

Attacking and defensive styles of play in soccer: analysis of Spanish and English elite teams

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ABSTRACT

The aim of this study was to define and categorise different styles of play in elite soccer and associated performance indicators by using factor analysis. Furthermore, the observed teams were categorised using all factor scores. Data were collected from 97 matches from the Spanish La Liga and the English Premier League from the seasons 2006–2007 and 2010–2011 using the Amisco[®] system. A total of 19 performance indicators, 14 describing aspects of attacking play and five describing aspects of defensive play, were included in the factor analysis. Six factors, representing 12 different styles of play (eight attacking and four defensive), had eigenvalues greater than 1 and explained 87.54% of the total variance. Direct and possession styles of play, defined by factor 1, were the most apparent styles. Factor analysis used the performance indicators to cluster each team's style of play. Findings showed that a team's style of play was defined by specific performance indicators and, consequently, teams can be classified to create a playing style profile. For practical implications, playing styles profiling can be used to compare different teams and prepare for opponents in competition. Moreover, teams could use specific training drills directed to improve their styles of play.

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Introduction

Strategies and tactics are important factors that influence the outcome of the game and the final result in soccer (Yiannakos & Armatas, 2006). A strategy is defined as the overall plan that is devised and adopted to achieve an aim or specific objective, and is normally accomplished via the application of specific tactics (Carling, Williams, & Reilly, 2005). For example, soccer teams adopt an overall combination of attacking and defensive styles of play that would increase their probability of success. A style of play could be considered as the general behaviour of the whole team to achieve the attacking and defensive objectives in the game. Performance indicators are a selection of action variables that try to define the aspects of a performance (Hughes & Bartlett, 2002) and can be associated with attacking and defensive tactics in soccer. Previous studies highlighted the influence of styles of play when measuring performance indicators related to physical (Buchheit & Laursen, 2013; Reilly, 2005), technical and tactical aspects in soccer (Bradley et al., 2011; Duarte, Araújo, Correia, & Davids, 2012; James, Mellalieu, & Hollely, 2002; Lago-Peñas, Lago-Ballesteros, & Rey, 2011; Pollard & Reep, 1997; Pollard, Reep, & Hartley, 1988; Tenga, Holme, Ronglan, & Bahr, 2010b; Tenga & Sigmundstad, 2011). For instance, styles of play affect physical performance indicators such as distance covered by the players or high-intensity running activities, due to players' different movements as a result of specific behaviours typical of a style of play. Moreover, styles of play can also affect technical and tactical performance indicators such as

individual playing area (Fradua et al., 2013), percentage of ball possession (Lago & Martín, 2007; Lago-Peñas & Dellal, 2010), distance of passes and passing distribution (Tenga & Larsen, 2003). These studies showed that styles of play should be accounted for during data interpretation.

Previous studies have identified attacking and defending styles of play. High pressure and low pressure have for example been defined as defending styles (Bangsbo & Peitersen, 2000; Wright, Atkins, Polman, Jones, & Sargeson, 2011). These two defending styles of play are characterised by the specific location on the pitch where teams apply defensive pressure on the opponent in possession, considering pressure as reducing the distance to player in possession and other near opponents in order to regain the ball as quickly as possible. For example, if defending players apply pressure in areas closer to the opponent's goal, they will be utilising the "high pressure" style. In contrast, the "low pressure" style of play involves the defensive players only applying pressure on the opponents in the defensive half of the pitch.

Attacking styles of play have previously been defined as direct, possession, counterattacking, total soccer and crossing (Bangsbo & Peitersen, 2000; Pollard et al., 1988). "Direct" and "possession" styles of play are the most commonly described attacking styles (Bate, 1988; Garganta, Maia, & Basto, 1997; Hughes & Franks, 2005; Olsen & Larsen, 1997; Redwood-Brown, 2008; Ruiz-Ruiz, Fradua, Fernández-García, & Zubillaga, 2013; Tenga, Holme, Ronglan, & Bahr, 2010a; Tenga et al., 2010b; Tenga & Larsen, 2003; Tenga, Ronglan, &

Bahr, 2010; Travassos, Davids, Araujo, & Esteves, 2013). In contrast to “possession” style, “direct” play is characterised by longer passes, low number of passes, short passing sequences and a low number of touches per ball involvement. Game control was also a performance indicator associated with these styles of play, and was employed by a recent study that utilised indexes calculated from different performance indicators to evaluate the use of the possession and direct styles of play in elite teams (Kempe, Vogelbein, Memmert, & Nopp, 2014). These indexes included several passing and ball possession parameters to measure tactical behaviour of teams. In addition, attacking styles such as “counterattacking play” (Bangsbo & Peitersen, 2000), “total soccer” (Bangsbo & Peitersen, 2000; Carling et al., 2005) and “crossing” (Pollard et al., 1988) have been defined but with no or little information on the key performance indicators for each of these styles.

A previous study that provided information on the performance indicators for different styles of play was a quantitative comparison between the styles of play used by English league teams during season 1984–1985, and national teams that played in the 1982 World Cup (Pollard et al., 1988). Six performance indicators were measured and factor analysis was used to define the different styles of play for the teams observed. The study identified three factors: factor 1 distinguished between direct and possession (elaborate) styles; factor 2 explained the use of crosses; finally, factor 3 made a distinction between a style that entails regaining the possession closer to the opponent’s or own goal. Each team’s dependence on a style was categorised on the basis of their factor score for the style of play.

