



THE IMPORTANCE OF THE ELEMENTS OF GAME STOPPAGE FOR THE FINAL SCORE OF A FOOTBALL MATCH

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Abstract The research was done on the sample of 64 football matches played at *FIFA World Cup Germany 2006* and 128 scores were divided according to three possible scores: victory, defeat, and draw. The main aim of the study was to establish the importance of interrupting a football match for the final score (victory, defeat or draw). According to the results and their interpretation it can be concluded that the results of the data analysis show that there were significant differences concerning the frequency of final scores relative to the analyzed elements of game stoppage. Even though the differences observed were not equally distributed in all classifications, the results show that there were significant differences concerning the analyzed elements of a football match. The analyses justified the hypothesis that important statistical differences exist with all analyzed elements of game stoppage concerning particular final scores of football matches (victory, defeat or draw). The difference in the elements of game stoppage was a consequence of different choice of tactics and techniques as well as the possibility of their realization during attack and defense.

Key words: importance, game stoppage, score, football match

INTRODUCTION

The main aim of this paper was to establish the impact of game stoppage on the final score of a football match. An overview of the available domestic and foreign literature on the topic under consideration in this paper indicates that this approach to the analysis of a football match has rarely been researched. However, more detailed access to literature has shown that during the 70's and 80's this topic was more interesting to football researchers. One can get an impression that football researchers abandoned this way of research rather easily regardless of the fact that a football match had to be quantified somehow. So far, the studies concerning techniques and tactics have not yet had them standardized or given their exact description [2, 3, 4, 5].

The field of techniques and tactics is very interesting for research because it is unexplored and it changes faster and faster each year. This field is very specific and does not bear many similarities with other disciplines. Due to the fact that either in our country or abroad there are no studies on this topic, we were bound to consider the results of several other studies that could help to analyze this topic indirectly [6, 7, 8, 9, 10].

This paper outlines the stoppages (according to official statistical data) of football matches on *FIFA World Cup Germany 2006*.

In order to facilitate and improve the research of the football game, FIFA accepted a specific questionnaire for collection and analysis of information of important elements of this game for the members of the World Football Federation as well as for football experts [1]. For the needs of this research the questionnaire included monitoring the frequency of the following elements:

- „foul“ – the number of fouls, the total of fouls over the opponent players issued during the match.
- „corn“ – the number of corners, represents the number of corner kicks during the match.

- „offs“ – the number of offsides, represents the number of offsides by the players of one team.
- „atgl“ – the number of auto-goals.
- „caut“ – the caution – yellow card, represents the number of cautions issued to the players of one team for misconduct during the match or a break.
- „sendoff“ – the sendoff – red card, represents the number of sendoffs issued to the players of one team for misconduct during the match or a break.

MATERIALS AND METHODS

SAMPLES

The sample of this paper consisted of 64 matches played on World Cup in Germany in 2006. The results represent the final score of each match after 90 minutes of play: victory for one team, defeat for the other or a drawn score for both teams. Each match had two scores, for two teams, which means that 128 final scores were analyzed in the 64 matches. It is necessary to mention that the units of observation were not the matches themselves but the elements of match interruptions for the teams which had won, lost or drawn.

GAME ANALYSE PROCEDURE

The sample of sanctions are the elements of the game of which official statistical data were taken, and which FIFA promoted for all tournaments under its control, the World Cup being among them. This research included 6 elements of game stoppage.

The classification of sanctions was done by the application of the mathematical model of equal frequency, according to which the exact category for each sanction was defined as follows:

- sanction – the total of fouls (foul) had three categories: from 0 to 15 fouls (*foul-1*), from 16 to 20 fouls (*foul-2*), and more than 21 fouls (*foul-3*);
- sanction – corner (corn) had three categories: up to three corners (*corn-1*), from four to six corners (*corn-2*), and more than seven corners (*corn-3*);
- sanction – the total of offsides (offs) had three categories: from zero to one offside (*offs-1*), from two to three offsides (*offs-2*), more than four offsides (*offs-3*);
- sanction – the number of autogoals (atgl) had two categories: without autogoals (*atgl-1*) and with one autogoal (*atgl-2*);
- sanction – caution (yellow card – *caut*) had three categories: one caution (yellow card-*caut-1*), from two to three cautions (yellow card-*caut-2*), more than four cautions (yellow card-*caut-3*);
- sanction-sendoff (red card-sendoff) had two categories: without sendoff (red card-*sendoff-1*), with sendoffs (red card-*sendoff-2*).

