

successively conducted testing cycles, the distance covered during the Cooper test was longer with each cycle. Lower post-training lactic acid level was determined in cycle III as compared with cycles I and II. Similar results were observed in the case of free fatty acids, glucose and growth hormone levels. Decreases in leptin levels were significant in cycles II and III.

**DISCUSSION & CONCLUSION** Training induced decrease in the biological cost of 60 minutes' physical effort, and improvement in the endurance level in the tested female swimmers. Lack of adverse hormonal response, continuous anabolic-catabolic balance, stable energy profile and maintenance of similar body mass are indicative of beneficial health-promoting effects of the training.

**KEY WORDS** Swimming training, anabolic-catabolic balance, leptin

## Qualitative versus quantitative analysis of the behavior patterns of the elite butterflyers

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**OBJECTIVE** The purpose of this study was to find patterns in the swimming technique of butterfly based on Behavioral Observation System of Technical and compare the data obtained from the kinematic analysis (quantitative).

**METHODS** In the analysis of temporal patterns (T-pattern) and a sequence of five cycles gestures executed at maximum speed at 25 meters, studied the behavior of three technical elite swimmers of Portuguese participants in the Olympics, with a record 259 and a full alphanumeric codes 120 configurations. The instrument based on a mixed system of categories and field formats, with technical features observed during the execution of hand cycles. The validity was assured by the index of intra-observer reliability (95%) and inter-observer accuracy (96%). To detect patterns exist, each swimmer, using the Theme 5.0 software, which allowed to identify the stable structures of technical performance within a critical interval of time ( $P < 0.05$ ) - t-patterns. To compare the data we performed a kinematic analysis. The calculation of kinematic variables was performed by software Ariel Performance Analysis System (APAS).

**RESULTS** The patterns were different, adjusting to the characteristics of technical implementation of the swimmers. Each swimmer may display settings with different levels of complexity of structure, depending on the implementation of changes within the hand cycle. By comparing the codes with the kinematical values found that complement and show the same information.

**DISCUSSION & CONCLUSION** The potential quality of this instrument is evident by the patterns obtained from a temporal sequence and that when faced with mathematical models describe the same information.

**KEY WORDS** Technical Analysis, Patterns; Butterfly; Chronology; Kinematics

## Observation of the stability of a technical implementation of evidence in 200m butterfly

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**OBJECTIVE** The aim of this study was find patterns in the swimming butterfly technique at a distance of 200 meters using the system Behavioural Observation System of the Technical Butterfly, qualitative analysis allows the observation and study of the stability of the technical implementation.

**METHODS** Instrument for ad-hoc, with the structure of the instrument based on a mixed system Categories and Field Formats which we can record specific techniques observed during the gestural cycles. We performed the analysis of temporal patterns (T-pattern), a sequence of five gestural cycles of the butterfly style in each part of 50 meters. To study the sequence of codes and their interaction representative of the technician in two swimmers at the national level. Swimmers performed the tasks with speed competition, with the same control by the GBK PACER. To detect the