Performance indicators associated with styles of play have been described in parts (Bate, 1988; Hughes & Franks, 2005; Lago-Peñas & Dellal, 2010; Pollard et al., 1988; Tenga et al., 2010b; Tenga & Larsen, 2003); however, there is no consensus and/or missing information for some styles. For example, Tenga and Larsen (2003) describe direct play as attacks involving direct set plays, counter-attacks, attacks with at least one long pass, attacks with a maximum of two passes, and attacks moving fast over and through midfield. In contrast, Hughes and Franks (2005) consider low passing sequences as the key performance indicator for direct play. Previous research suggests that performance indicators for the different styles of play are unclear and that additional indicators should be examined to analyse styles of play. Hence, direction of passes and ball possession in different areas could be, for instance, important performance indicators when trying to identify styles of play. Moreover, additional defensive performance indicators should be considered such as areas where defending teams apply pressure, or time required to recover ball possession (Vogelbein, Nopp, & Hökelmann, 2014). In addition, soccer involves an interaction between attack and defence (Moura et al., 2013), and this interaction makes it difficult to quantify team performance indicators and tactics without considering the opposition’s ones. Consequently, attacking and defensive behaviours of teams should be measured to account for this interaction. The aim of the study was to define different styles of play in elite soccer and identify the associated performance indicators. A secondary aim was to classify the

teams observed based on the styles so that a playing style profile can be created.

Methods

Match sample

A total sample of 97 matches from the Spanish La Liga and the English Premier League involving 37 different teams were collected for the study. Matches were monitored using a multiple camera match analysis system (Amisco Pro®, version 1.0.2, Nice, France). From the total sample, 72 matches corresponded to season 2006–2007, 40 matches from the Spanish La Liga and 32 matches from the English Premier League. These two group of matches involved 18 and 15 different teams, respectively. Furthermore, 25 matches corresponded to season 2010–2011 and were from the Spanish La Liga. This group of matches involved 16 different teams.

Teams that participated in both seasons were considered as different teams due to possible changes in the squad and technical staff of each team. These changes can lead to a different style of play. Moreover, teams with only one match available were excluded from the analysis as it was considered that one match is not enough of a sample to define a team’s style of play. Accordingly, 37 different teams were included in the analysis. From the overall sample, there were at least four matches available for 15 teams, three matches available for eight teams and two matches available for 14 teams. The present study follows the research ethics guidelines set out by Liverpool John Moores University.

Procedure

A total of 19 performance indicators (14 attacking and 5 defensive) were included in the study. Previous research relating to tactics was considered when selecting the following performance indicators for the study: possession of the ball (Jones, James, & Mellalieu, 2004; Lago & Martín, 2007), crosses (Lago-Peñas, Lago-Ballesteros, Dellal, & Gomez, 2010; Pollard et al., 1988) and shots (Hughes & Franks, 2005; Lago-Ballesteros & Lago-Peñas, 2010; Pollard & Reep, 1997). The remaining performance indicators, provided by the Amisco® system, were considered to be relevant to determine styles of play due to the importance of the spatial occurrence of the events for measuring tactical aspects (Castellano, Alvarez, Figueira, Coutinho, & Sampaio, 2013). The attacking and defensive performance indicators, description and measurement methods are presented in Table 1. For the following performance indicators presented in Table 1: 2, 3, 4, 11, 12, 15, 16 and 17; the pitch was divided into three spaces parallel to the goal lines to collect the data (see Figure 1). In addition, for the following performance indicators presented in Table 1: 5, 6, 18 and 19; the pitch was divided into three spaces parallel to the touchlines to collect the data (see Figure 1). Passing direction was also considered to measure the following performance indicators in Table 1: 7, 8, 9 and 10. Trajectories of passes were categorised according to the diagram in Figure 2.

For the analysis, a team mean score for each performance indicator was calculated and recorded using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA).

Table 1. Description and measurement of attacking and defensive performance indicators.

