

Analysis of Goal Scoring Patterns in the 2012 European Football Championship

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Submitted by Michalis Mitrotasios & Vasilis Armatas

ABSTRACT

Purpose: The aim of the present study was to investigate the factors associated with goal scoring in top class football matches. **Methods:** 76 goals analyzed from 31 matches from the European football Championship in Poland-Ukraine in 2012. The SportScout performance analysis tool was used to time code when goal scored and the associated behaviors relating to goal scoring. **Results:** It was presented that 57.9 % of the goals were scored in the second half and most of them in the last 15-min period, while the first goal seems to play an important role in the final result of the match. Most goals were scored during open play (72.4%) but 27.6% scored after a set play, mainly following corner kick and free kick. Concerning initiation zone of the attack, it was presented that 56.6% began from the attacking half. Most goals were scored after a cross (43.7%) while regarding goal scoring area, over 90% of goals were scored inside the penalty area and specifically from the area between penalty spot and goal zone (42.1%). Finally, almost ½ of goals were scored without any pressure from defenders. **Conclusions:** The present study presented guidelines to coaches in order to design trainings similar to the actual competition and adapt the game style with regard to match status. Moreover, coaches can use this information to establish objectives for players and teams with a special reference to the offensive or defensive play.

INTRODUCTION

Match analysis is the objective recording and examination of behavioural events that occur during competition (12). The main aim of match analysis is to identify strengths of one's own team, which can then be further developed, and its weaknesses, which suggest areas for improvement. Similarly, a coach analyzing the performance of an opposition side will use the data to identify ways to counter that team's strengths and exploit its weaknesses (11). A performance indicator has been described as a selection, or combination, of action variables that aims to define some or all aspects of a performance (19). These indicators constitute an ideal profile that should be present in the athletic activity to achieve success and can be used as a way to predict the future behaviour of sporting activity (27).

However, what might be classified as a good performance in football, such as a high proportion of possession, a higher number of goal-scoring opportunities, shots on target or corners, does not always relate to success. A football team can be successful and win a game or competition, despite performing suboptimal (50). At all competitive levels, the main concern is simply to score at least one more goal than the opponent while in some tournament settings, goal differential may influence attacking philosophy. A single goal can change radically, and for a considerable amount of time, the strategic environment in which teams interact (38). Consequently, the most identified components of the performance in football matches are the scored goals. An analysis of how goals are scored can reveal critical factors that will help determine the most appropriate attacking strategy, briefly to obtain winning formula.

Since the landmark work of Reep and Benjamin (42), many studies have focused on goal scoring patterns in various national and international football tournaments. Reep and Benjamin (42) showed that approximately 80% of goals scored were the result of a short sequence of three or less passes and that 1 in 10 shots tend to lead to a goal. More recently, Hughes and Franks (21) showed that in the 1990 and 1994 World Cup tournaments 84% and 80% of goals respectively came from possessions of four or less passes. In addition, 80% and 77% of the shots at goal were a result of a sequence of four or less passes.

Jinshan and co-workers (25) reported on the characteristics of goals from the 14th World Cup and showed that nearly 70% of all goals were scored in the 2nd half. Armatas, Yiannakos and Sileloglou (6) studied three World Cups (1998, 2002 and 2006) and reported that more goals were scored as time progresses, however lower percentages than Jishan et al. (25). Moreover, many studies have pointed out the influence in the final score of an early goal or the first goal in a match (3, 26, 37, 51).

Bangsbo and Peitersen (7) point out the magnitude of set plays in modern football and reported that twenty are estimated to appear, in average, for each team in every match. Many studies from international and domestic tournaments have reported that about 25%-40% of all goals have been scored on set plays (3, 25, 30, 48, 49, 51).

Other research has examined the position on the pitch from which goals are scored. In a recent study Wright et al. (50) showed that from 167 goals from English Premier League, 87% of goals were scored inside the penalty area which is similar to the 90% observed by Olsen (36) for the 1986 World Cup whereas Dufour (14) reported 80% for the 1990 World Cup. Yiannakos and Armatas (51) reported that 44.4% of goals scored were inside the penalty area, 35.2% inside the goal area, and 20.4% outside the penalty area, for the 2004 European Championship in Portugal. Finally, Hughes et al. (22) showed that successful teams in the 1986 Football World Cup made more attempts inside the penalty area in comparison to unsuccessful teams.

