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## THE RESEARCH OF TIME PERCEPTION OF CHILDREN WITH HEARING IMPAIRMENTS

Liliy Gatsoeva<sup>1</sup><sup>1</sup> Kherson State University, Kherson, Ukraine, gatsoeva@ukr.net<https://doi.org/10.29038/2220-7481-2017-04-73-77>

### Abstract

The article describes the peculiarities of perception of the length of time periods of children of elementary school age with hearing impairments. It is known that in the characteristics of time sensations the most important role is played by kinetic and auditory sensations. Therefore, the study of perception of time as an integral part of cognitive activity of children with hearing impairment is relevant.

In studies whose purpose was to *study* the perception of the time of children with hearing impairment, we were asked to study the data of scientific sources and analyze the results of the pedagogical experiment. The purpose and tasks were realized by *methods* of analysis and generalization of scientific and methodological literature and pedagogical experiment.

In investigational participated 24 children (an experimental group consisted of 12 girls with violation of rumor, control – from 12 girls in that a rumor was in a norm). For the study of perception of time in our research we used methodology of measuring of minute interval lot and executing an ccount to 60 after a second.

According to the results of the experiment, it was found that the majority of girls who participated in the study demonstrated a decrease in the length of the individual minute. There was no significant difference between the mean group values of the control and experimental groups in the first and second tests ( $p > 0,05$ ). The analysis of the results showed an ambiguous picture, which can be related to external and internal factors and features of the subjects.

**Conclusions.** Perception of time is an important characteristic of the mental activity of a child with hearing impairment. It determines the level of orientation of such a child in the world around him and depends on both external factors and the characteristics inherent in the child. It is natural to assume that such an individual characteristic as the perception of time can depend on the nature of the child, the degree and timing of hearing loss, the level of knowledge, the emotional state, and will be the subject of our further research.

**Key words:** Time, children with hearing impairments, minute interval.

**Лілія Гацоева. Дослідження сприйняття часу дітьми з вадами слуху.** У статті досліджено особливості сприйняття тривалості часових періодів дітьми з вадами слуху молодшого шкільного віку. Відомо, що в характеристиках часових відчуттів найбільш важливу роль відіграють кінетичні й слухові відчуття. Тому опанування сприйняття часу як складової частини пізнавальної діяльності дітей із порушенням слуху є актуальним.

У дослідженнях, мета яких полягала у вивченні сприйняття часу дітей із порушенням слуху, нами поставлено *завдання* вивчити дані наукових джерел і проаналізувати результати педагогічного експерименту. *Мета та завдання* реалізовувалися *методами* аналізу й узагальнення науково-методичної літератури та педагогічного експерименту.

У дослідженні взяли участь 24 дитини (експериментальна група складалася з 12 дівчаток із порушенням слуху, контрольна – із 12 досліджуваних, у яких слух був у нормі). Для вивчення сприйняття часу в нашому дослідженні ми використовували методику вимірювання хвилинного інтервалу без лічби й виконуючи рахунок до 60 через секунду.

За результатами експерименту встановлено, що більшість дівчат, які брали участь у дослідженні, продемонстрували зменшення довжини індивідуальної хвилини. Між середньогруповими значеннями контрольної та експериментальної груп у першому й другому тестуванні не виявлено достовірної різниці ( $p > 0,05$ ). Аналіз результатів засвідчив неоднозначну картину, що може бути пов'язана із зовнішніми та внутрішніми факторами й особливостями досліджуваних.

**Висновки.** Сприйняття часу це важлива характеристика психічної діяльності дитини з порушенням слуху. Воно визначає рівень орієнтованості такої дитини в навколишньому світі й залежить як від зовнішніх чинників, так і від особливостей, що властиві самій дитині. Природно припустити, що така індивідуальна характеристика, як сприйняття часу, може залежати від характеру дитини, ступеня та часу втрати слуху, рівня знань, емоційного стану, що й стане предметом наших подальших досліджень.

