



Motricidade

ISSN: 1646-107X

motricidade.hmf@gmail.com

Desafio Singular - Unipessoal, Lda
Portugal

Sarmento, H.; Leitão, J.; Anguera, T.; Campaniço, J.
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football
Motricidade, vol. 5, núm. 3, 2009, pp. 19-24
Desafio Singular - Unipessoal, Lda
Vila Real, Portugal

Available in: <http://www.redalyc.org/articulo.oa?id=273020560005>

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Observational methodology in football: Development of an instrument to study the offensive game in football

H. Sarmento¹, J. Leitão¹, T. Anguera², J. Campaniço¹

1 - Universidade de Trás-os-Montes e Alto Douro, Portugal

2 - Universidad de Barcelona, Spain

The following paper introduces a new approach to the analysis of offensive game in football. Therefore, the main aim of this study was to create an instrument for collecting information for the analysis of offensive action and interactions game. The observation instrument that was used to accomplish the main objective of this work consists of a combination of format fields (FC) and systems of categories (SC). This methodology is a particular strategy of the scientific method that has as an objective to analyse the perceptible behaviour that occurs in habitual contexts, allowing them to be formally recorded and quantified and using an ad hoc instrument in order to obtain a behaviour systematic registration that, since they have been transformed in quantitative data with the necessary reliability and validity determined level, will allow analysis of the relations between these behaviours. The codifications undertaken to date in various games of football have shown that it serves the purposes for which it was developed, allowing more research into the offensive game methods in football.

Key words: observational methodology, offensive game, football.

The most striking change within football's development is the application of science to its problems and in particular the use of increasingly sophisticated technology that, supported by scientific data, allows us to establish a "code of reading" of the reality of the game (Castelo, 2004).

Traditionally, the publications in the analysis of the game are mostly confined by the collection of quantitative indicators (e.g., number of passes), qualitative indicators (e.g., areas recovering from ball), and external indicators (e.g., distance) of the game. However, these indicators cannot necessarily capture the full complexity of a performance when framed within the context that has led to its expression (Borrie, Jonsson & Magnusson, 2002); specifically through an interactive analysis of contextual factors within the actions of the game, since their identity is created through an articulation of the system which creates conditions to maintain or change, depending on the circumstances (Garganta, 2005).

The different variables inherent to competition, the interaction that occurs between them and the difficulty in controlling the contextual variables, never the same in different situations, demand the use of observational methodology (Mendo, Anguera & Santos, 2005). In our study, maintaining that variability is an inherent aspect to each game and that significant behaviors show an emerging trend during game events, we propose to

determine behaviors, spatial and contextualized variables that allow to characterize and distinguish the offensive game methods a Soccer match.

The aim of this paper is to describe the development of an instrument for observation that can strengthen the existing schemes of game analysis in football in order to provide specific additional information on the offensive game methods.

Methods

Since the observation allows us to objectively describe reality in order to analyze it, the definition of the objectives becomes compulsory.

They were: a) identify indicators of technical and tactical performance and ascertain the existence of differences due to: i) different specific game cultures (Premier League, Italian League and Portuguese League), ii) location of the game (home / away); iii) game time (periods of 15 minutes), and iv) momentary result of the marker (lose / draw / win); b) characterize the tactical performance of counter-attack, quick attack and positional attack of three teams with different cultures of game (English, Italian and Portuguese League), within a qualitative framework.

After the objectives had been defined, we prepared the monitoring system. This is a combination of field formats and category systems, which had been developed ad hoc. The use of field formats provides the instrument with dimensionality and flexibility, and makes it readily adaptable, whereas the category systems render it more consistent. The observational design in our study, based on the specific characteristics of the subject dimensions, and time and flow, is of Follow-up design /Nomothetic/ multidimensional (F/N/M).

In order to prepare the field format, we firstly defined the instrument's vertebrates criteria and then, through an exploratory phase, produced an opened list of behaviors / situations observed, corresponding to each criterion. This exploratory phase was carried through the observation of video images for games ($n= 9$) of the English, Italian and Portuguese Leagues, focusing on the offensive sequences observed in those games. The games were recorded on VHS video and then converted to MPEG-1.