Usually, after international tournaments, such as the European Championship, successful teams set new trends in terms of playing style and training. Indeed, others will tend to imitate the tactics and play of winning teams, seeking to master those aspects of performance which are deemed to underlie their success (21). The European Football Championship provides an opportunity to examine the best teams and players in Europe. Thus the purpose of the present study was to analyze the goals scored in the European Championship in Poland-Ukraine in 2012.

METHODS

Footage from all matches from the 2012 European Championship was obtained via recording into AVI format of the television coverage, so it was compatible with the multisport notational analysis system (SportScout) that was used. In all, there were 2 goalless matches leaving 29 matches with 76 goals. One own goal was excluded from the study. A SportScout coding template was created to allow necessary information to be drawn from the footage by two experienced coders. All the output data was exported from SportScout into an excel data base for subsequent data analysis.

The following performance indicators were analyzed:

- a) Time of goal scored (0-15, 16-30, 31-45+, 46-60, 61-75, 76-90+, 1st extra time, 2nd extra time)
- b) Influence in the final score of the first goal (Win, Draw, Loss)
- c) Type of play (Open play, Set play)

- d) Style of play (Positional play, Direct play, Counter attack)
- e) Type of set play (Free kick, Corner, Penalty, Throw in)
- f) Initiation zone of the attack (pitch zones)
- g) Number of passes leading up to goal (1, 2, 3, 4, 5, 6, 7, 8+)
- h) Type of feed prior to goal scored (Pass<10m, Pass 10-20m, Cross, Shot, Individual action)
- i) Scoring area (pitch zones)
- j) Actions leading up to goal (One touch, Control+shot, Control+dribble+shot)
- k) Shot type (Instep shot, Inside of the foot, Header, Other)
- l) Existence of pressure by defenders on scorer (Pressure, No pressure)
- m) Scorer's playing position (Striker, Winger, Midfielder, Defender)
- n) Goal zone (a1, a2, a3, b1, b2, b3, c1, c2, c3)

Statistical Analysis

Firstly, a descriptive analysis of the data was done (frequency, average, standard deviation). Then, to compare distribution frequency between independent variables chi-square tests were used, while one-way repeated measures ANOVA and t-test were used to compare average. The inter-rater reliability of separate observations was calculated to guarantee the quality of the observation system. A reliability index of 0.96 was observed (intra-class correlation coefficient and kappa index). SPSS 18 was used for data analysis (Lead Technologies Inc, USA) and the level of significance was set at p Results

Altogether 76 goals from 31 matches were analyzed which is on average 2.62 ± 1.42 per match. Only in two of these matches no goals were scored. At Euro 2012, 57.9% of the goals were scored in the second half and 21.1% of them in the last 15-min period as shown in Table 1. However, there was not significant difference between the first and second half of the match ($F(1, 75) = 1.918, p = .170$) as well as ANOVA did not show that frequency of goals scored were time dependent ($F(5, 71) = 1.065, p = .387$). As expected, results presented that the first goal is critically important to match outcome. Moreover, of the teams that scored first results showed that they won 75.9%, lost 6.9% and had drawn 17.2% of the matches ($\chi^2(2, 29) = 24.069, p < 0.001$).

Most goals (72.4%) were scored during open play ($\chi^2(1, 76) = 15.211, p < 0.001$), mainly following positional play while the rest of them were scored after a set play (27.6%), mainly following corner kicks and free kicks, as shown in Figure 1. Concerning initiation zone of the attack, it was presented that 56.6% of goals began from the attacking half, 43.4% from the defending half, while 52.6% goals began from central zone of the pitch. No differences were found between right and left zone, where in each zone 23.7% of goals were scored (Figure 2). Table 2 illustrates the sequence length of ball possessions that resulted in goal, where 61.84% of goals came from team possessions of four passes or less. On the other hand, a sizeable amount of goals were also preceded by passing sequence eight or more, which represented roughly 20% of them.

Regarding the type of feed, most goals were scored after a cross (43.7%) or a short pass (35.2%) which were significant differently ($\chi^2(4, 71) = 46.535, p < 0.001$) compared to feed from pass 10-20m (4.2%), shot (7.0%) and individual action (9.9%). Moreover, results presented that after the final pass, the scorer finished in most cases with one touch (63.7%) which was statistically different ($\chi^2(2, 71) = 28.930, p < 0.001$), secondly after controlling the ball (19.7%) and finally after controlling and dribbling before shooting (16.9%). Figure 3 shows the pitch zones from which goals were scored, where over 90% of goals were scored inside the penalty area ($F(1, 75) = 149.224, p < 0.001$), ($T(1, 25) = 12.216, p < 0.001$) and specifically from the area between penalty spot and goal zone (42.1%). Concerning the way that the goals were scored from the player, it was shown that instep shots accounted for 38.67%, inside of the foot for 32.% and header for 29.33%, whereas almost ½ of the goals (47.2%) were scored without any pressure

($\chi^2(1,72) = 0,222, p=0.637$) from defending players.