**Ключові слова:** час, діти з вадами слуху, хвилинний інтервал.

**Лилия Гацоева. Исследование восприятия времени детей с нарушением слуха.** В статье рассказывается об особенностях восприятия длительности временных периодов детей с нарушениями слуха младшего школьного возраста. Известно, что в характеристиках временных ощущений наиболее важную роль играют кинетические и

слуховые ощущения. Поэтому исследование восприятия времени как составной части познавательной деятельности детей с нарушением слуха является актуальным.

В исследованиях, цель которых заключалась в изучении восприятия времени детей с нарушением слуха, нами ставились **задачи** изучения данных научных источников и анализа результатов педагогического эксперимента. Цель и задачи реализовывались **методами** анализа и обобщения научно-методической литературы и педагогического эксперимента.

В исследовании приняли участие 24 ребенка (экспериментальная группа состояла из 12 девочек с нарушением слуха, контрольная – из 12, у которых слух был в норме). Для изучения восприятия времени в нашем исследовании мы использовали методику измерения минутного интервала без счета и выполняя счет до 60, воспроизводя секунду.

По результатам эксперимента установлено, что большинство девочек, которые приняли участие в исследовании, продемонстрировали уменьшение длины индивидуальной минуты. Между среднegrupповыми значениями контрольной и экспериментальной групп в первом и втором тестировании не обнаружено достоверной разницы ( $p > 0,05$ ). Анализ результатов показал неоднозначную картину, которая может быть связана с внешними и внутренними факторами и особенностями испытуемых.

**Выводы.** Восприятие времени является важной характеристикой психической деятельности ребенка с нарушением слуха. Оно определяет уровень ориентированности такого ребенка в окружающем мире и зависит как от внешних факторов, так и от особенностей, присущих самому ребенку. Естественно предположить, что такая индивидуальная характеристика, как восприятие времени, может зависеть от характера ребенка, степени и времени потери слуха, уровня знаний, эмоционального состояния и станет предметом наших дальнейших исследований.

**Ключевые слова:** время, дети с нарушениями слуха, минутный интервал.

**Introduction.** According to experts in the area of psychology, perception is based on sensations. At the time of perception all the sensations are synthesized, creating complete images of objects and phenomena. There is a reproduction of past experience, perceived understanding, feelings and emotions in every perception that is not reducible to a simple sum of sensations. There are several classifications of perception nowadays. At the core of one of them is the object of perception, i.e. the perception of objects, motion, gravity, balance, acceleration of space and time, person etc [1].

Perception of time is a reflection of objective duration, speed and sequence of phenomena. Time is a regulator of social relations, different types of activities, including work, sport, learning etc.

Every period of physical time can only be measured by comparing it with the duration of another interval that is a time standard. But there is no energy in time, that would influence a «receptor time» in the human body. Accordingly, there must exist an indirect mechanism that converts physical intervals into touch sensation.

Conditioned reflexes are physiological basis of the process of time's perception, that are accomplished by the interaction of analyzers, with a help of which we reflect other aspects of the phenomena [11].

Studies on psycho-physiological characteristics of athletes, depending on the specialization on the example of different sports, were done by S. K Holyaka, S. I Stepanyuk [12].

In the perception of time different analyzers are involved, however, the most accurate differentiation of time provides kinesthetic and auditory sensations. The auditory sensations reflect temporary features of the current irritant: its duration, rhythmic nature etc. I. M. Sechenov named the hearing – a measuring instrument of time, and auditory memory – a memory of time [6].

Hearing loss not only hampers the formation of speech and verbal thinking, but also affects the development of cognitive activity in general. Few studies on psychophysiological features of young sportsmen who have disturbance of analyzers, including hearing impairment are known today

The impact of hearing loss on quality characteristics of perception, including the perception of time always remains in the focus of specialists in pedagogy, psychology, sociology, etc.

