# IMPORTANCE OF YELLOW CARDS IN FOOTBALL CONSIDERING FINAL OUTCOME OF THE MATCH AND LEAGUE SYSTEM OF COMPETITION

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## Abstract

*Based on 88 matches of 2014/2015 First Croatian football league we established the importance of yellow cards considering the final outcome of the match and the competition. Using Mann-Whitney test and Pearson correlation coefficient we concluded that yellow cards as situational efficacy indicators do not pose a statistically significant difference between the winning and the defeated team (p=0,93), nor is there a relation to final placement in league system of competition (r=-0,25). These results show that warning the players, especially in the case of yellow card which does not exclude them from the game, has no influence on the game outcome, but there is a need to control the mentioned segment of the game.*

***Key words:** yellow cards, notational analysis, situational efficacy, football, warnings.*

## Introduction

Matches, team or individual sports or martial arts competitions can be observed as complex dynamic systems in which two opposing entities fight for a win (two teams, two pairs, or two individuals).

The performance of these entities and its success are determined by level of abilities, skill, and knowledge of players participating in the result of the competition- victory as the final goal.

In football, this happens in a match. Systemic observation of the football match shows many characteristic events in the play which repeat themselves, are recognizable, and can be noted down. These events and their outcomes show a degree of situational efficacy of players and the team, and the level of their performance. Analyzing these events can show why a certain team won, or how the final result of the match was achieved.

A yellow card is a disciplinary measure that a referee utilizes/shows, according to game rules, to the player who broke the rules.

Yellow cards can be described in two ways, depending on the role of a player in the rule-breaking situation: the player breaks the rules and the yellow card is assigned to him, or the player extorts the disciplinary measure and the yellow card is assigned to the player on whom the foul was supposedly committed (Bašić et al., 2015).

Analyzing the yellow card parameter we can determine if the mentioned situational efficacy indicator is relevant and related to final outcome of the match and league system of competition.

## Methods

*Analysis material*
Research was done on 88 matches of Max tv First Croatian football league.

We analyzed one half-season consisting of 90 matches. Due to certain technical difficulties, one match was not recorded, and one ended in 3:0 due to rule-breaking.

*Sample*
Entities in this research are teams. First Croatian football league consists of 10 clubs.

*Variable sample*
Matches were described using notated performance indicators (variables) – yellow cards (Bašić et al., 2015)

*Data collection*
Matches were filmed on HDD/DVD in form of video. Using a special computer tool named Courteye the matches were analyzed and prepared for data analysis. Five notators worked on match analysis.

*Statistical analysis*
To determine reliability of gathered data we used the *intra-observer variability* for differences between different data gathered by the same notator (Hughes et al., 2002, 2003, 2004).

For yellow cards we determined a reliability of 100%. For determining differences between winning and defeated teams, we used Mann-Whitney test and Pearson correlation coefficient to determine the connection between performance indicators and final outcome of the competition.

Based on analyzed matches we can see the relation between *yellow cards* as situational efficacy indicators and final placement in league system of competition.

We can establish if there are any statistically significant differences between winning and defeated teams considering the said parameter.

## Results

Table 1. Final placement of teams after the half-season (TEAM), total number of matches played (NM), number of wins (WIN), draws (DRAW) and defeats (LOS), as well as the number of points (PTS), number of points per match (PTS/M) and total number of yellow cards (N-YC), arithmetic mean of yellow cards (AM-YC) and correlation coefficient of yellow cards and final placement (r).

