Specificity Of Cognitive Component Of Prognostic Competence In Schoolchildren With Hearing Impairment*

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Abstract. *Prognostic competence today is treated as the ability to make certain decisions and act with a certain temporal and spatial prediction in relation to future events. In domestic and foreign psychological sciences, the investigations of ontogenetic development of anticipation, its clinical aspects in the context of professional pedagogical activity, are carried out, and also the psycho-physiological principles of prognostic activity are of great interest. But nevertheless, this phenomenon is underexplored in children with hearing impairment; there are no studies for determining the cognitive features of anticipation in children with special need.*

Any kind of cognitive activity includes, to some extent, a forecast of what can happen, as well as the preparation of the subject for the upcoming events. Activation of the mechanisms of probabilistic forecasting is exerted in the regulation of the range of preliminary adjustment of all psycho-physiological systems, including the subsystems of the organism to the expected probable changes in the environment of the child. At the same time, the process of probabilistic forecasting determines the functional structure of activity regulation in the sphere of mental processes. The manifestation of the ability to predict in thinking activity characterizes the level of formation of the processes of mnestic and mental operations regulation, in other words, prognostic activity is closely related to cognitive processes. As a result, effective forecasting is an element of regulation of activity, behavior and, as a whole, participates in the processes of personal adaptation to changing environmental conditions.

Keywords: forecasting, anticipation ability, cognitive function, younger schoolchildren with hearing impairment.

Introduction

P.K. Anokhin and N.A. Bernstein [1]studied forecasting and prognostic activity; [2] and L. I. Peresleni[3] studied these issues in norm and pathology. The state of behavior, [4] the anticipatory skills of children with speech disorders

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[2] V. D. Mendelevich, "Anticipatory mechanisms of neurotic genesis," in *Psychological Journal*, XVII (1996), no. 4, p. 107 - 115.

[3] L. I. Peresleni, "A study of prognostic activity for characterization the level of mental development of children," in *Defectology*, VI (1982), p. 11 - 17.

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were studied by A.I. Akhmetzyanova (2014-2016),[5] the problems of forecasting, which affect the social sphere of children with disabilities were explored by Denisova.[6] A large number of authors investigated the prognostic ability in terms of general and special psychology, such as L.A. Regush (1997),[7] Y.P. Zinchenko& E.I. Pervichko (2012).[8]

Individual researches in the field of cognitive psychology were conducted by R.Solso (2006).[9] However, qualitative and quantitative results of studies of schoolchildren with hearing impairment are absent, as well as the correlation of cognitive components in comparison with children with normal psycho-physical development is not defined.

The main question, solved in this article, is a comparative analysis of the problems of prognostic activity and its cognitive specificity in younger schoolchildren with hearing impairment and junior schoolchildren with normal psycho-physical development.

The purpose of the study is to reveal the specificity of cognitive component of the prognostic competence in junior schoolchildren with hearing impairment.

Materials and methods

Methodological basis: the technique "Ugaday-ka" (Persleni, 2014). When processing the data and analyzing them, the following indicators were taken into account:

1) Indicator I - the number of erroneous predictions - this indicator reflects the rate of formation of an adequate forecast.

2) Indicator II - the number of errors of "abstraction" - the formation of regulatory processes, the stability of voluntary attention.

3) Indicator III - correct reproduction of the orders of three sets - the feature of long-term memory, the particular abilities for "information readout".

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4) Indicator IV - forecasting strategy –the use of strategies for successful forecasting, effectiveness and degree of difficulty in its application.

The success of performance the tasks of methodology was determined according to these criteria, and the types of prognostic activity I, IIa, IIb, IIIa, IIIb, IVa, IVb were assigned for each test person.

Results

The diagnosis of junior schoolchildren with normal psychophysical development was carried out on the basis of general education schools. The test group consisted of 243 schoolchildren, 8-11-year-old.

According to the results of diagnosis, it was found that the most of respondents - 58.4% (142 pupils), hadtype I of prognostic activity. 23.5% of the test persons (57 pupils) had the type of prognostic activityIIa. The type IIIa was defined in 15.2% of research subjects (37 pupils). 1.2% of subjects (3 pupils) hadthe type IIIb. The fewest of research subjects hadIIb and IVa types of prognostic activity - 0.8% (2 pupils).