**Analysis of Recent Researches and Publications.** Scientists believe that person's age is of great importance in the perception of time: in childhood, a person feels more bodily sensations (heart palpitation, breathing), therefore, the time is rapidly running out.

Nowadays, according to the results of research in the field of biology and medicine, it is determined that some medications influenced the perception of time (speed up and slow down time). It was also determined that the size of an individual minute largely depends on the nature and quantity of hormones produced in the human body. For the elderly, in the body of which the hormones are less than in people of middle age, time usually stretches more slowly. In people of middle age, an individual minute is the shortest – human hormones are more active.

The latest research has proved that there is a systematic tendency to overestimate time intervals less than one second.

It is also known that the perception of time depends on the mental and physical condition of a person. «Sense of time» is developed and improved under the influence of specially organized physical activities and assimilation of a variety of means of estimating the time. In such cases the perception of time begins to play the role of the activities regulator.

From household observations, it is known that the rate of events is perceived differently in joy and in boredom. Perhaps this has become one of the reasons for the continued attention of researchers to the perception of time to this problem. Determination of the level of time's development perception among children of primary school with hearing loss remains highly relevant today.

Children with hearing impairment have a number of peculiarities in psychophysical development and communication. These peculiarities do not allow them effectively develop, acquire knowledge, life-saving skills and necessary skills for their age. Many scientists were engaged in search and study of factors influencing the perception of time. The dependence on accuracy of time estimation from the intellectual level development was found out by B. I. Tsukanov. Ability to determine the time of a child is associated with knowledge of numbers. B. I. Tsukanov was also the first in the psychology world who revealed the value of temperament as a fundamental factor in the temporal organization of the individual [10] from temperature of the body and the environment [4; 13]. It is known, that while accelerating the metabolism, the subjective evaluation of time curves: it seems that time flows faster than normal, and vice versa. This effect was firstly described in 1933 by N. Hoagland. He found out that at high temperature, the subjective minute perceived by the patient was shorter than that at low. According to the N. Hoagland hypothesis, the brain has a biological clock that regulates the rate of metabolic processes in the body, which in turn affects the perception of time. Lowering the temperature should have the opposite effect. It should slow down metabolic processes, resulting in an underestimate of time. This assumption was checked for scuba divers on the coast of Wales in March at a water temperature of 4 ° C (Baddeley, 1966).

There is a considerable practical interest in such studies as effect of emotional stress on the accuracy of time estimation [8]. It was also studied the perception of time of such personality types are characterized by a high degree of emotional tension.

Y. M. Komarov together with G. I. Savenkov [3], investigated time perception among deaf individuals of 18–25 years old by comparing their data with the results of persons whose hearing was normal. They found out that during the «measurement of time interval» there were more mistakes among the deaf, than among those ones, who had normal hearing. However, playing back a specified interval, the deaf had fewer mistakes.

According to the study of A. V. Muteva, teenagers at the age of 13–15 who can hear, have better accuracy of the perception of time than the deaf at the same age [5]. Temporal parameters of movements among deaf children explored in their works I. M. Lyahova, O. I. Forstyan and others [3; 9].

But in an accessible scientific, scientific-methodical literature of domestic and foreign authors we have not come across an exhaustive study on the perception of time by children with hearing impairment. This question is of considerable interest, since the revealing of the connections of the perception of time with various factors would allow working out tests for professional suitability of people with hearing impairments in future. The analysis gives grounds to claim that the problem of time perception in the children of primary school age with hearing impairment has not been investigated enough.

**The purpose of the study** is to identify features of development of time perception among children of primary school age with a hearing disorder.

**Material and Methods.** According to the purpose our aim was to study and analyze data of scientific sources, concerning problems of time perception among children of primary school age with a hearing disorder. The aim and tasks were implemented by the methods of system analysis and synthesis of scientific and methodological literature on study issues, educational testing, and observation.

