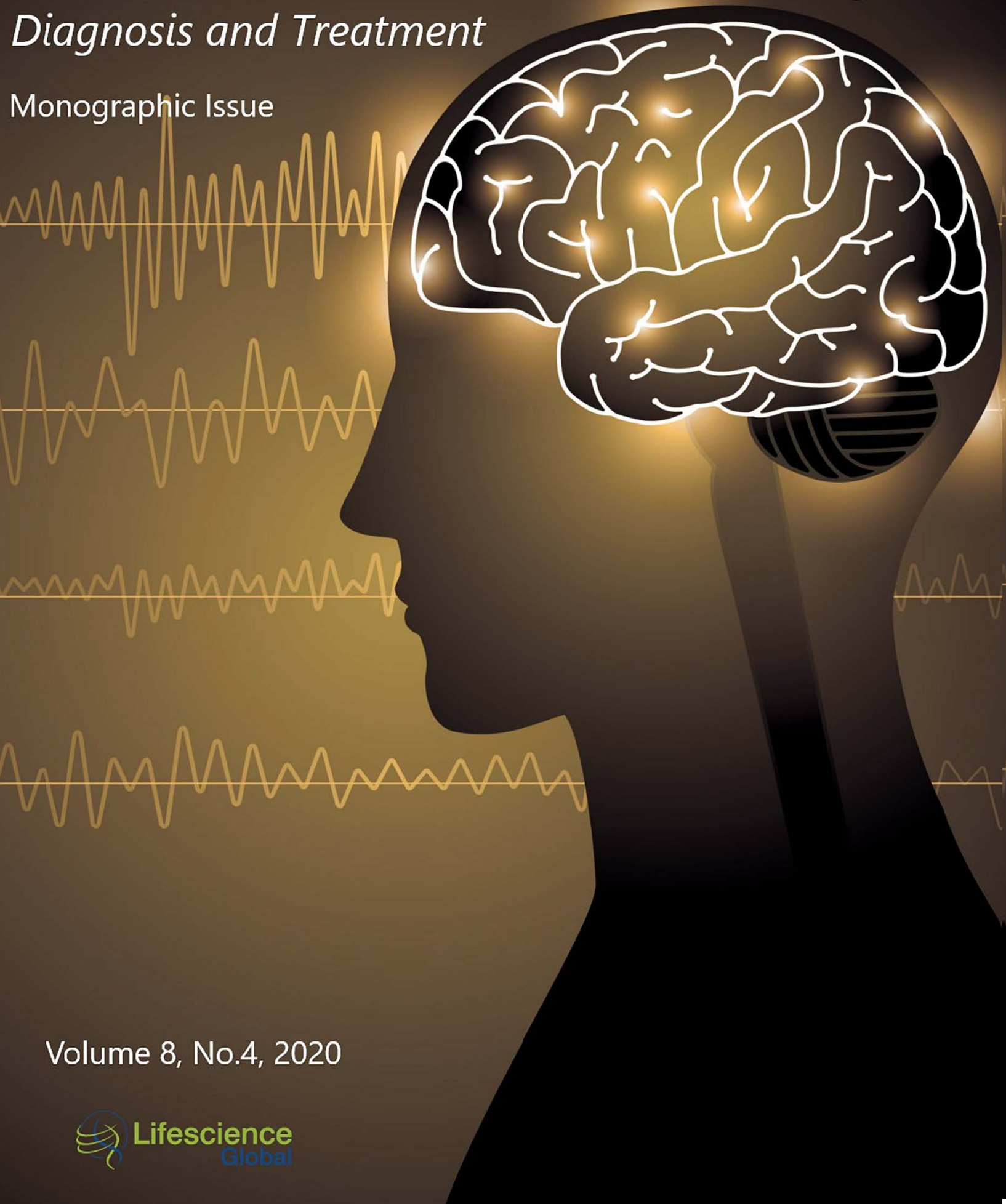


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Editorial: Features of Non-Verbal Communication in Children with Intellectual Disabilities

This monographic issue investigates the problems of intellectual disability, as well as the features of non-verbal communication in primary school children. The difficulties of identifying the features of communication skills in children with intellectual disabilities are becoming more and more relevant every year.

During the period from 1991 to 2000 in Russia, the frequency of diagnosis "mental retardation" in primary school children increased to 139.8 people per 100 thousand population [1]. Therewith, in 75% of cases, a slight degree of decrease in intelligence was established. Among the indicated group of children, persistent underdevelopment of cognitive activity in 75-90% is determined by organic damage to the central nervous system [2]. According to the Ministry of Education and Science of the Russian Federation (2016), over 60% of children of primary school age belong to the risk category of school, somatic, and psychophysical maladjustment. In 35% of them, even in preschool age, disorders of the neuropsychic sphere are found. The number of students who cannot cope with the requirements of the general education program has increased 2-2.5 times over the past 20 years, reaching 20-40% [3]. The researchers [4, 5] emphasise that the deterioration in the health of students becomes one of the reasons for the difficulties in the development of their adaptive and communicative potentials. Children with intellectual disabilities have a decrease in the ability to use verbal and various non-verbal means of communication, which have a compensatory value for the child's successful socialisation.

In the context of this study, a programme of psychological influence was developed to optimise the non-verbal communication of children with intellectual disabilities. With psychological influence aimed at the development of communication among children of primary school age with intellectual disabilities, more intact mental functions associated with the implementation of the emotional-personal and behavioural components of non-verbal communication are taken into account. The content of the programme places emphasis on the ability of primary school children with intellectual disabilities to recognise gestures designed to express their emotional states and behavioural interaction, which increases understanding and enhances the potential for non-verbal communication.

The empirical results obtained as a result of research can be used in the differential diagnosis of the communicative development of children with varying degrees of intellectual decline. A programme of psychological influence developed and tested for its effectiveness to harmonise the development of non-verbal communication components can be used in the work of clinical psychologists who provide assistance to children with intellectual disabilities. This

programme assumes an effective solution to the problem of the development of non-verbal communication in children with intellectual disabilities in preschool institutions in preparation for school and specialised correction-oriented schools for primary school students. The main provisions and methods of the programme of psychological influence on the optimisation of non-verbal communication of children with intellectual disabilities can be applied by clinical psychologists and primary school teachers when teaching children with disabilities.

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Modern Ideas about Intellectual Disability in Medical Psychology in the Context of Non-Verbal Communication of Primary School Children

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Abstract: *Objective:* The study of intellectual disabilities in children and their diagnosis has become more and more relevant in recent years. In the 21st century, in terms of diagnostics and the implementation of psychological influences, the problem of identifying the features of communication skills in children with intellectual disabilities becomes very significant and urgent.

Background: This study aims to review modern ideas about the role of intelligence in the development of communication. The methodological framework of this study was the combination of various theoretical methods of cognition. The author analysed the scientific literature of Russian and foreign researchers.

Method: The following methods of scientific cognition were used: data synthesis and analysis. In the process of writing this work on the modern ideas of scientists, according to the subject matter, the author studied the current level of research on this issue.

Results: The works of Russian and foreign scientists were considered, as well as conclusions, were drawn about the levels of study of the problem of intellectual disability in children.

Conclusion: The practical significance of this study lies in the identification of modern ideas about intellectual disabilities. The study and research of this subject will provide opportunities for the development of a programme of psychological influence on the optimisation of non-verbal communication of children with intellectual disabilities.

Keywords: Intelligence, intellectual disabilities, mental retardation, clinical psychology, mental development.

INTRODUCTION

Within the framework of this study, the investigation of the phenomenon of mental retardation is performed in the context of various scientific disciplines. In medicine, mental retardation is considered as a condition against the background of an organic disorder of the central nervous system, described by certain epidemiology, aetiology, pathogenesis, clinical picture, and comorbidity. Persistent and irreversible impairment of intelligence is regarded as a developmental pathology [1]. In clinical psychology, mental retardation is diagnosed from the standpoint of studying the dynamics of the course of cognitive, emotional, and behavioural processes in conditions of dysontogenesis. When describing this phenomenon, among other intellectual disorders, local pathological manifestations are indicated, as well as in the entire psyche as a whole.

In the context of studying the non-verbal communication of children of primary school age with intellectual disabilities, attention will be paid to mild mental retardation. And not only the features of

communication against the background of mental underdevelopment will be considered. Also, the adaptive capabilities of children with the help of which it is possible to compensate for the limitations that arise in the presence of mental retardation are studied

From the standpoint of medical psychology, mental retardation is understood as a generalised pathology, which is expressed in intellectual underdevelopment and unformed adaptive abilities of a person [2, 3]. Within the framework of the International Classification of Diseases of the 10th revision adopted on the territory of the Russian Federation [1], it is customary to distinguish the following clinical forms of mental retardation (classifier code F70 – F79 according to ICD-10): mild mental retardation (F70), moderate mental retardation (F71), severe mental retardation (F72), as well as profound mental retardation (F73). Nowadays, this disease is extremely common worldwide and accounts for about 2-4.5% of the total population. The most common is a mild decline in intelligence – 75% to 90% of all cases of mental retardation, especially in countries with middle or low-income populations [4].

The cause of general persistent mental underdevelopment can be congenital pathologies associated with mutations in the child's genome,

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causing either disturbance in the development of the central nervous system or leading to metabolic disturbances, and exogenous hazards that affected both the perinatal period, including various infectious diseases, exposure of the foetus to ionising radiation, birth trauma. In the early postnatal period, mental development is pathologically influenced by past infectious diseases, physical trauma, and other endogenous hazards, leading to persistent irreversible organic impairment of intelligence. External negative social factors that can cause mental retardation include long-term social deprivation, in which the adults pay practically no attention to the child since the early postnatal period, which is typical for dysfunctional families. Cases are also possible when endogenous and exogenous factors affect the development of mental retardation [2-5].

METHODOLOGY

The methodology of this paper is based on theoretical methods of scientific knowledge. In the context of this study, the following were used: theoretical analysis of the literature, synthesis, and analysis of data, system analysis of data. With the help of a theoretical analysis of scientific literature, the author studied the concepts and terms according to the subject matter. The study considers the concept of mental retardation, the process of intellectual disability, the specific features of communication of children against the background of mental underdevelopment, and adaptive capabilities for children with intellectual disabilities. The International Classification of Diseases of the 10th revision has been reviewed. The international classification of diseases distinguishes the following forms of mental retardation: mild mental retardation, moderate mental retardation, severe mental retardation, and profound mental retardation. Having studied this classification, it was concluded that currently, mild mental retardation is the most common form of mental retardation in children. The scientific articles of the researchers regarding the subject matter were considered within the framework of this study. The studies of foreign and Russian scientists are considered. Scientific publications, books, and practical manuals are reviewed. The information about children with mental retardation is analysed, theories, and proposals presented by the authors of the studies are considered.

This study used synthesis as a method of empirical research. It lies in the study of the phenomenon by combining its interconnected elements into a single

whole. This method was used to study modern ideas about the problem of intellectual impairment in children of primary school age. The most pressing problems of children with intellectual disabilities were identified, and the possibilities for their solution were considered. The method of analysis is a method of scientific cognition, which is used to divide a phenomenon into its component parts. In the context of this study, data on non-verbal communication of children of primary school age with intellectual disabilities were analysed. The study considered individual components that directly affect the process of intellectual disability in children. Intellectual impairment has been viewed as a developmental pathology in a child. The search for possible solutions to problems for children with intellectual disabilities was carried out.

With the help of system analysis, the study investigated scientific publications of foreign scientists about mental retardation in children, its forms, and the possibilities of prevention. The study analysed the information on the mental characteristics of children who were clinically diagnosed with mental retardation. The analysis of scientific articles devoted to this problem allowed us to draw conclusions about the insufficient knowledge of this topic and the possible prospects for the modernization of clinical practice. Embregts considers the effectiveness of using a video feedback package and improving self-control in people with mild mental retardation. The results obtained by Embregts showed a statistically significant reduction in inappropriate behaviour during the procedure. The author noted that the total number of interactions was stable at different stages of the study. Maulik *et al.* conducted a meta-analysis and collated data from published literature on the subject matter and assessed the prevalence of mental retardation [4]. The authors noted that this meta-analysis is of particular relevance for public health and future research. The study analysed the works of Hronis, Roberts, and Kneebone, in which the authors investigate the neuropsychological profile of children and adolescents with mild to moderate intellectual disability. The research findings may provide a basis for the possible adaptation of cognitive-behavioural therapy in clinical practice. Kok and other researchers also studied the issue of mental retardation in children. Their work examines the problems of adaptation of children with mental retardation to the environment, as well as the fact that children with intellectual disabilities are at increased risk of developing mental disorders.