| Attacking performance indicators | Description | Measurement | |
|---|---|---|--|
| 1. Possession of the ball | Percentage of time that the team has possession of the ball in the match. | Possession of the ball for the team was collected separately for each half of the match as it is provided by the Amisco system. The average from the possession of the two halves for each team was calculated. These performance indicators were calculated by taking the overall time that the team had the possession of the ball and the time that the team had the possession of the ball in the area corresponding to the performance indicator. Hence the percentage (normalised data) was calculated from these data provided by the Amisco system. | |
| 2. Possession of the ball in the defensive third of the pitch | Percentage of time that the team has the possession of the ball in the defensive third of the pitch. | | |
| 3. Possession of the ball in the middle third of the pitch | Percentage of time that the team has the possession of the ball in the middle third of the pitch from all the time that the team has the possession of the ball. | | |
| 4. Possession of the ball in the attacking third of the pitch | Percentage of time that the team have the possession of the ball in the attacking third of the pitch (next to the opposite goal) from all the time that the team have the possession of the ball. | | |
| 5. Possession of the ball in the central areas of the pitch | Percentage of time that the team has the possession of the ball in the central areas of the pitch from all the time that the team has the possession of the ball. | | |
| 6. Possession of the ball in the wide areas of the pitch | Percentage of time that the team has the possession of the ball in the wide areas of the pitch from all the time that the team has the possession of the ball. | | |
| 7. Direction of passes | A rate that summarise the direction of the passes made by the team. As this number increases, the team tends to use more passes in the direction of the opposite goal. | | A score of one was given to the backwards passes, a score of two was given to the sideways passes, and a score of three was given to the forwards passes. The mean of the scores of all the passes made by the team were calculated. The Amisco system provided the direction of the movements of the ball by looking at the point where the pass started and the point where the pass was received. Consequently, depending of the trajectory of the ball the pass was categorised following the diagram showed in Figure 2. Data was normalised by calculating the percentage of these passes according to the total number of passes made by the team. These performance indicators were measured by calculating the percentage of these kinds of passes from the overall amount of passes made by the team in the match. Data provided by the Amisco System was collected and normalised by calculating the percentage from all of these events made by a team during the whole match. |
| 8. Forwards passes | Percentage of passes from the overall number of passes made by the team that are made forwards (towards the opposite goal). | | |
| 9. Sideways passes | Percentage of passes from the overall number of passes made by the team that are made sideways. | | |
| 10. Backwards passes | Percentage of passes from the overall number of passes made by the team that are made backwards (towards the own goal). | | |
| 11. Passes from defensive third to middle third | Percentage of passes from the overall number of passes made by the team that are made from the defensive third (next to the own goal) to the middle third of the pitch. | | |
| 12. Passes from defensive third to attacking third | Percentage of passes from the overall number of passes made by the team that are made directly from the defensive third (next to the own goal) to the attacking third of the pitch (next to the opposite goal). | | |
| 13. Crosses | Percentage of attacking sequences that finish with a cross in the opposing half from all the attacking sequences made by the team. | | |
| 14. Shots | Percentage of attacking sequences that finish with a shot from all the attacking sequences made by the team. | | |
| Defensive performance indicators | Description | Measurement | |
| 15. Regains in the defensive third | Percentage of the number of times that the team regains the ball in the defensive third (next to own goal) from all the regains made by the team. | These performance indicators were calculated by taking the total number of times that the team regained the possession of the ball and the number of times that the team regained the possession of the ball in the area corresponding to the performance indicator. Hence the percentage (normalised data) was calculated from these data provided by the Amisco system. | |
| 16. Regains in the middle third | Percentage of the number of times that the team regains the ball in the middle third from all the regains made by the team. | | |
| 17. Regains in the attacking third | Percentage of the number of times that the team regains the ball in the attacking third (next to opposite goal) from all the regains made by the team. | | |
| 18. Regains in the central areas of the pitch | Percentage of the number of times that the team regains the ball in the middle areas of the pitch from all the regains made by the team. | | |
| 19. Regains in the wide areas of the pitch | Percentage of the number of times that the team regains the ball in the wide areas of the pitch from all the regains made by the team. | | |

Statistical analysis

Exploratory factor analysis using principal component analysis (PCA) was conducted on 19 performance indicators with orthogonal rotation (varimax). Factor analysis is a statistical method for identifying clusters of variables. This technique allows the reduction of data sets into factors through the grouping of variables measured (Field, 2013). For each factor, the performance indicators with the highest factor loading (i.e., the correlation between the performance indicator and

the factor) were identified. This technique groups performance indicators into fewer factors that represent different styles of play. In addition, a team's specific style of play can be categorised according to their score for each factor. Statistical analysis was carried out using IBM SPSS Statistics v.20.0 for Windows (SPSS, Chicago, IL USA).

Orthogonal (varimax) and oblique rotations were performed in factor analysis and the component correlation matrix of the oblique rotation showed a negligible correlation between factors, therefore orthogonal rotation was used

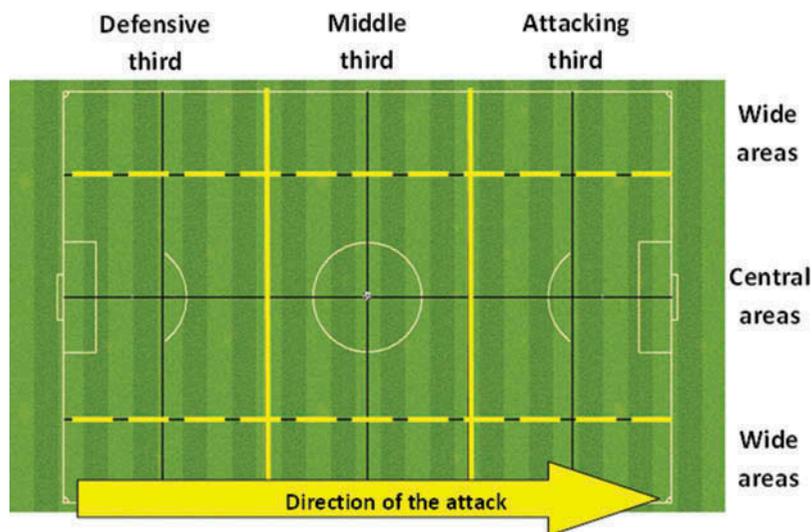


Figure 1. Pitch divisions in three thirds parallel to the goal lines and parallel to the touchlines.

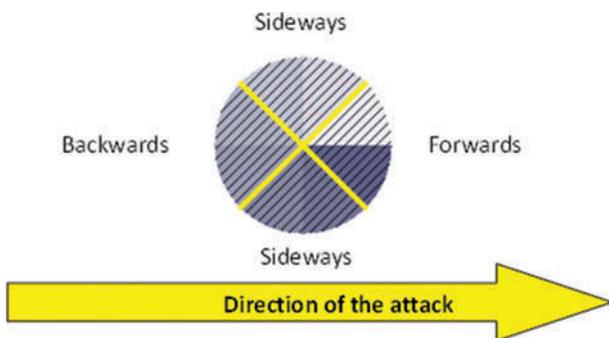


Figure 2. Direction of passes.