**The Results of the Research. Discussion.** The research involved 24 girls (12 girls with hearing impairment in the experimental group and 12 girls who have normal hearing were in the control group). The study was divided into two stages. At the first stage we investigated the perception of time. At the second stage we carried out mathematical processing of research results and their analysis.

Equipment: stopwatch and table-protocol of the study.

The procedure of the research: the study on time perception was done by two people, one of them was a test subject, while the second – an experimentalist. The study consisted of two experiments. In each experiment, the test subjects were asked to define a certain period of time without counting in the head and using a clock. The experimentalist determined the beginning of an interval by knocking with a pencil. The test subject determined the end of a certain period of time by raisings a hand or giving another signal. The time interval and the actual time that the test subject took for the given. The end of a certain period of time  $t$  interval was written in the table (table 1).

Table 1

**The Results of the First and Second Testing of Time Perception EG and CG, c**

№	Groups			
	The First Testing		The Second Testing	
	EG	CG	EG	CG
1.	31	51	57	48
2.	16	44	52	57
3.	31	43	49	49
4.	43	48	56	48
5.	85	45	43	49
6.	26	40	44	48
7.	35	42	48	47
8.	32	48	49	52
9.	44	52	42	54
10.	28	50	55	56
11.	92	48	59	51
12.	30	45	55	49
Mean Value ± σ	41,08±23,31	46,33±3.8	50,75±5,21	50,67±3,07
t	P>0,05		P>0,05	

Each of these groups that participated in the experiment proved to be different in terms of «individual minute». The perception of time was very individual, and during the retesting, these properties were repeated.

The short duration of individual minute by certain individuals, the EG (table 1) in our opinion can explain the emotional stress and the way of thinking of children with hearing impairment. Features of personal sphere of the test subjects (EG), lead to the appearance of a range of communication problems, and through them to increase in emotional intensity. The children of primary school age with hearing impairment are also characterized by the need to control the changes that are taking place around. It reduces the attention during task completing and accelerates individual minute.

We obtained the following results in our research. Due to less critical calculated value of t-criterion, we conclude that the differences between EG and CG that we observed during testing were not statistically significant ( $p > 0,05$ ). According to the results of the first and second tests, significant difference between EG and CG were not identified.

As the table shows us, during the second test, the records of girls' individual minute changed. The girls from EG were able to reproduce more accurately set periods, than the girls from CG. It was also revealed that in the EG and CG dispersion decreased in the second testing.

It is known that the reactions of excitation are of considerable diversity in strength of expression and in contrast to reactions of inhibition. Therefore, we can assume that a larger variability in individual minute in the EG group is connected with the fact of diversity of excitation reactions.

Thus, the obtained experimental results allow us to highlight some peculiarities of time perception, characteristic for children of primary school age with hearing impairment

**Conclusions and Perspectives of Further Research.** The analysis of scientific sources confirmed that the perception of time is an important characteristic of child's cognitive activity, especially the child with hearing impairment. The child perceives time indirectly and compares time units with his /her activities and phenomena that are constantly repeated in her/his life. More accurate children's imagination is excited on the basis of personal experience. Therefore, the children with hearing impairments during exercises, need to be familiar with time intervals that can be measured and determine the duration, sequence, rhythm.

Each group that participated in the experiment turned out to be different in terms of individual minute. In our opinion, the perception of time depends on both external factors and peculiarities of a child. We assume that such an individual characteristic as the perception of time of a child with hearing impairment may depend on the character, particular qualities of her/his thinking, the degree and time of hearing loss, the level of knowledge and emotional state.

Data from the studies on individual perception of time can be an additional diagnostic criterion for the differentiation of corrective actions.

After studying and analyzing psychological, pedagogical and methodological literature on the research problem, we can make assumptions about the effectiveness of influence properly selected physical exercises on formation of time notion of children with hearing impairments during physical education.

These questions require additional attention, so they will be the subject of our further research.

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