RESULTS

Mental Characteristics of Children Diagnosed with Mild Mental Retardation

Due to its aetiology, mental retardation can occur in combination with other concomitant features of the psyche – speech disorders, the work of analysers (partial loss of vision, hearing, etc.), behaviours described within the framework of the concept of mental disorders [2, 3, 6]. The clinical picture of mental retardation is described by a slow, insufficiently differentiated reaction of children with mental retardation to stimuli [7]. The underdevelopment of mental activity comes to the fore, which is described by a generalisation and clearly manifests itself in the hierarchy of mental processes. The revealed violations, in combination with the specific features of the course of cognitive processes, lead to difficulties in the development of knowledge, skills, and abilities, as well as in the further adaptation of such children [8]. It is quite difficult for such children to single out the most important features of objects in the context of the problem being solved, to find commonalities among various objects, to generalise and, as a consequence, to apply mental operations, in particular the ability to carry out classification and abstraction [9]. Based on these disorders, in turn, an entire complex of disorders of a different type is developed, which are more expedient to consider with the help of clinical and psychological knowledge in order to assess the impact of these disorders on specific areas of the psyche [4].

The mental characteristics of children in the presence of a clinical diagnosis of "mental retardation" within the framework of medical psychology are considered in the context of a biopsychosocial approach. It offers a complex multi-level consideration of the interrelationships of the psychological, biological, and social levels of an individual's functioning with the use of structural-dynamic approach developed by O.V. Zashchirinskaia [10]. This approach includes the possibility of considering three components of the manifestation of mental development – cognitive, emotional-personal, and behavioural. The cognitive sphere of children with mental retardation is described, depending on the clinical form, by the consequences of the underdevelopment of abstract thinking: in such children, against the background of a decrease in the ability to generalise and abstraction, visual-effective, and partially visual-figurative thinking prevails, which imposes significant restrictions on the implementation of cognitive abilities [2-4, 6, 11-14]. Such children

experience significant difficulties in their attempts to single out the most relevant characteristics of objects and situations among the set of characteristics to determine the general, most essential characteristics of the objects being cognised. Similar features are observed in children with mental retardation also in the process of perception, which is described by low differentiation and a reduced rate of the course of perceptual processes. In general, impaired cognitive processes are associated with a lack of randomness in their course [15].

Apart from impairments in the cognitive sphere, according to many authors [2-4, 6, 8, 11, 14], children with mental retardation have underdeveloped and insufficient differentiation of social emotions. Behaviour with this decrease in intelligence differs from normative development by the presence of deviations in social manifestation due to pathological features of their mental organisation: disorders of the psychomotor sphere, coordination, speech, problems with voluntary memorisation, and attention against the background of a general decrease in self-regulation. It is important to note that specialists have noted combined motor skills and speech disorders in children with mental retardation. At the heart of these features is the undifferentiated response, in which the meanings of words differ in concreteness and affective experiences, life experience, and can arise in the speech repertoire upon the use of similar concepts. A child with mental retardation establishes simple and specific connections between the words studied and objects of the surrounding reality. Subsequently, in the cognitive sphere, the inability to abstract from particular meanings and operate with the polysemy of words and their figurative meaning becomes fixed [14].

Underdevelopment of the cognitive, emotional-personal, and behavioural spheres of the psyche is reflected in the interaction of children with mental retardation with peers and adults [15]. On the one hand, depending on the clinical form of mental underdevelopment, they turn out to be limited in mastering the skills of self-service and communication with people, which is especially noticeable in relation to the difficulties that arise in communication. On the other hand, when communicating with such children, many adults are guided by various prejudices and stereotypes and often ignore their special needs, creating conditions for the emergence of manifestations of social deprivation, which, in turn, slows down and complicates the socialisation of such children [2].

The analysis of the features of mental development of children with mild mental retardation indicates a decrease in the degree of impairment of the cognitive, emotional-personal, and behavioural spheres in such children compared to peers with moderate, severe, or profound mental retardation [16].

To a lesser extent, children with mild mental retardation have expressed disturbances in the emotional and motivational-volitional sphere, namely: reduced cognitive activity, cognitive underdevelopment is noted. Nondifferentiation of emotional manifestations in communication is observed to a lesser extent. However, a general decrease in intelligence (the IQ coefficient in such children is diagnosed in the range of 50–69 points), among other things, is expressed in a markedly reduced ability to abstract. This feature is key in the picture of mental retardation, and, as mentioned above, it causes all other disorders affecting the cognitive, emotional, and behavioural spheres of the psyche, as well as the functioning of the psyche as a whole. Therewith, mild mental retardation is described by a lesser degree of intellectual impairment, which in turn has a less pronounced effect on the indicated mental spheres, which, however, remain sturdily impaired [13].

Teaching Children with Mild Mental Retardation and Their Adaptation in Society

In accordance with the degree of intellectual decline, children with mild mental retardation are considered to be significantly more adapted and, when trained in special education, are subsequently able to acquire a profession and lead an independent life. They have a sufficient level of self-service skills. In general, the learning ability in school and the social adaptation of such children turn out to be limited, which is reflected in the difficulties of communication, lack of inclusion in the process of school education, lack of understanding of general cultural traditions and norms. Children with mild mental retardation, having reduced learning ability, experience significant difficulties in mastering a special educational programme and adapting to the conditions of school education in general [3, 17-19].

The diagnosis "mild mental retardation" is often compared with the diagnosis of "mixed specific disorders of psychological development" (F83, according to [1]), which is used in Russian medical psychology instead of the previously generally accepted term "mental retardation". According to ICD-

10, this diagnosis combines heterogeneous disorders from F80 to F82 that occur together, affecting the cognitive, emotional, and behavioural spheres, in particular, speech and communication. With mixed specific psychological development disorders, intellectual disability is noted, which reduces the child's ability to learn. It may not have a generalised nature and is levelled by reaching puberty, in contrast to intellectual disabilities in the clinical diagnosis of F70 – mild mental retardation [20]. Thus, specific mixed disorders of psychological development can be considered as an intermediate mental state between conditionally normative development and persistent irreversible impairment of the cognitive sphere.

When teaching children with mild mental retardation, it is important to pay attention not only to the primary impairment of intelligence but also to the mastery of work skills, self-service skills, as well as the potential for compensation for their intellectual underdevelopment. In these children, indicators of the behavioural, emotional, cognitive spheres, as well as motor disorders, directly cause socialisation problems [21]. Therewith, one of the difficulties for organising the education of children with mild mental retardation is that, with various aetiologies, there are pronounced manifestations of violations of cognitive functions and speech, as well as difficulties in communication and disorders of the emotional-volitional sphere.

The process of adaptation of children with mild mental retardation, particularly social behaviour in favourable conditions of development, can proceed quite well, which is fundamental in socialisation. Conversational skills, as well as the skills of elementary communication with targeted psychological influence, can be sufficiently developed, but the dynamics of their improvement is ambiguous, accompanied by regression in the absence of constant reinforcement of the results achieved [13, 14, 19, 22].

Taking into account the considered psychological characteristics of the development and education of children with mild mental retardation, methods of intervention are being developed that affect work with children and include, among other things, game techniques for mastering new information. These methods can both be applied individually and be aimed at correcting disorders of coping with specific difficulties, as well as group forms of psychological influence, comprehensively affecting all problem areas of mental development of these children [10, 23-25]. With mental retardation, depending on the degree of

intellectual underdevelopment, the possibilities of further social adaptation remain. The criterion for assessing its success is psychosocial development based on interaction with others, and this, in turn, depends on the development of verbal and non-verbal communication skills [10, 24, 26-28]. Social adaptation is defined as the process of an individual's adaptation to changing environmental conditions [17, 18, 29, 30]. For children with mild mental retardation, an important aspect of the adaptation process is the mastery of independent communication, focused on certain conventional norms that regulate their behaviour and the development of motivational-volitional processes.

Thus, mild mental retardation is a mental state that is primarily reflected in the intellectual abilities of children and leads to the development of cognitive, behavioural, and emotional spheres according to the dysontogenic type. Persistent intellectual underdevelopment significantly limits the possibilities of integrating such children into the social environment [31].

Within the framework of clinical psychology, specialists carry out work not only considering the disturbing aspects of the psyche but primarily with reliance on safe processes in order to find and implement compensatory mechanisms that contribute to increasing the adaptive abilities of such children [32]. The psychological impact aimed at the development of these abilities implies active interaction with the child, which leads to its purposeful inclusion in the process of social communication. To increase communication effectiveness as a compensatory derivative of socialisation, it is important to study its features in children with mild mental retardation [33].

DISCUSSION

Many foreign and Russian researchers have considered modern ideas about intellectual disabilities in children. Below is the review of some of their studies. In the study *Prevalence of intellectual disability: a meta-analysis of population-based studies*, the authors conducted a meta-analysis and comparison of data from previously published literature on intellectual disabilities and assessed the prevalence of mental retardation the studies presented [4]. The authors' sample provides an overview of studies published between 1980 and 2009, as well as data on population groups that represent an understanding of the overall estimate of the prevalence of mental retardation in the population. Consequently, from the information

presented in this study, the descriptions of the problem of intellectual disability varied depending on the material support of the country, the territorial location, and the age group of the studied population. The highest rates were observed in low- and middle-income countries. Studies that were based on case-finding using psychological scores or scales indicated a higher prevalence compared to studies with the use of standard diagnostic systems and tools for identifying mental retardation. The meta-analysis presented in this study is of particular relevance to the international health care system and future research.

In the study by Embregts, *Effectiveness of video feedback and self-management on the inappropriate social behaviour of youth with mild mental retardation*, the effectiveness of a package of video materials for feedback and self-control is considered on the example of various types of behaviour of six young people with mild mental retardation [25]. The experiment procedure included video filming the participants' inappropriate behaviour, the next step for the researchers was to talk with the participants in order to convince them to control themselves and record their behaviour on a video camera, and then the participants were given the opportunity to evaluate their behaviour according to certain criteria and redirect themselves towards the appropriate behaviour. The researcher's results indicated a statistically significant reduction in inappropriate behaviour during the procedure.

The authors of the article "A review of cognitive impairments in children with intellectual disabilities: Implications for cognitive behavioural therapy" examine the neuropsychological profile of children and adolescents with mild to moderate intellectual disabilities to find out the best ways to adapt cognitive behavioural therapy for children and adolescents with these problems [34]. The authors note that children with mental retardation have significant attention deficit, learning difficulties, impaired memory, executive functions, and speech. These impairments can negatively affect outcomes during cognitive behavioural therapy. Researchers are making proposals for adapting therapy to address this wide range of disorders. The authors note that many cognitive factors need to be considered when modifying cognitive-behavioural therapy for children with intellectual disabilities. Moreover, they point out that further research is needed to test the effectiveness of modified cognitive behavioural therapy in practice. This study provides a framework for the possible adaptation of cognitive-behavioural therapy in clinical practice.

The authors of the study *The effectiveness of psychosocial interventions for children with a psychiatric disorder and mild intellectual disability to borderline intellectual functioning: A systematic literature review and meta-analysis*, studied and conducted a meta-analysis of more than a thousand scientific articles and publications on the problems of children with mental retardation [35]. The results of this study suggest that children with mental retardation often experience difficulties in adaptation in society. Several studies that were analysed by the authors indicate that children with intellectual disabilities are at increased risk of developing mental disorders. The study was aimed at the systematic assessment of qualitatively based research on the effectiveness of psychosocial interventions specifically aimed at mental disorders in children with intellectual disabilities. The study results showed that most of the published empirical material has many limitations and that the methodological differences between studies are significant.

