MOTOR DEVELOPMENT IN CHILDREN WITH SPEECH DISORDERS

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S u m m a r y. The article analyzes the state of motor sphere in preschool children with speech disorders. In the article the author emphasizes the need to assess the levels of motion formation, the state of physical qualities and degree of development of basic movements. It is necessary for the organization of differentiated correction in various forms of disontogenesis.

K e y w o r d s: motor development, coordination, preschool children with speech disorders.

INTRODUCTION

Any behavior manifests itself in motion. Child's mental development takes place on the basis and with the improvement of motor skills. It is known that motion largely determines motor shape of a subject and method of responding to external stimuli. Motor reactions, being the most common form of interaction between an individual with the environment, are of great importance in a holistic approach to child's personality.[2]

Numerous studies have confirmed high diagnostic value of motor parameters for understanding the mechanisms of mental activity. Motor organization of humans, their behavior, activity including speech, reflects their essential characteristics as individuals and social beings. In the view of understanding how human movement is organized it is extremely important not only for psychological theory, but also in practice including correctional one.

The theory of organization of human motion was created by A. N. Bernshtein [A. N. Bernstein, 1966] who continued to develop the idea of I. M. Sechenov about active nature of mental activity and offered his own concept of building movements. Based on the concepts of unity in philosophy and ontogenesis he proved experimentally the existence of five levels of motor control in the form of hierarchically organized structures of the brain:

- level of synergy (A) responsible for posture, strength;
- level (B) responsible for the coordination of all the muscles in the performance of elementary basic movements;
- level of space (C) responsible for the development of spatial field: for the assimilation of targeted commutative movements, precision, accuracy, change-over, flexibility and agility;
- level of action (D) responsible for implementing accurate differentiated movements, providing domestic motor skills;
- level (E) the highest cortical level of symbolic coordination and psychological organization of movements, providing the implementation of speech, written presentation of ideas, improvisation of movements, communication.

The involvement of these levels in the management of speech can be illustrated by an example of writing. The supreme symbolic level E of psychological organization of movements contributes to the solution of the problem "to present some thought." To solve this problem it is necessary to possess controlled vocabulary to know

the letter composition of these words and be able to write them. This act provides for an objective level D. The level of spatial organization of movement C is determined by movements of the hand and a writing instrument in space (a letter on the line). The level of synergy provides the coordination of muscles, thereby writing acquires its specific shape, roundness, speed. The level A regulates the excitability of muscle and tone. In the case of child's abnormal development psychomotor relations are particularly important. Many authors support the idea of focused work on different aspects of movement in children with speech disorders [Koltsova, M. M., 1973; Kumala I. A., 1986; Rychcova N. A., 1985; Shostak B. I., 1967].

However, the question of development of motor sphere has not obtained enough attention especially in the field of correction and teaching preschool children. Analysis of the literature on the correction of speech disorders showed that teachers focus only on articulatory motor acts while developing other forms of movements, such as walking, manipulating objects and facial expressions are not corrected. The creation of a special program for the formation of a full range of motor skills in children with speech disorders needs to clarify the nature of motor disorders in these children.

The aim of this study was to analyze motor disorders in preschool children with speech and language impairment.

METHODS

Comparative study of the motor areas was carried out in more than 700 preschool children with alalia, dyslalia, stuttering at the age of 6-7 years. The following criteria were applied:

- level of the quality of movement strength, endurance, flexibility, agility and quickness;
- motor learning in terms of degree of development of motor skills and skillful execution of such movements as running, walking, jumping, throwing, climbing;
- general characteristics of movements, hand, facial and articulating movements;
- complete functioning at different levels of movement control (by N.A. Bernshtein).

Methodology of assessment of motor development in children, which was proposed by N. N. Ozeretskiy [Gurevich M. O., Ozeretskiy N. I., 1930] and modified by Ovchinnikova T. S. [Ovchinnikova T. S., V. A. Kalyagin, 2004] used a series of tests to evaluate the dynamic coordination, speed, strength of movement, synkinesis and static coordination.

It was found that children with speech disorders lag behind their fellows without speech disabilities only in terms of agility and speed, making 2-4 times more mistakes when performing tasks. N. A. Bernshtein implies that dexterity encompasses an ability to cope with motor tasks and stresses that it is always necessary to ensure a joint coordinated work of at least two levels subordinate to each other. He identifies the qualitative aspect of dexterity, determines the appropriate result that "what you need" and quantification which determines the accuracy of movements. Obviously, the speech quality depends largely on this mobility.

