

NEUROPSYCHOLOGICAL DIAGNOSTICS AND CORRECTION IN LEARNING FOR CHILDREN WITH DISABILITIES OF PRESCHOOL AGE

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Abstract

Due to increase in the number of children with various forms of dysontogenesis it is necessary to search effective ways of correction of deviant mental and speech development. Neuropsychological approach in correctional work is one of the most efficient ways to make development of a child with disabilities more normal. The research outcomes showed that the neuropsychological approach provides positive changes in regulatory, praxical, gnostical and speech processes.

The article presents analysis of correction of mental development of preschool children with systemic speech underdevelopment caused by various forms of mental dysontogenesis (general speech underdevelopment and mental retardation).

The diagnostic programme of the research included individual samples of battery of tests adapted for children by A. Luria (T. Akhutina et al., Zh. Glozman et al.) The test battery included 22 samples that were analyzed due to 73 parameters. The researchers were interested in the fact of how effective the neuropsychological approach was in training of children brought up in bilingual environment.

At the initial stage during the academic year complex remedial work based on combination of kinetic and cognitive correction was carried out in individual and group forms. One of the main ideas of the programme making was the methodology of succenturiate ontogenesis that is the basic neuropsychological technology of correction, prevention and habilitation of children with different degree of development developed by A. Semenovich. This method is based on the theory of three functional blocks of the brain and learning about neuropsychological rehabilitation of mental processes by A. Luria. The basis of the methodology is the principle of correspondence of a current status of a child with the main stages of the brain organization of mental processes and the following retrospective reproduction of the ontogenesis parts that were not effectively developed due to different reasons.

Analysis of the final outcomes of the research proves the effectiveness of the differentiated remedial work made with the account of relevant capabilities of a child defined on the basis of the neuropsychological status. The revealed tendencies determine the necessity of psychological and pedagogical support of children of preschool age with disabilities with the account of the neuropsychological status of a child and specific character of multilingual social and cultural environment.

Keywords: dysontogenesis, neuropsychological approach, remedial work, speech pathology.

1. INTRODUCTION

Modern development of theory and practice of overcoming dysontogenetic processes in development of children of preschool age is characterized by formation of ideas about systematic violation in speech development as the secondary signs of primary dysontogenesis in formation of higher mental functions of a child (Astayeva A.V., Voronkova D.I., Koroleva M.B, 2010, p.84). The outlined ideas about genesis of speech pathology suggest that it is necessary to use the neuropsychological approach in implementation of traditional technologies of logopedic support.

In the current situation the systematic approach to correction and habilitation of mental development of a child is more effective. It is the reason why in the recent decade neuropsychology widely penetrates into modern teaching practice (T. Akhutina, I.Kamardina, N. Korsakova, Y. Mikadze, N. Polonskaya, A. Semenovich).

As it was noted in the preceding research (Borisova E., Kozina I.,2015, p.58; Borisova, E.Y., Kozina, I.B., Aron I. S., Karandaeva T. A, Shalaeva S. L. and Trofimova V. I., 2016, p.1660), the Republic of Mari El is the multicultural region with a multilingual character of the population. Children living in some districts of the Republic communicate with the representatives of two or three linguistic groups. In the majority of cases it is the Russian language from the East Slavic languages, the Mari language from Finno-Ugric languages and the Tatar language from Turkic languages. How does the multilingual situation influence the peculiarities of mental and, first of all, speech development? It is for a reason that usual practice of logopedic support of bilingual children is not sufficiently effective. That is why it is necessary to use methods of neuropsychological diagnostics and correction of mental and speech development of children living in the region.

In the opinion of modern scientists, practical psychologists and speech pathologists, the number of children with disabilities who need specific psychological, pedagogical and correctional help of specialists is increasing every year. "... Accumulation of pathological stigmas in modern child population is increasing..." (Astayeva A.V., Voronkova D.I., Koroleva M.B, 2010, p.86). During development of programmes and technologies designed to help these children peculiarities of development and interaction of the brain systems and mechanisms in the situation of learning different languages by a child, as a rule, are not taken into account. The research and correction of speech of these children in the complex with other basic mental functions in the frames of the neuropsychological approach will help to reveal the connection between the structures of the maturing brain and mental function developed on the basis of it, as well as to reveal violations specific for speech pathology. In addition, such research will probably help to assess the factor of multilingualism of the social environment of a child as the factor that complicates the multiple-factor image of speech underdevelopment. The hypothesis of the research was the suggestion that the programme of remedial learning based on the results of differentiated and systematic neuropsychological diagnostics may be sufficiently effective.

