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# Analysis of goals scored in European Championship 2012

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## ABSTRACT

Michaildis Y, Michaildis C, Primpa E. Analysis of goals scored in European Championship 2012. *J. Hum. Sport Exerc.* Vol. 8, No. 2, pp. 367-375, 2013. The purpose of the present study was to evaluate goal scoring characteristics of European Championship 2012 and the sample consisted of all the games of the final phase of the organization (N=31). The statistical analysis of the results was conducted with the use of the non parametric chi square test. According to the results of the present study the short pass (<10m) was the basic final attacking action in most of the goals (18.4%) when the long pass was at the second place (>10m) (17.1%) and the individual action at third place (14.5%). Most of the goals (40.8%) were scored with shot and then with header (27.6%) and with the inner part of the foot (21.1%). Also the most of the goals achieved through the penalty box (71.1%) (p<0.001). Finally when a team scored the first goal was the winner of the match (70.97%). The findings indicate to the coaches to use a lot of offensive exercises with short and long passes. Also the most of exercises have to locate inside the penalty box. As concerns the impact of the first goal was strong for the match outcome, so the teams have to be prepared to deal with a situation that the opponent scored the first goal. **Key words:** SOCCER, GOAL SCORED, GOAL EVALUATE, PERFORMANCE INDICATORS IN SOCCER.

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## INTRODUCTION

It is known that feedback plays an important role in the learning process. It helps the person to correct his mistakes and to be more effective. With the same way feedback helps soccer players to improve their performance. The soccer player after an action knows through internal feedback if the action was right or wrong. At the same time the comments of coach provide additional feedback information to the athlete about his energy. The last decades, the teams use the video feedback that helps the soccer players to improve themselves and also helps the coaches in the organization of the training sessions.

More specifically the systematic monitoring and analysis of a game by using video and computers is the major method to test the performance of the soccer players and the performance of the teams (Lames, 1994; Singer & Willimczik, 2002). According to Czwalina (1992) the team sports systematic observation distinguished in two kinds: a) the observation of the behaviour of individual match selected players (e.g. control techniques, movements) and b) the observation of the performance of a group of players or all the team (e.g. kind of system, success of goals).

Without questioning the importance of the qualitative analysis of various parameters of the matches made by coaches and specialists in soccer, it is clear that this kind of observations is not complete. The development of technology and the soccer programs that have been created, enable coaches to receive information in live time about the performance of their teams and opponent's teams. This fact helps coaches to give appropriate instructions to their players even at half time of the match (Hohmann & Rommel, 1994)

Among the many technical and tactical aspects of players behaviour, the goals are the most studied. It is true that the goal is the key of success for the teams (Cachay & Thiel, 2000) and therefore its analysis in all matches in a big soccer tournament (European championship, world cup) allows for multiple assessments. These results used by the coaches with the view of producing more effective training sessions about their teams. Additional analyses consecutive tournaments and compare the results can indicate trends in soccer evolution over time (Lottermann, 2000; Theis, 2000). In the literature appear several studies that related to the achievement of goals in various soccer tournaments or championships (Olsen, 1988; Garganta et al., 1997; Jinshan et al., 2002; Michailidis et al., 2004; Yiannakos & Armatas, 2006). However, it is necessary a continuously recording of these elements because tactics in soccer always change (Yiannakos & Armatas, 2006).

The aim of the present study was to identify and evaluate the characteristics of goals achieved at the European Championship 2012. Specifically, it was examined the timing of achieving the goal, the way in which the goal was achieved, the action that preceded the goal, the area from which the goal was scored and the first's goal influence in match's outcome.

## METHODS

We studied all the soccer matches (thirty one, 31) from the final phase of the Euro 2012 in which a total of seventy six (76) goals have been achieved without including the goals achieved during penalty process.

The matches were analyzed through systematic observation according to Lames (1991, 1994) and Singer & Willimczik (2002). For the recording, was used a game observation leveled board which was based on

past studies (Loy, 1992, 1995; Theis, 1992a, 1992b, 2000). Every game has been analyzed by two experienced observers who were specially trained for the accurate and reliable data recording.

