

# The influence of match status on attacking patterns of play in elite soccer teams

## *A influência do resultado momentâneo do jogo nos padrões de ataque em equipes de Futebol de elite*

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**Abstract** – The attacking performance in elite soccer is a complex process that is influenced by several situational variables, such as match status. The objective of this study was to investigate the influence of match status on the configuration of attacking patterns of play performed by elite soccer teams based on the analysis of matches played by the semi-finalists of the 2010 FIFA World Cup. We observed 28 matches, 7 per semi-finalist team of the 2010 FIFA World Cup, resulting in 1938 attacks, further ordered according to match status (winning, drawing or losing). The SoccerEye observational instrument, SoccerEye recording software (version 3.2), and SDIS-GSEQ analysis software (version 5.1) were used. The national teams of Germany, Netherlands and Uruguay showed more difficulty in scoring goals while losing the match, although they scored after a positive crossing or after a free kick committed by the opposing team. The national team of Spain tended to shoot into the opponent goal after short passing, in both losing and winning situations. We conclude that attacking patterns of play were influenced by match status in the 2010 FIFA World Cup, with the exception of Spanish national team, which tended to use an indirect style of play with no dependence on match status.

**Key words:** Behavior; Observation; Psychomotor performance; Soccer; Sports.

**Resumo** – O desempenho ofensivo de equipes de futebol de elite é influenciado por diversas variáveis situacionais como, por exemplo, o resultado momentâneo do jogo. O presente estudo teve como objetivo indagar a influência do resultado momentâneo do jogo na elaboração dos padrões ofensivos em futebol de elite, a partir da análise dos jogos das equipes semifinalistas do Campeonato do Mundo FIFA 2010. Foram observados 1938 ataques realizados pelas seleções semifinalistas do Campeonato do Mundo FIFA 2010 que, posteriormente, foram elencados de acordo com o resultado momentâneo do jogo: vitória, empate ou derrota. Utilizaram-se os softwares SoccerEye (versão 3.2) e SDIS-GSEQ (versão 5.1) para o registro e análise dos dados, respetivamente. As seleções nacionais da Alemanha, Holanda e Uruguai revelaram maior dificuldade em marcar gols quando se encontravam em desvantagem no marcador dos jogos disputados, conseguindo-os após cruzamento positivo ou infração às leis do jogo cometida pela equipe adversária. Por sua vez, a seleção nacional de Espanha tendeu a rematar à baliza adversária após passe curto, tanto em situação de derrotada como de vitoriosa. Os padrões ofensivos parecem ser influenciados pelo resultado momentâneo do jogo, com exceção para a equipa de Espanha, que utilizou um estilo de jogo indireto, independentemente do resultado momentâneo do jogo.

**Palavras-chave:** Comportamento; Desempenho psicomotor; Esporte; Futebol; Observação.

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## INTRODUCTION

The attacking performance in elite soccer is a complex process influenced by several situational variables<sup>1</sup>. In this respect, the behaviors of the players and teams involved in attacking patterns of play seem to strongly depend on the type of competition<sup>2</sup>, on game location, i.e. home/away factor<sup>3,4</sup>, on opponent quality<sup>3,5</sup> and on match status, i.e., when the teams are winning, losing or drawing<sup>6-9</sup>.

The strategic variation as a function of team match status was studied<sup>8</sup> in the 2003/2004 English Championship, with the data obtained indicating that the expression of the performance indicators “time of ball possession” and “areas of the field of play used” is influenced by the match status of the game. The study<sup>10</sup> of the 2003/04 Spanish championship confirmed that the time of ball possession is influenced by match status, by game location and by the characteristics of the team itself and of its opponent. Several studies<sup>3,7,11</sup> have pointed out that attacking patterns tend to be shorter when the opponent is top-level, and that the time of ball possession is longer when the teams are at a scoring disadvantage.

In turn, studies conducted on the 1998, 2002 and 2006<sup>12</sup> FIFA World Cups and on the Spanish League<sup>13</sup> have shown that the team that scores first has a greater probability of winning the game, and that the team playing at home is more likely to score first than its opponent. This confirms that match status conditions, and is conditioned by, different situational variables.

However, few studies have characterized and described the attacking patterns of play in terms of the match status of each game. Thus, the objective of the present study was to determine the influence of match status on the expression of attacking patterns in elite soccer teams based on the analysis of the games of the semi-finalist teams of the 2010 FIFA World Cup. The intention was to observe which semi-finalist team tended to denote a greater influence of match status. Based on the results obtained in the present study, the aim is to help coaches and other parties acting in soccer to prepare and direct the training and competition process by providing effective and up-to-date knowledge about the attack configurations that each match status tends to induce in the elite soccer game.