As expected, most of the goals were scored from strikers (41.3%) and wingers (29.3%), whereas midfielders (20%) and defenders (9.3%) had diminished percentages. Finally, Figure 4 shows the goal zones where the goals were ended.

DISCUSSION

The aim of the study was to investigate the factors associated with goal scoring patterns in football, taking into consideration a broader range of performance indicators. Firstly, it was presented that goals scored were not time dependent. Although no statistical difference was observed, more goals scored in the second half of the matches, while 15min period analysis revealed that more goals were scored in the beginning and in the end of the second half. Game period has been suggested as one of the factors that influence team performance (10) and the majority of papers in the literature are in agreement with the present study. In this way, Kirkendall and his colleagues (28) found that goals were most common at the start of the second half and the end of the game in World Cup 1998. Moreover, Abt, Dickson and Mummery (1) observed an upward trend in the number of goals scored as time progressed in 703 matches played during four seasons of the Australian National Soccer League. The highest percentage of goals was scored in the last 5-minute period of each half (41st-45th min. and 86th -90th min.). Armatas and Yiannakos (3) verified that in 2006 FIFA World Cup matches the greatest number of goals was scored between the 75th and 90th minutes, while Yiannakos and Armatas (51) in their study for Euro 2004 found that significant more of goals were scored in second half.

The results of the present study could be attributed in tactical and physiological factors. In a recent study, Pratas, Volossovitch and Ferreira (39), found that teams perform significantly fewer direct plays in the first half and make significantly more shots in the second half of Portuguese league matches. One reason could be that players consider rapid movements with the ball to involve risk and therefore attempt less such actions during the first half, when the match result is not yet decided (10). Additionally, Reilly (43) reports that play may become urgent towards the end of match as teams chase a result, thus players are more willing to take greater risks towards the end of a match in order to affect an outcome (1). It is also possible that the losing team pushes players forward in order to create scoring opportunities, thereby scoring themselves or conceding further goals (44).

Several studies have reported a decrease in physical performance in the second half of matches and explained that this is due to physical fatigue (8, 40). According to Mohr et al. (33), the time – motion analyses and performance measures during match-play, fatigue or reduced performance seem to occur at three different stages in the game: a) after short-term intense periods in both halves; b) in the initial phase of the second half; and c) towards the end of the game. Moreover, it has been observed that the amount of high-intensity running is reduced in the final 15 min of a top-class football match (32) and that jumping, sprinting, and intermittent exercise performance is lowered after versus before a football match (33).

Preparing for a team to last for 90 minutes does not reduce the need to be alert right from the kickoff. It is a terrible setback to concede a goal in the first minute and, of course, extreme boost for the scoring team. The results of the present study highlighted the significance of the first goal to the match outcome; it was shown that when a team scored first, it won 75.9% of the matches. In previous studies it was presented that teams which scored first went on to win 73.5% in 1994 World Cup tournament, 59.4% of the matches where there was a winner in 2002 World Cup (34) and 73.21% in 2002 World Cup 2006 (3). Research on psychological momentum agrees with the present results. Moreover, it has shown that early success in a competition (e.g. scoring first) is a strong predictor of outcome in football (26, 37).

Performance after the first goal is controlled by two responses: firstly how well the team which scores the first goal retains its advantage and secondly how well the team which concedes the first goal counters its disadvantage (35).

Thus when leading, it is important to keep pressing for more. In training, therefore, a coach should subject a team to a situation of playing while in the lead so the players develop the mental strength that is needed to sustain a lead. This can be done through simulated handicapped play, where a team starts a game knowing that they are either ahead by one or trailing by one or two goals. This will enable the coach to assess the reaction of the players in the different situations (35).