In the article *Caring for children with an intellectual disability: An exploratory qualitative study*, the authors focus on the upbringing of children with mental retardation. They note the difficulties faced by the parents of such children, and especially the mothers of children with mental retardation [36]. The study emphasises that people who do not have children with intellectual problems, as well as people who have not experienced such violations, do not understand what the parents of such children go through. In this case, it is considered necessary to constantly cooperate between government departments, such as the ministries of health and social development, to work with the relevant non-governmental organisations. It is important to raise awareness about mental retardation among people. The authors suggest that informing society about the causes and consequences of stigmatisation and isolation of persons with mental retardation will have a beneficial effect on the position of children and their parents in society.

CONCLUSIONS

This study theoretically examines the issue of the features of non-verbal communication of primary school children with intellectual disabilities. A variety of theoretical approaches to the study of mild mental retardation was investigated. A review of literary sources indicated relatively sufficient research into the issue of communication of children with mental

retardation with adults and peers. However, the specificity of their non-verbal communication remains understudied. Children diagnosed with mild mental retardation display impairments in the cognitive sphere, underdevelopment, and insufficient differentiation of social emotions. The behaviour in the presence of such a diagnosis may differ from conventionally normative manifestations. There is a reduced speed of response and unstable activity against the background of their mental organisation's pathological features. Disorders of the psychomotor sphere, coordination, and speech are observed. In such children, they are often combined with problems of voluntary memorisation and attention in the presence of a general decrease in self-regulation. Children diagnosed with mild mental retardation establish simple and concrete connections between words and objects of the surrounding reality. Underdevelopment of the cognitive, emotional-personal, and behavioural spheres in children with this diagnosis often affects their communication with peers and adults.

In the context of this study, the features of teaching children with mental retardation are analysed. The problems of adaptation of such children in society are presented. In the case of organic impairment of intelligence, it is important to address not only the persistent cognitive limitations but also the assimilation of work skills, self-service skills, and the potential for compensation for their intellectual underdevelopment. In children with mild mental retardation, the process of adaptation and social behaviour in favourable conditions of development can be carried out quite well, which is the basis for socialisation in society. An important aspect of adaptation for children with this diagnosis is mastering the skills of independent communication. Psychological impact involves active interaction with the child. In the future, this will ensure the inclusion of the child in the processes of social communication.

This study discusses the work of researchers on similar subjects. After analysing the publications of foreign and Russian researchers, conclusions were made about the modern concept of intellectual impairment in children of primary school age in medical psychology. At this stage, the problem of intellectual disability in children is understudied. Most psychologists are inclined to believe that this issue is a priority in international health care and the development of the social environment for persons with intellectual disabilities.

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Specificities of Communication in Children with Intellectual Disorders

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Abstract: *Objective:* The purpose of this work is to study the characteristics of communication in children with intellectual disabilities.

Background: The study of the specificities of communication in children with intellectual disabilities has become more and more relevant in the past few years.

Method: The methodological basis of this study was the combination of various theoretical methods of cognition.

Results: In the process of writing this work, the author studied the techniques of verbal and non-verbal communication. The works of Russian and foreign authors, as well as methods of improving communication in children with intellectual disabilities, were considered. It was found that the impact of intellectual disabilities with mild mental retardation on the cognitive, behavioural and emotional-personal spheres of the communicative process naturally entails the emergence of serious difficulties in establishing contacts with people around, and therefore in the process of social adaptation of the child in general.

Conclusion: The practical significance of this work lies in the study of the characteristics of communication in children with intellectual disabilities, which will be useful for psychologists, teachers and medical workers. The study and research of this topic will provide further opportunities for the development of a program of psychological influence to optimise communication for children with intellectual disabilities and their adaptation in society.

Keywords: Intellectual impairment, mental retardation, social interaction, social adaptation, non-verbal communication, verbal communication.

INTRODUCTION

Among children with mild mental retardation, social interaction, in general, is manifested in a simplified form. They use a less wide range of communication tools and respond less differently to information from other people. When studying the phenomenology of communication in the presence of intellectual underdevelopment, the specificity of the levels of social interaction between two individuals or within a group is taken into account. Each level is characterised by certain parameters since within the framework of social psychology dyad, small and large groups have common characteristics as social groups, but are associated with different involvement of an individual in social communication [1]. Within the framework of this study, it is necessary to consider social interaction in a small group, and, first of all, in a peer group. Children with mild mental retardation have characteristic problems of adaptation to the social environment at the micro and macro levels. For successful work, it is necessary to identify the main factors that hinder their constructive communication.

Taking into account the forecast of social adaptation of children with mild mental retardation, the following parameters of its assessment were used. First, researchers point to the degree of intellectual underdevelopment and its impact on other mental processes. Secondly, such a parameter is individual personality traits of a child, which include the characteristics of temperament, the forming character, individual personality characteristics, the structure of his motives and needs. Thirdly, the phenomenon of purposeful activity is also taken into account – the presence and frequency of actions in a child as an active communicator, capable not only of organising interaction with the outside world but also of conditioning self-development [2]. Fourthly, the factor of endurance is considered – the ability to withstand and cope with constant or temporary loads and difficulties arising for a long time. In addition, one cannot ignore the adaptation to the requirements of the environment, that is, the correspondence of behavioural reactions to external conditions, which correlates with the adequacy of the actions used.

Emotional balance and the degree of stability of its manifestation, that is, the ability to consciously respond to external influences, frustration, and cope with negative emotional reactions, serves as an indicator of the child's social adaptation. A significant parameter of

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social adaptation is the nature of interests and motivations, which determines the formation of their motivational-need sphere in children: how much it is structured and hierarchically organised. The motivational structure of the personality largely determines the prognosis of socialisation. A positive assessment of the selected parameters can serve as an indicator of the individual's successful social adaptation to social requirements [3]. The regularity lies in the fact that with the maximum involvement of individual characteristics of adaptability, the likelihood of a positive forecast of social adaptation of children with mild mental retardation increases. It should be emphasised that one of the most important parameters in optimising the process of socialisation of these children is self-control [4].

METHODOLOGY

The research carried out in this work was based on theoretical methods of scientific knowledge. In the context of this study, the following were used: theoretical analysis of the literature, synthesis and analysis of data, system analysis of data.

To consider terms and concepts in the context of the subject of this work, a theoretical analysis of scientific literature was used. The features of communication in children with intellectual disabilities were considered. In the context of this work, the articles of foreign researchers were analysed. The works of foreign and Russian scientists were considered, such as: scientific publications, books, practical manuals. The information about children with mental retardation, the characteristics of communication in such children were analysed, theories and proposals presented by the authors of the works were regarded.

One of the research methods used in the context of this work was synthesis. Synthesis is a method of scientific research, the essence of which is studying phenomena as a whole, on the basis of combining elements related to each other into a single whole. The synthesis in this work was used to theoretically study the characteristics of communication in children with intellectual disabilities. Several communication features have been identified in children with intellectual disabilities. Analysis, as a method of scientific knowledge, involves the division of phenomena into separate component parts. Features of verbal and non-verbal communication were analysed using this method of scientific knowledge. Certain features of

communication were considered that affect the process of social adaptation in children with intellectual disabilities. The search for possible solutions to communication problems in children with intellectual disabilities was analysed.

The next method of scientific knowledge used was systematic data analysis. Systematic data analysis was used to analyse scientific publications on the characteristics of communication in children with intellectual disabilities. The authors analysed information about the features of communication that affect the socialisation of children in society.

A review of scientific articles by foreign authors made it possible to conclude that the problem of communication features in children with intellectual disabilities has not been sufficiently studied. The results of the analysis of the reviewed works indicate the need for further study of the communication features as mentioned above for the successful adaptation of children with intellectual disabilities in society. During the research, the works of Cockerill, McDaniel, Matheson and other researchers were considered. In his work, Cockerill noted that genetic disorders could be a possible problem of impaired intelligence and communication in children. The author investigated the issues of learning disabilities, speech problems, as well as vision and communication problems in children with intellectual disabilities. Researcher McDaniel considered a strategy for screening complex verbal, simple verbal, simple visual, and spatial working memory in children with intellectual disabilities. The author has developed a strategy that can be used by professionals who are interested in testing the ability of their clients to remember and retrieve newly obtained information. Matheson's article discusses the problem of emotion recognition deficit in children with intellectual disabilities. This study suggests a practical value for studying patterns of aggression and subsequent clinical interventions.

Researchers Rodas, Zidik and Baker investigated the increased mental health risks of children with mental retardation, namely the increased risk of developing other psychological disorders. The authors conducted a study in the families of children with mental retardation.

RESULTS

For modern medical psychology, the most important task is to create conditions for the development of

children's ability to self-determination in the changing circumstances of life. Communication can be viewed as a special form of activity between several people. Its result is the establishment of contact between people. The development of communication as a type of activity implies the formation of certain skills, taking into account the influence of psychological defence mechanisms in children [5].

Communication, according to the works of domestic and foreign researchers, is of particular importance as an object of research in the context of their relationship with other mental phenomena such as personality and cognition. The relationship between communication and activity is most fully elucidated in the works of representatives of the Moscow and Leningrad psychological schools [5-12]. Within the framework of the work of these schools, the influence of the communication process on the development of personality was investigated [13, 14], as well as the question of the importance of communication for the development of human cognitive processes [15].

According to M.I. Lisina, for children, communication is an active action, with the help of which a child can exchange information and experiences with the people around him, and also satisfy his needs [11]. Also, M.I. Lisina identifies the ontogenetic sequence for the formation of means of communication with adults and with peers in children. The first to develop are expressive-mimic means of communication, which are responsible for the direct expression of emotions and are directly related to the expression of the child's subjective state. Then, when a child interacts with an adult, object-effective means appear, which are no longer associated with a subject, but with actions he performs, directed at external objects. And already in the last place, speech means of communication are formed – verbal communication, the main instrument of which is human speech in all its diversity.

With this means of communication, a sequential process of formation takes place in accordance with specific periods of ontogenesis. In interaction with peers under conditions of normative intellectual development, these basic conditions of interaction with close people are formed by the age of three against the background of an increase in the independence and purposefulness of child's actions. Researchers define the following parameters of communicative activity during the period of adaptation to the schooling of younger students. First, the author refers to them as

social sensitivity – the child's ability to perceive the impact of communication partners and respond to them. In addition to it, communication initiative is also important – the ability to address another person on their own initiative. In the phenomenology of communication, the emotionality of interaction stands out separately, which is formed in each individual personality based on personal experience and individual properties [16].

In medical psychology, the study of the communication process, interpersonal interaction of children is of particular interest in the context of the development of training programs and the development of socialisation strategies [17-23]. The problem of developing communication in children is associated with the problem of adaptive resources that allow such children to effectively cope with emerging difficulties, understanding them correctly and effectively overcoming them.

Based on the research results of M.I. Lisina, it can be concluded that the adaptation of a younger student in a peer group directly depends on the development of communicative abilities during the interaction, both verbal and non-verbal [11]. An analysis of the sociometric status of junior schoolchildren during the adaptation period shows the presence of motivational difficulties in establishing contacts with peers, which are due to egocentric behaviour, and insufficiently developed desire for cooperation. The importance of communication for children becomes most obvious during the transition of children to schooling. Communication difficulties become the basis of the goal for psychological intervention due to the importance of the communication process during the period of school adaptation. This is due to the fact that a child does not learn to communicate with other people; it is difficult for him to communicate, to acquire new knowledge and forms of behaviour. Communication experience cannot be acquired from books or other sources, but can only be obtained directly through involvement in relationships with people [24].

The adaptation period becomes extremely important for the formation and development of communication abilities in children with mild mental retardation. Communication skills, according to A.V. Mudrik, are a complex that combines the qualities of a person as a social and as a psychological character [24]. Communication skills are developed through a variety of social interactions and in the process of purposeful communicative development.

The level of development of communication skills directly affects the quality of life of children with mild mental retardation. The development of their communicative sphere is a criterion for the success of the socialisation process, in which adaptation is the primary stage [25-30].

To solve the set tasks, complex systems have been developed to support families raising children with mild mental retardation, combining one-time treatment, rehabilitation and correction. Including for them, numerous technologies of social rehabilitation have been tested based on ideas about mental disorders of the type of persistent intellectual underdevelopment. The research focuses on taking into account the severity of a decrease in intelligence and the characteristics of the personality development and communication skills of a child [28, 31-33]. It can be concluded that the study of the specifics of the communicative sphere in children with mild mental retardation is of significant interest in developing their adaptive skills.

