

Track and field athletics elite: discipline-specific psychomotor tests and analysis

UDC 796.01:159.9



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Abstract

Objective of the study was to obtain and analyze discipline-specific psychomotor data of the national track and field athletics elite.

Methods and structure of the study. The psychomotor tests qualities of the sample were tested by the UPFT-1/30 "Psychophysiolgist" Test System to obtain the simple visual-motor response, simple sensorimotor response, nervous functions mobility, dynamic visual response speed, accuracy and nervous control test rates; plus the nervous system strength rating hand tapping test; and sensorimotor dynamic coordination test rates (dynamic tremorometry). We sampled for the study Masters of Sports (n=12) and Candidate Masters of Sports (n=26) from every track and field athletics discipline (n=38 on the whole) to produce an inclusive psychomotor tests database for analysis.

Results and conclusion. Sprinters were tested high on the simple visual-motor response and simple sensorimotor response test scales. The middle-distance runners were tested high on the nervous functions mobility and tapping test scales. The jumpers (pole vault and high jump) and all-round competitors were tested very high on the nervous function mobility test scale and high on the sensorimotor dynamic coordination test scale i.e. with the high assessment and differentiation accuracy verified by the spatial and power movement control parameters. Therefore, such psychomotor rates and analyses may be effectively used to select and specialize young and adult athletes in every track and field sports discipline and every progress stage. The coaching teams may use the psychomotor data and analyses to prudently design and manage the general and special physical fitness models for different types of physique; and forecast individual competitive progresses.

Keywords: track and field sports, psychomotor tests, psychomotor characteristics, physique type, psychophysiolgist.

Background. Modern elite sports are rapidly progressing, with the individual athletic progress secured by individualized training systems – that give a special priority to the psychomotor tests and analyses as a basis for training system design and management [2, 3]. The training systems are increasingly designed to factor in multiple training progress components [5], with the individual psychomotor test rates playing a special role for the sports selection theory and practice and

the long-term psychomotor tests design and management aspects. The psychomotor rates of the sport elite (MS and CMS) may be used as reference points for selections in the primary and advanced stages of the long-term training service [1]. The psychomotor characteristics rating databases make it possible to analyze the strengths and weaknesses in the individual athletic fitness to implement effective corrective and progress management training models for success [4].

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Methods and structure of the study. The psychomotor tests qualities of the sample were tested by the UPFT-1/30 "Psychophysiological" Test System to obtain the simple visual-motor response, simple sensorimotor response, nervous functions mobility, dynamic visual response speed, accuracy and nervous control (RMO) test rates; plus the nervous system strength rating hand tapping test; and sensorimotor dynamic coordination test rates (dynamic tremorometry). We sampled for the study Masters of Sports (n=12) and Candidate Masters of Sports (n=26) from every track and field athletics discipline (n=38 on the whole) to produce an inclusive psychomotor tests database for analysis.

Results and discussion. The psychomotor data analysis made it possible to group the psychomotor rates by qualifications (MS and CMS) and athletics disciplines and offer progress recommendations based on the mean discipline-specific psychomotor characteristics and standard deviations: see Figures 1-5.

