# Game location and team quality effects on performance profiles in professional soccer

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**Abstract**

Home advantage in team sports has an important role in determining the outcome of a game. The aim of the present study was to identify the soccer game-related statistics that best discriminate home and visiting teams according to the team quality. The sample included all 380 games of the Spanish professional men's league. The independent variables were game location (home or away) and the team quality. Teams were classified into four groups according to their final ranking at the end of the league. The game-related statistics registered were divided into three groups: (i) variables related to goals scored; (ii) variables related to offense and (iii) variables related to defense. A univariate (t-test and Mann-Whitney U) and multivariate (discriminant analysis) analysis of data was done. Results showed that home teams have significantly higher means for goal scored, total shots, shots on goal, attacking moves, box moves, crosses, offsides committed, assists, passes made, successful passes, dribbles made, successful dribbles, ball possession, and gains of possession, while visiting teams presented higher means for losses of possession and yellow cards. In addition, the findings of the current study confirm that game location and team quality are important in determining technical and tactical performances in matches. Teams described as superior and those described as inferior did not experience the same home advantage. Future research should consider the influence of other confounding variables such as weather conditions, game status and team form.

**Key words:** Association football, home advantage, game-related statistics, match analysis, discriminant analysis.

## Introduction

Home advantage refers to the consistent finding that home teams in sport competitions win over 50% of the games played under a balanced home and away schedule (Courneya and Carron, 1992). Since Schwartz and Barsky's study (1977), home advantage has been well identified at both amateur and professional level in many sports (Gómez et al., 2008; Varca, 1980). In particular for soccer, home advantage has been shown to exist since the beginning of the Football League in England in 1888-1889 and has continued at all levels of the professional game since then (Nevill and Holder, 1999; Pollard and Pollard, 2005, Sánchez et al., 2009). In an attempt to improve the understanding of the phenomenon, Courneya and Carron (1992) proposed a framework to investigate the effects of the location of a match or competition and any subsequent home advantage. The framework comprised five interrelated components suggested to influence home advantage, including the match venue, game loca-

tion factors, the critical psychological and behavioural states of the competitors, coaches, and officials, and the subsequent performance outcomes.

Notational analysis is commonly used within research and applied settings to investigate the technical-tactical aspects of football performance through recording behaviour incidence and outcomes (Taylor et al., 2008). According to Tucker et al. (2005), the final influence of the location of the game is upon the performance of the team, individual or official being studied with respect to primary, secondary and tertiary measures. Primary measures consist of fundamental skill execution (i.e., batting average, free throw percentage, penalties per game). Secondary measures usually reflect the scoring necessary to win a contest (e.g., points or goals scored), while tertiary measures indicate the final match outcome (win/loss, point's difference etc.). The majority of subsequent empirical research using Courneya and Carron's (1992) framework have predominantly focused on the influence of game location factors and critical psychological states upon secondary and tertiary performance measures (see Carron et al., 2005; for a review).

In soccer, few studies have considered the effects of game location upon primary performance measures and their results are still inconclusive (e.g. Carmichael and Thomas, 2005; Glamser, 1990; James et al., 2002; Lago, 2009; Lago and Martin, 2007; McGuire et al., 1992; Sasaki et al., 1999; Seçkin and Pollard, 2008; Taylor et al., 2008; Tucker et al., 2005). Sasaki et al. (1999), for example, analysed the matches of an English 1st division soccer team from the 1996-97 season and found significant differences in the frequency of goal attempts, shots on target, shots blocked, shots wide and successful crosses. Tucker et al. (2005) also found that the professional British football team they studied performs a greater number of corners, crosses, dribbles, passes, and shots during home matches, while more clearances, goal kicks, gains of possession, and losses of control were evident when playing away. Additional examination of the behaviour outcomes highlighted more successful aerial challenges, crosses, passes, and tackles by the team during home matches. However, Taylor et al. (2008) found that in the professional British team they studied the outcomes of most behaviours were not influenced by match location. It is possible that these equivocal findings may be due to the fine-grained approach to soccer analysis adopted in the previous studies by considering a single's team performance over a sustained period (one or two seasons). This contrasts with previous soccer literature that has tended to aggregate performance of different teams during analysis.