(Pedhazur & Schmelkin, 1991). The Kaiser–Meyer–Olkin measure (Kaiser, 1974) and communalities values after extraction (MacCallum, Widaman, Zhang, & Hong, 1999) were employed to verify the sampling adequacy for the analysis. Adequacy of correlations between items was done according to Bartlett's test of sphericity. Kaiser's criterion of 1 (Kaiser, 1960) and interpretation of the scree plot were considered for factor retention. Performance indicators with factor loadings greater than $|0.7|$ showed a strong positive or negative correlation and indicated a substantial value for factor interpretation (Comrey & Lee, 2013).

Results

The Kaiser–Meyer–Olkin (KMO) measure verified the sampling adequacy for the analysis, KMO = 0.53, and the communalities after extraction were greater than 0.7 in 18 of 19 performance indicators, deeming sample size to be adequate for factor analysis. Bartlett's test of sphericity ($\chi^2 = 2254.53$, $df = 171$, $P < 0.001$) indicated that correlations between items were sufficiently large for PCA. Six components had eigenvalues over Kaiser's criterion of 1 and in combination explained 87.54% of the total variance (Table 2). The percentage of variance explained by each factor decreased from factor 1 to 6. The scree plot was slightly ambiguous and showed inflexion

points that would justify retaining four or six factors. Therefore, six factors were extracted following the Kaiser's criterion as the number of performance indicators was less than 30 and communalities after extraction were greater than 0.7 (Stevens, 2009). The rotated component matrix for the factor loadings identified the performance indicators associated with each factor (Table 3).

Descriptions of factors were interpreted based on the group of associated performance indicators. Factor 1 (possession directness) defines how direct a team's possession is. A team with a positive score in this factor tends to use a direct (D) style. In contrast, a team with a negative score adopts a more elaborate, possession (P) style. Factor 2 (width of ball regain) defines teams that pressure and regain the ball in wide areas (PW) or in the central areas (PC) of the pitch. A team with a positive score regain more balls close to the touchline, whereas a team with a negative score regain more balls in the central areas. Factor 3 (use of crosses) distinguish between crossing (C) and no crossing (NC) styles. This factor defines a team's use of crosses and how much possession of the ball they have in the defensive third. These performance indicators correlate highly, consequently a team that scores positively on this factor have a higher percentage of possession in the defensive third and use crosses to finish the attack. Factor 4 (possession width) defines teams that tend to play in wider areas of the pitch using a wide possession (WP) style if they score positively on this factor. In contrast, teams that score negatively tend to use central areas of the pitch to develop the attack using a narrow possession (NP) style. Factor 5 (defensive ball pressure) defines teams that use a high- or low-pressure style of play. A positive score defines a low-pressure (LP) style, whereas a negative score defines a high-pressure (HP) style. Finally, a positive score on factor 6 (progression of the attack) defines teams that employ a fast progression (FP) style and usually progress straight to the opponent's goal, whereas negative scoring teams utilise a slow progression (SP) and tend to use more maintenance passes to supporting players behind the position of the ball to look for better options to progress to the opponent's goal.

Table 2. Eigenvalues for components and total variance explained.

| Component | Initial eigenvalues | | | Extraction sums of squared loadings | | | Rotation sums of squared loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 7.043 | 37.069 | 37.069 | 7.043 | 37.069 | 37.069 | 5.281 | 27.795 | 27.795 |
| 2 | 3.243 | 17.069 | 54.138 | 3.243 | 17.069 | 54.138 | 2.796 | 14.718 | 42.513 |
| 3 | 2.402 | 12.640 | 66.778 | 2.402 | 12.640 | 66.778 | 2.777 | 14.617 | 57.130 |
| 4 | 1.749 | 9.208 | 75.986 | 1.749 | 9.208 | 75.986 | 2.631 | 13.849 | 70.979 |
| 5 | 1.159 | 6.098 | 82.083 | 1.159 | 6.098 | 82.083 | 1.879 | 9.890 | 80.869 |
| 6 | 1.036 | 5.453 | 87.536 | 1.036 | 5.453 | 87.536 | 1.267 | 6.667 | 87.536 |
| 7 | 0.687 | 3.617 | 91.153 | | | | | | |
| 8 | 0.512 | 2.695 | 93.849 | | | | | | |
| 9 | 0.410 | 2.156 | 96.004 | | | | | | |
| 10 | 0.312 | 1.644 | 97.648 | | | | | | |
| 11 | 0.242 | 1.276 | 98.924 | | | | | | |
| 12 | 0.125 | 0.658 | 99.582 | | | | | | |
| 13 | 0.068 | 0.355 | 99.938 | | | | | | |
| 14 | 0.011 | 0.060 | 99.998 | | | | | | |
| 15 | 0.000 | 0.002 | 100.000 | | | | | | |
| 16 | 0.000 | 0.000 | 100.000 | | | | | | |
| 17 | 0.000 | 0.000 | 100.000 | | | | | | |
| 18 | 0.000 | 0.000 | 100.000 | | | | | | |
| 19 | 0.000 | 0.000 | 100.000 | | | | | | |