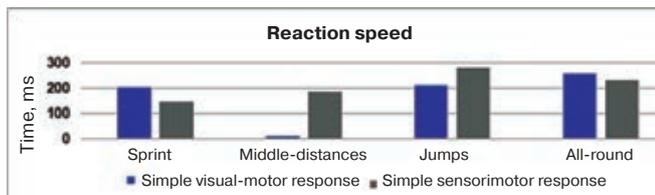


Figure 1. Simple response test rates

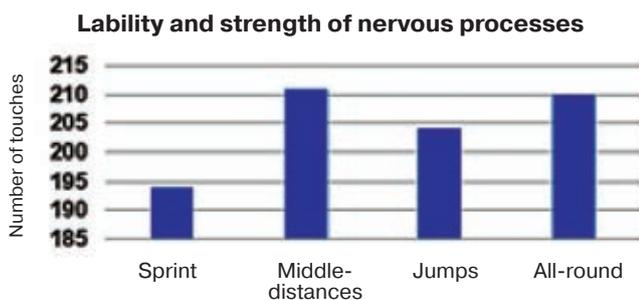


Figure 2. Nervous functions mobility and strength – nervous functions mobility

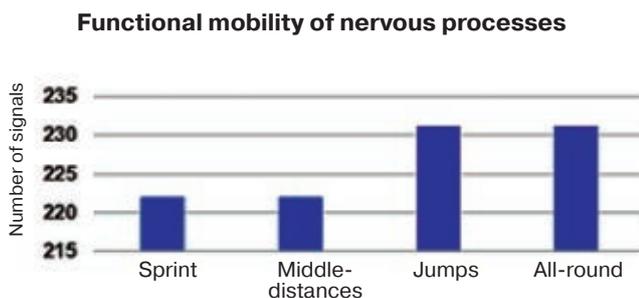


Figure 3. Dynamic visual response speed

Sensorimotor dynamic coordination

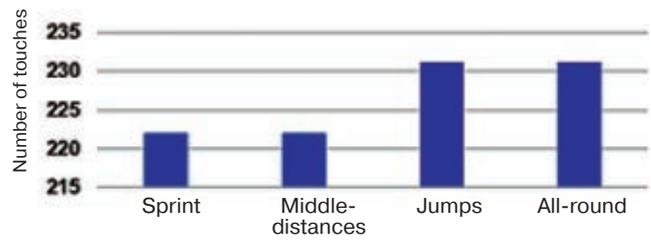


Figure 4. Tapping test – TT

Balance of the main nervous processes

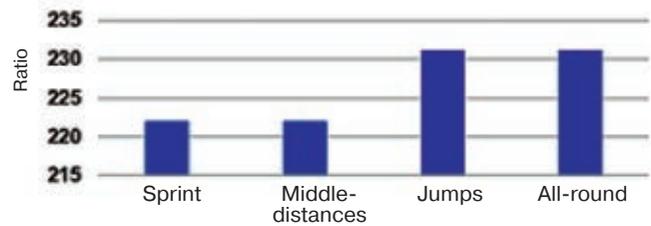


Figure 5. Sensorimotor dynamic coordination – sensorimotor dynamic coordination

Our analysis of the psychomotor rate of the sample ranked the sampled sprinters high on the simple visual-motor response, simple sensorimotor response, and nervous functions mobility test scales. They were also tested above the average in the RMO and tapping test. The RMO test found some shift of the balance in the response speed and accuracy of the main nervous processes.

The middle-distance runners were tested high on the nervous functions mobility and tapping test scales, plus the RMO test scale; above the average in the simple visual-motor response and simple sensorimotor response tests; and mean on the sensorimotor dynamic coordination test scale.

The jumpers (pole vault and high jump) were tested very high on the nervous functions mobility test scale and high on the sensorimotor dynamic coordination test scale. The tapping tests and simple visual-motor response tests yielded the above the average results. And the simple sensorimotor response test rates were below average; whilst the RMO test found some shift of the balance in the response speed and accuracy of the main nervous processes.

The all-round competitors were tested very high on the nervous functions mobility test scale and high on the nervous process lability and strength (endurance) sensorimotor dynamic coordination scale. They showed moderate results in the simple visual-motor response and simple sensorimotor response tests;



whilst the RMO test found some shift of the balance in the response speed and accuracy of the main nervous processes.

Conclusion. Sprinters were tested high on the simple visual-motor response and simple sensorimotor response test scales. The middle-distance runners were tested high on the nervous functions mobility and tapping test scales. The jumpers (pole vault and high jump) and all-round competitors were tested very high on the nervous functions mobility test scale and high on the sensorimotor dynamic coordination test scale i.e. with the high assessment and differentiation accuracy verified by the spatial and power movement control parameters. Therefore, such psychomotor rates and analyses may be effectively used to select and specialize young and adult athletes in every track and field sports discipline and every progress stage. The coaching teams may use the psychomotor data and analyses to prudently design and manage the general and special physical fitness models for different types of physique; and forecast individual competitive progresses.

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