Thus, a comparative analysis of the results is as follows (see Table 1): the most successful in the implementation of the methodology is Sample 2 (9-year-old pupils), the number of subjects with prognostic activity of I typeis 43.2% (105 pupils), where 100 % - 243 pupils. But there are also pupils in this sample who haveIIb, IIIa and IVa types - 0.8% (by 2 pupils in each), which are unproductive. The smallest number of respondents with type I were found in Sample 1, their number was 8 pupils - 3.3%. 11.9% of respondents (29 pupils) from the Sample 3 have type I of prognostic activity.

Table 1. Aggregated indicators of the study of junior schoolchildren with normal psycho-physiological development, using the technique "Ugaday-ka"

Type	8-year-old		9-year-old		10-11-year-old		Total, %
	% of Sample 1	% of all test persons	% of Sample 2	% of all test persons	% of Sample 3	% of all test persons	
I	9,1%	*3,2%*	33,2%	*6,5%*	28,6%	*13%*	*22,7%*
IIa	18,2%	*6,5%*	16,7%	*3,2%*	14,3%	*6,5%*	*16,2%*
IIb	36,3%	*13%*	0%	*0%*	21,4%	*9,7%*	*22,7%*
IIIa	18,2%	*6,5%*	16,7%	*3,2%*	21,4%	*9,7%*	*19,4%*
IIb	0%	*0%*	0%	*0%*	7,1%	*3,2%*	*3,2%*
Va	9,1%	*3,2%*	1 6,7%	*3,2%*	7,1%	*3,2%*	*9,6%*
IVb	9,1%	*3,2%*	16,7%	*3,2%*	0	*0%*	*6,4%*

Type IIa by the number of test persons was practically equal in three samples: 8.2% (20 pupils) - Sample 1, 7.8% (19 pupils) - Sample 2, 7.4% (18 pupils) - Sample 3.

The most of pupils with type IIIa belonged to the Sample 2, their number was 9.9% (24 pupils). Sample 3 – 4.1% (10 pupils) – is in the second place in descending order. The smallest number of respondents with this type of prognostic activity was in the Sample 1, only 1.2% (3 pupils).

The study of junior schoolchildren with hearing impairment was carried out on the basis of the State-Funded Educational Institution "Boarding school named after E.G. Lastochkina for children with disabilities".The test group consisted of 31 schoolchildren,from 8 to 11 years old. The sample was presented by younger schoolchildren with a hearing loss of 1-2, 3-4 degrees. Diagnosis was conducted in the first half of the day, individually with each child in a separate room. The results were recorded in individual protocols.

As a result of the study, it was found, that the most of children of three samples hadthe types of prognostic activityI and IIb (by 22.7% in each). And the smallest number of junior schoolchildren hadthe type IIIb (3.2%) (see Table 2).

Despite limitations in the functioning of auditory analyzer, 22.7% of children have I type of prognostic activity. This type is characterized by:

- High-speed of prediction or high level of forecasting process.
- The ability to keep in memory forecasts, compare them with the order of the presented elements.
- This category of children does not have distraction errors.
- Children have a steady voluntary attention.
- Memory is characterized by long-term memorization.
- Rational strategies were used by the test persons, having this type of prognostic activity, to perform the task of the technique. There were the following strategies: comparing of aprioristic forecast with a real sequence, a strategy with priority for input information, a strategy with a priority for aprioristic forecast.

The most successful was Sample 2 (9-year-old junior schoolchildren), where Itype was assignedto 33.2% of children.

22.7% of children were given IIb type of prognostic activity, equally with I type. Children with this type have:

- Average prediction speed.
- Difficulties in maintaining a stable level of activity, as evidenced by the presence of errors of distraction.
- Revealed orders were reproduced only partially –the features of long-term memory.
- This group of respondents usedas rational strategies,as irrational ones – change of strategies.