The soccer elements that analyzed were:

- The number of goals achieved in each half including the extra time.
- The number of goals achieved per 15 minutes (1-15, 16-30, 31-45, 1st extra time, 45-60, 61-75, 76-90, 2nd extra time).
- The ways that the goals achieved (shot, "place" or inner part of the foot, header, another place of the body, own goal, penalty).
- First goal impact on the game outcome for the scoring team (win, draw, defeat).
- The action that preceded the goal (pass <10m, pass >10m, own action, header, foul, cross from the right, cross from the left, corner from the right, corner from the left, defender rebuttal, defender mistake, goalkeeper rebuttal, goalkeeper mistake, goalpost, direct set play like foul or penalty).
- Area from which the goal was scored (goal box, penalty box, outside the penalty box).

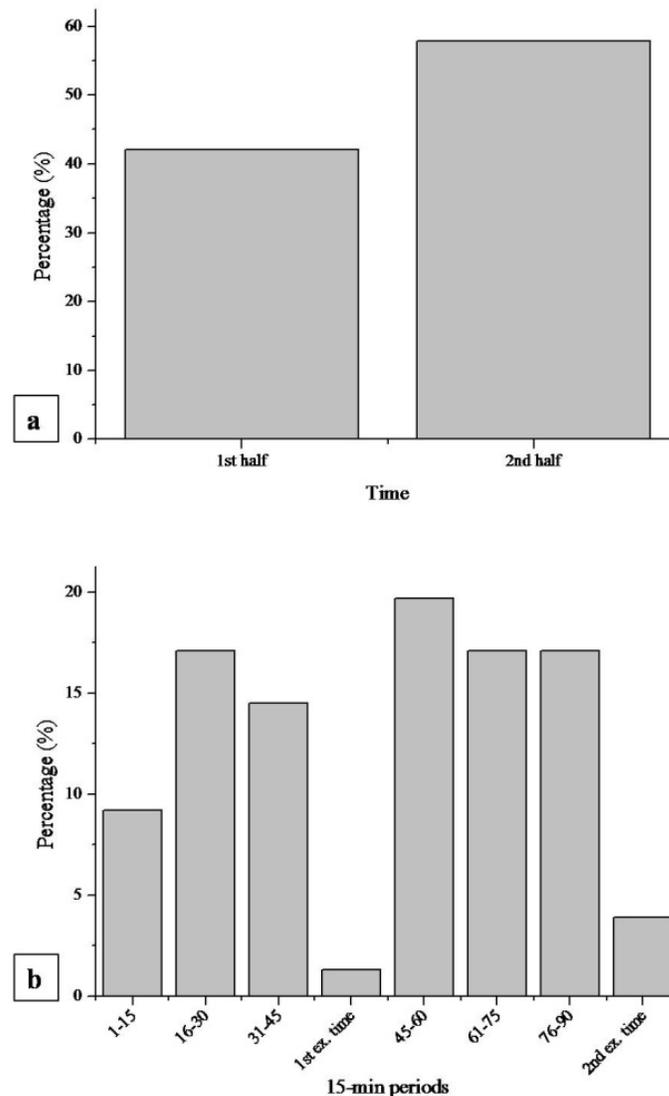
From the results of this study can be extracted important information for coaches and researchers of soccer about the way that the goals achieved. This will help them to improve the offensive and defensive tactics of their teams.

#### *Statistical analysis*

All data were analyzed using the SPSS 16.0. statistical package for PC (Lead Technologies Inc, USA). Non parametric chi-square ( $\chi^2$ ) analysis was used to determine the statistically significant differences and the level of significance was set at  $p < 0.05$ .