2. THE MAIN PART

The article presents analysis of correction of mental development of preschool children with systemic speech underdevelopment caused by various forms of mental dysontogenesis (general speech underdevelopment and mental retardation). The research was held in the frames of the scientific project with the support of the Russian Foundation for Basic Research "Development of the Technology of Neuropsychological Support of Children with Disabilities of Preschool Age Living in the Multicultural Region (by the example of the Republic of Mari El)". The demographic map of the research included students of preschool educational institutions of towns and rural settlements of the Republic of Mari El. (Borisova E., Kozina I.,2015, p.54). The methods of neuropsychological examination developed by A. Luria (1969) (Luriya, A.R.,2000, p.237) and methods modified in the Laboratory of Neuropsychology (headed by T. Akhutina) of the Faculty of Psychology at Moscow State University (Akhutina, T.V., Pylaeva, N.M. and Hotyleva. T. Y. 2011, p.72) were used in the research. At previous stages we analyzed speech development of children of old age and preschool age with normal development and with signs of mental dysontogenesis.. It is interesting how effective implementation of the neuropsychological approach in logopedic support of children studying in the bilingual environment will be.

70 students of the middle groups of pre-school institutions with general speech underdevelopment of the 3rd level and with mental retardation took part in the experiment. 40 preschool children were in an experimental group and 30 people were in a control group. The formation of groups was carried out on the basis of the conclusions of the psychological, medical and pedagogical commission, as well as on the basis of indicators of teachers' evaluation (speech therapists). All students were with systemic speech underdevelopment, i.e.

with signs of primary and secondary speech pathology (general speech underdevelopment and mental retardation). All children are brought up in educational institutions of various districts of the Republic of Mari El and are in a multi- / bilingual social environment. Teachers, speech therapists, speech pathologists and group educators took part in implementation of the support programme.

The diagnostic programme of the research included individual samples of battery of tests adapted for children by A. Luria (T. Akhutina et al., Zh. Glozman et al.) The test battery included 22 samples that were analyzed due to 73 parameters. The examination was carried out at the identifying and control stages. In addition, intermediate diagnostics was made in order to evaluate indicators dynamics.

At the initial stage during the academic year complex remedial work based on combination of kinetic and cognitive correction was carried out in individual and group forms. One of the main ideas of the programme making was the methodology of succenturiate ontogenesis that is the basic neuropsychological technology of correction, prevention and habilitation of children with different degree of development developed by A. Semenovich. This method is based on the theory of three functional blocks of the brain and learning about neuropsychological rehabilitation of mental processes by A. Luria. The basis of the methodology is the principle of correspondence of a current status of a child with the main stages of the brain organization of mental processes and the following retrospective reproduction of the ontogenesis parts that were not effectively developed due to different reasons.

Influence on the sensorimotor level with the account of general ways of development activates all higher mental functions, their development and, consequently, creates a basic prerequisite for the child's complete learning of training materials.

Neuropsychological correction is a three-level system. "Each of the correction levels has its own specific "target" of influence and is aimed at all three blocks of the brain " (Semenovich, A.V. 2002. p.13-14). Thus, a number of initial gaps of ontogenesis can be completed by going through all stages of child's motor (sensorimotor) development from the very beginning (his birth).

In the programme of neuropsychological support for children development four main blocks of exercises were presented in each lesson: breathing exercises, oculomotor exercises, exercises for flexibility, and exercises of the motor repertoire. The programme is a remedial system that provides creation of optimal conditions for development of emotional, volitional, cognitive, motor spheres, development of positive qualities of every child and their health improvement. Correction and pedagogical support is aimed at overcoming and prevention of secondary developmental disorders, as well as at formation of certain knowledge and skills necessary for the successful preparation of children for school. It is achieved by modification of general development programmes and the entire complex of remedial work with the account of psychophysical development of these children, and also by achieving the general preschool educational objectives including synchronous mental and speech development of children.

3. ACKNOWLEDGEMENT

In order to evaluate the indicators dynamics after the first stage of the support programme (two months of correction work), the interim diagnostics for individual samples (dynamic praxis, reciprocal coordination, delayed motor memory, correction tasks and making a story according to the pictures) was carried out. Positive changes in the majority of the examined parameters reflecting the age-related dynamics of development of regulatory functions were noted in both groups. Evaluation of differences in the dynamics of the studied parameters by the Mann-Whitney U criterion in the control and experimental groups revealed significant positive changes in the groups due to such parameters as programme implementation ($p = 0.036$) and serial organization errors ($p = 0.008$) in the sample for delayed motor memory, effectiveness of the correction task ($p = 0.043$) and the story programming ($p = 0.003$) (Borisova E. Yu. 2017. p.78).