The communicative development of children with mild mental retardation differs from the development of their peers without intellectual underdevelopment from the very first days of life. This characterises by a lack of interest in the environment, inertia of their response, and a reduced degree of emotional manifestations in contact with the mother. The whole range of observed communication disorders reflects both the characteristic features of the intellectual underdevelopment in such children and the features of the development of other areas of mental activity in them.

In children with mild mental retardation, verbal communication disorders are manifested in the fact that they, as a rule, begin to speak at a later age than children with a standard intellectual level (on average, at the age of 4–5 years). In general, the development of speech in such children lags significantly behind their peers. For example, when children without intellectual disabilities master the first words, only babbling is characteristic of children with mild mental retardation. The interval between different phases of speech development is also longer in these children [34]. In general, the systematic nature of violations affects the verbal and non-verbal communication of children with mild mental retardation. Underdevelopment of perception and intellect complicates the ability to competently build a speech and understand emotional states of an interlocutor,

change a position in relation to what is happening in the course of a conversation. Disturbances of attention and regulation also negatively affect communication between a child with mild mental retardation and his interlocutors, since it becomes difficult to switch between different topics, as well as to fix voluntary attention. Violation of the emotional sphere is manifested both in the ability to respond to ongoing events adequately and to understand the emotions of other people. A decrease in the intellectual level negatively affects the formation of semantic connections between words and social interactions against the background of the rigidity of the course of cognitive processes, and the detailed speech statements of such children remain specific and focused on the actual needs of a child. Motility disorders not only impede sufficient mastering of object interaction with the outside world but also significantly limit the possibilities of non-verbal communication since there are stable limitations in facial expressions and gestures [34, 35].

Dialogue speech in children with mild mental retardation is characterised by certain features. There is a reduced initiative of such children when initiating a dialogue, their inability to start a conversation. Difficulties in the development of expressive speech, emotional disturbances, and difficulties in the implementation of cognitive processes are reflected in the ability to understand an interlocutor, take into account different points of view, correctly assess the questions asked and productively formulate answers to them.

For children with mild mental retardation, mastering monologue speech due to impaired cognitive (attention and imagination), regulatory and volitional processes is largely difficult since it is difficult for such children to plan, follow certain communication and behaviour strategies that arise during the implementation of various mental operations [34, 36].

Summing up all of the above, it can be said that mild mental retardation in children is a complex poly structural phenomenon characterised by a whole range of disorders that affect the development of their communicative abilities. Moreover, these features can be caused both by the direct influence of the existing intellectual pathology and by the indirect influence of reduced intelligence on the development of interaction between a child and the social environment, which is manifested in the formation of certain communication styles, the classification of which was proposed by

O.V. Zashchirinskaia [37]. This classification will be discussed below.

A child may feel comfortable in formal situations and show no desire to dominate the communication process. This style of communication is called partially adapted since the communication process as a whole remains intact, and a child himself experiences only minor difficulties in certain aspects of verbal and non-verbal communication.

In communication, a child may experience insufficient development of self-control and immaturity of emotional manifestations, which corresponds to a maladaptive reactive style of communication, which prevents the child's successful social adaptation.

In the process of communication, a child is able to steadily demonstrate the characteristic signs of personality disorders, then his ability to understand the mental state of others will be reduced. These manifestations of behaviour can be attributed to the disjunctive-reactive style of communication, in which not only the ability to adequately express one's thoughts and feelings is impaired but also to understand an interlocutor.

In some cases, the child's desire for social isolation is observed, which outwardly resembles behaviour in autism spectrum disorders, this style of communication is called egocentric and is characterised by serious distortions of the structure of the communicative process.

As mentioned above, communication plays various roles in the life of children: information exchange, planning and organising joint activities, perception, and understanding of a partner. Communication skills include: speech, mimic, pantomimic. In his research, A.V. Mudrik points out that the conditions of the educational process can burden the process of communicative development [24]. For example, this is expressed in the fact that primary school students have a number of difficulties in realising their communicative potential. This feature is due to the transition to a new leading type of activity – educational. In contrast to normative development, with mental retardation, play actions dominate even against the background of a change in the social environment. All this contributes to a decrease in age indicators in the formation of the skills of formalised pedagogical communication and interpersonal interaction with peers, which in turn requires a targeted impact on the development of communication skills – both verbal and non-verbal.

The analysis of the study of the peculiarities of communication showed that in the conditions of teaching in the first grades, children with a mild degree of mental retardation show a pronounced need for communication without focusing on the success of interpersonal contact [18, 38]. While in normatively developing children, it decreases, and 30% of the examined children, against the background of an intellectual decrease, are distinguished by persistent difficulties in communication with peers. The data from these studies also demonstrate that children with mild intellectual disabilities are more interested in the relationships between play partners and those normatively developing children are more interested in the attributes of play.

The process of communication of children with a mild degree of mental retardation during the period of their adaptation to schooling clearly demonstrates that their communication is formed and developed in accordance with mental laws in ontogenesis, but has a number of specific features, the general character of which is fixation at earlier stages of development. Accordingly, it is necessary to consider this phenomenon as a variant of underdevelopment, that is, to apply wide possibilities of compensation for existing violations. However, even the possibilities for potential compensation will be limited by the existing methods of intervention and the age of its initiation.

When communicating with peers, children with mild mental retardation are characterised by the expression of emotions, accompanied by changes in intonation and the expression of emotions, inadequate in various changing social situations. In the communication of children with a mild degree of mental retardation, expressive-mimic manifestations are observed, overly pronounced intonations – from affects to delight, but at the same time emotions in such children are difficult to differentiate and realise; they are generally impulsive [39, 40].

Another feature of the communication of children with mild mental retardation is the persistent limitation of statements, phrases, and speech turns, which is expressed in the use of additional sounds, stereotyped words, and phrases. There is a significant dominance of response statements over proactive ones. The above features clearly demonstrate the complexity of the process of verbal and non-verbal communication in children with mild mental retardation. To realise the goals of psychological impact, it is necessary to purposefully develop the child's non-verbal

communicative abilities, due to which he learns to speak and understand another, assimilate new information, express himself, and also enter into different relationships [41].

When comparing the level of development of non-verbal communication in children of primary school age diagnosed with “F70 – mild mental retardation” and “F83 – specific mixed disorders of psychological development”, one should note differential variations. Despite the fact that intellectual disabilities can be of a deeper and irreversible nature, the picture of underdevelopment of the components of the communicative sphere in children with various intellectual disabilities with diagnoses F70 and F83 (according to [42]) is generally similar – communication skills are much worse developed than in children with a level of intelligence within the age norm. They have significant communication difficulties; there is a smaller range of communication techniques. However, with mixed specific disorders of psychological development, these features are, as a rule, episodic in nature and are largely reversible [27].

Thus, the impact of intellectual disabilities with mild mental retardation on the cognitive, behavioural, and emotional-personal spheres of the communicative process naturally entails the emergence of serious difficulties in establishing contacts with people around them, and, therefore, in the process of social adaptation of a child as a whole.

DISCUSSION

Many foreign and Russian researchers have considered in their scientific publications the peculiarities of communication in children with intellectual disabilities. Let's analyse some works of foreign authors.

In the work of Cockerill, the features of communication of children with intellectual disabilities are highlighted. The author notes that learning disabilities and other problems can be a consequence of genetic diseases [20]. Children with intellectual disabilities may have limitations in the assimilation of new educational material, problems with speech, as well as significant difficulties in business communication. The author indicates the need and importance of the joint work of specialists, the child's family, and teachers. Additional and alternative communication options such as signatures, symbols, and various paralinguistic means of information

exchange can play an important role in developing social communication and the search for compensatory resources for a child's learning.

In the article *Playing it cool: Temperament, emotion regulation, and social behaviour in preschoolers*, the authors examined the complex aspects of the interaction between temperament regulation and emotional regulation and predicted social functioning quality [23]. The authors note that most of the research that scientists have done in the past has focused on predicting social competence and externalising problems. By using evidence-based research for a group approach to teaching emotion regulation that includes both parents and teachers, children can learn to socially interact with other children and adapt better in society.

McDaniel's research paper discusses a strategy for screening complex verbal, simple verbal, simple visual, and spatial-working memory [29]. The author noted that the strategy is described in such a way that it can be used by other professionals who are interested in testing the ability of their clients to store and retrieve newly obtained information. The procedure was found to discriminate well between different levels of mental retardation, correlate reasonably well with IQ, and have relatively good retest reliability.

Matheson's article looks at emotion recognition deficits. The author believes that this phenomenon is associated with aggression [40]. In this study, the author developed new techniques to study emotion identification skills in 19 aggressive and 15 non-aggressive adults with mental retardation. Emotion identification improved with an increase in the number of contextual cues in both groups. The obtained data are of practical importance for the study of models of aggression and subsequent clinical interventions.

Scientists Rodas, Zeedyk, and Baker, in their study, noted that children with mental retardation are at increased risk of developing other psychological disorders [43]. The researchers monitored children with intellectual disabilities and their parents. In the results of the work, the authors noted that the psychological health of parents affects the psychological state of children. The authors note that the father's depression was a significant moderator of the relationship between parenting and child behaviour problems.

The study, which was conducted by scientists in the article *Symptoms and development of anxiety in*

children with or without intellectual disability, is an important step towards the study of anxiety symptoms and disorders in children with moderate and borderline intellectual disabilities, as well as children with typical cognitive development [44]. The results of the study showed that children with intellectual disabilities have a higher level of anxiety over time. The value of the intervention is discussed in terms of the importance of screening and treating anxiety in children with intellectual disabilities.

CONCLUSIONS

This study theoretically examines the issue of communication features for children with intellectual disabilities, including mental retardation.

The ontogenetic sequence of the formation of means of communication with adults and with peers in children was considered. The process of adaptation of a younger student in a group of peers was considered. The author notes that adaptation in a peer group directly depends on the development of communicative abilities during an interaction, both verbal and non-verbal. The adaptation period becomes fundamental for the formation and development of communication skills in children with mild mental retardation. The author examined the level of development of communication skills and its impact on the quality of life of children with mild mental retardation.

Verbal and non-verbal communication in children with mild mental retardation was considered. In children with mild mental retardation, violations in verbal communication are manifested in the fact that they begin to speak at a later age, and the development of speech in such children significantly lags behind their peers. The author is inclined to believe that the main cause of violations in verbal communication in children with mild mental retardation is the systematic nature of violations. A weighty reason is also under the development of perception and intellect, which makes it difficult for children to competently build their speech and understand the emotional states of an interlocutor. A decrease in the level of intelligence in children negatively affects the formation of semantic connections between words. Another violation is motor impairment. This impedes the normal development of object interaction with the outside world and also significantly limits the possibilities of non-verbal communication since there are stable restrictions in facial expressions and gestures. Mild mental retardation in children is a

complex poly structural phenomenon characterised by a number of disorders that affect the development of their communication skills. Insufficient development of self-control and immaturity of emotional manifestations in children with intellectual disabilities were noted. This prevents a child from successfully socialising in society. In some cases, researchers have observed the child's desire for social isolation from society. However, when communicating with peers, children with mild mental retardation are characterised by a limited and inadequate expression of emotions, accompanied by changes in intonation and locomotion in various changing social situations.

After analysing all the above facts, it can be noted that impaired intelligence with mild mental retardation affects the cognitive, behavioural, and emotional-personal spheres of the communicative process, and also naturally entails the emergence of serious difficulties in establishing contacts with people around and in the process of socialisation of a child as a whole. The study presented in this paper includes expanded information on the characteristics of communication in children with intellectual disabilities. This work is of practical importance for teachers, psychologists, and doctors who work with children with intellectual disabilities.

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Nonverbal Communication as a Means of Social Integration: The Development of Nonverbal Communication in Primary Schoolers with Intellectual Disabilities

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Abstract: *Objective:* The study of nonverbal communication in primary schoolers with intellectual disabilities is an urgent topic for medical psychology.

Background: The purpose of this paper is to study nonverbal communication as a means of social integration.

Method: The methodological basis of this study is represented by various theoretic methods of scientific cognition. Methods of synthesis and analysis, system analysis of data and analysis of literary sources were used. In the context of the study, papers of foreign authors on the topic of nonverbal communication were considered.