Table 3. Rotated component matrix for the performance indicators.

| | Component | | | | | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Number of sideways passes % | -0.947 | 0.084 | 0.027 | 0.022 | -0.164 | 0.126 |
| Number of forward passes % | 0.945 | -0.092 | -0.065 | 0.036 | 0.179 | 0.102 |
| Average direction of passes | 0.882 | -0.115 | -0.094 | 0.102 | 0.174 | 0.309 |
| Possession % | -0.858 | 0.185 | 0.207 | -0.154 | -0.192 | 0.136 |
| Passes from defensive to attacking third % | 0.696 | -0.396 | -0.034 | 0.174 | -0.128 | 0.257 |
| Number of shots % attacking sequences | -0.640 | 0.170 | 0.461 | -0.250 | 0.238 | 0.221 |
| Number regains wide areas % | -0.253 | 0.937 | -0.052 | 0.093 | -0.103 | -0.016 |
| Number regains central areas % | 0.325 | -0.905 | 0.041 | -0.120 | 0.126 | 0.018 |
| Number regains middle third % | 0.131 | 0.602 | -0.116 | -0.599 | -0.319 | 0.158 |
| Possession % middle third | 0.072 | 0.156 | -0.930 | 0.123 | 0.152 | -0.004 |
| Possession % defensive third | -0.075 | -0.168 | 0.869 | -0.352 | -0.175 | -0.078 |
| Number of crosses % attacking sequences finish opposing half | -0.179 | 0.133 | 0.806 | 0.095 | -0.003 | -0.190 |
| Possession % attacking third | 0.049 | 0.121 | -0.319 | 0.787 | 0.155 | 0.255 |
| Possession % central areas | -0.588 | -0.030 | 0.107 | -0.701 | 0.155 | -0.109 |
| Possession % wide areas | 0.588 | 0.030 | -0.108 | 0.701 | -0.154 | 0.109 |
| Number regains attacking third % | -0.132 | 0.160 | 0.148 | 0.201 | -0.759 | -0.123 |
| Passes from defensive to middle third % | 0.365 | -0.110 | -0.208 | 0.322 | 0.672 | 0.027 |
| Number regains defensive third % | -0.056 | -0.603 | 0.036 | 0.436 | 0.625 | -0.083 |
| Number of backwards passes % | -0.070 | -0.015 | 0.168 | -0.191 | -0.091 | -0.913 |

Factor loadings in bold showed a strong positive or negative correlation.

275 These factors can be plotted in different combinations to visually represent team styles, where the location of an individual team on the axes describes how much they adopt that playing style. For example, the team scores for factor 1 are plotted against the scores for the other attacking factors (see Figure 3(A)–C). Factor 1 was used to plot against the other factors because it explained the highest amount of variance (27.8%). In addition, team scores for the defensive factors 2 and 5 are plotted in Figure 3(D).

Discussion

285 Defining different styles of play that soccer teams can adopt during a match may be important when analysing performance data. Therefore, the aim of the study was to identify and define the styles of play in elite soccer. Exploratory factor analysis extracted six factors that defined 12 different playing styles, split into eight attacking and four defending styles. Each factor defined two different styles of play based on a

290 positive or negative factor score on the continuum. Furthermore, a team’s score on each factor indicates their reliance on that specific style of play (see Table 4).

295 Possession directness (factor 1) explained the highest percentage of variance and differentiates the previously reported direct and possession styles (Bate, 1988; Garganta et al., 1997; Hughes & Franks, 2005; Olsen & Larsen, 1997; Redwood-Brown, 2008; Ruiz-Ruiz et al., 2013; Tenga et al., 2010a, 2010b; Tenga & Larsen, 2003; Tenga et al., 2010; Travassos et al., 2013). “Sideways passes” and “possession of the ball” were the performance indicators that correlated negatively with this factor and suggested a possession style. The indicators that correlated positively and suggested a direct style were “possession of the ball” and “sideways passes”. The performance indicator “passes from defensive to attacking third” was also included for direct style of play interpretation as it showed a high positive score loading for factor 1. During season 2010–2011, Barcelona showed a considerable high score for possession style of play (see Table 4). This team