An important limitation of case studies designs is that generalization of findings is precluded. Thus, Tucker et al. (2005) suggest that tactics and strategies are unique to individual teams and what is successful for one team may therefore not be for another.

In this context, Carmichael and Thomas (2005) showed that in the Premier League in England home teams have significantly higher figures for attack indicators, such as shots and successful passes in the scoring zone. Conversely, away teams committed significantly more fouls and suffered more red and yellow cards. However, Seçkin and Pollard (2008) analyzed 301 matches during the season 2005-2006 in the Turkish Super League and showed that although home teams took 26% more shots at goal than away teams, the success rates for shots do not differ. In addition, for fouls and disciplinary cards there were not differences between home and away teams. The contradictory findings showed in these studies may be due to the fact that the authors did not examine the effects of match location on technical and tactical performances as a function of the team quality. It has been suggested (Hughes and Franks, 2005; Lago and Dellal, 2010) that top teams are able to impose and maintain their pattern of play despite the alteration in variables over the match (e.g. evolving score) and between matches (e.g. playing at home or away). For example, Bloomfield et al. (2005) found that the top three teams in the English Premier League in the 2003-2004 season (Chelsea, Manchester United, and Arsenal) dominated possession against their opponents whether winning, losing, or drawing. It seems likely that match location could have different effects on behaviour incidence and outcome depending on the team quality. In fact, several studies have shown that team quality affects the degree of home advantage obtained in sport (i.e., Schwartz and Barsky, 1977; Madrigal and James, 1999). Schwartz and Barsky (1977) concluded that game location and team quality were equally important in determining performance outcomes in sport as stronger teams appeared to have higher home advantages than weaker teams. However, the effects of game location and team quality on primary measure of performance in soccer have not been studied deeply. Another limitation of the previous studies is that have examined a limited number of performance indicators.

The aim of this investigation therefore was to examine the influence of game location and team quality on technical and tactical performances (primary measure of performance). The first objective was to extend the existing home advantage literature in soccer that has examined a limited number of performance indicators (e.g., Nevill et al., 1999; Sasaki et al., 1999) by investigating whether there were differences between technical indicators of performance of the team at home and away. Finally, as existing studies have only examined technical aspects of soccer performance as a function of game location, the second objective was to consider any differences in the tactics-related behaviours of the team.

## Methods

### Sample

In order to carry out this study, all 380 games corresponding to the 2008-2009 season of the Spanish League have been analyzed. In the Spanish League, teams played each other twice each season, once at home and once away. This type of playing schedule is said to be balanced and provides the framework for an unbiased calculation of home advantage. Teams receive three points for a win, one point for a draw, and no points for a loss. The top four teams in the competition qualify for the UEFA Champions League. The fifth, sixth and seventh placed teams qualify for the UEFA Europe League. The three lowest placed teams in the competition are relegated to the Second Division.

### Procedures

The collected data were provided by Gecasport, a private company dedicated to the performance assessment of teams in the Spanish Soccer League (www.sdifutbol.com). The accuracy of the Gecasport System has been verified by Gómez et al. (2009a; 2009b). For previous uses of the Gecasport System see Lago and Martín (2007), Gómez et al. (2009a), Sola-Garrido et al. (2009), Lago (2009) and Lago et al. (2010). Reliability was assessed by the authors coding five randomly selected matches and the data being compared with those provided by Gecasport. The Kappa (K) values ranged from 0.95 to 0.98.

The studied variables were divided into three groups as seen in Table 1. Teams were classified into 4 groups according to their final ranking at the end of the league: Group 1 was composed by the top five teams of the table; Group 2 was integrated by those teams who were classified between positions 6 to 10; Group 3 was conformed by those teams who were classified between positions 11 to 15 and finally Group 4 was composed by the lowest five placed teams.

