method for creating high-quality scoring opportunities. The high percentage of shots at goal (16.5%) further reinforces the idea that counterattacks look to bypass prolonged structured build-up phases, which often allows teams to effectively exploit numerical differences or defensive lapses.

Overall, these results show that different styles of play—counterattacking, direct, and elaborate—offer specific tactical advantages and disadvantages, depending on the context of the game, the opposition and the defensive strategies demonstrated by opponents. While counterattacking was the most effective for offensive outcomes, elaborate play remains essential for maintaining control and controlling the tempo of the match, despite its lower efficiency in scoring. This study adds to the research that tactical diversity is key in football, and teams must adapt their styles of play to exploit specific situational advantages during a match.

To conclude, this study has provided original tactical analysis on the Premier League 2, while integrating current soccer tactics and trends, such as the importance of exploiting defensive disorganisation in counterattacks and the challenges of breaking down compact defences through elaborate possession. The use of spatial dynamics and defensive pressures to explain the varying success of different playing styles provides further contextual information, reflecting the complex dynamics between offensive and defensive moments that is central to tactics in football.

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