In relation to type of play, most goals scored after open play (72.4%) and almost 1/3 after set plays (27.6%). This coincides with the results of James, Mellalieu and Taylor (23), Lago and Martin (30) and Taylor, James and Mellalieu (48) who showed that about 25%-40% of all goals have been scored on set plays. Our findings provide further evidence for the importance of practicing set plays because of their potential productivity, despite their relatively low occurrence in comparison to open play opportunities. Concerning the style of play that was used to score a goal, the majority of goals were scored after positional attacks (60%) but significant percentage was scored after counter attack (20%) and direct play (20%).

In a recent study, that examined the goal scoring patterns in Euro 2004 presented similar results (positional attacks: 44.1%, counter attacks: 20.3%, set plays: 35.6%) (51). Also, according to Dufour (14) 88% of the goals in the World Cup Tournament in 1990 came from an organized offense and 12% from a counter-attack. A more recent study (4) found that despite the fact that frequency of counter-attacks in modern football is low (4.9%), they are considered to be more effective than organized offense moves; the following percentages are indicative and support such a proposition: 16.9% of counter-attacks lead to a goal whereas only 11.1% of positional attacks are successful.

Concerning the set play's effectiveness, the data collected in present study are similar to those found by other authors and allow us to assert that corner kick (47.6%) and free kick (33.3%) are the plays that are performed on set pieces which result in the highest number of goals. Thus, free kicks and corner kicks have been shown to be the greatest source of goals, producing 46% and 13% of goals respectively at the 1994 World Cup (46) and 50% and 47.6% at the 1998 competition (15) and 33.3% and 26.7% at the 2006 competition (5).

Regarding the initiation zone of the attack, it was presented that most goals began from the attacking half while no differences were found between right and left zone. Jankovic and his colleagues (24) studied Euro 2008 and presented that 28.8%, 38.3% and 31.2% of goals initiated from the defensive third, middle third and attacking third respectively. Moreover, recent studies presented that in the 5 minutes before a goal was scored, the scoring team had significantly more possession in the middle and attacking thirds compared to the half average (41, 45). The authors suggested a definite shift and territorial advantage for the team about to score in the 5 minutes leading to the goal.

Some studies (9, 42) showed that goals occur when teams played with direct method. Particularly, Reep, and Benjamin (42) found that approximately 80% of goals resulted from a sequence of three passes or less. Moreover, Hook and Hughes (17) found that successful teams utilized longer possessions than unsuccessful teams in Euro 2000, although no significant differences were found in the number of passes used in attacks leading to a goal. These authors suggested that keeping the ball for longer durations was indicative of success. However, in a similar study, Stanhope (47) found that time in possession of the ball was not indicative of success in the 1994 World Cup. Jones, et al. (27) showed that successful teams in the English Premier league typically had longer possessions than unsuccessful teams, irrespective of the match status (evolving score). The results of the present study indicated that most goals (61.84%) resulted from a sequence of four passes or less; however 20% of goals resulted from a passing sequence of eight or more. Consequently, with the evolution of football, other styles of play have emerged, with more sequence of passes before the shot, i.e., teams try to find the best moment to attack with efficacy, maintaining the ball and the control of the game, waiting for the mistake or equilibrium break of the

opponent (13). Therefore, there is probably not a principle that determines that ball possessions with few or many passes provide more or less shots to goal, once both ways can create kicks or headers conditions, depending on the match situations.

As proposed from previous resources (3, 50, 51), our findings showed that most goals were scored when the type of feed was from a cross (43.7%). Griffiths (16) found that France, who was at that time considered the best international team in the World, created significantly more crosses than their opponents, while Lago et al. (29) proposed that crosses is one of the variables that better differentiate winning, losing and drawing teams in a global way. Theis (49) supported that wing offensive play with long passes is a primary offensive tactic in order to face defending deep. Often, defenders used to commit errors in such cases because they observe the player that has the possession of the ball and not the unmarked players. Therefore, training should focus on improving long passes inside penalty area, preparing players to have the ability to score goals after an air ball but also defend better it such situations (3).

The results of the present study supported previous findings that more than 90% of goals were scored from within the penalty area. The current value is similar to the 90% observed by Olsen (36) for the 1986 World Cup, 87% by Wright and his colleagues (50) for English Premier League and 83.4% by Armatas and Yiannakos (3) for the 2006 World Cup. Moreover, it was presented that there seems to be an 'effective' area inside the penalty from which 42.1% goals scored. Hughes and Franks (20) have previously identified the key objective of getting the ball into a 'prime target area', which was defined as the area that consists of the length of the six-yard box and is from the penalty spot to within two yards inside the six-yard box. Hughes (18) stated that about four goals in every five scored from crosses are hit from this area, while Carling et al. (12) found that 37% were scored from the same area in the 2002 World Cup. The increased rate of recurrence of offensive actions and effectiveness inside the penalty area is justified by the fact that this area is nearer to goalpost and outside of the goalkeeper's reaches (31). Thus, training should be focused on drills that contain shots inside the penalty area under match conditions but also on defensive response from defenders and goalkeeper.