Results: The study of the nonverbal communication development in primary school-aged children will allow for more successful socialisation of children with mild mental retardation, which in turn partially compensates for the intellectual impairment, and will also reduce the risks of social isolation.

Conclusion: This study is of practical value for psychologists and educators who work with children with a certain level of intellectual disability.

Keywords: Schoolchildren, communication, intellectual disability, psychological influence, socialisation.

INTRODUCTION

Social integration and subsequent socialisation of the child set a special task for specialists who implement programmes of psychological influence when working with children with mild intellectual disabilities. Nonverbal communication is considered as a compensatory opportunity for socialisation [1]. This problem is given attention by representatives of different psychological schools. Thus, the personally significant environment of the people with whom the subject interacts plays a significant role in the formation of his beliefs and values-based orientations, the boundaries of understanding acceptable behaviour, as well as directly motivating the subject.

In the study of the biological and social aspects of adaptation [2-4], a general view of the process under consideration can be seen: socialisation allows a person to accomplish individual development goals. At the same time, some specialists [5, 6] emphasise the importance of emotional and psychological support for children with learning difficulties. For sociologists, the socialisation can be viewed as a "social reproduction" of behaviour.

In general, when questions of the relationship between verbal and nonverbal communication are raised, it is important to understand its significance for the development of a child with intellectual disabilities. In various interdisciplinary studies, the development of communication is considered not only from the standpoint of humanism but also the issue of the phylogenesis of nonverbal communication is considered as a much earlier achievement of evolution. Such views are based on ideas about the biological role of emotions and their expression in primates, which were theoretically formulated by Charles Darwin, and then subjected to careful empirical verification by P. Ekman. In the studies, various classifications of basic expressions of emotions were identified, which made it possible to achieve significant results within the scope of the psychology of lying [7]. The primacy of nonverbal communication and its special significance for building a system of information exchange (the first acts as a model for the formation of the second) is also considered in the studies of Russian specialists [8].

These scientific facts are applied as a theoretical basis for modern experimental clinical psychology. Nonverbal communication in the presence of mental deficiency turns out to be an earlier method of communication and, as a result, is more closely related to the socialisation. Its mechanisms, in general, maybe less correlated with the level of development of consciousness and personality. Accordingly, purposeful work on the development of nonverbal communication

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will presumably allow for more successful socialisation of children with mild mental retardation, which in turn partially compensates for the intellectual impairment and reduces the risks of their social isolation.

METHODOLOGY

The research presented in this paper was carried out using theoretical methods of scientific cognition. The following methods of scientific cognition were used: the method of synthesis and analysis of data, system analysis of data. A theoretical analysis of literary sources on the topic of nonverbal communication was performed, the works of various authors who studied the topic of nonverbal communication as a means of social integration were considered.

A theoretical overview of scientific publications on the topic was used to consider social integration and nonverbal communication in children with intellectual disabilities. The features of nonverbal communication as a means of social integration were considered. The influence of nonverbal communication on the socialisation and adaptation of children with intellectual disabilities in society was analysed. It was found that in modern scientific publications, there is a relatively small number of clinical and psychological studies that address the development of nonverbal means of communication in children with mild mental retardation.

Using the synthesis method, which consists of combining related elements of an object or phenomenon into one whole, the main points of nonverbal communication were considered. In this study, the synthesis method was used to consider the features and positive aspects of the use of nonverbal communication as a means of social integration of children with intellectual disabilities. Using the method of analysis, the positive aspects of the introduction of nonverbal communication for primary schoolers were also analysed. This method is based on dividing the phenomenon into separate parts for a more detailed study. Using the method of analysis, it was revealed that nonverbal communication is one of the most effective ways of adaptation and socialisation for children with intellectual disabilities.

The method of systematic data analysis was also applied. Systematic data analysis was used for a detailed review of papers on the subject of nonverbal communication of primary schoolers with intellectual disabilities. Information about nonverbal communication for children with intellectual disabilities

was analysed. Methods of socialisation of children with intellectual disabilities were considered.

A theoretical analysis of papers on the topic was carried out. Nonverbal communication as a means of social integration for children with intellectual disabilities has been insufficiently studied. However, some researchers in the field of pedagogy and psychology have considered this issue. The papers concerning social integration and nonverbal communication were reviewed. In the first paper reviewed, researchers investigate the relationship between gestures and various attention processes in adolescents with an autism spectrum disorder. The authors note that the analysis carried out in the paper indicated a significant correlation between gestures and warning, orientation, and attention. The results obtained in the paper can be applied in practice both to the development of gestures and to studies of attention in adolescents with an autism spectrum disorder. In the second paper reviewed, the authors conducted a study on the issue of social integration of children with intellectual disabilities. The study took place among parents of children with and without intellectual disabilities. The results showed that parents of children with intellectual disabilities are more likely to respond to the child's emotions. Correlation and regression analysis emphasises specific links between certain maternal and paternal reactions and conversations, on the one hand, and the characteristics of children, their social integration or behavioural problems, on the other.

RESULTS

Nonverbal Communication as A Means of Social Integration

Since the socialisation is considered as a process of personality development based on interaction with other people, we can say that it is directly related to communication development. Consideration of social integration from the standpoint of the establishment of the necessary conditions for the disclosure of communicative potential in the context of studying children with mild mental retardation in the primary school system is of particular importance for the study. If we rely on the basic provisions of humanistic psychology when studying their nonverbal communication, then the process of social integration itself will be presented as an opportunity to create the prerequisites for self-actualisation of the individual. This consideration of socialisation makes it possible to

discover and apply effective means of psychological influence as a derivative of the compensation mechanism in children with mild mental retardation. In the process of personal development, the child not only strives to meet urgent needs but also to a variety of interactions with society. These views are widely considered not only within the framework of humanistic psychology. Ideas about how a child's interaction with the external social environment forms his personal identity has become central. In general, Russian psychologists have scientifically substantiated ideas about the relationship between the socialisation and the of activities at different stages of development, and also developed questions about the role of the human personality in the process of socialisation [9, 10]. A.N. Leontiev, within the framework of his theory of activity, points to the social source of the formation of a complex structure of motives, which are also manifested in communication.

Various representatives of humanistic psychology emphasised the fact that through self-actualisation, a person develops creative abilities. This, in turn, not only contributes to success in social life but also becomes a psychological determinant of an individual's adaptation to different living conditions and helps to prevent possible difficulties in communication and the problem of deviant conduct [11].

The parameters of social integration in children with intellectual disabilities are labile and changeable. This is due to the state of the psyche from the organic damage to the central nervous system, as well as negative environmental factors, among which situational reasons are more likely to appear. In the context of studying the social integration of children with mild mental retardation, it is worth noting that, in aggregate, these parameters, with the relative stability of manifestations, can be considered as completely reliable criteria for social integration or as predictive factors. In this case, it is important to define them not only as personal qualities but as psychological and psychophysiological characteristics of communication and behaviour, largely taking into account the functional state of the central nervous system [12].

The process and the effectiveness of social integration have become the central forming link since they directly affect the personality development in the socio-cultural environment, and, consequently, the development of communication skills, methods of interaction, as well as the prerequisites for self-realisation of children. It should be noted that the Law of the Russian Federation "On Education" focuses on

the development of a child's social competence, the ability to navigate and appropriately respond in various situations of interaction with society and in communication. For children with severe intellectual disabilities, it is especially difficult to communicate successfully [13].

The successful adaptation of a child in society has an impact on all structural components of his life. Communicative development, in turn, directly affects the socialisation of the individual. The study of this process is significant for improving the quality of social integration of children with intellectual disabilities. Qualitative indicators of social integration also depend on various institutions of socialisation: family, school, society, that is, all those social communities in which the child learns to be involved in social relations, acquire standards of social behaviour, assimilates group norms and is formed as a subject of social interaction [14].

When assessing the quality of socialisation, researchers pay attention not only to the actual development of a child but also to the quality of his joint activities with those who directly contribute to socialisation. Interaction with parents, teachers and peers helps to assimilate all the experience necessary for the child's further social development. Various authors emphasise the importance of a dynamic assessment of the quality of the social situation of a child's development as a member of society.

Communication is the leading determinant of the personal adaptation of children with mild mental retardation since socialisation includes the process and conditions of the interaction of a person with the surroundings. Therefore, attention is paid to the characteristics of a child's personal adaptation both in micro- and macro-groups. At the same time, social communities will have different meanings at different stages of development, and as a means of influence, targeted programmes of influence on the communication of children both through micro- and macro social environments will be the most effective.

Thus, we can say that communication and the process of social adaptation are inextricably linked and determine the result of socialisation of children with intellectual disabilities. Nonverbal communication is an integral part of the communication process. It becomes a means of compensation in the presence of mental retardation in a child since it is phylogenetically earlier than verbal communication [15].

The problem of communication of children with intellectual disabilities is, according to modern researchers [16], insufficiently studied. It is often viewed precisely from the perspective of pedagogy. However, in order to understand the problem at hand and search for the content of effective educational programmes, it is important to consider communication from the standpoint of knowledge in the field of psychology, which will allow not only to identify significant compensatory features of the communication of children with mild mental retardation but also to analyse the complex of reasons underlying intellectual disabilities and affecting the dynamics of the child's mental development, which interferes with normal communication with adults and impede the socialisation process. A special task is to consider the question of how to compensate for underdevelopment and what intact spheres of the psyche can contribute to the activation of compensatory mechanisms in the process of nonverbal communication.

Within the framework of the study, it is necessary to dwell on the present features of intellectual disabilities. In children with mild mental retardation, difficulties in nonverbal means of communication are associated, first of all, with motor disorders, lack of emotional development, inability to express their own emotions and understand facial expressions of other people against the background of a decreased ability of such children to use communicative signs [17, 18] correctly. Insufficient development of emotional control in children with mild mental retardation in some cases can negatively affect the development of nonverbal communication due to difficulties in coping behaviour [19, 20]. However, the question of the actual existence of significant difficulties in the expression and understanding of emotions by children with mild mental retardation remains very controversial, since there are comparative data indicating that these children do not experience limitations leading to the impossibility of their gradual socialisation. However, the totality of experimental data suggests that it is difficult for children with mild mental retardation to control and express their emotions in the process of communication, and at the level of cognitive processes, the lack of understanding of the facial expressions and gestures of the interlocutors is revealed. All researchers highlight the connection between social adaptation and communication skills, which becomes the theoretical basis for the development of programmes for the development of nonverbal communication in children with intellectual disabilities.

Among the papers on the subject, there is a relatively small number of clinical and psychological studies that touch upon the development of nonverbal means of communication in children with mild mental retardation. However, the following techniques and forms of influence exist and are actively used: verbal instructions, video training, which can help with the identification and expression of emotions, and also facilitate control over the behaviour of a child with intellectual disability.

These possibilities of psychological influence are also separate exercises created within the framework of a behavioural approach and aimed at the assimilation of specific communication techniques by children. To increase the efficiency of their assimilation, various stimulating material can be used, that is, the work is carried out based on both the direct behaviour of children and in the context of observing their communication using video recordings. In the process of helping children, both direct reinforcement [21] and various instructions and commands are used to regularly correct their behaviour. In addition, the intervention can be carried out in a complex with a drug effect, which ultimately increases its potential effectiveness [22].

The main feature of various programmes of psychological influence is their focus on specific communication difficulties in children when a specialist establishes the target of influence and consistent clinical and psychological work is carried out with it. With this approach, the development of the communication component dominates, which is considered as a potential resource for social adaptation. Indeed, the conscious control of mental processes allows one to overcome the existing limitations in the functioning of the psyche of a child with mild mental retardation. However, a need remains to take into account the individual characteristics of such children, since the variety of violations in the volitional sphere can significantly reduce the effectiveness of psychological influence using standardised programmes with universal methods for the development of nonverbal communication.

Thus, communication, communicative processes are an important determinant of the socialisation process, without which it is impossible for a child to assimilate the personal social experience. At the same time, the development of the nonverbal sphere becomes the most important compensatory opportunity

in the communication of children with adults and peers. Socialisation slows down significantly if the conditions for a constant influence on the mental state and communication skills are not established, taking into account the age-related patterns of dysontogenesis in the presence of persistent and irreversible intellectual disabilities. The totality of scientific ideas on the peculiarities of communication against the background of intellectual disabilities is the basis for the development of applied aspects of their interaction with people around them, which in general, taking into account mental dysontogenesis, will positively affect the communicative and personal development and socialisation of children with mild mental retardation.

