



## Full Length Article

## Adaptive behaviours of attacking futsal teams to opposition defensive formations

B. Travassos<sup>a,b,\*</sup>, J. Bourbousson<sup>c</sup>, P.T. Esteves<sup>b,d</sup>, R. Marcelino<sup>b</sup>, M. Pacheco<sup>a</sup>, K. Davids<sup>e</sup><sup>a</sup> Department of Sport Sciences, University of Beira Interior, Covilhã, Portugal<sup>b</sup> Research Centre in Sports Sciences, Health Sciences and Human Development, CIDESD, CreativeLab Research Community, Portugal<sup>c</sup> Sport Sciences Faculty, University of Nantes, France<sup>d</sup> Polytechnic Institute of Guarda, Guarda, Portugal<sup>e</sup> Centre for Sports Engineering Research, Sheffield Hallam University, UK

## ARTICLE INFO

## Article history:

Received 27 November 2015

Revised 8 February 2016

Accepted 16 February 2016

## Keywords:

Team performance

Tactical behaviours

Futsal

Performance analysis

Defensive formation

Constraints

## ABSTRACT

This study evaluated tendencies towards flexibility/stability of coordinated behaviours in international futsal teams, considered as complex collective systems, according to changes in opposition defensive formations. Six games of two international futsal teams (Spain and Portugal) were selected for Social Network Analysis to capture the coordination tendencies that emerge in the tactical behaviours of players when performing against different defensive formations. Ball trajectories in each offensive pattern of play were notated in an adjacency matrix where each entry accounted for the linkages between 12 spatial field areas. Each offensive play was coded according to the defensive formation of an opposing team (i.e. conservative or risky formation). Results revealed similar network properties between teams when competing against more risky defensive formations, while notable differences were observed against conservative defences. Effect of defensive formation of opponents on macro network properties was observed in both the Portuguese and Spanish teams. At a meso-level, only the Spanish national team exhibited notable changes, suggesting a greater level of adaptability to unfolding performance events. The observed flexibility in tactical behaviours of the Spanish team appeared to express their greater expertise levels.

© 2016 Elsevier B.V. All rights reserved.

## 1. Introduction

Over the past few years, research on team sports performance has moved beyond the traditional notation of action frequencies and their relation to success, to consider the effects of situational game constraints on team performance (Lago & Martín, 2007; Lago-Ballesteros, Lago-Peñas, & Rey, 2012). For example, variations in some situational variables (e.g. game result, the on-field locale of ball recovery, or the balance in opposition teams) can constrain the attacking play exhibited by a team, resulting in changes in the probability of reaching the critical scoring space in football (Lago-Ballesteros et al., 2012). Also, in the team sport of Futsal, Gómez, Moral, and Lago-Peñas (2015) revealed that the probability of successfully maintaining ball possession depends on the type of team possession and the defensive formation of the opposition. These findings reinforce the idea that the adaptability of teams to emergent game constraints is crucial to improve performance and achieve competitive successful outcomes.

\* Corresponding author at: Sport Sciences Department, University of Beira Interior, Convento de Sto. António, 6201-001 Covilhã, Portugal.

E-mail address: [bruno.travassos@ubi.pt](mailto:bruno.travassos@ubi.pt) (B. Travassos).

Additionally, analysis of team performance has moved beyond the notation of action frequencies towards a theoretical interpretation of patterns of play as emergent coordination tendencies in teams considered as complex collective systems (Travassos, Davids, Araujo, & Esteves, 2013). Indeed there have been increasing attempts to analyze and interpret the emergent coordination tendencies between players of interacting teams in adopting such a complex systems approach to understanding team sports performance (Carling, Wright, Nelson, & Bradley, 2014). It has been proposed that intra- and inter-team patterns of coordination can reveal team tactical behaviours (Davids, Araújo, & Shuttleworth, 2005; Kempe, Grunz, & Memmert, 2015; Silva, Garganta, Araújo, Davids, & Aguiar, 2013). This conceptual approach suggests that analysis of how two competing teams continuously interact to achieve their performance goals can provide important insights into the adaptability of players and teams to the dynamics of competitive performance environments (Araújo & Davids, 2009; Davids, Araújo, Correia, & Vilar, 2013).

