



Indicators of time perception among students in special correctional and general education schools

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Abstract

Objective of the study was to determine indicators of time perception in 10-year-old children studying in correctional and general education schools.

Methods and structure of the study. The examination involved 78 healthy primary schoolchildren (boys 10 years old) and 34 of their peers suffering from sensorineural hearing loss (III-IV degree). We used the computer program "Researcher of Temporal and Spatial Properties of Humans." The "Individual Minute" (IM) test was used to reproduce the duration of the time interval.

Results and conclusions. In healthy schoolchildren and in students with auditory deprivation, different numbers of children with a shortened IM, a long IM and a normal IM were noted. There are significant differences in the studied groups of children with shortened IM. No differences in indicators were recorded when reproducing the duration of a time interval with a light pulse.

Keywords: *time perception, 10-year-old students, auditory deprivation.*

Introduction. Currently, one of the significant tasks of teaching in primary school is to create conditions for the development in the cognitive sphere of individual typological characteristics, which include the spatio-temporal orientation of students.

According to N.V. Davidenko (2007) "...spatio-temporal orientation is an action represented by a complex of operations (perceptual, motor, mental) aimed at identifying and operating with spatio-temporal features of the surrounding reality...".

The overwhelming number of natural movements that we make are spatially oriented, aimed at achieving a specific point in space. At the same time, researchers are attracted to questions of the organization of movements in time [9].

So, even in the work of E.I. Boyko (1964) noted that reaction time is determined by the factor on which component of the movement attention is focused on - sensory or motor. Studying the perception of short

time intervals, Yu.V. Bushov et al. (2004) indicated the organization of two foci of integration (in the fronto-central and parieto-occipital areas of the cortex).

Subsequent studies showed that the best regulation of the functioning of a biological system is ensured exclusively through its temporal organization ("sense of time") [5, 6].

According to Yu.V. Koryagina (2010), an important criterion for the body's adaptation to various environmental conditions is the chronobiological features of time perception. In this case, a significant role in the apparatus of time orientation is played by the conditioned reflex timing of time intervals. It should be noted that in addition to the innate sense of time, there is also the possibility of a conscious assessment of time [8].

Thus, the level of motor activity has a certain influence on the accuracy of time perception; the higher it is, the more "correct" the perception and the authen-



tivity of the perception of behavior dynamics in the “fast-slow” range increases.

Thus, the formation of temporary representations is a condition for effective cognition and proactive interaction with the surrounding reality. This is especially true for children with auditory deprivation. The problem of developing temporary education is one of the cardinal ones for existing educational programs for students in correctional schools.

Objective of the study was to determine indicators of time perception in 10-year-old children studying in correctional and general education schools.

Methods and structure of the study. The experiment was carried out in the laboratory of the Department of Anatomy and Sports Medicine of the Kuban State University of Physical Culture, Sports and Tourism, at the Municipal Autonomous General Educational Institution gymnasium No. 18 and at a special correctional boarding school in Krasnodar.

The examination involved 78 healthy primary schoolchildren (boys 10 years old) and 34 of their peers suffering from sensorineural hearing loss (III-IV degree).

To implement the formulated goal, we used the computer program “Researcher of Temporal and Spatial Properties of Humans” [7].

Unfortunately, within the framework of one article it is technically difficult to display a complete complex showing the spatio-temporal characteristics of the subjects, so a fragment of the study was taken.

Before the examination began, the children were given instructions.

When determining the time range, the “Individual Minute” (IM) test was used. The subject pressed a laptop key at the beginning and end of the action and measured sixty seconds (interval). The result of the duration of an individual minute was set using a system timer based on the discrepancy between the beginning and end of the measurement.

A decrease in the duration of an individual minute is qualified as a sign of increased anxiety, emotional intensity, and tension in adaptation mechanisms. An increase in the individual minute indicates the advan-

tage of inhibitory processes in the central nervous system, and fatigue develops.

When reproducing the duration of a time interval for memorizing a light stimulus lasting 1000 - 10,000 ms, which were displayed on the computer screen in random order. The student was asked to carry out the task by pressing keys on the keyboard. That is, the subject pressed the “space” key, remembering the amount of time of the stimulus that arose, and then reproduced it with the same key (at the beginning and end).

This study makes it possible to assess the perception of time and the “correctness” of time orientation, etc.

Methods of mathematical analysis. The experimental data obtained during the study were processed using standard mathematical and static methods on IBM compatible computers [3]. In this case, the following values were calculated: arithmetic mean value (M); average error of the arithmetic mean ($\pm m$); standard deviation ($\pm \sigma$). Differences in arithmetic means obtained in the study were determined using Student’s t-test. A five percent significance level was considered significant. The study also used the statistical method of one-way analysis of variance.

The students took part on a voluntary basis; informed consent was obtained from parents and representatives of the children.

Results of the study and discussion. The conducted studies showed (Figure 1) that in healthy schoolchildren and students with auditory deprivation, in percentage terms, there are different numbers of children with shortened IM, extended IM and normal MI.

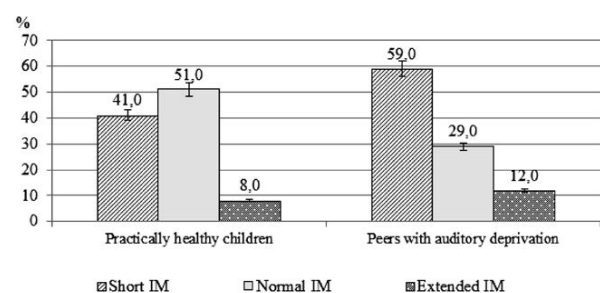


Figure 1. Distribution of schoolchildren by definition of time intervals (individual minute, %)

Table 1. Average IM values in practically healthy children and those suffering from auditory deprivation (s)

Indicators	Shortened IM	Extended IM	Normal IM
Practically healthy children n – 78	50,8±1,7	67,1±1,9	59,6±2,4
Children suffering from auditory deprivation n – 34	43,6±2,3	69,2±2,1	60,1±1,8
	p<0,01; r = 2,52	p>0,05; r = 0,74	p>0,05; r = 0,86

Note: p – reliability of differences in indicators between practically healthy children and their peers suffering from auditory deprivation.



Table 2. Parameters of errors when reproducing time intervals filled with a light stimulus (%) in the studied groups, $M \pm m$

Indicators	Practically healthy children	Children suffering from auditory deprivation	p
Light stimulus	28,9 ± 1,8	30,1 ± 1,5	>0,05 r = 0.61

Note: p – reliability of differences in indicators between practically healthy children and their peers suffering from auditory deprivation.

As a comparative analysis of IM parameters showed (Table 1), there are significant differences among primary school students. They were registered only in groups of children with shortened IM.

It should be noted that the closest value of an individual minute to astronomical time was recorded in practically healthy students, due to the optimization of mechanisms that ensure the balanced functioning of a group of analyzers.

When implementing the task of reproducing the duration of a time interval filled with a light stimulus, no differences in indicators were recorded between practically healthy children and their peers suffering from auditory deprivation (Table 2).

Conclusions. The duration of an individual minute can be considered as an adaptive criterion for the potential of a student in a general education organization.

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