The Development of Nonverbal Communication in Children with Intellectual Disabilities by Means of Psychological Influence

When considering the methodological foundations of psychological influence on the development of nonverbal communication, the modern paradigms of clinical and psychological research in medical psychology are taken into account. This study has chosen the structural-dynamic approach, which allows us to consider the cognitive, emotional-personal and behavioural components of nonverbal communication in the process of adaptation to school. Attention is drawn not only to the relationship between the mental, biological and social aspects in the analysis of mental processes but primarily to the internal structure of communication, which is consistent with the objectives of the study. This methodological aspect is a further development and detailing of the biopsychosocial approach [23], adopted by clinical psychology from medicine. Within the framework of this approach, in the second half of the 20th century, there was a tendency for a radical revision of the primacy of the biological paradigm, the application of which often did not correspond to either experimental data or the current situation in the practical work of specialists [24]. In modern research, it is important to overcome the contradictions between the variety of different concepts of health and make the transition to a holistic consideration of a person and his health as a complex multi-level phenomenon.

The biopsychosocial approach was first established in 1980 as a working alternative to radical reductionism, which simplified the psychic solely to the level of neurophysiological processes in the brain. From that moment on, in medicine and related spheres,

the phenomena of the mental and social gained their independence, which made it possible to consider them as independent factors available for scientific study and targeted influence.

In this clinical and psychological study, it is proposed to apply a structural-dynamic approach, which will allow paying sufficient attention to all areas of mental functioning of children, namely, cognitive, behavioural and emotional. A multicomponent consideration of nonverbal communication as a mental phenomenon will allow taking into account not only the external behaviour of children, as was customary among behaviourists, not only emotional states and motivation, which is used by supporters of psychodynamic and humanistic approaches, and not only various aspects of cognitive activity, but a complex of relationships and interconnections between these different, but combined with each other, components of the psychic sphere. Adhering to the structural-dynamic approach, followed by numerous psychologists, it is necessary to pay sufficient attention to the direct subjective experiences of children. Some researchers point to the fundamental importance of understanding, analysing and using subjective ideas about their own state and capabilities in children for the successful implementation of psychological influence on their nonverbal communication.

However, when using the corresponding research paradigm, it is also necessary, in addition to the possibilities, to be aware of its fundamental limitations. M.M. Reshetnikov in his study [24] indicates that in the modern biopsychosocial approach, attention is just beginning to be paid to social and psychological factors, and this attention may not be enough to form the most objective picture of developmental disorders in order to create and apply optimal programmes of psychological influence.

Thus, this study is focused on a multi-level analysis of human mental processes - the structural-dynamic approach, considers the psyche as a set of behavioural, emotional and cognitive spheres, which allows us to study and pay attention to both objective indicators of communicative development and its limiting factors, as well as subjective experiences that arise in children in connection with their states and communication skills. Moreover, paying enough attention to the mental factor of the development of primary schoolers, the problem of mild mental retardation from the standpoint of the development of nonverbal communication will be considered with

respect to the latest achievements of medical psychology.

On the basis of the indicated research methodology, the specificity of intellectual disorders in children among other mental states was determined, the main approaches to the study of mental retardation as a special variant of underdevelopment were considered, which, as a medical phenomenon, has its own epidemiology, aetiology, pathogenesis, clinical picture and often a combination of concomitant diseases. As a clinical and psychological phenomenon, mental retardation is considered from the standpoint of the characteristics of the functioning of the cognitive, emotional, personal and behavioural spheres. For practising specialists, the presence of mental retardation in a child is, first of all, the problem of providing it with assistance in order to optimally compensate for persistent irreversible mental underdevelopment.

The prospect of further research makes it possible to develop ideas about intellectual disabilities in an interdisciplinary context, finding ways to solve the problems of developing effective programmes of psychological influence aimed at improving the quality of life of children with mild mental retardation. The emphasis on the study of the problems of the development of nonverbal communication in children opens up opportunities for the study of intact mental capabilities, which make it possible to partially compensate for the existing mental development disorders. Features of nonverbal communication are manifested in the early stages of a child's development. In order to prevent the negative influence of secondary factors of socialisation associated not with the disease, but with long-term limitations on the communication of children with the people it is advisable to begin to realise the child's potential in the development of cognitive, emotional, and behavioural spheres of communication.

It should be recognised that the approach of V.A. Labunskaya [25] is of heuristic and methodological significance for the development of an effective holistic programme of psychological influence in order to develop nonverbal communication in children with intellectual disabilities. The range of means offered by the author is primarily aimed at developing the control function, which allows children to master their own behaviour through training, to recognise their emotions and control them. In turn, the ability to understand and express their emotional states can contribute to the

understanding of the emotional states of people with whom the child interacts.

A positive condition for the use of methods and techniques for providing assistance is the relative ease of their application since only one of the aspects of communication is affected, which allows the attention of a specialist to be focused on it. In addition, the centralisation of the influence preserves the purposefulness of communication development programmes. It is possible to consolidate the acquired skills in constant interaction with people in the framework of various activities, as well as in free time.

The main difficulties in assessing the effectiveness of such influences lie in their focus on one of the most important aspects of the development of nonverbal communication in children with intellectual disabilities - behaviour control. At the same time, a purposeful influence on the regulation of mental processes can be carried out by rather limited methods of rendering assistance. These influences are made separately from other aspects. However, when defining the content of the programs, the effectiveness of a complex one, affecting all spheres of the human psyche, was repeatedly proved in comparison with isolated psychological influences aimed at separate goals. Only individual work on the social adaptation of the child is seen by the authors as ineffective and insufficient since, in addition to individual norms of behaviour and the ability to control his emotional state, a child with intellectual disabilities should be able to assimilate group norms and learn to understand the peers. It is not advisable to produce psychological influence without taking into account the individual developmental options of specific children without understanding their personal characteristics, which together will determine the context of helping the child and his family in the development of nonverbal communication. Taking into account the specifics of the development and implementation of programmes of psychological influence for children with intellectual disabilities makes it possible to achieve the effectiveness of psychological influence, compensate for their underdevelopment and overcome secondary difficulties in socialisation.

To test the considered predictive capabilities of the programme of psychological influence on the development of nonverbal communication skills, purposeful research work is required. The study material collected from several educational institutions will make it possible to test the practical results of

providing assistance to primary school-aged children with intellectual disabilities.

DISCUSSION

Nonverbal communication as a means of social integration for children with intellectual disabilities is an insufficiently studied issue. However, some researchers in the field of pedagogy and psychology have considered this issue.

The authors of the paper "The relationship between gestures and nonverbal communication and attentional processing in high-functioning adolescents with autism spectrum disorder" investigate the relationship between gestures and various attention processes in adolescents with an autism spectrum disorder. They note that this issue has not been sufficiently studied. Previous research has highlighted the effect of focusing on the effectiveness of gestures without examining the effect of alerting and descending attention processes. The object of their study was to investigate the connections between attention processes and indicators of descriptive, conditional and emotional gestures, as well as other aspects of nonverbal communication in adolescents with an autism spectrum disorder. The attention network test and the colour trail test were used. These tests were used to measure attentional processes, while descriptive, standard and emotional gestures were assessed using the autism diagnostic observation schedule and diagnostic interview. The analysis carried out in this work showed a significant correlation between gestures with warning, orientation and attention. The corresponding structural equation model showed that attention processes affect gestures, but gestures do not affect attention processes. Emotional gestures are associated with the warning. Spatial visual search has been associated with facial expression and the integration of nonverbal communication with behaviour. There was no significant interaction between executive attention and gestures. The results obtained can be applied both to the development of gestures and to studies of attention in adolescents with an autism spectrum disorder [26]. This study and the results obtained are of practical value for medical psychology and pedagogy.

The paper "*The unforeseen influence of parents' socialisation behaviours on the social adjustment of children with intellectual disabilities*" explores the question of how parents of children with intellectual disabilities control emotions and how this behaviour affects the social integration of their children. The

objectives of this study were: to determine the emotion-related social behaviour used by the parents of children with disabilities, in comparison with the parents of typically developing children; to study the extent to which these reactions and conversations affect social competence and maladaptation of children. Parents who respond to emotions as supportive or non-supportive of children's socialisation, their development and their conversations about emotions with children are also considered important in this matter. However, little is known about these reactions and conservatism in mothers or fathers of children with intellectual disabilities. The first study compared 54 mothers and 32 fathers of preschool children with and without intellectual disabilities. The results showed that parents of children with intellectual disabilities are more likely to respond to a child's emotions. The second study examined the relationship between parental responses and conversations and their children's profiles (identifiers, age, development). Correlation and regression analysis emphasise specific links between certain maternal and paternal reactions and conversations, on the one hand, and the characteristics of children, their social adaptation or behavioural problems, on the other [27]. This study also examines the issues of social adaptation of children with intellectual disabilities and is of interest to practising psychologists and teachers.

CONCLUSIONS

The present paper theoretically considers the issue that social integration is a special task for specialists who implement programmes of psychological influence when working with children with intellectual disabilities. The investigation of social adaptation from the perspective of the creation of the necessary conditions for disclosing the communicative potential in the context of studying children with mild mental retardation in the primary school system is of particular importance for the present study. Thus, this consideration of the socialisation process makes it possible to discover and apply effective means of psychological influence as a derivative of the compensation mechanism in children with mild mental retardation. It is important to note that in the aggregate, the parameters of social integration, with the relative stability of manifestations, can be considered as quite reliable criteria for social adaptation or as predictive factors.

It was determined that communicative processes are an important determinant of the socialisation

process, without which it is impossible for a child to assimilate the personal social experience. The development of the nonverbal sphere is the most important compensatory opportunity in the communication of children with mild mental retardation with adults and peers. Socialisation slows down significantly if the conditions for a constant influence on the mental state and communication skills are not created for a child, taking into account the age-related patterns of dysontogenesis in the presence of persistent and irreversible intellectual disabilities.

It is not advisable to make psychological influence without taking into account the individual developmental options of specific children, without understanding their personal characteristics, which together will determine the context of helping the child and his family in the development of nonverbal communication. Taking into account the specifics of the development and implementation of psychological influence makes it possible to achieve the effectiveness of psychological influence when working with children, significant compensation for their underdevelopment and overcome secondary difficulties in socialisation, including such children in the social environment and forming stable skills of nonverbal communications.

Having analysed all of the above facts, it is important to note that further purposeful research is necessary to test the considered predictive capabilities of the psychological influence programme on the development of nonverbal communication skills. The materials and conclusions presented in this work, which were collected on the basis of several educational institutions, provide extended information about the features of communication in children with intellectual disabilities. This study is of practical importance for teachers, psychologists and doctors who work with children with intellectual disabilities, and will also make it possible to test the practical results of rendering assistance to primary school-aged children with intellectual disabilities.

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Study of the Understanding of Gestural Communication in Children with Intellectual Disabilities in the Dynamics of Psychological Impact

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Abstract: *Objective:* The purpose of the study is to investigate the specific features of non-verbal communication in children with intellectual disabilities in the dynamics of psychological impact.

Background: Gestures are one of the most important components of non-verbal communication. The development of non-verbal communication in children with intellectual disabilities contributes to their normal social adaptation.

Method: To study the current state and dynamics of the development of the ability to recognise and understand gestures in the process of psychological influence, factor analysis was used by the principal component method with the use of varimax rotation. To verify the applicability of factor analysis to the selected variables, the Kaiser-Meier-Olkin measure of sample adequacy and Bartlett's sphericity test were used.

Results: The data of the study showed that, depending on the level of intelligence or, more precisely, on the diagnosis given to the child, there are differences in the dynamics of the development of the components of non-verbal communication. Children with mild mental retardation display lower results than children with mixed specific disorders of psychological development and children with a normative level of intellectual development.

Conclusion: The results obtained in the process of this study can be applied in practice by teachers and psychologists when working with children with intellectual disabilities.

Keywords: Sign language, schoolchildren, psychology, pedagogy, communication skills.

