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Perspective

Holistic Approach in Sports Science Research

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Holistic approach enabled to develop, for the last years, deterministic models to describe and predict performance. Recently some limitations were pointed out to these models and claims that dynamic systems theory should be used as major framework to analyze sports performance. Hence, the development of research based on non-linear parameters (i.e. fractal analysis, entropy, etc) is a step forward for this research field and only briefly described in some of the last papers published under this field. Therefore, it seems a hot topic for the sports science research.

A term that gained a lot of popularity on recent years was the so called "marginal gains theory". High-performance athletes are not able to improve significantly their performances. It is the marginal gains improvement (i.e. non-significant) in a few variables or performance determinants that helps them to excel. It is quite challenging to obtain accurate measures of these minimal gains with experimental testing. Sports enhancement is associated not only to the athlete himself but also with the equipment used or the apparatus selected to his analysis in control and evaluation settings (training or competition). In this sense, partnerships and research with sports industry should be consider an important goal on sports science research and development to help with the design & development of equipment (i.e. sportswear, sports equipment) and evaluation apparatus (i.e., equipment to analyze the athlete in competition and/or training settings).

Hence, three major goals can be set on the future of sports performance analysis: (i) the development of models to describe and explain sports performance based on dynamic systems theory and/or non-linear parameters; (ii) the selection of experimental approaches for the assessment of technique details of a human movement; and (iii) design & development of equipment and evaluation apparatus.

Moreover, in addition to the development of performance models, research groups should seek to focus their research on the following aims: (iv) the development of specific performance and training evaluation tools (e.g. physiological, psychological, biomechanical) in order to control more strictly the adaptive response to training in different sports; and (v) the characterization of the role of exercise and training to injuries prevention.