**Table 1.** Variables studied in the Spanish League 2008-2009.

| Group of variables | Variables or game statistics or performance indicators |
|---|---|
| **Variables related to goals scored** | Goals Scored, Total Shots; Shots on Goal. |
| **Variables related to offense** | Attacking moves, Box moves, Crosses, Offsides committed, Losses of possession, Fouls received, Assists, Passes Made, Successful Passes Made, Dribbles, Successful Dribbles, Ball possession. |
| **Variables related to defence** | Gains of possession, Fouls committed, Yellow cards, Red cards, Clearances. |

### Statistical analysis

The assumption of normality was analyzed through the use of the Kolmogorov-Smirnov test. Only the variables possession, gains of possession and losses of possession followed the Normal distribution. Following this exploratory analysis of the data, a descriptive analysis of the data was done. Then, depending on the distribution of the variables, either a T-test or a Mann-Whitney U was carried out to identify univariate differences between the game-related statistics of home and away teams. Afterwards, a discriminant analysis (Ntoumanis, 2001) was

done to find the variables that better discriminate home and away teams. Through the Structural Coefficients (SC) these variables were identified. An SC above 0.30 was considered relevant discrimination between groups (Sampaio et al., 2004; Sampaio et al., 2006; Tabachnick and Fidell, 2007). The statistical analyses were performed using SPSS software Release 17.0. and statistical significance was set at p < 0.05.

## Results

In the 2008-2009 season of the Spanish League, 61.95% of the games were victories for the home teams and 38.05% were victories for the visiting teams (draws were excluded). The percentage of victories for the home teams according to their quality and to the opposition quality is shown in Table 2. As can be seen, home teams won a higher percentage of games against inferior visiting teams than against equally or superior matched visitors.

**Table 2. Percentage of victories for the home teams according to their quality and to the opposition quality.**

| Home Teams | Visitors | | | |
|---|---|---|---|---|
| | Group 1 | Group 2 | Group 3 | Group 4 |
| **Group 1** | 52.94 | 82.61 | 81.82 | 81.82 |
| **Group 2** | 41.18 | 91.67 | 75.00 | 77.78 |
| **Group 3** | 22.22 | 55.00 | 68.75 | 71.43 |
| **Group 4** | 25.00 | 30.00 | 66.67 | 69.23 |

Means and standard deviations for the game-related statistics for home and visiting teams are presented in Table 3. Analyses showed statistically significant differences for several comparisons. Home teams had higher means for goals scored, total shots, shots on goal, attacking moves, box moves, crosses, offsides committed, assists, passes made, successful passes, dribbles made, successful dribbles, ball possession, and gains of possession, while visiting teams presented higher means for losses of possession, and yellow cards.