## **RESULTS**

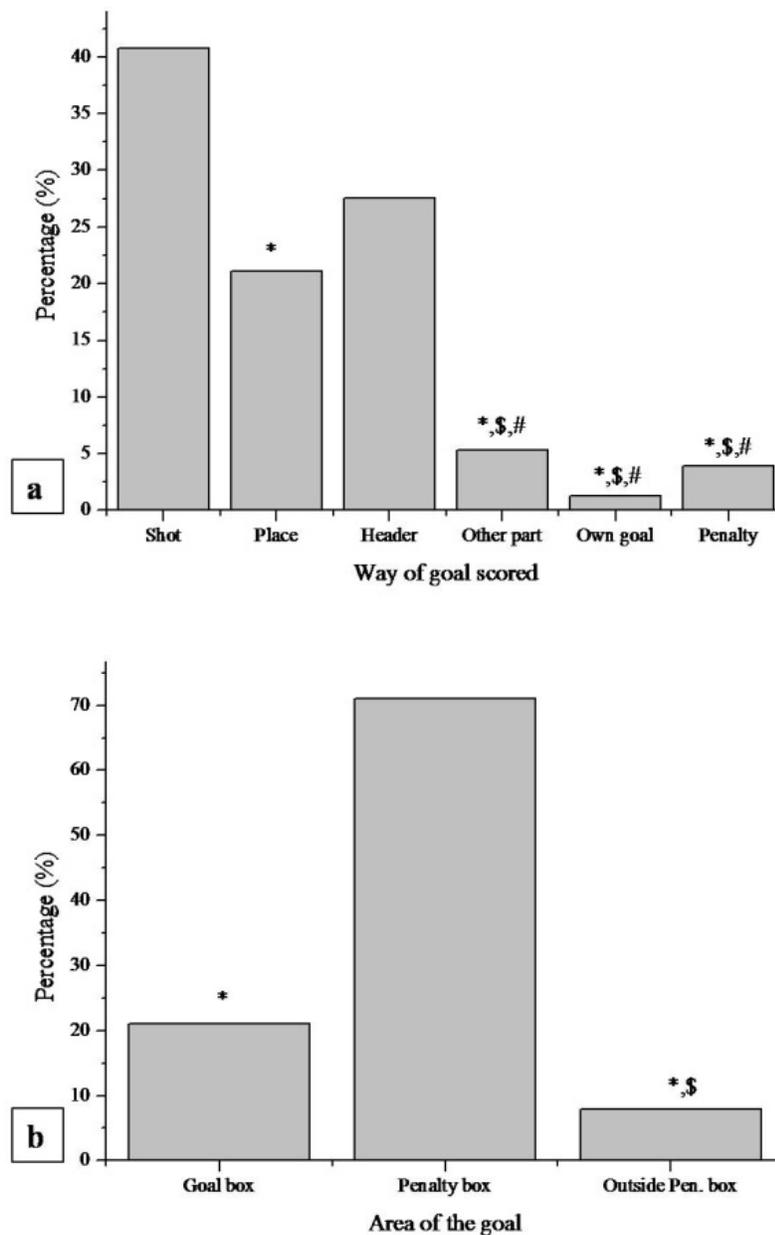
In the second half the teams scored more goals than the first half, but no statistical differences were observed (42.1% vs. 57.9%,  $p > 0.05$ ) (Figure 1a). 15-min analysis of goals showed a similar percentage of scoring in all periods of 15 minutes with exceptions of the periods of extra time of the half's and the first 15 minutes period (Figure 1b).



**Figure 1.** Scoring frequency per 45 minutes and b. per 15 minutes periods.

The statistical analysis for the way that the goals scored showed significant differences. The analysis presented that 40.8% of goals scored from shot, 27.6% from the inner part of the foot ("place"), 21.1% from header, 5.3% from other part of the body, 1.3% from own goal and 3.9% from penalty (Figure 2a). Data analysis showed statistical differences between the first three groups and all the others. Also at the first three groups statistical differences observed between the goals scored after a shot versus the goals scored with the "place" ( $X^2=4.787$ ,  $p<0.05$ ).