## METHODOLOGICAL PROCEDURES

### Study design

The observational design of a study guides the investigator in data collection, management and analysis, playing, by definition, a pivotal role in the observational methodology<sup>14</sup>.

According to specific taxonomy<sup>14</sup>, the present study belongs to quadrant IV, i.e., it is a nomothetic study (the 4 semi-finalist teams of the 2010 FIFA World Cup were analyzed), a follow-up study (the behaviors of the players and teams were recorded along 28 games), and a multidimensional study (an observation instrument supporting the combination of field formats and category systems was used)<sup>15</sup>.

## Participants

The FIFA World Championships involve the best teams, players and coaches and the results obtained in these competitions are highly valued due to the fact that the competitions are held at four year intervals<sup>16,17</sup>. On this basis, the successful teams of the 2010 World Cup were selected according to the definitions proposed in various studies<sup>18,19</sup>.

The study was approved by the Ethics Committee of the Sports Faculty of the University of Porto (CEFADE) (Protocol No. 010/2012). The seven games of each semi-finalist team of the 2010 World Championship ( $n_{total}=28$ ) were observed, corresponding to a total of 1938 attack sequences divided according to match status (winning: 671; drawing: 1117, and losing: 150) and to semi-finalist team (Germany: 442; Spain: 511; Netherlands: 481, and Uruguay: 504).

## Observation instrument

The SoccerEye<sup>20</sup> observational instrument was used, which consists of 80 exclusive and mutually excluding categories distributed according to 7 criteria that combine field format and a category system, namely: (1) Start of offensive phase/ball recovery; (2) Development of defence/attack transition state; (3) Progress of ball possession; (4) End of offensive phase; (5) Pattern of pitch space position (Figure 1); (6) Centre of game, and (7) Spatial pattern of interaction between teams<sup>16</sup>.

The first four criteria concern the behaviors of the players of the team under observation, while the fifth is a structural criterion that divides topographically the game field into 12 zones. The sixth and seventh criteria characterize the contexts of team interactions on a micro- and macro-scale, considering the opposition and cooperation relations among the players.



**Figure 1.** Pattern of pitch space position divided into 12 zones. DS: defensive sector; MDS: mid-defensive sector; MOS: mid-offensive sector; OS: offensive sector. Consult the Instrument SoccerEye<sup>20</sup>

## Recording Instrument

The offensive sequences were visualized and recorded using the SoccerEye<sup>22</sup> software (version 3.2, March 2013), which, among other functions, permits direct data exportation to the language of the SDIS-GSEQ analysis software<sup>23</sup>. Before recording the behaviors, the field zones and the contexts of

team interaction, the observer records the “match status” variable, which permits him to identify whether the result to be recorded occurs in a winning, drawing or losing situation.

## Procedure

The offensive sequences were observed and analyzed during the regulation game time and all situations with incomplete observation were excluded. The observation session ended whenever one of the confronting teams permanently remained in a situation of numerical inferiority, since the reduction of effective team number appears to influence the configuration of the game patterns.

## Quality of the data

The intraobserver data reliability was determined using the Cohen kappa index ( $\mathbf{K}$ )<sup>24</sup>. Thus, the same observer recorded the first 45 minutes of the final competition match (Spain vs. Netherlands) twice with an interval of 15 days. The  $\mathbf{K}$  values detected using the SDIS-GSEQ software (version 5.1)<sup>23</sup> were located within the 0.91 to 0.96 range, indicating that, according to the literature<sup>25</sup> ( $\mathbf{K}^3 0.75$ ), the results of the study were of high quality.

## Data analysis

Lag sequential analysis was performed using the SDIS-GSEQ software (version 5.1, 2011)<sup>23</sup>. This technique permits the investigation of the existence of stability in the succession of events above random probabilities<sup>26</sup> using the  $z$ -score ( $z > 1.96$ ;  $p < 0.05$ ). A retrospective analysis of the ten behaviors preceding the end of effective attacks was used to determine the diachronic associations between behaviors, showing that, the higher the  $z$  value, the stronger the associations between events. In the present study, we did not follow the standard rules proposed by the literature<sup>27</sup> to determine the maximum lag.

## RESULTS

The results of the investigation were listed according to the match status of the game when the attack was recorded, namely: (i) when the teams were losing; (ii) when the teams were drawn, and (iii) when the teams were winning.