INTRODUCTION

Non-verbal communication against the background of a decrease in intelligence turns out to be an earlier method of communication in conditions of dysontogenesis and, as a result, is more closely related to socialisation. Its mechanisms as a whole may be less correlated with the level of development of consciousness and personality [1]. Accordingly, purposeful work on the development of non-verbal communication will presumably allow for more successful socialisation of children with mild mental retardation, which in turn partially compensates for the intellectual impairment and reduces the risks of their social isolation [2]. Non-verbal communication is an integral part of the communication process. It becomes a means of compensation in the presence of mental retardation in a child since it occurs phylogenetically earlier than verbal communication [3]. Non-verbal communication of children with mild mental retardation in comparison with normatively developing peers and with mixed specific psychological disorders is described by a lower level of development of cognitive, emotional-personal, and behavioural components [4].

Furthermore, the most pronounced is the underdevelopment of the cognitive component, which is associated with the specific features of impaired intelligence.

Gestures are one of the most important components of non-verbal communication. In many countries, gestures are classified into two types [5]. The first type is the sign language of deaf people. This type is primary and does not depend on the spoken language. This type has its individual grammar, a system of inflexion, which differs from the spoken language; there are also certain dialectal differences. The second type of manual signs is sign systems [6]. Sign systems are secondary; they convey verbal speech literally. Signal systems that correspond to spoken language are often used to work with hearing people who have certain impairments in communication skills. Gestures and speech are used when using alternative methods of communication simultaneously due to the fact that gesture systems are based on verbal speech [7]. Gestures help children visualise words; they help the child memorise them better. Also, gestures help the child understand the meaning of words. All existing gestures can be divided into several groups [8].

The first group is symbolic social gestures and movements. The child can learn this group of gestures

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with the help of situational business communication. For example, with the help of the following words and gestures: "Yes", "No", "Come here", "Hello", "Goodbye", and many others. The second group includes additional social gestures. This group of gestures imitates simple object-related actions, for example, while eating, playing, washing, travelling, while preparing for bed.

The next group includes gestures of a descriptive nature that convey certain characteristic properties and traits that are inherent in a particular object, for example, gestures showing animals, books, cars, planes, trains, or certain gestures that describe objects, for example, small, large, tall, low, etc. [9].

Gestures have advantages and disadvantages. The advantages include the ability to constantly use the hands, unlike other special devices, sign language is visual, parents or teachers can help the child with their own hands, and sign language is accompanied by eye contact [10]. The disadvantages include limited communication of children with motor dysfunctions, and some gestures may not be understandable to everyone, gestures disappear immediately after their "pronunciation", the child also needs to remember all the gestures and be capable of reproducing them [11].

METHODOLOGY

Diagnostic examination of each child was carried out with the obligatory consideration of its individual characteristics. Thus, in the course of the study, normally developing children gave faster and more complete answers to the questions asked. The total time spent on the diagnostic procedure varied from 30 to 45 minutes. Peers with intellectual disabilities had to spend much more time looking for an answer; it was more difficult for them to formulate speech statements during the diagnostic examination. They spent additional time perceiving and comprehending the diagnostic material, which was within the individual range of time indicators from 45 to 60 minutes or more, considering the need for rest breaks in such children, based on their fatigue and impaired concentration. These features of the diagnostic procedure persisted with the repeated presentation of subtests after the classes under the programme of psychological influence on the development of non-verbal communication in children with intellectual disabilities.

This version of the study of assessing the level of development of non-verbal communication was performed directly during interaction with children. The diagnostic procedure was performed with each child individually with the use of special demonstration cards depicting people showing various gestures, and the result of the examination was recorded by a psychologist in a special protocol. For the correct conduct of the study, the psychologist needed to establish a trusting contact with the child, offering it to take a look at several interesting pictures. During the examination, the child's biographical data were indicated in detail, and pictures with questions were presented strictly in the order specified in the protocol.

The images were presented in turn, and those that had already been answered were removed out of the child's sight. During the survey, the response time was assessed, and it was not recommended to rush the child or prompt it to answer questions. All the child's responses and other statements that occurred during the conversation were carefully recorded, as well as all additional information about the observed behaviour of the examined child. When showing the images, the child was asked questions about what it sees in the picture, what this gesture means, whether the child uses it and in what situations, how the child and adults relate to this gesture. According to the results of the diagnosis, the psychologist gave a score from 0 to 4 for each picture, where the score of 0 corresponded to the adequate understanding of the gesture and the correctness of its use. This version of the diagnostic study was used since gestures constitute one of the key components of non-verbal communication. This approach allowed not only to conduct a qualitative study of this component of non-verbal communication but also to translate qualitative indicators into quantitative ones through the use of the developed measuring scale.

To process and analyse the data obtained, various methods of mathematical and statistical processing of indicators of communication development were used: factorial and variance analyses. The data obtained were systematised and presented in the form of graphs, tables, and figures. For theoretical consideration of information, the scientific literature on the subject matter was analysed. Scientific publications of foreign authors on the subject of non-verbal and gesture communication in children with intellectual disabilities were considered.

RESULTS

The Study of Understanding Gestural Communication

To study the current state and dynamics of the development of the ability to recognise and understand gestures in the process of psychological influence, factor analysis was used by the principal component method with the use of varimax rotation. To verify the applicability of factor analysis to the selected variables, the Kaiser-Meier-Olkin measure of sampling adequacy and Bartlett's sphericity test were used. The Kaiser-Mayer-Olkin measure of selective adequacy and the Bartlett test are presented in Table 1.

Table 1: Kaiser-Meyer-Olkin Measure of Selective Adequacy and Bartlett Test

Criterion		Value
Kaiser-Meyer-Olkin measure of selective adequacy		0.902
Bartlett's criterion for sphericity	Approximate χ^2	4,453.307
	Statistical properties	496
	p-value	< 0.001

The criterion for the adequacy of the Kaiser-Meyer-Olkin sample is a value that describes the degree of applicability of factor analysis to a given sample. The Kaiser-Meyer-Olkin measure of sample adequacy = 0.902 – the data are certainly adequate for the application of factor analysis. Bartlett's sphericity criterion is a multidimensional normality criterion for the distribution of variables. Apart from normality, the criterion checks whether the correlations differ from 0. A p-value less than 0.05 indicates that the data is quite acceptable for Cattell factor analysis, according to which the number of factors is determined by the inflexion point on the graph before it reaches a gentle straight line after a sharp decline of eigenvalues, eigenvalues of the selected factors are greater than 3. The scree plot is presented in Figure 1.

The 3 highlighted factors explain 74.69% of the total variance of the analysed indicators. The contribution of factors to the total variance of the studied indicators is presented in Table 2. The graphic structure of the factors is presented in Figure 2.

For the studied "factor 1", the load was distributed on the indicators of response time to cards: greeting

(0.746), request (0.768), prohibition (0.955), demonstration (0.957), praise (0.935), consideration (0.952), pointing gesture (0.951), concealing gesture (0.959), offensive gesture (0.960), anger (0.931), refusal (0.935), threat (0.960), fun (0.939), reluctance (0.939), punishment (0.953), mocking gesture (0.909). The contribution of this factor to the total variance of the initial traits was 44.3%. Based on the variables included in this factor, reflecting the cognitive activity of students, aimed at assessing the object, this factor is called "The cognitive component of non-verbal communication".

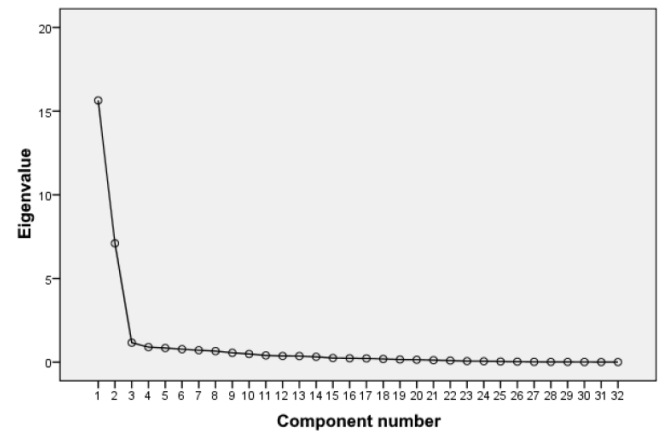


Figure 1: Scree plot.

Table 2: Contribution of Factors to the Total Variance of the Indicators Understudy

Factor	Sums of squares of rotational loads	
	% variance	Cumulative %
1	44.30	44.30
2	24.60	68.90
3	5.79	74.69

In the studied "factor 2", the load was distributed on the following gestures: prohibition (0.739), demonstration (0.654), praise (0.766), consideration (0.760), concealing gesture (0.853), anger (0.775), refusal (0.710), threat (0.786), fun (0.807), reluctance (0.761), punishment (0.725), teasing gesture (0.807). The contribution of this factor to the total variance of the initial traits was 24.6%. The name of the factor: "The emotional and personal component of non-verbal communication". This component reflects the inextricable link between emotions and personal behaviour in children.

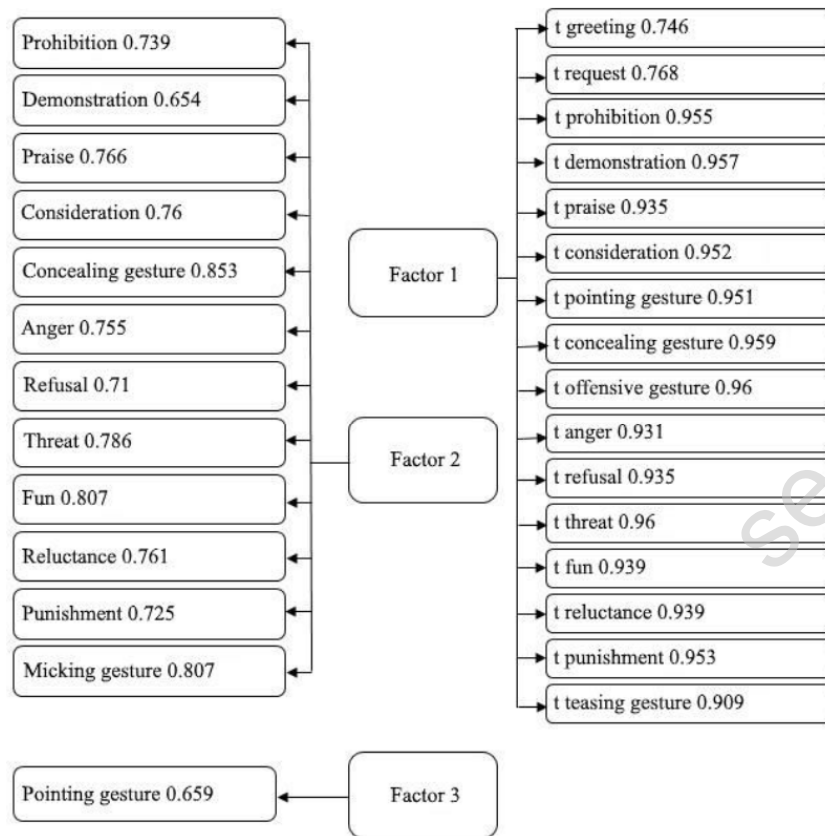


Figure 2: The factor structure of the results of the experimental psychological study of gestures.

For the studied "factor 3", the load was distributed to the following indicator: pointing gesture (0.659). The contribution of this factor to the total variance of the initial traits was 5.8%. This factor is called the "Behavioural component of non-verbal communication", since this gesture is primarily a behavioural response aimed at interacting with other people.

Based on the obtained factor estimates of the level of development of the components of non-verbal communication, a comparative analysis was

performed, which allowed dividing the subjects into groups depending on the diagnosis. Considering the correction for multiple comparisons, the boundary probability of a type I error was set at the level $\alpha = 0.017$. The average values of the compared components of non-verbal communication with the use of the example of studying the understanding of gestures are presented in Figure 3.