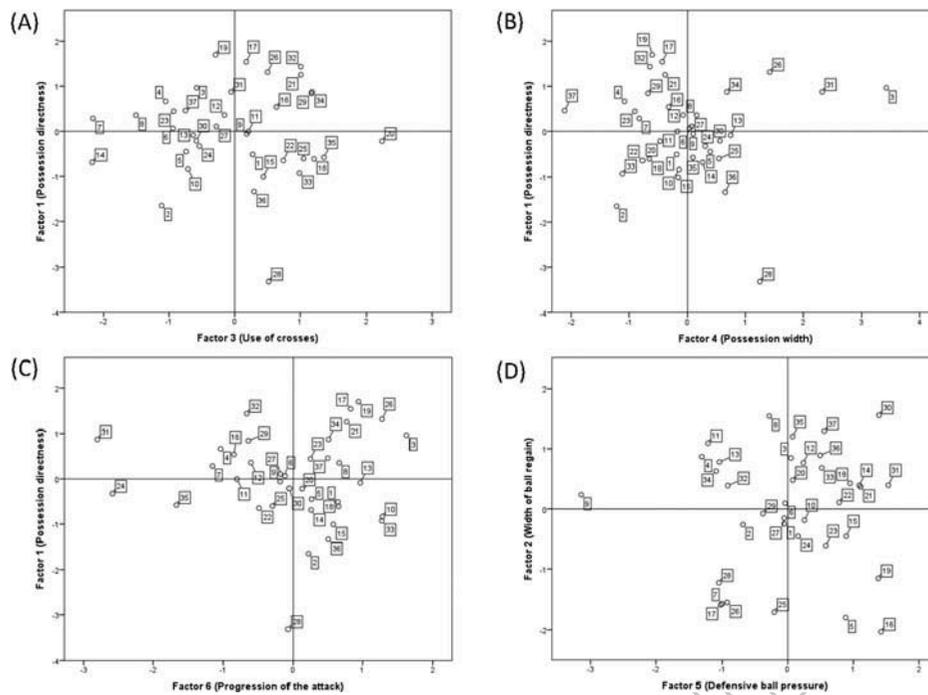


Figure 3. Styles of play of soccer teams according to factors. Attacking styles of play: (A) factor 1 and factor 3, (B) factor 1 and factor 4, (C) factor 1 and factor 6. Defensive styles of play: (D) factor 2 and factor 5.

demonstrates a good representation of the possession style and it may be due to their playing philosophy and the highly skilled players in the team for passing abilities. It is suggested that the tactical principle of playing sideways causes imbalances in the opposition's defence, therefore increasing the success of the attacking sequence and the opportunity to score a goal (Tenga et al., 2010a, 2010b; Tenga et al., 2010; Tenga & Sigmundstad, 2011). Previously, a direct style was described as being more advantageous than the possession style (Bate, 1988; Garganta et al., 1997). However, Hughes and Franks (2005) stated that, for successful teams, possession style produced more goals per possession than the direct style. In comparison, Tenga et al. (2010a) reported no difference in goals scored between these styles. Possibly, the long and short passing abilities and skill of players influence the effectiveness of a direct or possession style. Moreover, opponent's defensive style of play can also have an impact on the team's direct or possession style.

Factor 2 differentiates two defensive styles; a style of play that implies regaining the ball close to the touchline, and a style where ball is regained in the central areas of the pitch. These styles have not been reported previously. Styles of play differentiated by factor 2 are associated with the performance indicators "regains in the central areas of the pitch" and "regains in the wide areas of the pitch". Negative values for the former and positive values for the latter determine where the team regains the ball. Wright et al. (2011) reported that central ball regains are more likely to result in a scoring attempt compared to wide ball regains. In addition, recent studies showed successful teams normally regain the ball in central areas of the defensive and middle third (Barreira, Garganta, Guimaraes, Machado, & Anguera, 2014; Barreira, Garganta, Machado, & Anguera, 2014). This could possibly be because central areas provide different options of passing to

the sides or forwards, whereas regaining the ball in the sides limit passing options due to the touchline. Furthermore, the utilisation of these styles could depend on team formation (number of players per area), player defensive abilities and/or the opponent's attacking abilities. Attacking styles of play employed by the team. Although the defensive team can lead the opposition players to specific areas of the pitch for conducting an attack (e.g., accumulating players in central areas and leaving free spaces on the sides for doing pressure to opposition in wide areas), a prevalence of an attacking style of play used by the opposition can affect the defensive style employed by the team.

Factor 3 defines two styles based on percentage of possession in the defensive third (i.e., time that the team control the ball near their own goal) combined with the use of crosses. Correlation between these indicators could suggest that teams using crossing might have more ball possession in the defensive third so that wide players have time to move into wide areas and execute a cross. Crossing is a tactic to create the chance of scoring (Ensum, Pollard, & Taylor, 2005; Hughes & Churchill, 2005; Konstadinidou & Tsigilis, 2005; Lago-Peñas et al., 2010, 2011; Oberstone, 2009; Pollard, Ensum, & Taylor, 2004); however, increases in scoring efficiency are not reported consistently (Flynn, 2001). Crossing can also be a risk due to the possibility of losing the ball and produce a counter-attacking opportunity for opponents. Use of crosses might be more effective for teams that adopt this style and have wide midfielders that employ long passing, strikers that create space in the penalty area, win aerial challenges and shot at goal with one touch (Carling et al., 2005; Ruiz-Ruiz et al., 2013). Moreover, this style could be useful when the opposition lacks aerial abilities, as the probability of taking advantage of their mistakes would be increased.

Table 4. Teams' attacking and defensive styles of play.