### Offensive sequences in the losing situation

When the national teams of Germany, Netherlands and Uruguay were at a scoring disadvantage, they attempted to use crossing (Germany:  $z=4.00$ ; Netherlands:  $z=5.83$ ) and opponent's violations of the laws of the game (Uruguay:  $z=2.67$ ) to penetrate the offensive center/central strip and consequently create opportunities to score. In particular, Germany (Figure 2A) and Netherlands (Figure 2B) scored after a crossing resulting from reception/control behaviors (Germany:  $z=3.87$ ; Netherlands:  $z=2.44$ ). It was also observed that the national German team, in a losing situation, scored its goals from the central offensive zone ( $z=2.15$ ) within a context

of attacker(s) versus opponent goalkeeper ( $z=4.00$ ). In turn, Uruguay used dribbling ( $z=2.69$ ) to conclude its attack and score a goal from the central sector of the middle-offensive path ( $z=2.24$ ) (Figure 2C) by taking advantage of the opponent's violation of the laws of the game ( $z=2.67$ ).

Since the Spanish national team did not score when it was losing the game, in order to compare the playing patterns of Spain as a function of match status (the objective of the present study), the study focused on the creation of scoring opportunities, i.e., the finishing passes to the opponent's goal that did not result in a goal. These passes tended to be due to the behaviors developing during ball control, such as short passing ( $z=2.04$ ) or dribbling ( $z=2.00$ ).



**Figure 2.** Attacking patterns leading to goal for the national teams of Germany (A), The Netherlands (B) and Uruguay (C) during a defeat. For abbreviations. Consult the Instrument SoccerEye<sup>20</sup>

- (ii) Offensive sequences in a drawing situation

The goals scored by the German national team in a drawing situation tended to be preceded by intervention of the opponent's goalkeeper ( $z=5.82$ ), by opponent's violation of the laws of the game ( $z=5.82$ ), by a goal kick ( $z=2.67$ ), or by opponent's intervention with no success ( $z=3.17$ ). The Dutch national team, in turn, finalized the attacks with a goal from the central offensive zone (11:  $z=3.78$ ) and in a situation of numerical equality without pressure ( $z=3.72$ ). The goal occurred after a shot ( $z=7.99$ ) or dribbling ( $z=2.22$ ) in a situation of defense/attack transition or after opponent's intervention with no success developing during ball possession ( $z=4.85$ ) in the central offensive zone (11:  $z=6.25$ ), when the ball was located between the offensive line of The Netherlands team and the opponent's back line ( $z=3.08$ ).

The national team of Uruguay scored after crossings ( $z=9.66$ ) or running with the ball ( $z=3.21$ ) in defense/attack transitions. However, there were also attacking patterns in situations of defense/attack transition in which a goal resulted from dribbling during development of ball possession ( $z=3.21$ ), whereas the shots made by Spain tended to occur in the central path of the offensive sector ( $z=3.80$ ). In most cases, these shots were

preceded by positive short passing ( $z=2.53$ ) or by dribbling ( $z=3.26$ ), in a situation of development of ball possession in both cases.

- (iii) Offensive sequences in a winning situation

In a winning situation, the German national team scored its goals from the central offensive zone ( $z=4.80$ ) in a situation of attacker(s) versus opponent goalkeeper ( $z=5.32$ ). However, two distinct patterns were observed leading Germany to score a goal while winning the game, thus increasing its scoring advantage (Figure 3A): (a) running with the ball in the defense/attack transition (lag -2:  $z=1.96$ ), reception/control (lag -1:  $z=2.87$ ); (b) running with the ball during ball possession (lag -3:  $z=2.62$ ), dribbling (1x1) (lag -2:  $z=2.36$ ), and crossing (lag -1:  $z=3.75$ ).

In turn, The Netherlands used predominantly collective behaviors to score a goal, with the goal being preceded by a short passing ( $z=2.99$ ) in the central zone of the offensive sector ( $z=3.39$ ) (Figure 3B). However, attacking patterns were also observed, with the goal being preceded by intervention of the opponent goalkeeper ( $z=7.87$ ) after a shot during development of ball possession ( $z=7.39$ ).

Uruguay tended to score a goal from the central offensive zone (11:  $z=2.55$ ) in a condition of numerical equality with no pressure in the center of the game ( $z=3.71$ ) and in situations of attacker(s) versus opponent goalkeeper ( $z=4.00$ ). However, the attacking configurations leading Uruguay to a goal were more variable since the goal was preceded by opponent's violation of the laws of the game ( $z=2.53$ ) or by a crossing ( $z=6.16$ ), although both behaviors were observed after individual plays such as dribbling ( $z=5.70$ ) (Figure 3C). In contrast, the Spanish national team (Figure 4D) tended to shot to the opponent's goal after positive short passing ( $z=2.43$ ) or dribbling ( $z=2.00$ ), both when winning, losing or drawing, thus showing no significant changes in the attacking patterns of play as a function of match status.