With relation to the goal scorer, we found that 41.3% and 29.3% of goals were scored by strikers and wingers respectively. In a recent study, Acar and his colleagues (2) concluded that forward players scored 57% of goals in the 2006 World Cup while Mitrotasios and colleagues (31) studied Greek SuperLeague and concluded that strikers scored 47.7% of goals. In the present study, strikers and wingers were discriminated because of the massive usage of the wings due to systems of play with winger players (1-4-2-3-1 and 1-4-3-3). Moreover, in most cases the player scored the goal with one touch (63.7%) and almost ½ of the goals were scored without any pressure from defenders, however the above results could not be comparable because of the lack in literature.

CONCLUSIONS

The main objective of this study was to analyze the performance parameters of the most successful teams in Europe which competed in the final tournament of the European Championship in 2012, in order to give clues for specific tactical issues and training guidelines that coaches and competitive players need to carry out to be successful. The results demonstrate that top European teams score 1/4 of goals after set plays, initiate attacks from offensive half and there is not a principle that determines that ball possessions with few or many passes provide more goals. Moreover, there seems to be a critical zone inside the penalty area from which most goals are scored, crosses identified as a relevant factor for team goals and almost ½ of the goals were scored without any pressure from defenders.

APPLICATIONS IN SPORT

The present study presented values that can be used as normative data to design and evaluate practices and matches for football performance in a collective way. Likewise, it will allow coaches to design training exercises similar to the actual competition and adapt the game style with regard to match status. Moreover, coaches can use this information to establish objectives for players and teams. These objectives can be oriented in a positive way (things or number of things to try to achieve) or in a negative way (things or number of things to try to avoid) with a special reference to the offensive or defensive play.

The limitation of the present study is that it is based on one specific championship (2012 European football championship). The need for constant record and evaluation of football characteristics is prevalent, since it presents continuous evolution; thus further research concerning goal analysis should include different competitions that involve other contextual factors (game location in a balanced schedule, continental differences, match status, etc.).

REFERENCES

1. Abt, G.A., Dickson, G., & Mummery, W.K. (2002). Goal scoring patterns over the course of a match: An analysis of the Australian National Soccer League. In W. Spinks, T. Reilly, & A. Murphy (Eds.), *Science & Football IV* (pp. 107-111). London: Routledge.
2. Acar, M., Yapicioglu B., Arikan, N., Yalcin, S., Ates, N., & Ergun M. (2009). Analysis of goals scored in 2006 World Cup. In T. Reilly, & F. Korkusuz (Eds.), *Science & football VI* (pp. 235-242). Oxon: Routledge.
3. Armatas, V., & Yiannakos, A. (2010). Analysis and evaluation of goals scored in 2006 World Cup. *Journal of Sport & Health Research*, 2, 119-128.
4. Armatas, V., Yiannakos, A., Ampatis, D., & Sileloglou, P. (2005). Analysis of the successful counter-attacks in high-standard soccer games. *Inquiries in Sport & Physical Education*, 3, 187-195.
5. Armatas, V., Yiannakos, A., Papadopoulou, S., & Galazoulas, Ch. (2007). Analysis of set plays in the 18th World Cup in Germany. *Physical Training*, October 2007.
6. Armatas, V., Yiannakos, A., & Sileloglou, P. (2007). Relationship between time and goal scoring in soccer games: Analysis of three World Cups. *International Journal of Performance Analysis in Sport*, 7, 48-58.
7. Bangsbo, J., & Peitersen, B. (2000). *Soccer systems and strategies*. Champaign, IL: Human Kinetics.
8. Barros, R., Misutal, M., Menezes, R., Figueroa, P.J., Moura F.A., Cunha, S.A., Anido, R., & Leite, N. (2007). Analysis of the distances covered by first division Brazilian soccer players obtained with an automatic tracking method. *Journal of Sports Science & Medicine*, 6, 233-242.
9. Bate, R. (1988). *Football chance: Tactics and strategy*. In T. Reilly, A. Lees, K. Davids, & W.J. Murphy (Eds.), *Science & Football* (pp. 293-301). London: E. & F.Spon.
10. Carling C. (2010). Analysis of physical activity profiles when running with the ball in a professional soccer team. *Journal of Sports Sciences*, 28, 319-26.
11. Carling, C., Reilly, T., & Williams, A. (2009). *Performance assessment for field sports*. London: Routledge.
12. Carling, C., Williams, A., & Reilly, T. (2005). *The handbook of soccer match analysis*. London: Routledge.
13. Clemente, F., Couceiro, M., Martins, F., & Mendes, R. (2012). Team's performance on FIFA U17 World Cup 2011, Study based on notational analysis. *Journal of Physical Education & Sport*, 12, 13-17.
14. Dufour, W. (1993). Computer-assisted scouting in soccer. In T. Reilly, J. Clarys, & A. Stibbe (Eds.), *Science & Football II* (pp. 160-166). London: E. & F. Spon.
15. Grant, A.G., Williams, A.M., & Reilly, T. (1999). Analysis of the goals scored in the 1998 World

