

## **Individual Indicators of Time Perception among Acrobats of Different Sports Qualifications**

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**Abstract.** *Results of researches lasting for many years and dealing with the problem of forming professionally-applied physical education of students of naval colleges mastering swimming specialties based on the four models methods being worked out by the researchers are presented in the paper.*

**Keywords:** *professionally-applied physical education, students of naval colleges, four modulus methods.*

### **Introduction**

It is known that the IM parameter is a criterion of human adaptive abilities (4, 5). The perception of "Me and time" is considered one of the main factors influencing sports performance (7, 6).

The ability to accurately differentiate, reproduce and measure time intervals of various durations, internal time counting (autochronometry) is of great importance in sports that place increased demands on coordination abilities and precision in performing movements (gymnastics, acrobatics, hockey, martial arts), the ability to show their maximum capabilities in a short period of time (boxing, heavy lifting athletics) (2).

The time factor is of great importance when performing group and team exercises (7), movement control in time and space is a genetic marker of athletic giftedness (3, 8).

The aim of the study was to determine the ability of acrobats of high and medium qualifications to accurately perceive time intervals of different durations. Male acrobatic couples took part in the study. Taking into account their sports qualifications, they were divided into two experimental groups. The first experimental group included highly qualified athletes (masters of sports and masters of sports of international class), the second – less qualified (athletes of the 1st category, candidates for masters of sports). The control contingent consisted of male youths who were not associated with sports activities. The age of the athletes and non-athletes studied ranged from 17 to 21 years old. Taking into account the possibility of differences in physiological data, the entire experimental contingent was divided into "upper" acrobats performing dynamic functions on the shoulders, arms and head of partners, and "lower" ones providing conditions for static retention when performing elements of the program by "upper" ones.

The subjects were asked to measure and reproduce one second on a stopwatch with maximum accuracy without visual control (4, 5). To determine it, they used the computer program "Researcher of human temporal and Spatial Properties" (1). The subject measured a 60-second interval by pressing a key at the beginning and end. The estimation of the duration time was measured using a system timer by calculating the difference between the time of the beginning and the end of the measurement. The methods of Student and Wilcoxon-Mann-Whitney were used in statistical processing.

In determining the IP, due to the extremely short time interval, the difference of several tens of milliseconds has already revealed significant differences between representatives of different groups. Thus, in young men who do not engage in sports, the average IS error was 311 ms and showed a significant difference with an identical indicator in acrobats of average qualification (112 ms,  $P<0.01$ ) (Table). Their peers with a higher level of training lacked 126 ms before fully performing the experimenter's installation, which indicated a significant statistical difference with the other two study groups ( $P<0.01$  in both cases). A comparison of the "upper" acrobats by IC showed a difference ( $P<0.05$ ) in the error during installation. Highly skilled acrobats were wrong by 132, average-skilled acrobats were wrong by 124 ms. In the "lower" athletes, the reliability of differences in this indicator between the groups was not found (111 and 109 ms,  $P>0.05$ ). An intra-group comparison of the "upper" with the "lower" revealed a difference in favor of the latter. Highly qualified acrobats were wrong by 21ms ( $P<0.001$ ), average – by 15ms ( $P<0.01$ ). During his research, statistical processing of the material showed a significant difference in the dynamics of these tests.

The "top" highly skilled acrobats under-measured the duration of IM by 1.9, the average skilled ones - by 3.8 seconds ( $P<0.01$ ). The "lower" highly qualified acrobats had a shorter MI compared to the acrobats of average qualification (-3.9, 5.0 s, respectively,  $P<0.01$ ), the analysis of the error ratio within the groups showed a significant difference between the "upper" and "lower" athletes. Acrobats of high qualification did not measure the duration of THEM. In the "upper" acrobats, the error was 1.9, in the "lower" – 3.9 s ( $P<0.01$ ). Acrobats of average qualification working "at the top" under-measured the duration of them by 3.8 seconds,

Table Error in determining time intervals ("individual second", "individual minute") acrobats of different qualifications ( $M\pm m$ )

The studied indicators	Ед. изм	Qualification					
		high (1)	average (2)	P 1-2	We don't do sports (3)	P 1-3	P 2-3
Individual second M wed	мс						
Upper (in)		126±0,06	112±0,05	<0,01	0,311±0,07	<0,05	<0,01
Lower (N)		132±0,08	124±0,09	<0,05	-	-	-
R v-n		111±0,07	109±0,06	>0,05	--	-	-
Individual minute M wed	с	<0,001	<0,01	-	-	-	-
Upper (in)		-2,9	±4,4	<0,01	5,4±0,48	<0,001	<0,01
Lower (N)		-1,9	-3,8	<0,01	-	<0,001	<0,05
R v-n		-3,9	5,0	<0,01	-	<0,01	<0,001
Upper (in)		<0,01	<0,01	-	-	-	-

the lower ones were mistaken by 5.0 s with an advance reaction ( $P<0.01$ ). The average error values for the groups showed that highly qualified acrobats had a 2.9 s shorter MI, and less trained athletes had a mixed type reaction ( $\pm 4.4$ s,  $P<0.01$ ). Non-training peers were 5.4 seconds wrong, over-measuring the set time, which marked the difference with athletes of average ( $P<0.01$ ) and higher ( $P<0.001$ ) qualifications. Thus, with the improvement of skills in acrobatics, the ability to reproduce short (1c) time intervals decreases, especially for athletes working "at height". Such a conclusion does not apply to IM reproduction, where the smallest error value was observed in highly qualified athletes, the highest in young men who do not engage in sports. He found more accurate indicators in acrobats working at the top.

**Conclusions.** The peculiarities of acrobats' perception of time depend on the nature of their activity in their chosen sport. This data can be used in sports selection. The duration of MI in acrobats is closest to astronomical time compared to young men who do not engage in sports. With advanced training, acrobats form an individual standard of time, which can serve as one of the characteristics of the adaptive capabilities of the body.

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