STATISTICAL ANALYSIS

This research used the methodology which was adapted to the set goals. Namely, transversal method was applied, which means that the sanctions-variables, statistically proved, were analyzed according to the final scores of the football matches.

This research used multivariate and univariate analyses, that is, a multivariate analysis of variance (Manova), a discriminative analysis, Roy's test and the coefficient of discrimination. According to the analyses mentioned, it can only be concluded whether the observed groups were similar or not.

RESULTS

The analysis of the differences proved or disproved the existence of significant differences among the scores (victory, defeat or draw) relative to game stoppage.

Table 1. The importance of the difference among the scores relative to game stoppage

	n	F	p
MANOVA	6	2.870	.001

According to the data presented in Table 1, which show $p=.001$ and MANOVA analysis, it can be said that there was a significant difference among the three scores according to the six sanctions: the sendoff (red card-sendoff), the total of offsides (offs), the number of autogoals (atgl), the corner (corn), the total of fouls (foul), and the caution (yellow card-caut).

Table 2. The importance of the difference among the scores relative to game stoppage (Roy's test)

	χ	R	F	p
foul	.213	.199	2.592	0.079
corn	.259	.222	3.278	0.041
offs	.274	.269	4.911	0.009
atgl	.152	.154	1.532	0.220
caut	.179	.168	1.835	0.164
sendoff	.252	.260	4.583	0.012

As shown in Table 2, $p = 0.009$ for the total of offsides (offs). This means that there was a significant difference among some of the three scores relative to the sanctions of sendoffs (red card-sendoff) (0.012), corners (corn) (0.041) and the total of fouls (foul) (0.079).

As shown in Table 2, $p = 0.164$ for the sanction of caution (yellow card-caut). This means that there was no difference among some of the three scores relative to the number of autogoals (atgl) (0.220).

Table 3. The importance of the difference among the scores relative to the number of fouls (foul)

groups		level	ratio		%		p
gr1	gr2		m1/n1	m2/n2	ratio1	ratio2	
victory	defeat	more than 21 fouls	12/49	22/49	24.49	44.90	0.036

The teams that won and the teams that lost were different at the level of **more than 21 fouls** in favor of the defeated teams which shows that the defeated teams had more fouls because they were technically and tactically weaker and they could not stop the players of the opponent teams.

Table 4. The importance of the difference among the scores relative to the number of corners (corn)

groups		level	ratio		%		p
gr1	gr2		m1/n1	m2/n2	ratio1	ratio2	
victory	defeat	more than 7 corners	19/49	8/49	38.78	16.33	0.015
victory	draw	from 4 to 6 corners	15/49	16/30	30.61	53.33	0.048
defeat	draw	up to 3 corners	19/49	6/30	38.78	20.00	0.086

The teams that won outnumbered the defeated teams significantly as concerned corners. With respect to victory and draw for the level of **four to six corners**, there was the difference that shows that as the risk rose, the final score went in favor of a drawn score.

Table 5. The importance of the difference among the scores relative to the number of red cards – sendoffs (sendoff)

groups			ratio		%		
gr1	gr2	level	m1/n1	m2/n2	ratio1	ratio2	p
victory	defeat	without sendoffs (red card)	46/49	37/49	93.88	75.51	0.013
victory	defeat	with sendoffs (red card)	3/49	12/49	6.12	24.49	0.013
victory	draw	without sendoffs (red card)	46/49	21/30	93.88	70.00	0.005
victory	draw	without sendoffs (red card)	3/49	9/30	6.12	30.00	0.005

Table 5 shows the significant difference among victory, defeat, and draw concerning two levels. Victory was characteristic of a small number of sendoffs in comparison with defeat and a drawn score, where there were more sendoffs. There were no statistically significant differences among the teams that were defeated or had drawn scores relative to the observed levels so they were omitted from the table.

Table 6. The importance of the difference among the scores relative to game stoppage

	n	F	p
DISCRIMINATORY	6	2.842	.001

According to the data from Table 6 which shows that $p=.001$, there was a significant difference and clearly defined margin between some of the final scores relative to game stoppage.

Table 7. The coefficient of discrimination among the scores relative to the game stoppage

coefficient of discrimination	
sendoff	.070
offs	.067
atgl	.041
corn	.040
foul	.030
caut	.025

The coefficient of discrimination shows that the greatest contribution to the discrimination of the scores relative to the game stoppage was as follows: sendoffs (red card-sendoff) (0.070), the total of offsides (offs) (0.067), the number of autogoals (atgl) (0.041), corners (corn) (0.040), the total of fouls (foul) (0.030) and cautions (yellow card-caut) (0.025).