Cup. *Journal of Sports Sciences*, 17, 826-827.

16. Griffiths, D.W. (1999). An analysis of France and their opponents at the 1998 soccer World Cup with specific reference to playing patterns (Unpublished master's thesis). University of Wales Institute, Cardiff, Wales.
17. Hook, C., & Hughes, M. (2001). Patterns of play leading to shots in Euro 2000. In M. Hughes, & I. Franks (Eds.), *Performance analysis of sport V* (pp. 295-302). Cardiff: UWIC.
18. Hughes, M. (1996). Notational Analysis. In T. Reilly (Ed.) *Science & Soccer* (pp.343-362). London: E. & F. Spon.
19. Hughes, M., & Bartlett, R. (2002). The use of performance indicators in performance analysis. *Journal of Sports Sciences*, 20, 739-754.
20. Hughes, M., & Franks, I. M. (2004). Notational analysis - a review of the literature. In M. Hughes, & I. Franks (Eds.), *Notational analysis of sport: Systems for better coaching and performance in sport* (pp. 99-107). Abingdon: Routledge.
21. Hughes, M., & Franks, I. (2005). Analysis of passing sequences, shots and goals in soccer. *Journal of Sports Sciences*, 23, 509-514.
22. Hughes, M., Robertson, K., & Nicholson, A. (1988). Comparison of patterns of play of successful and unsuccessful team. In T. Reilly, A. Lees, K. Davids, & W. Murphy (Eds.), *Science & Football* (pp. 373-376). London: E. & F. Spon.
23. James, N., Mellalieu, S., & Taylor, J. (2004). Notational analysis of corner kicks in English premier league soccer. In T. Reilly, D. Araujo, & J. Cabri (Eds.), *Science & football V* (pp. 225-230). London: E. & F. Spon.
24. Jankovic, A., Leontievic, B., & Pasic, M. (2009). Analysis of efficient attacks in the 2008 European football championship. *Physical Culture*, 37, 180-184.
25. Jinshan, X., Xiakone, C., Yamanaka, K., & Matsumoto, M. (1993). Analysis of the goals in the 14th World Cup. In T. Reilly, J. Clarys, & A. Stibbe (Eds.), *Science & Football II* (pp. 203-205). London: E. & F. Spon.
26. Jones, M., & Harwood, C. (2008). Psychological momentum within competitive soccer: Players' perspectives. *Journal of Applied Sport Psychology*, 20, 57-72.
27. Jones, P., James, N., & Mellalieu, S. (2004) Possession as a performance indicator in soccer. *International Journal of Performance Analysis in Sport*, 4, 98-102.
28. Kirkendall, D., Dowd, W., & DiCicco, A. (2002). Patterns of successful attacks: a comparison of the men's and women's World Cup. *Revista de Fútbol y Ciencia*, 1, 29-36.
29. Lago, C., Lago, J., Dellal, A., & Gomez, M. (2010). Game-related statistics that discriminated winning, drawing and losing teams from the Spanish soccer league. *Journal of Sports Science & Medicine*, 9, 288-293.
30. Lago, C., & Martin, R. (2007). Determinants of possession of the ball in soccer. *Journal of Sports Sciences*, 25, 969-974.
31. Mitrotasios, M., Sentelidis, T., & Sotiropoulos, A. (2006). The systematic observation and analysis of the scored goals in soccer as a base to coaching in the training and the match. *Hellenic Journal of Physical Education and Sport Science*, 60, 58-74.
32. Mohr, M., Krstrup, P., & Bangsbo, J. (2003). Match performance of high-standard soccer players with special reference to development of fatigue. *Journal of Sports Sciences*, 21, 519-528.
33. Mohr, M., Krstrup, P., & Bangsbo, J. (2005). Fatigue in soccer: a brief review. *Journal of Sports Sciences*, 23, 593-599.
34. Njororai, W. (2004). Analysis of the goals scored at the 17th World Cup Soccer Tournament in South Korea- Japan 2002. *African Journal for Physical, Health Education, Recreation & Dance*, 10, 326-332.