Table 2.Aggregated indicators of the study of junior schoolchildren with hearing impairment, using the technique "Ugaday-ka"

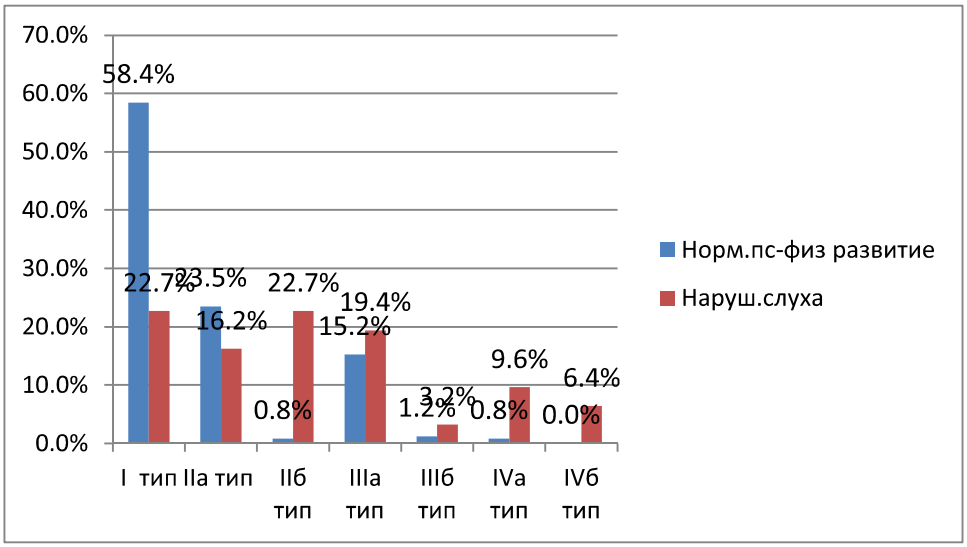
Type	**8-year-old**		**9-year-old**		**10-11-year-old**		**Total, %**
	% of Sample 1	% of all test persons	% of Sample 2	% of all test persons	% of Sample 3	% of all test persons	
I	25%	*3,3%*	68,2%	*43,2%*	50,9%	*11,9%*	*58,4%*
IIa	62,5%	*8,2%*	12,3%	*7,8%*	31,5%	*7,4%*	*23,5%*
IIb	0%	*0%*	1,3%	*0,8%*	0%	*0%*	*0,8%*
IIIa	9,4%	*1,2%*	15,6%	*9,9%*	17,5%	*4,1%*	*15,2%*
IIIb	3,1%	*0,4%*	1,3%	*0,8%*	0%	*0%*	*1,2%*
IVa	0%	*0%*	1,3%	*0,8%*	0%	*0%*	*0,8%*
IVb	0%	*0%*	0%	*0%*	0%	*0%*	*0%*

Based on the obtained data, it can be said, that this group of children suffer from a deficit of remembering processes, information readout and the use of productive strategies.

Discussion

Comparing two categories of junior schoolchildren with normal psycho-physical development and junior schoolchildren with hearing impairment, we came to the following conclusion (Figure 1):

Significantly higher percentage of junior schoolchildren with normal development has the most productive type of prognostic activity (I type). Considering the less productive types IVa, IVb, it is clearly seen, that the priority is given to children with disorders of auditory analyzer in percentage terms.



Нормальноепсихо-физическоеразвитие	Normal psycho-physical development
Нарушениеслуха	Hearing impairment

Figure 1. Comparison of the results of the study of younger schoolchildren with normal psycho-physical development and hearing impairment

Thus, it can be concluded, that the studied younger students with hearing impairment have difficulties in performing the forecasting process. In the process of investigation, several groups of children were identified, which had some defects of short-term and long-term memory, unstable attention, and used irrelevant strategies in the process of solving the tasks of technique. This proves the existence of the fourth types of prognostic activity.

Summary and conclusion

Our research allows us to state, that younger schoolchildren with hearing impairment have difficulties of probabilistic forecasting and connected with it cognitive components of anticipatory abilities. Most of the difficulties lie in the use of ineffective forecasting strategies, the difficulty of memorizing, the small span of long-term memory, the insufficiency of regulatory processes.

Thus, we have experimentally proved, that the prognostic competence of junior schoolchildren with hearing impairment is limited, weak formed, in comparison with younger schoolchildren, of the same age, with normal psycho-physical development.