

CRITICAL VELOCITY RELATIONSHIP TO VENTILATORY GAS EXCHANGE PARAMETERS AND MAXIMAL LACTATE STEADY STATE IN SWIMMING

ESPADA, M.1,2,3, PESSOA FILHO, D.2, ALVES, F.3

(1) POLYTECHNIC INSTITUTE OF SETUBAL / (2) LABOREH LABORATORY OF HUMAN PERFORMANCE SPORTS OPTIMIZATION, UNESP / (3) FACULTY OF HUMAN KINETICS - UNIVERSITY OF LISBON

Introduction

It is acknowledged that the evaluation of physiological measures provide fundamental information for training prescription, monitorization and performance maximization. Maximal lactate steady state (MLSS) has been described as the gold standard for aerobic training prescription and critical velocity (CV) associated to the boundary between the heavy and severe exercise intensity domains. The respiratory compensation point (RCP) seems to be close to the lower boundary of the severe-intensity domain in swimming exercise indicating that it is possible that the maximal oxygen uptake (VO₂max) might be attained in this exercise intensity. The aim of this study was to examine the relationship between CV, MLSS and ventilatory gas exchange parameters in swimming.

Methods

Twelve male competitive swimmers (18.6±3.4 years of age) completed an incremental test composed by 5x250m and 1x200m front crawl for gas exchange threshold determination through Log-log and Dmax methodology, RCP and VO₂max, as well as the respective swimming velocities (SV). MLSS was determined from the traditional methodology (30-min at constant velocity at 85, 90 and 95% of MAV, previously determined). In all these tests, VO₂ was directly measured using a telemetric portable gas analyzer (K4b2, Cosmed, Rome, Italy). CV was calculated without VO₂ measurement from the slope of distance-time relationship from maximal trials performed in training environmental and the respective covered distances (100, 200, 400 and 800 m). Pearson's product-moment correlation coefficient was used to establish correlations. Paired-samples t-test was used to compare swimming parameters and variables. Statistical significance was set at p<0.05.

Results

CV₂₀₀₋₄₀₀ (1.41±0.05 m.s⁻¹), CV₂₀₀₋₄₀₀₋₈₀₀ (1.39±0.05 m.s⁻¹) and CV₁₀₀₋₂₀₀₋₄₀₀₋₈₀₀ (1.39±0.05 m.s⁻¹) overestimated vMLSS (1.30±0.04 m.s⁻¹), which in turn, was significantly correlated with vRCP (1.31±0.09 m.s⁻¹) (r=0.81, p<0.01) and vDmax (1.30±0.04 m.s⁻¹) (r=0.83, p<0.01), all these SV were not significantly different. RCP (49.4 ± 6.7 ml.kg⁻¹.min⁻¹) was not significantly different from VO₂ at vMLSS (49.0±8.9 ml.kg⁻¹.min⁻¹), both were significantly different from VO₂max (57.4±7.1 ml.kg⁻¹.min⁻¹). vVO₂max (1.45±0.04 m.s⁻¹) was significantly correlated to vDmax (0.87, p<0.01), vMLSS (0.83, p<0.01) and vRCP (0.62, p<0.01). All CV determinations were correlated to vDmax and vVO₂max but no correlations were observed with vRCP.

Discussion

These findings indicate that CV does not provide an accurate estimation of the physiological parameters traditionally associated to the transition from the heavy to the severe exercise intensity domain in swimming, namely vRCP and vMLSS. It could be argued that vMLSS can be indirectly estimated through an incremental test and the swimming distances used for CV determination should be carefully selected.

Invited symposia

IS-SH09 The psychology of judgments and decision-making in sport and exercise

THE POWER OF SIMPLICITY: WHY LESS-IS-MORE IN SPORT AND EXERCISE CHOICES

RAAB, M.

GERMAN SPORT UNIVERSITY COLOGNE

Judgments and choices and sport and exercise differ on many dimensions. Here I will focus only on the choices and judgments of athletes operating with limited time available. One approach that proposes that considering less information (cues) or fewer alternatives when making such complex athlete choices such as to whom to pass the ball is the fast-and-frugal heuristics approach. According to this approach, experts learn to rely on heuristics in an adaptive way in order to make accurate decisions. We test the adaptive use of heuristics in three ways: the descriptive study of the heuristics in the cognitive "adaptive toolbox;" the prescriptive study of their "ecological rationality," that is, the characterization of the situations in which a given heuristic works; and the engineering study of "intuitive design," that is, the design of transparent aids for making better decisions. I will provide examples for discrete choices as well as examples from sequential choices that illustrate when relying on your intuition is beneficial.

THE POWER OF PARALLEL PROCESSING: EXPERTS USE OF MULTIPLE CUES IN AN INSTANT

PLESSNER, H.

UNIVERSITY OF HEIDELBERG

So called multiple-cue approaches to judgment and decision making generally highlight people's ability to make decisions by assessing multiple features of the decision making situation. According to these approaches, the ability to process multiple cues in a parallel fashion and to draw valid conclusions even under time pressure can be considered as an important factor of decision makers' expertise. Consequently, the value of multiple-cue approaches for the understanding of expert performance in sport has been recognized in various studies on athletes' decision making in recent years. In addition, our own work focused on referees' decisions in sports like soccer and basketball. Among others, the application of a multiple-cue approach in this area turns the attention to the question of how referees can be supported in their learning of valid cue-criterion correlations. This talk provides an overview on respective training studies and discusses multiple-cue probability learning as a general framework for improving decision making in sport.