As done in previous studies (e.g., Lopes, 2007; Silva, 2004), the process of development of our observational tool started by setting criteria. For each of the criteria dimensions (according to the field formats), we built a system of categories for subsequent data collection based on diachronic settings.

Results

Ten criteria were defined through observation of relevant conduct in every offensive sequence:

- Criterion 1 - Characterization of the game (E / MS);
- Criterion 2 - Offensive Game Methods (E/MS);
- Criterion 3 – Start of the Offensive Process (...);
- Criterion 4 – Development of the Offensive Process (...);
- Criterion 5 - End of the Offensive Process (...);
- Criterion 6 – Way and Direction of the pass (...);
- Criterion 7 - Height of the pass (...);
- Criterion 8 – Rhythm of the game (...);
- Criterion 9 - Spatial Characterization (E/ME);
- Criterion 10 – Game Centre (E/ME);

The criteria were produced by a system of comprehensive and mutually excluding categories (criteria one, two, nine and ten). Of these, six (three to eight criteria) have an open character. This construction converged in a system in which all behaviors were likely to be registered, so that to each corresponds only one category.

The next phase was the allocation of a set of behaviors that correspond to each of the criteria, forming a list called the catalog.

In Tables 1 and 2 it is presented an example of the conduct attributed to the six criteria, way and direction of the pass:

Table 1. Settings for the criterion 6.

Field Format Criteria 6		
Way and direction of the pass (TP)		
Conceptual Definition: Represents the direction of the ball during their movement between two elements of the same team with the aim of following up the game to allow the continued and successful possession of the ball.		
We propose 3 possible categories to guide the actions techniques - Way / Direction.		
Categories	Code	Description
Pass to the front	PPf	Where the holder of the ball makes a pass towards the opponent goal.
Pass to the back	PPt	Where the holder of the ball makes a pass towards the defended goal.
Pass to the side	PPI	Where the holder of the ball makes a lateral pass to the axis of attack.
...

Table 2. General structure of the Instrument (part 1)

Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
Characterization of the game	Method of Offensive Play	Start of the Offensive Process	Development of the Offensive Process	Ending of the Offensive Process
Portuguese L.	Counter-attack	Recovery of possession of ball by interception	Dev. by passing short / medium	With Effectiveness
English L.				Shot to obtain goal
Italian L.				Shot within
Part 1				shot defended by GK
Part 2				Shot out
Home	Quick attack	possession of ball for disarmament	Dev. by conduction	Shot against opponent
Away				Direct free kick
Wins + 1 goal				Corner
Wins 1 goal				Penalty
Draw				Pass into the large area opponent
Loses 1 goal	Positional attack	Recovery of possession of ball by interruption to regulate	Dev. by reception / control	Not Effectiveness
Loses + 1 goal				Recovery of possession of ball by the opponent
				all out
				Infringement of the laws of the game

Table 2. General structure of the Instrument (part 2)

Criterion 6	Criterion 7	Criterion 8	Criterion 9	Criterion 10
Way and Direction of the pass	Height of the pass	Rhythm of the game	Spatial Characterization	Game Centre
Pass to the Front	Shallow Pass	Fast rhythm	1	PRESSURE
Pass to the back	Half time Pass	Slow / medium rhythm	2	Relative inferiority
Pass to the side	High Pass		3	Absolute inferiority
			4	Equal pressure
			5	
			6	NO PRESSURE
			7	Equality not pressed
			8	Relative Superiority
			9	Absolute superiority
			10	
			11	
			12	

Conclusion

The codifications undertaken to date in various games of football, using this instrument, have shown that it serves the purposes for which it was developed, allowing more research into the offensive game methods in football. Also, it enables the analysis of aspects of the game through perspective and contextual sequences, which we consider to more accurately fit the "reality" of the game of football.

Since these types of studies require stability within observations, i.e., the existence of reliability in data collection, it is essential to assure for data quality, which can be verified by the degree of inter-observer agreement (Kappa index of reliability).

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