**Table 3. Comparisons between home and away teams in the Spanish League. Data are means (±SD).**

| | | All teams | Group 1 | Group 2 | Group 3 | Group 4 |
|---|---|---|---|---|---|---|
| **Goals scored** | Home | 1.66 (1.34)* | 2.29 (1.59)** | 1.75 (1.18)* | 1.41 (1.15)* | 1.19 (1.11) |
| | Away | 1.24 (1.17) | 1.74 (1.38) | 1.09 (1.07) | 1.00 (0.99) | 1.11 (1.07) |
| **Total shots** | Home | 14.71 (5.16)* | 17.21 (5.16)* | 14.49 (4.89)* | 13.22 (4.50)* | 13.93 (5.24)* |
| | Away | 11.83 (4.68) | 13.94 (5.46) | 11.35 (4.60) | 10.40 (3.64) | 11.64 (4.15) |
| **Shots on goal** | Home | 5.60 (2.80)* | 6.76 (2.99)* | 5.87 (2.72)* | 4.84 (2.54)* | 4.95 (2.51)** |
| | Away | 4.38 (2.39) | 5.53 (2.77) | 4.25 (2.15) | 3.60 (2.08) | 4.14 (2.08) |
| **Attacking moves** | Home | 118.74 (12.48)* | 118.75 (10.14)** | 116.75 (15.24) | 117.36 (11.42)** | 122.13 (12.04) |
| | Away | 115.96 (12.10) | 115.68 (9.55) | 116.25 (9.51) | 112.43 (15.71) | 119.45 (11.68) |
| **Box moves** | Home | 3.91 (2.98)* | 5.69 (3.45)* | 3.79 (2.91)* | 3.02 (2.31) | 3.14 (2.35) |
| | Away | 2.90 (2.47) | 4.40 (3.21) | 2.05 (1.70) | 2.39 (1.87) | 2.77 (2.17) |
| **Crosses** | Home | 32.29 (9.71)* | 31.83 (9.10)* | 31.74 (9.21)* | 33.20 (9.78)* | 32.37 (10.76)* |
| | Away | 25.13 (8.92) | 24.38 (10.83) | 23.87 (7.72) | 26.54 (8.23) | 25.72 (8.46) |
| **Offsides committed** | Home | 2.78 (1.92)** | 2.94 (1.97) | 3.12 (1.88) | 2.29 (1.69) | 2.78 (2.07) |
| | Away | 2.52 (1.93) | 2.41 (1.61) | 2.85 (2.17) | 2.21 (1.86) | 2.62 (1.99) |
| **Losses of possession** | Home | 74.04 (8.50)* | 73.28 (7.96) | 73.09 (6.83)** | 73.58 (9.77) | 76.21 (8.92) |
| | Away | 76.06 (8.85) | 75.26 (9.25) | 75.91 (8.67) | 75.17 (8.44) | 77.88 (8.87) |
| **Fouls received** | Home | 16.57 (4.46) | 16.98 (4.11) | 17.23 (4.50) | 16.08 (4.72) | 16.00 (4.44) |
| | Away | 16.80 (4.52) | 17.23 (4.53) | 16.87 (4.35) | 16.63 (4.53) | 16.45 (4.68) |
| **Assists** | Home | 8.94 (3.83)* | 10.53 (3.66)* | 8.59 (3.90)* | 8.41 (3.65)* | 8.25 (3.71) |
| | Away | 7.12 (3.26) | 8.09 (3.75) | 6.85 (3.21) | 6.38 (2.72) | 7.15 (3.07) |
| **Passes made** | Home | 421.64 (95.31)* | 510.38 (87.17)* | 399.56 (79.57) | 371.02 (67.14)** | 405.59 (82.97) |
| | Away | 395.96 (90.56) | 467.32 (96.44) | 384.99 (76.95) | 344.65 (63.35) | 386.89 (76.29) |
| **Successful passes** | Home | 309.18 (92.11)* | 401.29 (87.71)* | 290.49 (74.04) | 255.96 (60.25)** | 288.99 (72.11)** |
| | Away | 286.72 (87.38) | 361.14 (94.92) | 278.42 (72.24) | 234.44 (56.63) | 272.86 (68.77) |
| **Dribbles made** | Home | 24.42 (13.97)** | 32.47 (15.09) | 22.03 (11.56) | 18.55 (10.16) | 24.63 (14.71) |
| | Away | 22.02 (13.67) | 28.39 (15.43) | 20.79 (13.08) | 17.55 (10.83) | 21.36 (12.80) |
| **Successful dribbles** | Home | 15.85 (9.98)** | 22.13 (11.31)** | 13.33 (7.99) | 11.77 (6.72) | 16.19 (10.07) |
| | Away | 14.17 (9.47) | 18.62 (11.04) | 13.22 (9.08) | 10.83 (6.86) | 14.00 (8.86) |
| **Ball possession** | Home | 51.58 (7.96)* | 56.84 (7.24)* | 49.74 (7.00)** | 48.91 (6.67)* | 50.83 (8.40)* |
| | Away | 48.42 (7.96) | 53.02 (8.82) | 47.26 (7.05) | 45.54 (6.64) | 47.85 (7.25) |
| **Gains of possession** | Home | 54.65 (8.71)* | 56.06 (7.92)** | 53.91 (8.98) | 53.06 (8.84)** | 55.59 (8.87) |
| | Away | 52.05 (8.66) | 53.28 (8.87) | 51.68 (7.82) | 50.12 (9.08) | 53.12 (8.56) |
| **Fouls committed** | Home | 16.80 (4.51) | 15.67 (3.94) | 16.88 (4.33) | 18.60 (4.75) | 16.03 (4.50) |
| | Away | 16.57 (4.46) | 15.66 (4.58) | 16.41 (4.15) | 18.09 (4.47) | 16.13 (4.32) |
| **Yellow cards** | Home | 2.76 (1.56)** | 2.61 (1.55) | 2.72 (1.51) | 3.07 (1.57) | 2.65 (1.60) |
| | Away | 3.06 (1.65) | 2.85 (1.54) | 3.15 (1.84) | 3.22 (1.68) | 3.01 (1.51) |
| **Red cards** | Home | .22 (.51) | .15 (.38) | .14 (.35) | .29 (.65) | .28 (.58) |
| | Away | .25 (.52) | .25 (.53) | .20 (.43) | .31 (.58) | .23 (.51) |
| **Clearances** | Home | 113.11 (17.15) | 108.52 (17.07) | 115.43 (16.85) | 114.63 (16.73) | 113.85 (17.34) |
| | Away | 115.20 (18.67) | 112.39 (19.15) | 114.88 (18.86) | 118.16 (18.11) | 115.38 (18.39) |