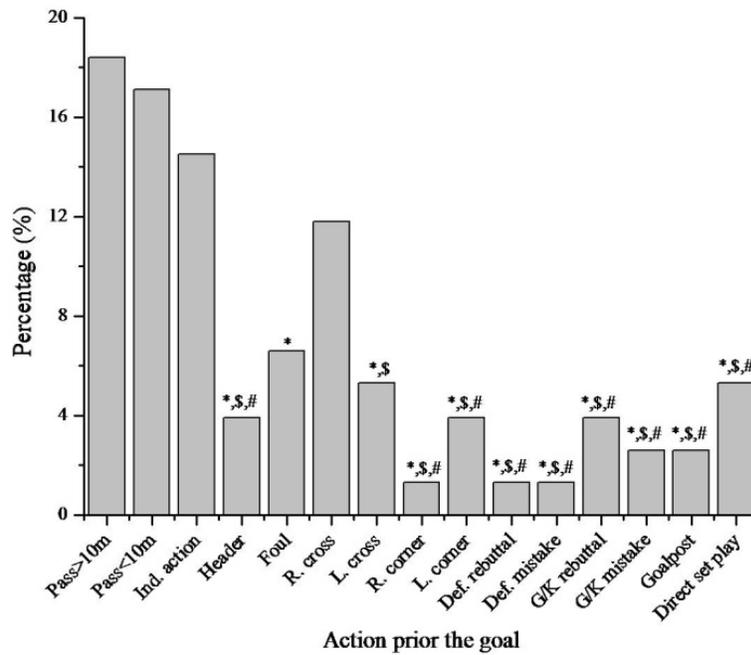
About the area of the field where the goals achieved, the findings indicate that 71.1% of the goals were scored inside the penalty box, 21.1% inside the goal box and 7.9% outside the penalty box (Figure 2b). Statistical analysis showed that there are significant differences between goals scored inside the penalty box versus goals scored inside goal box ( $X^2=20.629$ ,  $p<0.001$ ), goals scored inside the penalty box versus goals scored outside the penalty box ( $X^2=38.4$ ,  $p<0.001$ ), as well as the goals scored inside the goal box versus the goals scored outside the penalty box ( $X^2=4.545$ ,  $p<0.05$ ).



**Figure 2. Way the goal scored.**

\* denotes significant ( $p < 0.05$ ) difference with shot; \$ denotes significant ( $p < 0.05$ ) differences with "place"; # denotes significant ( $p < 0.05$ ) differences with header. b. Goal scoring area. \* denotes significant ( $p < 0.05$ )

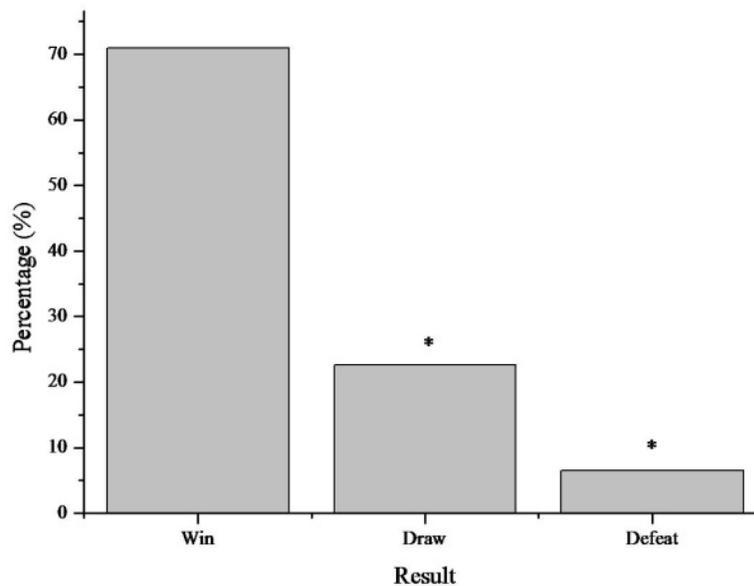
The most goal scored after a long pass (>10m) (18.4%). At the second place were the goals that achieved after a short pass (<10m) (17.1%) and then after an individual action (14.5%). The next bigger percentage observed to the goals that scored after a cross from the right (11.8%). All other actions had rates lower than 7% (Figure 3). Data analysis showed for the above kinds of actions not statistically significant differences between them. More specifically the statistical indices for the short pass versus the long pass were  $X^2 = 0.167$  ( $p > 0.05$ ) and for the long pass versus individual action were  $X^2 = 0.391$  ( $p > 0.05$ ).



**Figure 3.** Actions prior to goal scoring.

\* denotes significant ( $p < 0.05$ ) difference with long pass (>10m); \$ denotes significant ( $p < 0.05$ ) differences with short pass (<10m); # denotes significant ( $p < 0.05$ ) differences with individual action.

As for the impact of the first goal on match outcome, data analysis showed that the team that scored the first goal also won the match (70,97%) and presented statistical significant difference versus draw ( $X^2=7.759, p < 0.01$ ) and defeat ( $X^2=16.667, p < 0.001$ ) (Figure 4).



**Figure 4.** First goal impact on match outcome.

\* denotes significant ( $p < 0.05$ ) difference with win.