**Figure 3.** Attacking patterns of play leading to a goal for the national teams of Germany (A), The Netherlands (B) and Uruguay (C), and shots to the opponent's goal by the Spanish national team during the victory (D). Consult the Instrument SoccerEye<sup>20</sup>



## DISCUSSION

The objective of the present study was to determine the influence of match status on the configuration of attacking patterns of play by elite soccer teams. The quantity of attacks in relation to a losing condition was reduced in the semi-finalist teams of the 2010 FIFA World Cup (n=150). This is explained by the fact that these are successful teams according to the data and definitions of the literature<sup>9,18,19</sup>, which report that the teams that suffer the first goal in a FIFA World Cup game are able to reverse this situation only in 13.3% of the occasions.

Thus, when Germany, The Netherlands and Uruguay national teams were losing they tended to show more difficulty in penetrating the offensive sector/central path and in creating scoring opportunities. This difficulty seems to result from a change in strategy of the teams that are winning the game, which tend to become more defensive, thus performing fewer penetrations in their penalty area<sup>28</sup>.

When the teams were losing the match they tended to create score situations only by means of positive crossings and of the opponent's violations of the laws of the game. The literature<sup>6</sup> shows that losing teams tend to perform more crossings than winning teams.

The configuration of attacking patterns of play in a situation of momentary defeat revealed a greater probability of the occurrence of behaviors in the situation of progress of ball possession than in the defense/attack transition state, in agreement with various studies<sup>5,7,11</sup>. In the 2008 UEFA European Championship<sup>7</sup>, it was observed that losing teams tended to have a longer time of ball possession in advanced zones of the field in order to attack the opponent's goal and thus reduce the disadvantage or tie the game, with a sharper offensive behavior.

In turn, in drawing situations, in which a larger number of attacks is observed (n=1,117), the teams tend to set up their offensive game in terms of what each coach predefines in a tactical-strategic perspective for the team and for the competition, with a consequent wide variability of the offensive patterns. This observation agrees with literature data<sup>7</sup>, since a greater variability in the attacking patterns of play of the teams was observed when they were tied during the games.

In a winning situation, the German, Netherlands and Uruguay national teams tended to use predominantly individual behaviors (e.g., dribbling, running with the ball) within interaction contexts of an eminently offensive nature. Thus, they tended to create more advantageous configurations compared to losing and drawing situations, with a consequent higher shot frequency, as also reported in the study<sup>6</sup> conducted on the Spanish League in 2008 and 2009, revealing that winning teams tend to shoot more at the opponent's goal.

In a winning situation, the teams tended to use predominantly individual behaviors (e.g., dribbling) to penetrate the opponent's back zone. However, studies<sup>5,7</sup> have shown that a winning team tends to become less

offensive, running less with the ball, with a reduction in the number of dribblings performed. In this respect, although offensive patterns leading to the scoring of a goal after a positive crossing have been detected, when a team is winning it predominantly uses dribbling (1x1) and running with the ball in order to end the attack successfully. A possible explanation for this observation is that a team, when winning, does not give strong priority to an increase in its scoring advantage but rather tends to take advantage of the defensive imbalance of its opponent in order to penetrate the central path of its offensive sector. This is based on dribbling and running with the ball, as reported in a study<sup>29</sup> of the Spanish Soccer League between the 2003/2004 and 2007/2008 sports seasons.

The present results show that the Spain national team did not vary its attacking patterns of play as a function of match status. Throughout the competition, the team engaged in behaviors involving ball possession, i.e., short passing and dribbling, in order to create conditions for the penetration of the opponent's penalty area. These findings agree with the literature<sup>30</sup>, which shows that in the 2010 World Cup the Spanish national team favored the maintenance of ball possession regardless of match status, with the behavior of the players tending to be unaffected by the result of the game.

## CONCLUSION

The way the national teams of Germany, Netherlands and Uruguay structured their respective attacks tended to be influenced by match status. In situations of momentary defeat, these teams had difficulty in penetrating the penalty area of the opponent, so positive crossing and taking advantage of opponent's violation of the laws of the game turned out to be the most frequently used behaviors in order to create scoring opportunities. However, when the teams were winning, behaviors such as dribbling, running with the ball and positive passing were those most frequently used in order to create scoring situations.

In contrast, the attack configuration of the national team of Spain appeared to be stable, i.e., it tended not to be influenced by match status, with the team following a game pattern favoring the maintenance of ball possession and looking for progression on the field from the defensive midfield in order to create contexts of interaction with the opponent team in zones close to the opponent's goal, favoring penetration of its central defense zone.

The present study underscored the importance of maintaining the identity and integrity of the expression of the tactical behaviors of a team by keeping in mind the idealized and trained game model. Similarly, one can perceive the positive consequences of a confrontation with various opponents when a team faithfully follows its ideas about the game despite the pressure of various situational constraints.



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