* p < 0.01. ** p < 0.05.

**Table 4. Standardized coefficients from the discriminant analysis of the game statistics between home and away teams in the Spanish Football League.**

| Game statistics variable | Function | | | | |
|---|---|---|---|---|---|
| | All teams | Group 1 | Group 2 | Group 3 | Group 4 |
| Goals scored | .363* | .635* | .438* | .307* | -.015 |
| Total shots | .082 | -.131 | .349* | .227 | .251 |
| Shots on goal | .060 | -.407* | -.018 | .200 | .180 |
| Attacking moves | .110 | .613* | -.116 | .194 | .042 |
| Box moves | .098 | .044 | .365* | -.090 | -.052 |
| Crosses | .657* | .480* | .712* | .443* | .596* |
| Offsides committed | .186 | .400* | .164 | .087 | .172 |
| Losses of possession | -.503* | -.331* | -.340 | -.591* | -.702* |
| Fouls received | -.145 | -.153 | -.091 | -.488* | -.092 |
| Assists | .027 | .526* | -.247 | .009 | -.510* |
| Passes made | 1.474* | 1.432* | 1.709* | 1.632* | -.396* |
| Successful passes | -1.482* | -.858* | -1.709* | -1.328* | .007 |
| Dribbles made | .228 | -.611* | 1.018* | -.050 | .283 |
| Successful dribbles | -.295 | .604* | -1.161* | -.144 | -.073 |
| Ball possession | -.207 | -.691* | -.088 | -.115 | .190 |
| Gains of possession | .414* | .001 | .151 | .413* | .912* |
| Fouls committed | .331* | .347* | .341* | .396* | .195 |
| Yellow Cards | -.183* | -.029 | -.200 | -.114 | -.385* |
| Red Cards | -.161 | -.059 | .213 | .253 | .326* |
| Clearances | -.091 | -.313* | .199 | -.118 | -.312* |
| Eigenvalue | .274 | .348 | .650 | .374 | .261 |
| Wilks´Lambda | .785 | .742 | .606 | .728 | .793 |
| Canonical Correlation | .463 | .508 | .628 | .522 | .455 |
| Chi-square | 180.859 | 53.154 | 89.104 | 56.558 | 41.305 |
| Df | 20 | 20 | 20 | 20 | 20 |
| Significance | .00 | .00 | .00 | .00 | .003 |
| % of Variance | 100% | 100% | 100% | 100% | 100% |
| Reclassification, % | 70.8 | 72.1 | 77.9 | 71.6 | 67.4 |

*SC discriminant value ≥|.30|

With respect to game location and team quality (see Table 3), home teams from Group 1 presented significantly higher means on goals scored, total shots, shots on goal, attacking moves, box moves, crosses, assists, passes made, successful passes, successful dribbles, ball possession, and gains of possession. Home teams from Group 2 presented significantly higher means on goals scored, total shots, shots on goal, box moves, crosses, assists, and ball possession. Visiting teams presented significantly higher means in losses of possession. Home teams from Group 3 presented significantly higher means on goals scored, total shots, shots on goal, attacking moves, crosses, assists, passes made, successful passes, ball possession, and gains of possession. Visiting teams presented significantly higher means in losses of possession. Finally, home teams from Group 4 presented significantly higher means on total shots, shots on goal, crosses, successful passes, and ball possession.

