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DEVELOPMENT OF ADVANCEMENT METHODS OF SPECIAL PSYCHOMOTOR ABILITIES OF TRACK-AND FIELD SPRINT ATHLETES

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Key words: track-and-field athletes, sprint, psychomotor system, time perception, space perception, movement perception, coordination abilities.

Annotation. The purpose of the study is a development of advancement methods of special psychomotor abilities in track-and-field sprint athletes. The study results showed that the level of sports qualification of track-and-field athletes affects the presentation of special psychomotor abilities in tests for evaluation of precision of time and space perception and motor tests. Athletes of higher qualifications (I degree, in comparison with II and III degrees) perform tasks for evaluation and measuring time and space parameters more precisely. Effective methods for advancement of special psychomotor abilities in track-and field sprint athletes were developed and approved during the 3-stage pedagogical experiment.

Introduction. Achievement of high results in different types of sports depends a lot on the development of psychomotor abilities, integral components of which are abilities to differentiate, repeat and measure space and dime parameters, to change body position in space and time [1-3]. Some studies of psychology and physiology of sports point at the connection between psychomotor abilities related to differentiating movement parameters, athletic prowess and athletic abilities [4-8].

The purpose of this study is the development of advancement methods of special psychomotor abilities in track-and field sprint athletes.

Methods and organization. The research was conducted on the base of the BI of AE "Olympic Reserve School of track-and-field №7" located in Omsk in 2019. 28 track-and-field athletes, aged 16-18 years, were examined. All examined athletes

were divided into 2 groups according to their sports qualification: the first one included athletes of I degree (12 people), the second one included athletes of II and III degree (16 people).

Before and after the pedagogical experiment a result of a competitive exercise of 60-meter running (in seconds) was determined, an evaluation of psychomotor abilities using tests of assessment of precision of space and time parameters perception (intervals evaluation – 2-17 cm of length, intervals measuring – 2-17 cm of length, time evaluation, time measuring) (in %) and movement exercise tests was conducted.

Developed methods of advancement of special psychomotor abilities in track-and-field athletes and their approbation (the pedagogical experiment) included training actions on sensory systems of athletes: the 1st stage includes visual training of time and space perception through the visual sensory system; the 2nd stage – visual and motor training of time and space perception through visual and motor sensory systems; the 3rd stage – motor training of time and space perception through the motor sensory system.

On the first stage of the pedagogical experiment, tasks for evaluation and measuring of time and space intervals were used as exercises.

On the second stage of the experiment, subjects performed such exercises as jumping down on the mark, jumping in place with a certain degree turn [9]; repeating the mode of movement, which was previewed on 30 m, 40 m and 50 m distance [10], standing long jump with minimum increase of its length [9].

The third stage included such exercises as an evaluation of running duration [10], exercise for “preservation of rhythm” and “precise tempo of running” exercise [9].

Statistical data processing included counting of the arithmetic mean, the standard (mean square) error of the arithmetic mean, and comparison of sample means using T-Student’s criteria.

Results and discussion. The research of initial level of psychomotor abilities before the experiment showed that track-and-field athletes of I degree assessed time and space intervals more precisely than athletes of II and III degree.

Table 1

Values of errors (%) made by track-and-field athletes of various qualifications during test of psychomotor abilities before and after the pedagogical experiment

Test name	Before		P<	After		P<
	I degree	II – III degree		I degree	II – III degree	

	M ± m	M ±m		M ±m	M ±m	
Time evaluation	1,3 ±1,7	-5,3 ±2,7	0,05	1,2±1,8	-3,7±2,3	-
Space evaluation	1,6 ±1,7	-11,8 ±3,7	0,01	4,8±2,5	10,1±2,5	-
Time measuring	9,5 ±3,4	10,5 ±3,5	-	0,9±1,3	-5,3±2,4	<0,05
Space measuring	1,3 ±2,1	2,6 ±3,2	-	0,06±1,4	0,03±2,3	-

After the first stage of experiment results of time measuring among athletes of I degree were significantly better in comparison with initial ones, results among athletes of II and III degrees were not significantly improved. I degree athletes were better at differentiating time and space parameters than athletes of lower qualification, which approves connection of psychomotor abilities with the level of athletic prowess.

On the second stage of the pedagogical experiment results of athletes of I degree were not changed in the jumping down exercise (error value is 0,3%), athletes of II and III degrees showed worse results before the training session (error value is 4,3%), therefore the training session with the use of given jumping exercise helped them to achieve results and the level of athletes of I degree in the test ($p<0,05$).

Analysis of "jumping with a turn" test showed, that athletes of I degree during performance of the jump with a 90° turn showed better results (error value is 1,7%) than athletes of the II and III degrees (error value is 2,6%). After the training session with this exercise athletes of I degree improved and showed precise results, while athletes of II and III degrees also improved their results (error value is 0,4%), but the absolute precision of performing the test was not registered.

During the exercise of repeating the mode of movement the initial level of results in the first group was a little worse (error value 3,5%), than those showed by athletes of II and III degrees (error value is 3,1%). However, after the training session athletes of I degree showed precise results, athletes of II and III degrees improved them significantly (error value is 0,3%).

During long standing jumping with minimum increase of its length track-and-field athletes of I degree had low initial indicators (error value is 5,1%), after the special training session with the use of given exercise they improved them significantly (error value is 1,2%; $p<0,05$). Track-and-field athletes of II and III

degrees showed more precise results (error value is 1,2%; $p<0,05$), they also improved their results after the training session (error value 0,7%; $p<0,05$).

After the first stage of the pedagogical experiment athletes of II and III degrees were as good as athletes of I degree, which, in our opinion, can be explained by lower initial level of motor preparedness.

Special psychomotor training did not influence significantly results of 60-meter running. Before and after the training session athletes of I degree did not change their results and showed 7,6±0,2 s in average. Athletes of II and III degrees showed 8,0±0,1 s in average before the session, 7,9±0,1 s after the session. However we suggest that the development of special psychomotor and coordination abilities of track-and-field athletes should support an improvement of results during performance of harder and longer exercises (running of 100 and more meters, running with barriers, track-and-field jumping).

Conclusion. Thus, the level of sports qualification of track-and-field athletes influences on presentation of special psychomotor abilities in tests of evaluation of precision of time and space parameters perception and motor exercise tests. Elite athletes perform tasks of evaluation and measuring time and space parameters more precisely. Effective methods for advancement of special psychomotor abilities in track-and field sprint athletes were developed and approved.

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