Previous research on team sports using Social Network Analysis (SNA) (Bourbousson, R'Kiouak, & Eccles, 2015; Clemente, Martins, Wong, Kalamaras, & Mendes, 2015; Duch, Waitzman, & Amaral, 2010; Fewell, Armbruster, Ingraham, Petersen, & Waters, 2012; Passos et al., 2011) has provided a quantitative expression of the interactions (i.e., links) between players, or field areas based on analysis of ball passing actions). Generally, SNA has revealed that changes in tactical behaviours are associated with successful or unsuccessful outcomes, with changes in game contexts or due to the expertise levels of the competing teams. For example, Passos et al. (2011), studying water polo teams, observed distinctive intra-team coordination tendencies between players that differentiated between successful and unsuccessful performance outcomes. Similar results have been reported in investigations of sports teams by Grund (2012), Fewell et al. (2012), Peña and Touchette (2012) and Duch et al. (2010). Their studies revealed that networks with high 'density' centralization tendencies (i.e., high relational links between players), but low 'betweenness' centralization predispositions (i.e., low dependency of the network structure on a specific player and consequently high flexibility of players' involvement), were associated with successful performance outcomes. Network structures of successful sport teams were characterized by a higher level of shared coordination between players and lower dependency on the performance of a specific leader. Recently, Gama et al. (2014) and Clemente et al. (2015) went further by identifying key individual players within team tactical performance using SNA techniques.

However, it is important to note that the impact of specific performance constraints, related to the dynamics of competitive environments, such as opposition defensive formations, on emergent coordination tendencies in sports teams still remains an open issue (Carling et al., 2014; Fewell et al., 2012; Gómez et al., 2015). Sport teams are constantly confronted with changes in performance environments during competition (i.e., co-positioning of opponent players, changes in ball location, game pace, match status) (Sampaio, Lago, Gonçalves, Maçãs, & Leite, 2013), and their ability to rapidly adapt tactical behaviours is mandatory to achieving high performance levels (Eccles, 2010). For example, acknowledging levels of team flexibility (i.e., adaptation of patterns of play to a wider range of task solutions and styles of play according to changes in the competitive performance environment) or stability (i.e., maintaining a playing system yielding a limited range of task solutions or patterns of play, despite changes in the competitive performance environment) may reveal the potential for adaption to ever-changing situational performance constraints (Folgado, Lemmink, Frencken, & Sampaio, 2012; Olthof, Frencken, & Lemmink, 2015). As previously noted, team flexibility and a low reliance on the performance of a specific (superstar) player or a particular pattern of play, appear to be a hallmark characteristic of successful sport teams (Fewell et al., 2012; Grund, 2012). Thus, more research is needed to understand how, for example, changes in opposition defensive formation such as level of pressure exerted on the ball, may constrain the amount of ball possession and coordination tendencies that sustain successful team tactical behaviours in terms of stability and flexibility (Fewell et al., 2012; Gómez et al., 2015).

This study sought to characterize the coordination tendencies that sustain tactical behaviours of attacking teams according to changes in the opposition defensive formations in international futsal matches. Assuming that situational performance constraints such as the evolving spatial and temporal relations between players and teams are crucial to the emergence of team tactical behaviours, we analyzed how changes in the spatial formation of a defensive team (risky or conservative formation) impacted on the functions of an attacking team. We hypothesized that changes in defensive formations would differently influence the coordination tendencies (both at macro and meso-levels of organization) of attacking teams, providing insights into the variations in their tactical behaviours. Based on previous research (Duch et al., 2010; Grund, 2012; Peña & Touchette, 2012), we also hypothesized that flexibility/stability levels of attacking teams would be related to their level of expertise. It was expected that the best-ranked international teams would express higher levels of flexibility in their coordination tendencies at different levels of organization according to changes in the defensive formation of their opponents.

## 2. Methods

### 2.1. Participants

The performance behaviours of two national teams which participated in the UEFA futsal Euro 2012 competition, Spain (Winner) and Portugal (5th ranked), were analyzed during four games at the group stage and two games in the knock out phase (from the quarter finals onwards). Three games of each team were considered for comparison purposes. The Portuguese and Spanish teams were selected for convenience according to the purposes of the study. The Spanish team was the overall winner of the competition and ranked first in the FIFA futsal rankings, while the Portuguese team came

Download English Version:

<https://daneshyari.com/en/article/7291453>

Download Persian Version:

<https://daneshyari.com/article/7291453>

[Daneshyari.com](https://daneshyari.com)