The multivariate analysis (Table 4) shows that the discriminant functions obtained were significant and correctly classified 70.8% of the teams differentiating home and visiting teams, 72.1% of the teams from Group 1, 77.9% of the teams from Group 2, 71.6% of the teams from Group 3, and 67.4% of the teams from Group 4. When discriminating home and visiting teams, the variables that best differentiated the two groups were goals scored, crosses, losses of possession, passes made, successful passes, gains of possession, fouls committed and yellow cards. To differentiate home and visiting teams from Group 1, variables which best discriminated the two groups were goals scored, shots on goal, attacking moves, crosses, offsides committed, losses of possession, assists, passes made, successful passes, dribbles made, successful dribbles, ball possession, fouls committed, and clearances. When differentiating home and visiting teams from Group 2, the variables that best differentiate the groups were goals scored, total shots, box moves, crosses, passes made, successful passes, dribbles made, successful dribbles, and fouls committed. To differentiate home and visiting teams from Group 3, variables which best discriminated the two groups were goals scored, crosses, losses of possession, fouls received, passes made, successful passes, gains of possession, and fouls committed. Finally, when differentiating home and visiting teams from Group 4, the variables that best differentiate the groups were crosses, losses of possession, assists, passes made, gains of possession, yellow cards, red cards, and clearances.

## Discussion

This study investigated technical and tactical measures of performance as a function of game location and team quality in a sample of matches from a professional soccer league. The home winning percentages (61.95%) found in the current study was very close to the worldwide figure of 61.5 % (Pollard, 2006a; 2006b).

Authors argue that game location and the standard competition would configure different game tactics and strategies, thus this would be reflected in different discriminant tactics and strategies. Present results confirm this hypothesis. The findings confirmed the predictions

that more successful technical and tactical indicators would be performed at home compared to away. Similar to Carmichael and Thomas (2005), Sasaki et al. (1999) and Tucker et al's (2005) findings, home teams have significantly higher figures for attack indicators, such as goal scored, total shots, shots on goal, attacking moves, box moves, crosses, offsides committed, assists, passes made, successful passes, dribbles made, successful dribbles, and ball possession. These findings are also similar to those reported in other team sports such as basketball (Varca, 1980; Gómez et al., 2008; Sampaio et al., 2004). One explanation for these performances is that the notion that the home environment (i.e. the social support of the crowd) is associated with an increased functional aggressive response manifested by more offensive than defensive behaviour (Glamser, 1990; Schwartz and Barsky, 1977). Specifically, a greater number of functional aggressive behaviour (i.e., behaviours related to aggression and assertion that aim to improve performance such as shots, passess, and crosses) appear to be exhibited by the players of the home team in front of their home crowd (McGuire et al., 1992; Varca, 1980). However, while differences were evident across several technical and tactical indicators as a function of game location in the current study there was no corresponding variation in the number of rule breaches (fouls, offsides, etc.) by the team at home or away. These findings are contrary to the belief that the crowd may cause the referee to bias their decisions towards the home team (Nevill et al., 1999; 2002) and also that the crowd may cause an increased dysfunctional aggressive response in the away side (Glamser, 1990). However, these results are similar to those provided by Tucker et al. (2005) and Seçkin and Pollard (2008).