| TEAM | NM | WIN | DRAW | WIN | PTS | PTS/M | N-YC | AM-YC |
|------|----|-----|------|-----|-----|-------|------|-------|
| Dinamo | 17 | 13 | 4 | 0 | 43 | 2,53 | **23** | **1,35** |
| Rijeka | 18 | 12 | 3 | 3 | 39 | 2,17 | **33** | **1,83** |
| Hajduk | 17 | 8 | 5 | 4 | 29 | 1,71 | **49** | **2,88** |
| Lokomotiva | 18 | 7 | 4 | 7 | 25 | 1,39 | **27** | **1,50** |
| Zagreb | 18 | 6 | 6 | 6 | 24 | 1,33 | **31** | **1,72** |
| SlavenBelupo | 17 | 5 | 5 | 7 | 20 | 1,18 | **26** | **1,53** |
| Split | 17 | 3 | 8 | 6 | 17 | 1,00 | **35** | **2,06** |
| Istra 1961 | 18 | 3 | 7 | 8 | 16 | 0,89 | **26** | **1,44** |
| Osijek | 18 | 4 | 3 | 11 | 15 | 0,83 | **44** | **2,44** |
| Zadar | 18 | 3 | 3 | 12 | 12 | 0,67 | **41** | **2,28** |
| **r=-0,25** | | | | | | | | |

Table 2. Arithmetic mean (AM) and standard deviation (SD) of yellow cards of winning (WIN) and defeated (LOS) teams, and z-value (z) for determining significance differences and errors (p).

| | AM | SD | z | p |
|-----|------|------|------|------|
| WIN | **1,83** | 1,33 | 0,85 | **0,93** |
| LOS | **1,89** | 1,52 | | |

## Discussion and conclusion

Based on results (Table 1 and 2) of relatively low correlation coefficient (r=-0,25) and difference in arithmetic mean between winning (AS=1,83) and defeated teams (AS=1,89), which is not statistically significant (p=0,93), we can conclude that *yellow card*, as a situational efficacy indicator, does not pose a difference between winning and defeated teams and is not related to final placement in league system of competition. These results are in accordance with other researchers (Castellano, Casamichana and Lago, 2012; Lago-Penas and Lago-Ballesteros,2011; Lago-Penas et al., 2010). Yellow card is a disciplinary measure utilized in case of rule-breaking, and can be used in many situations. Even though one might expect that teams with less technical and tactical knowledge and less ball possession along with more need for defense tactical tools would be more prone to breaking the rules and getting yellow cards, this is not the case in this research. Regardless of their placements, teams get about the equal number of yellow cards. Of course, one should make an in-depth analysis of reasons for getting a yellow card. Sometimes the leading team breaks the rules on purpose (holds the ball, an unallowed way to celebrate the goal score), so it is not always the case that a weaker team gets yellow cards. There can be individual cases of teams who get more yellow cards due to the way they play (more agressive approach on the field) or accentuated charge that the home audience transfers to the team, which can lead to dysfunctional behaviour and more risk of getting a yellow card. Or, on the other hand, teams get less yellow cards in matches on home turf due to home audience pressuring the referee. Results also show that regardless of three yellow cards in a larger number of matches and not playing in the next match, even if it concerns more quality players, this will not have a negative effect in league system of competition.

However, in individual key matches (cup system) things can be different. We can also conclude that, regardless of the yellow card, the players will equally use dominant defense tactical tools paying no attention to the danger of getting the second yellow card which would exclude them from the game. Based on results for variable *yellow cards* we can conclude that it has no significant connection to final placement in league system of competition and it does not differentiate between winning and defeated teams.

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## VAŽNOST ŽUTIH KARTONA U NOGOMETU OBZIROM NA KRAJNJI ISHOD UTAKMICE I LIGE SUSTAVA NATJECANJA

**Sažetak**

*Na temelju 88 utakmica 2014/2015 Prve hrvatske nogometne lige utvrdili smo važnost žutih kartona s obzirom na konačni ishod utakmice i natjecanja. Koristeći Mann-Whitney test i Pearsonov korelacijski koeficijent, zaključili smo da žuti kartoni kao situacijski pokazatelji učinkovitosti ne predstavljaju statistički značajnu razliku između pobjedničkog i poraženog tima (p = 0,93), niti postoji veza s konačnim plasmanom u ligi sustava natjecanja (r = -0,25). Ovi rezultati pokazuju da upozoravanje igrača, posebno u slučaju žutog kartona, koji ih ne isključuje iz igre, nema utjecaja na ishod igre, ali postoji potreba za kontrolom spomenutog dijela igre.*

***Ključne riječi:*** *žuti kartoni, notacijska analiza, situacijska učinkovitost, nogomet, upozorenja.*