RESULTS AND DISCUSSION

Motor learning in children with speech disorders was significantly lower in quality than in their healthy fellows. They had troubles in all the major movements (running, walking, jumping, climbing), to the greatest extent with rhythm, the ability to hold pace and coordination of movements. In the development of technical skills, they lagged behind their healthy 1.5-2.0-year old fellows.

The comparison of different movements of motor groups confirmed that preschool children with speech disorders lagged behind their fellows without speech disorders, but mostly (almost twice) lag was observed in articulatory movements.

The tests, which were included in the methodology, allowed to evaluate the degree of preservation in children with speech disorders at various levels of movement control:

- involuntary regulation of tone, static endurance and coordination level A;
- expressive movements, facial expressions, pantomime, plastic, motor automatisms level B;
- coordination of the motor act with the outside with the leading role of visual afferentation level C.

The results of this evaluation are shown in Table 1. They allow to talk about the lack of functioning at all analyzed levels of motor control in children with speech disorders. The observed prevalence of disordered elementary movements (level A) lets talk about the lack of formation of their motor analyzer as a whole. Mismatched degree of various motor skills allows us to speak about the complex and ambiguous nature of their interaction. Noteworthy is that the greatest difficulties in children with speech disorders are observed in the performance of hardly coordinated movements, which manifests itself in synkinesis, lack of movement automation, poor learning, less expressive movements and facial expressions. As developed psychomotor skills are among the most important conditions for the full course of communication act, including the participation of speech, children with speech disorders need to develop these skills as one of leading correction tasks.

Levels of motion formation	Children with speech disorders (SD)	Children without speech disorders (WSD)	SD/ WSD
Level A	1.27	2.43	1.91
Level B	1.24	2.04	1.65
Level C	1/29	2.28	1.77
X	1.26	2.25	1.78

Table 1. Levels of motion formation(in points)

The findings showed that in all forms of speech disorders (alalia, dyslalia. stutter) the examined subjects demonstrated lagging behind psychomotor development expressed in varying degree of impairment. The greatest movement disorders were found in children with alalia, and the smallest in the group of children with dyslalia. That can be explained by the degree of representation in the etiology of organic brain lesions of these diseases. Stammering children suffer mostly from static or dynamic coordination, tempo and rhythm of movement, proportionality, consistency of movements and coordination of simultaneous movements. These disorders produce different manifestations, e.g. general, facial, hand and articulatory motor skills. The severity of motor disorders of stutterers depends on the presence of organic component disorder.

The comparison of different groups of motions found the same ratio of the extent of their disorders in various forms of speech disorders. Voice expression was mostly broken (on average 87% of children). Complex motor acts were violated in 65%, and elementary movements in 62% children. Such a high ratio can be attributed to an increase in differentiation of movements from

elementary movements to speech. However, quite pronounced violations of elementary movements indicate the lack of motor instincts in all forms of speech disorders. Violations of fine motor skills and facial expressions were observed more rarely (respectively 44% and 36%).

The analysis suggests that the indicators of movements depend on the severity of organic brain disorders, thus on the complexity of motor acts.

CONCUSIONS

- Mastering motor skills by children with various speech disorders was different. The observed discrepancy in the degree of mastery allows us to speak about the complex and ambiguous nature of their interaction.
- 2. The analysis of children with various speech disorders revealed a clear hierarchy in the degree of violation of various kinds of movements (speech and non-speech, simple and complex).
- 3. Differences in the degree of motor skills were found to be associated with:
 - - the presence or absence of organic disease;
 - - the preservation of elementary movements associated with the makings;

• - degree of preservation of cognitive processes;

4. Children with speech disorders have various types of troubles regardless of the nature of these movements (prosody, facial expressions, pantomime).

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МОТОРНОЕ РАЗВИТИЕ ДОШКОЛЬНИКОВ С РАССТРОЙСТВАМИ РЕЧИ

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Аннотация: Статья посвящена исследованию состояния моторной сферы дошкольников с расстройствами речи. В статье подчеркивается необходимость оценки уровней построения движений, состояния физических качеств и степени сформированности основных движений. Это необходимо для организации дифференцированной коррекции при разных формах дизонтогенеза.

Ключевые слова: моторное развитие, координация движений, дошкольники с речевыми расстройствами