When analyzing the results overall, the univariate analysis (Table 2) showed that there are sixteen variables with statistically significant differences (goals scored, total shots, shots on goal, attacking moves, box moves, crosses, offsides committed, losses of possession, assists, passes made, successful passes, dribbles, successful dribbles, ball possession, gains of possession, and yellow cards). On the other hand, when applying a multivariate analysis (Table 3), the number of statistically significant variables was reduced to eight (goal scored, crosses, losses of possession, passes made, successful passes, gains of possession, fouls committed, and yellow cards). These results indicate that the type of statistical analysis will determine some results. It should be the goals of the study that determine the type of analysis that is more adequate.

Several studies have shown that team quality affects the degree of home advantage obtained in sport (i.e., Madrigal and James, 1999; Schwartz and Barsky, 1977). Schwartz and Barsky (1977) suggested that the magnitude of a home advantage would be expected to vary in accordance with the quality of the home team and its visiting opponents. In other words, a superior home team would be expected to win a higher percentage of games against inferior visiting teams, than against equally matched visitors. Present results confirm this hypothesis. Moreover, the findings of the current study confirm that game location and team quality are important in determining technical and tactical performances in matches. Teams described as superior and those described as inferior did not experience the same home advantage. Top teams performed significantly less goals, shots, shots on goal, attacking moves, box moves, crosses, assists, passes, successful passes, successful dribbles and gains of possession when playing away. Moreover they spent less time in possession of the ball. However, home teams from Group 4 presented significantly higher means than visitors only on total shots, shots on goal, crosses, successful passes, and ball possession. No significant differences were found in relation to the rest of the performance indicators. One explanation for these performances is that weaker teams are not able to impose and maintain their pattern of play against visiting teams.

Although this study has considered the home advantage at a behavioral level in greater depth than any previous investigation there are several limitations that provide subsequent directions for future research. First, from a methodological perspective, the findings are limited to a certain extent by the sample size in that due to logistical and resource constraints matches were sampled only from a domestic league season. Future investigations should therefore attempt to maintain the current level of detailed analyses present in our study but across different seasons and countries. According to Tucker et al. (2005), one reason for the lack of discrepancies identified in technical and tactical behaviours in the present study and in the existing home advantage literature may have been a failure to consider the other various personal and situational (environmental) factors that may serve to confound or influence the outcome of a match or competition. Indeed, some authors (e.g. James et al., 2002; Taylor et al., 2008; Tucker et al., 2005; Lago, 2009; Lago and Martin, 2007) suggest that to assume that players will perform in a similar manner across matches without consideration of other factors that are specific to each match is inadequate. Consequently, before any inferences regarding a teams' technical or tactical performance can be made, the influence of variables such as the time of kick-off, weather conditions, and game status (i.e., whether the team is winning, losing or drawing at the time of data collection) must be accounted for.

Future research into the influence of home advantage upon soccer performance, should consider the effects of these and other variables that have been suggested to affect technical and tactical behaviour, such as team form, distances travelled, days between games and crowd attendances (Brown et al., 2002; Courneya and Carron, 1992; Nevill and Holder, 1999; Pollard, 1986; Schwartz and Barsky, 1977).

## Conclusion

Home teams have significantly higher figures for attack indicators probably due to facilities familiarity and crowd effects. However, while differences were evident across several technical and tactical indicators as a function of game location there was no corresponding variation in the number of rule breaches (fouls, offsides, etc.) by the team at home or away.

Moreover, the findings of the present study showed

that game location and team quality are important in determining technical and tactical performances in matches. Teams described as superior and those described as inferior did not experience the same home advantage. Top teams performed significantly less goals, shots, shots on goal, attacking moves, box moves, crosses, assists, passes, successful passes, successful dribbles and interceptions when playing away. However, weaker teams performed significantly less total shots, shots on goal, crosses, successful passes, and ball possession when playing away.

Future research into the influence of home advantage upon soccer performance, should consider the effects of these and other variables that have been suggested to effect technical and tactical behaviour, such as team form, distances travelled, days between games and crowd attendances.

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## Key points

- Home teams have significantly higher figures for attack indicators probably due to facilities familiarity and crowd effects.
- The teams' game-related statistics profile varied according to game location and team quality.
- Teams described as superior and those described as inferior did not experience the same home advantage.

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