Interdependence between perceptual and motor sub-systems in pattern-forming dynamics in team sports

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Traditionally, performers’ decision-making in team sports have been investigated by analyzing perception and action separately as if they were functionally independent [1]. However, research is needed to consider, not only how players make use of perceptual information to regulate movement, but also the role of movement in the pick up of perceptual information for action. In this communication we aim to show how players’ interpersonal patterns of coordination are constrained by informational variables from the locations of the goal and direct opponents.
Seventy-one players \((M=25.31, \ SD=4.73 \ years)\) from five national teams played ten futsal games in the 2009 Lusophony Games. Matches were filmed and plays ending in a goal \((n=30)\), a goalkeeper’s save \((n=30)\), and an interception by the nearest defender \((n=30)\) were randomly selected for further analysis. Spatial (Defender-attacker’s angle to the goal, Relative distance to the goal and Interpersonal distance) and temporal measures of coordination (Relative velocity) were accessed at four specific moments during performance: (i) assisting attacker’s ball reception, (ii) pass to shooter, (iii) shooter’s ball reception and (iv) shot on goal. Mixed-Model ANOVA showed that the defender’s angle to the goal was significantly smaller in plays ending in a goal than those ending in a defender’s interception. The attacker and defender relative distance to the goal was significantly lower in plays ending in a goal than those ending in a defender’s interception, suggesting that successful shots emerged when the attacker was (at least) at the same distance to the target as the defender. When the defender was closer to the attacker at the moment of shooting, results revealed a higher probability of interception of the shot. Finally, when the attacker was moving at the same velocity (at least) as the defender he was able to prevent the defender from intercepting the ball. Results suggested that the analysis of players’ decision-making behavior in team sports should consider the complementary relationship between their perceptual and motor sub-systems.

Bibliography