The programme of the final diagnostics fully corresponded to the primary one in its composition. Comparison of positive changes in the control and experimental groups (Mann-Whitney U) revealed statistical significant differences in the following parameters: program learning ($p = 0.019$) and order of elements ($p = 0.015$) in the sample for dynamic praxis; programme implementation in the sample for reciprocal coordination ($p = 0.023$); effectiveness of tasks execution for praxis of the position of the left arm ($p = 0.033$), as well as interhemispheric interaction in the same sample ($p = 0.001$); effectiveness of tasks execution for oral praxis ($p = 0.00001$); quality of copying the picture ($p = 0,021$); effectiveness of identifying realistic images in the sample for visual gnosis ($p = 0.003$); semantic correctness of the story ($p = 0.030$) in the task for making a story on a series of pictures with a plot; understanding logical and grammatical constructions ($p = 0.011$). Such parameters as compilation time ($p = 0.065$) and the number of words in an independent story ($p =$

0.065) in a series of pictures with a plot do not have statistical significance but can be considered as a tendency for improvement. In general, it can be stated that implementation of the neuropsychological approach in support of children with disabilities provides positive changes in regulatory, praxical and gnostical processes (Borisova E. Yu. 2017. p.79).

It is necessary to consider the indicators of children' coherent speech. The difference in the positive dynamics of the coherent narrative programming is more noticeable: the number of missing semantic units and unreasonable repetitions of linking words has decreased in 40% of students of the experimental group, while in the control group 90% of children have not improved their results. The analysis of the complex sample "Compilation of a story based on a series of pictures with a plot" was of great interest. The stories of children became more connected, they lost the signs of inadequacy, and the plot was presented more correctly. Children of the experimental group who needed help at the initial stage coped with the task independently in the following stages. A small number of students in the control group continued to make repetitions of the linking words in their speech. Thus, the dynamics of speech development in the experimental group was more significant than in the control group.

In the sample for the objects naming all children of the experimental group understood the corresponding terms without mistakes. In the experimental group 20% of students searched for nominations; there was an increase in the latent period in the name of words. It is characteristic that in both groups there were no children who showed presence of multiple paraphases and perseverations. The analysis of the sample for naming low-frequency words showed that 80% of children in the experimental group had no difficulty in naming the words. The rest of the children searched for nominations; there was an increase in the latent period of naming, and individual paraphasia was also noted. There were students who needed help in naming the first sound of the word. In the control group about 50% of students had difficulties in naming objects; all the rest completed the task successfully.

One of the tasks of the research was the analysis of the outcomes on the basis of influence of the linguistic environment on effectiveness of remedial work. For this purpose, two subgroups equal in nosological features were made: 1 - children brought up in families speaking one language, 2 - children brought up in the multilingual environment (mainly bilingual).

The statistical analysis on the basis of the results of the interim diagnostics (Mann-Whitney U) did not show significant differences in changes of the examined parameters in the monolingual and multilingual experimental groups, but there were different responses to the corrective influence on preschool children from bilingual and monolingual families. In particular, it turned out that the improvements in implementation of the already learnt motor programme were characteristic of bilingual students. At the same time, influence of training in the group of monolinguals is more noticeable according to the parameter of reducing the number of mistakes of the serial organization. According to other parameters characterizing voluntary regulation, at the stage of interim diagnostics the changes that occurred under the influence of training in the group of mono- and bilinguals did not differ significantly (Borisova E. Yu. 2017. p.79).

In order to clarify the situation typical for preschool children who are brought up in multilingual families, it is necessary to consider the results of the control group too. Comparison of changes of the examined parameters in the mono- and multilingual experimental and control groups reflects specific response to corrective effect on students who are brought up in different linguistic environments. Significant differences in the degree of changes in the control and experimental groups were more characteristic of multilingual students, since in these subgroups statistically significant differences were defined for a greater number of examined parameters (5 in the monolingual group and 15 in the multilingual group). This fact suggests that lack of special support which takes into account the neuropsychological status of a child affects more negatively on preschool children who are brought up in multilingual families.

On the basis of the research outcomes the following can be stated:

1. The analysis of speech development of preschool children living in the multicultural region with the use of the neuropsychological approach indicates that formation of indicators of child's speech development and the basic components of speech as higher mental functions is not complete.
2. The use of the neuropsychological approach in support of children with disabilities provides positive changes in regulatory, praxical, gnostical and speech processes.
3. Lack of corrective work that takes into account the neuropsychological status of a child with disabilities does not provide the significant changes in formation of the regulatory functions.
4. The use of the neuropsychological approach in corrective work with children has a more significant impact

on preschool children who are brought up in monolingual families, and lack of special support that takes into account the neuropsychological status of a child has a more negative impact on preschool children who are brought up in multilingual families.

In general, the analysis of the final outcomes of the research proves the effectiveness of the differentiated remedial work made with the account of relevant capabilities of a child defined on the basis of the neuropsychological status. The revealed tendencies determine the necessity of psychological and pedagogical support of children of preschool age with disabilities with the account of the neuropsychological status of a child and specific character of multilingual social and cultural environment.

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