35. Njororai W. (2007). Scoring goals. What the coach should know about the timing. *Soccer Journal*, 11/12: 34-36.
36. Olsen, E. (1988). An analysis of goal scoring strategies in the World Championships in Mexico. In T. Reilly, A. Lees, K. Davids, & W. Murphy (Eds.), *Science & Football* (pp. 373-376). London: E. & F. Spon.
37. Olsen, E., & Larsen, O. (1997). Use of match analysis by coaches. In T. Reilly, J. Bangsbo, & M. Hughes (Eds.), *Science & football III* (pp. 209-220). London: E. & F. Spon.
38. Palomino, F., Rigotti, L., & Rustichini A. (2000). Skill, strategy and passion: an empirical analysis of soccer. mimeo, Tilburg University. Retrieved from: <http://www.pitt.edu/~luca/Papers/soccer.pdf>
39. Pratas, J., Volossovitch, A., & Ferreira, A.P. (2012). The effect of situational variables on teams' performance in offensive sequences ending in a shot on goal. A Case Study. *The Open Sports Sciences Journal*, 5, 193-199.
40. Rampinini, E., Bishop, D., Marcora, S.M., Ferrari Bravo, D., Sassi, R., & Impellizzeri, F.M. (2007). Validity of simple field tests as indicators of match-related physical performance in top-level professional soccer players. *International Journal of Sports Medicine*, 28, 228-235.
41. Redwood-Brown, A. (2008). Passing patterns before and after goal scoring in FA Premier League soccer. *International Journal of Performance Analysis in Sport*, 8, 172-182.
42. Reep, C., & Benjamin, B. (1968). Skill and chance in association Football. *Journal of the Royal Statistical Society*, 131, 581-585.
43. Reilly, T. (1996). Motion analysis and physiological demands. In T. Reilly, J. Bangsbo, & M. Hughes (Eds.), *Science & football III* (pp. 65-81). London: E. & F. Spon.
44. Reilly, T. (1997). Energetics of high intensity exercise (soccer) with particular reference to fatigue. *Journal of Sports Sciences*, 15, 257-263.
45. Ridgewell, A. (2011). Passing patterns before and after scoring in the 2010 FIFA World Cup. *International Journal of Performance Analysis in Sport*, 11, 562-574.
46. Sousa, T., & Gargantua, J. (2001). The importance of set-plays in soccer. In M. Hughes, & F. Tavares (Eds.), *Proceedings of the IV World Congress of Notational Analysis of Sport*, 22-25 September 1998 (pp.53-57). Faculty of Sport Sciences & Physical Education, University of Porto, Portugal.
47. Stanhope, J. (2001). An investigation into possession with respect to time, in the soccer World Cup 1994. In M. Hughes (Ed.), *Notational Analysis of Sport III* (pp. 155-162). Cardiff: UWIC.
48. Taylor, J., James, N., & Mellalieu, S. (2004). Notational analysis of corner kicks in English premier league soccer. *Journal of Sports Sciences*, 22, 518-519.
49. Theis, R. (2001). Torchancenerarbeitung im Spitzenfußball. In Lange, P. (Ed.), *Leistungsdiagnostik und Coaching im Fußball* (pp. 59-67). Hamburg: Czwalina.
50. Wright, C., Atkins, S., Polman, R., Jones, B., & Lee S. (2011). Factors associated with goals and goal scoring opportunities in professional soccer. *International Journal of Performance Analysis in Sport*, 11, 438-449.
51. Yiannakos, A., & Armatas, V. (2006). Evaluation of the goal scoring patterns in European championship in Portugal 2004. *International Journal of Performance Analysis in Sport*, 6, 178-188.