The greatest contribution to the difference was with sendoffs (red card), followed by offsides, autogoals, corners, fouls and cautions (yellow cards).

DISCUSSION AND CONCLUSION

The research was done on the sample of 64 football matches played at *FIFA World Cup Germany 2006* with the 128 scores divided into three parts according to the score: victory, defeat, or draw.

The main aim of the study was to establish the impact of stopping the game at a football match on the final score (victory, defeat or draw).

According to the results and their interpretation the following can be concluded:

- The results of the data analysis showed that there were significant differences concerning the frequency of final scores (victory, defeat or draw) relative to the analyzed elements of game stoppage. Even though the differences noticed were not equally distributed in all classifications, the results show that there were significant differences concerning the analyzed elements of a football match.
- The analyses justified that statistically significant differences existed with all analyzed elements of game stoppage concerning particular final scores of football matches (victory, defeat or draw).

The difference of the elements of game stoppage was a consequence of different choices of tactics and techniques as well as the possibility of their realization during the attack and defense.

The analysis of game stoppage shows that the final score of a football match firstly depends on the sendoff (red card), followed by the total of offsides, while the number of autogoals comes last. This points out to the fact that the teams that won had fewer cautions (yellow cards) and sendoffs (red cards), which tells us that the teams were psychologically, physically, technically and tactically prepared to score, while in the defense they succeeded in preventing the opponents to attack and score. On the basis of the aforementioned, the main characteristics of the winning teams, defeated teams, and the teams that had drawn scores may be defined.

The winning teams had the following characteristics:

- no player sendoffs,
- more than four offsides,
- no autogoals.

The offense tactics (4-5-1, 4-3-3, 4-4-2) showed that players had more offsides. In most cases, this tactics saved them from having sendoffs. These characteristics can be described with a large number of goal attempts and at the same time moving the game to the opponent's half of the field.

The teams that had drawn scores had the following characteristics:

- sendoffs,
- from 0 to 1 offside.

These were the teams that employed defensive tactics (5-4-1, 4-5-1) with the aim to have the ball in possession as long as possible and to maintain the score until the end of the match. For choosing such tactics the players were forced to violate the rules which led to sendoffs. The proof of this was the small number of offsides (from 0 to 1), because they had no chance to attack.

The defeated teams had the following characteristics:

- a reasonable number of offsides (from 2 to 3),
- one autogoal.

The chosen defensive tactics or the quality of the opponent (winning) teams was more important so the defeated teams could oppose neither technically nor tactically during the match. These characteristics showed that the defensive tactics with such results always led to defeat. Such a choice of tactics or the dominance of the opponent team showed that the defeated teams had more sendoffs and more autogoals during the match. Defensive tactics allowed the opponent teams to display all characteristics of the winning teams.

PRACTICAL APPLICATION

In the past few years there have been several attempts to apply modern information technology to monitor players' activity and analyze the data. Mathematical and statistical analyses of research methodology have recently been regarded as impossible procedures concerning the practice of sport disciplines.

In the world nowadays various raw data recording techniques are used as bases for further analysis by various program languages and packages. For that reason there is a need to adjust the methodology so that the problem could be researched more scientifically and to avoid making separate programs for each research.

There are such tendencies in our country as well, but they are still just individual interest fields that have not been organized or institutionalized. If we want to have a high quality approach to this issue we must educate sport experts who will create programs that will solve problems concerning the complexity of sport activities. They will normally have to know all relevant factors as well as the basics of information technology, which will enable them to communicate with programmers.

Monitoring players' activity represents an important source of information both about the team and their opponents. The model used here resulted from monitoring the best world selections, which was used as a norm of the required physical, technical and tactical preparedness. Working creativity should be included only when we have understood all relevant factors that influence the play. (In our country intuition is mentioned much too often, which shows the fact that the problem has not been researched well enough).

Nowadays, monitoring players' activity during the game has become one of the basic preconditions of coaching, although it has until recently been regarded just as an additional factor of successful coaching technology. The evidence for this is the fact that coaches today monitor their players' activity more and more so that the imperfections could be noticed and the game improved. Previously, just the opponents have been monitored and their imperfections analyzed.

This research contributes to the solution of this problem by the review of concrete data that could be further analyzed and used as comparison with future research.

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