

## Effects of manipulations of player numbers vs. field dimensions on inter-individual coordination during small-sided games in youth football

Pedro Silva<sup>1,2</sup>, Pedro Esteves<sup>3,4</sup>, Vanda Correia<sup>5,6</sup>, Keith Davids<sup>7,8</sup>, Duarte Araújo<sup>6</sup> & Júlio Garganta<sup>1</sup>

<sup>1</sup> CIFI<sup>2</sup>D – Centre for Research, Education, Innovation and Intervention in Sport, Faculdade de Desporto, Universidade do Porto, Porto, Portugal

<sup>2</sup> FC Zenit, St. Petersburg

<sup>3</sup> School of Education, Communication and Sport, Polytechnic Institute of Guarda, Guarda, Portugal

<sup>4</sup> CIDESD – Research Center in Sports, Health Sciences and Human Development, Portugal;

<sup>5</sup> School of Education and Communication, University of Algarve

<sup>6</sup> CIPER, Faculdade de Motricidade Humana, Universidade de Lisboa, Cruz Quebrada Dafundo, Portugal

<sup>7</sup> Centre for Sports Engineering Research, Sheffield Hallam University, UK

<sup>8</sup> FidiPro Programme, University of Jyväskylä, Finland

### Abstract

*The relative space per player formulated in small-sided and conditioned games can be manipulated either by promoting variations in player numbers or by modifying field dimensions. In this study we analysed how the same relative spaces per player, obtained through manipulations of player numbers and field dimensions, influenced inter-individual coordination. The positional data (GPS, 10 Hz) of 24 U-15 yrs performing in three different relative spaces per player (118, 133 and 152m<sup>2</sup>) was used. Inter-individual behavioural measures included: (i) effective relative space per player, (ii) radius of free movement; (iii) numerical relations inside each player's relative space per player; and (iv) players' spatial distribution variability. Magnitude-based inferences were used to analyse the practical significance of the selected variables. Results showed that manipulations of player numbers elicited more free space in the vicinity of each player. However, more advantageous numerical relations adjacent to each individual player and broader individual spatial distributions on field were observed during manipulations of field dimensions. These findings highlight the complex nature of performance behaviours captured by the co-adaptation of players to surrounding spatial constraints. Sport pedagogists should carefully evaluate the use of player numbers and field dimensions as strategies to simulate constraints of specific game contexts.*

**Keywords:** co-adaptive behaviours, coordination tendencies, task constraints, GPS, soccer.