| Teams (season 2006–2007) | Attacking styles of play | | | | | | | | Defensive styles of play | | | |
|--------------------------|--------------------------|----|-----|-----|------|----|----|-----|--------------------------|-----|----|------|
| | D | P | C | NC | WP | NP | FP | SP | PW | PC | LP | HP |
| 1. Atletico de Madrid | | • | • | | | • | • | | | • | | • |
| 2. Barcelona | | •• | | •• | | •• | • | | | • | | • |
| 3. Betis | • | | | • | •••• | | •• | | • | | • | |
| 4. Bilbao | • | | | •• | | •• | | •• | • | | | •• |
| 5. Celta | | • | | • | • | | • | | | •• | • | |
| 6. Deportivo | • | | | • | • | | | • | • | | | • |
| 7. Espanyol | • | | | ••• | | • | | •• | | •• | | •• |
| 8. Mallorca | • | | | •• | • | | • | | •• | | | •• |
| 9. Osasuna | | • | | | • | | | • | • | | | •••• |
| 10. Real Madrid | | • | | • | | • | •• | | | • | • | |
| 11. Real Sociedad | | • | • | | | • | | • | •• | | | •• |
| 12. Sevilla | • | | | • | | • | | • | • | | • | |
| 13. Valencia | | • | | • | • | | • | | • | | | •• |
| 14. Zaragoza | | • | | ••• | • | | • | | • | | •• | |
| 15. Arsenal | | •• | • | | | • | • | | | •• | • | |
| 16. Aston Villa | • | | • | | | • | | • | | ••• | •• | |
| 17. Bolton | •• | | • | | | • | • | | | •• | •• | •• |
| 18. Chelsea | | • | •• | | | • | • | | • | •• | • | |
| 19. Everton | •• | | | • | | • | • | | | •• | •• | |
| 20. Liverpool | | • | ••• | | | • | • | | • | | • | • |
| 21. Manchester City | •• | | •• | | | • | • | | • | | •• | |
| 22. Manchester United | | • | • | | | • | | • | • | | • | |
| 23. Portsmouth | • | | | • | | • | • | | | • | • | |
| 24. Tottenham | | • | | • | • | | | ••• | | • | • | |
| 25. West Ham | | • | •• | | •• | | | • | | •• | | • |
| 26. Wigan | •• | | • | | •• | | •• | | | •• | | • |

| Teams (season 2010–2011) | Attacking styles of play | | | | | | | | Defensive styles of play | | | |
|--------------------------|--------------------------|------|----|----|-----|-----|----|-----|--------------------------|----|----|----|
| | D | P | C | NC | WP | NP | FP | SP | PW | PC | LP | HP |
| 27. Atletico de Madrid | • | | | • | • | | | • | | • | | • |
| 28. Barcelona | | •••• | • | | •• | | | • | | •• | | •• |
| 29. Bilbao | • | | •• | | | • | | • | | • | | • |
| 30. Getafe | | • | | • | • | | | • | •• | | •• | |
| 31. Levante | • | | | • | ••• | | | ••• | • | | •• | |
| 32. Osasuna | •• | | •• | | | • | | • | • | | | • |
| 33. Real Madrid | | • | • | | | •• | •• | | • | | • | |
| 34. Real Sociedad | • | | •• | | • | | • | | • | | | •• |
| 35. Valencia | | • | •• | | • | | | •• | •• | | • | |
| 36. Villarreal | | •• | • | | • | | • | | • | | • | |
| 37. Zaragoza | • | | | • | | ••• | • | | •• | | • | |

Abbreviations for attacking and defensive styles of play: Direct (D), Possession (P), Crossing (C), No Crossing (NC), Wide Possession (WP), Narrow Possession (NP), Fast Progression (FP), Slow Progression (SP), Pressure on Wide Areas (PW), Pressure on Central Areas (PC), Low Pressure (LP) and High Pressure (HP). The number of dots indicates the degree of utilisation of the style of play by the team, more dots indicates a higher utilisation.
 • Score between 0 and ±1. •• Score between ±1 and ±2. ••• Score between ±2 and ±3. •••• Score between ±3 and ±4.

380 Possession width (factor 4), suggest the differentiation
 between wide and narrow possession styles. These styles are
 associated with the percentage of ball possession teams have
 in central or wide areas; however, it does not necessarily mean
 that they play wide or narrow in their attacking sequences.
 "Possession of the ball in the attacking third of the pitch", "pos-
 session of the ball in the central areas of the pitch" and "possession
 385 of the ball in the wide areas of the pitch" are the
 performance indicators associated with this factor. The former
 performance indicator correlated highly with the latter, which
 could be due to easier maintenance of ball possession in attack-
 ing third wide areas compared to central areas. However, central
 areas could be larger in surface, so caution should be applied
 390 when interpreting this playing style. Moreover, due to the goal
 position, percentage of possession in central areas could be
 influenced. Betis was the team, during season 2006–2007, that
 relied the most on a wide possession style (see Table 4). The
 position of skilled players on the sides of the pitch and the use of
 395 playing formations that accumulated players in these areas could
 explain the high score of this team for this style. Attacking third

central areas are dangerous for defensive teams and result in
 more attempts at goal, therefore defensive actions will be more
 intense (Pollard & Reep, 1997; Ruiz-Ruiz et al., 2013; Scoulding,
 James, & Taylor, 2004; Tenga et al., 2010; Wright et al., 2011; 400
 Yiannakos & Armatas, 2006). For example, British soccer teams
 (2001–2002) had more ball entries into central (60.3%) compared
 to wide (39.7%) areas (James et al., 2002). Moreover, Hughes,
 Robertson, and Nicholson (1988) suggested that successful
 teams have more possession in the central compared to wide 405
 areas. The use of a wide or narrow possession style will probably
 depend on the abilities of the wide and central players of the
 team. For example, teams with skilled wide midfielders and/or
 fullbacks would utilise the wide possession style of play due to
 the abilities of these players for maintaining ball possession. 410
 Opponent's defensive style of play could also influence the use
 of narrow or wide possession style.