## DISCUSSION

As mentioned above the teams scored more goals at the second half but the statistical analysis that followed did not show significant differences between the two half's. Also no significant differences observed in periods of 15 minutes. On the contrary observed a similar frequency of goals in all periods except the first period and the delays of the half's. From the literature it becomes obvious that there are studies with results similar to ours where there was no significant correlation between the time and the number of the goals that achieved (Jinshan et al., 1993; Michailidis et al., 2004). However in other studies found significant association of goals with time to achieve them (Abt et al., 2002; Yiannakos & Armatas, 2006; Armatas et al., 2007a, 2007b; Armatas & Yiannakos, 2010).

The fatigue that affect athletes conditioning and concentration is one reason that can explain the increased numbers of goals in the second half compared to first half (Bangsbo, 1994). According to Reilly (1996) defensive players are showing stronger signs of fatigue which favors the efficacy of offensive players. Also because it is a competition where after the phase of groups, the teams' play knocked out matches and the players with the coaches in the last minutes of the game risking for a favorable outcome (Reilly, 1997; Abt et al., 2002). This study found a similar frequency of scoring goals (11-15 goals) in all 15 minutes periods with exception for extra time periods of the half's and the first 15 minute period. Of the four goals scored in the half's extra time only one play crucial role for the next phase of tournament. The first period of 15 minutes usually used for identified the opponent. So the two teams play guardedly and this may be the reason that in this period scored fewer goals than the other 15 minute periods. In the present study the same frequency of goals in other periods of 15 minutes indicate that players were continuously focused on the game and did not seem to be affected by fatigue.

The goals in Euro 2012 were achieved mainly by shot, header and "place". However in previous studies the three main ways of achieving the goals appeared in a different order. First one was the "place", second one the shot and third the header (Bauer & Loy, 1989; Lottermann, 2000; Wedegartner, 2004). It is true that the "place" is used for short distances and actions required accuracy. But most players of this level can use the shot with the same accuracy and efficiency. Also the fact that the header was the second way that scored the most goals indicates the tactics of the teams. For example, when a team has to face up a deep defense, has to use wing offensive play with crosses and long passes (Theis, 2001). This may be is one reason that achieved enough goals by the head. However, to confirm the above should be made a study about the defensive tactics of the teams in Euro 2012.

In the present study about the area where the final effort was materialized concerned, results indicate that 71.1% of goals achieved through the penalty box, 21.1% through the goal box and the remaining 7.9% outside the penalty box. Similar results have been reported in previous studies (Olsen, 1988; Roberson & Nicholson, 1988; Dufour, 1993; Michailidis et al., 2004; Armatas & Yiannakos, 2010). This is expected since the area is very close to the goalpost but far enough away from the goalkeeper (Michailidis et al., 2004). These findings illustrate that the players in training have to familiarize themselves with the scoring from various locations within the penalty box under competitive conditions and to a lesser degree in actions from outside the penalty box.

In this tournament the most used actions prior a goal were the long pass >10m (18.4%), the short pass > 10m (17.1%), the individual action (14.5%) and the cross from right (11.8%). It seems that the two types of pass (<10m and >10m) were used almost equally. This finding does not agree with previous research that became in championships and world cups in which the most important action before the goal was the long

pass but with big differences with the small pass (Hughes, 1990; Saltas & Ladis, 1992; Jishan et al., 1993; Armatas et al., 2010). In our study the rate of the goals came after individual action was lower than the rates reported in previous studies (22% Saltas & Ladis, 1992, 17.1% Yiannakos & Armatas, 2006). These differences may be due to the quality of studied games and the improvement of the defensive tactics.

The last variable that studied was the impact of the first-goal on the match outcome for the team that scores it. From the results observed that when a team scored the first goal manage to get the victory in approximately 71%. This occurred both in the group matches and knocked out matches. Similar results mentioned for the World Cup 2006 by Armatas & Yiannakos (2010) and for the Greek championship by Armatas et al. (2009). The scoring of a goal increases the self-confidence of the players and their general performance (Theis, 1992a). Also probably after achieving a goal the coaches change their tactics and give more defensive orientation in their team.

## CONCLUSIONS

The results of this study can help coaches to design their training sessions and help their teams to be more effective. Specifically the players have to be focused throughout the game. Also the training should focus on scoring through the penalty box and from different locations. The players have to become able to score easily with the "place", shot and head. Finally, the coaches when design a training session have to reproduce competitive exercises where the players prior the goal have to use short and long passes and individual actions.

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