Factor 5 identifies teams that use high- or low-pressure defen-
 sive styles of play. "Number of regains in the attacking third" was
 the performance indicator that correlated negatively with this 415
 factor. Moreover, "passes from defensive to middle third" also

had a high positive score loading for this factor, and this could suggest that teams that move the ball from defensive to middle third to build the attack, tend to regain the ball in these areas. In season 2006–2007, Osasuna was the team that employed the high-pressure style in the most emphasised way (see Table 4). A high-pressure style could cause a risky situation for the defensive team due to the space produced behind the defensive players or the space between players in case that the team failed to keep compactness. However, it can also influence scoring opportunities because the ball can be regained closer to the opponent's goal, while increasing the likelihood of facing an imbalanced defence (Bell-Walker, McRobert, Ford, & Williams, 2006; Garganta et al., 1997; Grant, Williams, Reilly, & Borrie, 1998; Pollard & Reep, 1997; Russell, 2006; Scoulding et al., 2004; Wright et al., 2011). Successful teams from European Leagues and World Cups tend to have higher attacking third regains (Bell-Walker et al., 2006; Garganta et al., 1997). Moreover, Tenga et al. (2010a) reported that the probability of producing a score-box possession decreases when a balanced defence is present (i.e., defenders provide defensive backup and cover). The utilisation of high- or low-pressure styles could be notably influenced by the opposing team's style of play (Cotta, Mora, Merelo-Molina, & Merelo, 2013). For instance, using a high-pressure style of play against a team that utilises a possession style of play could be very effective for regaining the ball due to time and space denied to attacking players, while increasing the chances of scoring opportunities.

Factor 6 describes team progression towards the opponent's goal; however, it accounts for the lowest percentage of variance (6.67%). The use of backward passes moves the ball further from the opponent's goal; therefore, an increase in backwards passes is more likely to increase the time taken to reach the opponent's goal. For this reason, a high quantity of backwards passes could suggest a slow progression of possession. In contrast, fewer backward passes would suggest a fast progression of possession. These styles are not mentioned in previous studies, and the only performance indicator associated with factor 6 (i.e., "backwards passes") makes it complex to explain. The progression of the possession factor could be associated with the directness; however, it is different. When using backwards passes the team tries to secure or support ball possession by passing the ball to a less advanced teammate to create space and new opportunities to attack. For example, a team that uses a direct style might also use backwards passes to create a new opportunity for scoring. This team would have a slow progression but also score high on possession directness (e.g., Bilbao in both seasons 2006–2007 and 2010–2011).

A secondary aim was to classify the team's styles so that playing style profiles could be created for each team. Positive or negative scores for the six factors would determine how much a team relies on one specific style or combination of these styles. For example, in season 2006–2007, Everton used the direct, no crossing, narrow and fast progression styles of play in attack. In defence they used a low-pressure style while applying pressure in central areas to regain the ball. Everton's high score on factor 1 defines a direct style in attack due to the team's high percentage of forward passes, low percentage of sideways passes and possession of the ball. In contrast, during the 2006–2007 season, Barcelona applied pressure in

central areas and used high-pressure defensive styles, combined with possession, no crossing, narrow and fast progression attacking styles. Barcelona scored high on the percentage of regains in the attacking third, which is one of the performance indicators that define the high-pressure style. Moreover, during the 2010–2011 season, Barcelona adopted alternative styles and intensified the use of previously used styles. They used the crossing, wide and slow progression attacking styles, and increased their factor scores for the possession attacking style, pressure in central areas and high-pressure defensive styles, compared to the 2006–2007 season. These individual examples highlight how a team uses specific attacking and defensive styles of play in a season. Moreover, in the case of Barcelona it highlights changes that occur in the styles of play across two separate seasons, which could be due to the tactical management of the coach and the players.

In conclusion, 12 (eight attacking and four defensive) different playing styles and associated performance indicators utilised in elite soccer were identified in this data set. Furthermore, the selected factors together explained 87.54% of the variance. The degree to which a team relies on a specific style can be determined based on the team's score for each factor. Findings from this study have several practical implications for performance analysis. First, teams can objectively determine the styles they use and their reliance on specific styles to create playing style profiles and normative profiles for associated performance indicators. These profiles can be used to benchmark team's performance during competition or alternatively adjust their styles based on reference values they wish to adopt. Furthermore, teams could use specific training drills to develop styles that they will employ in competition while using the associated performance indicators to monitor change. Second, playing styles profiling can be used on opponents to identify their dominant styles and benchmark their performance indicators. This data could be used to prepare tactics that would perturb the opponent's dominant style(s) and identify strengths and weaknesses of the opposition. Third, recruitment analysts could introduce playing styles profiling into their analysis framework when identifying individual players that they wish to integrate into the team. Finally, previous research provided contradictory evidence when measuring performance indicators associated with success in isolation of factors (i.e., style of play, home advantage, type of competition, quality of opponents and quality of team) that might affect the value. Therefore, differences in performance indicators might be a factor of their playing styles. Researchers should be aware of these different styles and may integrate this into their analysis. Limitations of this study should be noted. Contextual variables (e.g., playing home/away, opposition level) were not measured and these variables could affect styles of play used by teams. These variables could also explain the missed percentage of the variance. Moreover, interaction process should be considered for a more accurate analysis of styles of play as opponent's tactics can also influence the style of play employed by a team. This study provides an introduction to analysing playing styles. More variables and matches should be considered to supply conclusive definitions for playing styles and generalisability of the data. Further research should attempt to establish the efficiency and effectiveness of playing styles when measuring performance and outcomes (i.e., scoring probability).

535 **Disclosure statement**

No potential conflict of interest was reported by the authors.

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