As suggested by the above diagram (a higher score corresponds to a lower level of development), the level of development of each component has a minimum

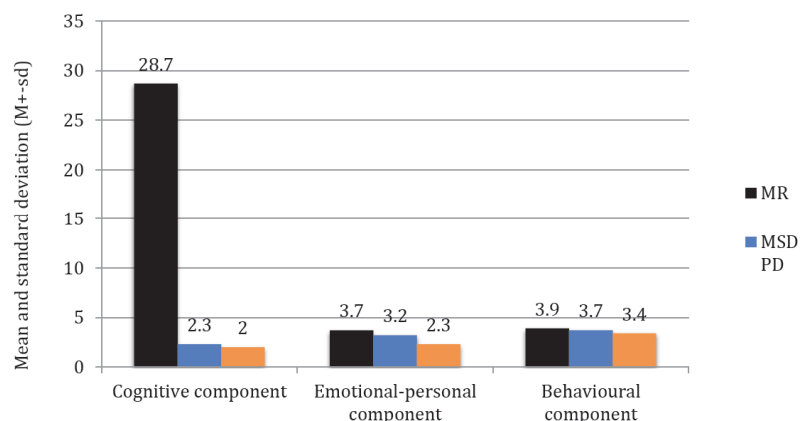


Figure 3: Average values of the components of gesture communication in children depending on the diagnosis.

Table 3: Comparative Characteristics of the Components of Non-Verbal Communication in Children

	Group 1 (MR) (M±sd)	Group 2 (MSDPD) (M±sd)	Group 3 (ND) (M±sd)
Cognitive component	28.74 ± 16.87*	2.32 ± 2.8	2.04 ± 1.8***
Emotional-personal component	3.75 ± 0.32*	3.22 ± 0.66**	2.29 ± 0.82***
Behavioural component	3.94 ± 0.24	3.67 ± 0.84	3.37 ± 1.22

Notes: * — statistically significant differences in groups 1 and 2 ($p < 0.017$).

** — statistically significant differences in groups 2 and 3 ($p < 0.017$).

*** — statistically significant differences in groups 1 and 3 ($p < 0.017$).

value in the group of children with a normative level of intellectual development (hereinafter on all diagrams – "ND"), slightly higher – in the group of children with mixed specific disorders of psychological development (hereinafter on all diagrams – "MSDPD"), and maximum – in the group of children with mild mental retardation (hereinafter on all diagrams – "MR").

At the qualitative level, emotional-personal and behavioural components in the group with mild mental retardation correspond to the assessment "no response, inadequate interpretation of people's actions, justification of the wrong naming of the gesture".

In the group of subjects with mixed specific disorders of psychological development, at the qualitative level, the behavioural component corresponds to the assessment "no response, inadequate interpretation of people's actions, a justification for the wrong naming of the gesture", and the emotional-personal component corresponds to "general response, oral description of the image in the picture. Therewith, the child does not pay attention to the gesture. The interpretation of gestures or movements of people is conveyed in the form of their direct speech. Shows gesture unassisted".

In the group of children with a normative level of intellectual development, who study in the first grade, the behavioural component at the qualitative level corresponds to the assessment "general response, oral description of the image in the picture. Therewith, the child does not pay attention to the gesture. The interpretation of gestures or movements of people is conveyed in the form of their direct speech. Shows gesture unassisted." The emotional-personal component includes the assessment "the description of the gesture is replaced by the correct description of the situation or the actions of the people in the picture. The person's gesture is definitely not named. Justification of understanding the gesture in the form of separate words or unstructured statements".

As the table below suggests, the level of development of the emotional-personal component is statistically significant ($p < 0.017$) different in all groups of the surveyed, decreasing in the continuum from a group of children with mild mental retardation to a group of children with a normative level of intellectual development. Comparative characteristics of the components of non-verbal communication in children are presented in Table 3. The best indicators are observed in the group of normatively developing children, low results – in the group with mild mental retardation. In the group with mixed specific disorders of mental development, the severity of the emotional-personal component takes an intermediate position.

The cognitive component is also statistically ($p < 0.017$) lower in the group of those surveyed with mild mental retardation compared to children with mixed specific disorders of psychological development and normatively developing children. Thus, the surveyed children with mild mental retardation give statistically significantly longer answers to the questions posed; they are described by prolonged reflection and the search for the correct answer. To study the dynamics of changes in the components of non-verbal communication in relation to recognition and understanding of gestures after psychological impact, analysis of variance with repeated measures was used. The results of the dynamics of changes in the groups are presented in Figures 4, 5, and 6.

As the diagram suggests, the level of development of the cognitive component in all groups of the surveyed increased. Thus, in the group of children with mild mental retardation, the average response time decreased by 51%, in the group of those surveyed with mixed specific disorders of psychological development – by 51.3%, in the group of children with a standard level of intelligence development – by 76%.

As the above diagram suggests, the level of development of the emotional-personal component of

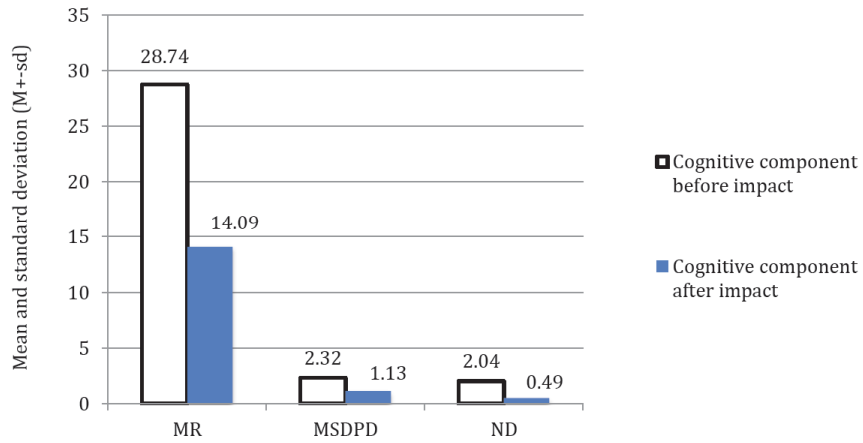


Figure 4: Dynamics of changes in the cognitive component in the study groups.

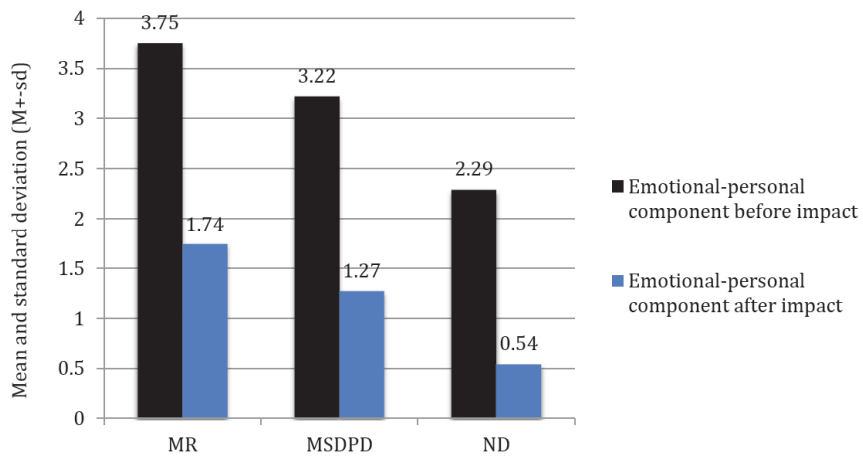


Figure 5: Dynamics of changes in the emotional and personal component in the surveyed groups.

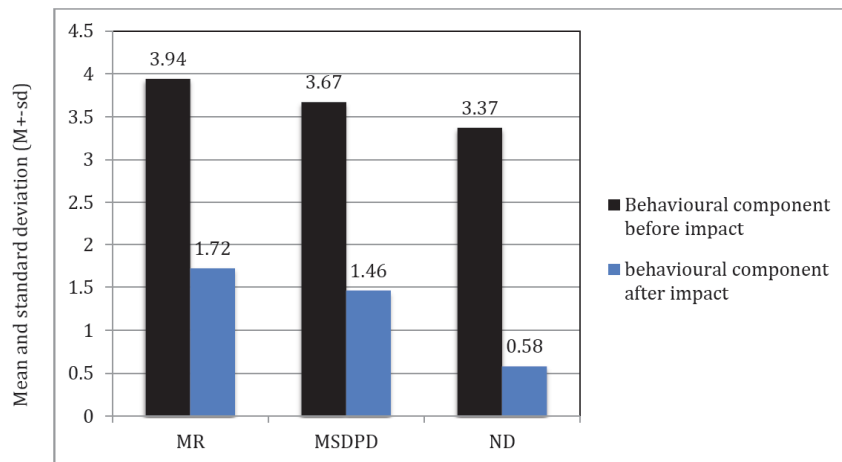


Figure 6: Dynamics of changes in the behavioural component in the groups of examined children.

non-verbal communication in all groups of the surveyed increased. The quality of answers in the group of those surveyed with mild mental retardation improved by 53.6%, in the group of those surveyed with mixed specific disorders of psychological development by

60.6%, in the group of children with a normative level of intelligence development – by 76.4%.

In the above graph (Figure 6), the level of development of the behavioural component of non-

Table 4: Dynamics of Changes in the Surveyed Groups

Component	Group 1 (MR) (M±sd)	Group 2 (MSDPD) (M±sd)	Group 3 (ND) (M±sd)
Cognitive component before impact	28.74 ± 16.87	2.32 ± 2.80	2.04 ± 1.80
Cognitive component after impact	14.09 ± 7.60*	1.13 ± 1.07*	0.49 ± 0.72*
Emotional-personal component before impact	3.75 ± 0.32	3.22 ± 0.66	2.29 ± 0.82
Emotional-personal component after impact	1.74 ± 0.81*	1.27 ± 0.36*	0.54 ± 0.50*
Behavioural component before impact	3.94 ± 0.24	3.67 ± 0.84	3.37 ± 1.22
Behavioural component after impact	1.72 ± 0.96*	1.46 ± 0.88*	0.58 ± 0.59*

Notes: * — differences are statistically significant ($p < 0.05$) before and after psychological impact.

verbal communication increased in all groups. In the group with mild mental retardation, the quality of answers improved by 56.3%, in the group with mixed specific disorders of psychological development – by 60.2%, in the group of children with a standard level of intelligence development – by 82.8%.

According to the results of comparative analysis, the dynamics of changes in all groups is statistically significant. The dynamics of changes in the groups studied are presented in Table 4.

Psychological impact statistically ($p < 0.05$) improved the main components of non-verbal communication (cognitive, emotional-personal, behavioural) (see Table 4). The most pronounced positive dynamics is noted in the group of children with a normative level of intellectual development, less pronounced in the group of children with mild mental retardation. The results of a comparative analysis after psychological impact are presented in Table 5.

After psychological influence, the level of expression of the main components of non-verbal communication in the continuum from mild mental retardation to the conditionally normative level of intellectual development remained (see Table 5). Statistically significant ($p < 0.017$) differences in the

level of severity of the behavioural component between children with mixed specific disorders of psychological development and normatively developing children were added to the existing differences that were identified at the summative stage of the study.

Thus, to get a general idea of the results obtained in two groups (a group of children of primary school age with a normative level of intellectual development and a group of children with intellectual disabilities) the parameters under study were compared with the use of the Student's t-test for independent samples.

The largest number of statistically significant differences is observed in the indicators obtained during the study of non-verbal communication of primary school children by a psychologist. Therewith, the reaction time indicators are statistically ($p < 0.05$) higher in children with intellectual disabilities, while the assessments reflecting the level of recognition, identification, and understanding of various gestures, on the contrary, are statistically higher in normatively developing children.

The least differences between the groups are observed in the assessments of children's non-verbal communication by parents. For them, in general, there is no difference in how their children communicate

Table 5: Comparative Characteristics of the Components of Non-Verbal Communication in Children after Psychological Impact

	Group 1 (MR) (M±sd)	Group 2 (MSDPD) (M±sd)	Group 3 (ND) (M±sd)
Cognitive component	14.09 ± 7.60*	1.13 ± 1.07	0.49 ± 0.72***
Emotional-personal component	1.74 ± 0.81*	1.27 ± 0.36**	0.54 ± 0.50***
Behavioural component	1.72 ± 0.96	1.46 ± 0.88**	0.58 ± 0.59***

Notes: * — statistically significant differences in groups 1 and 2 ($p < 0.017$).

** — statistically significant differences in groups 2 and 3 ($p < 0.017$).

*** — statistically significant differences in groups 1 and 3 ($p < 0.017$).

depending on their diagnosis. Therewith, teachers, on the contrary, tend to notice differences in the manifestations of children's non-verbal communication, depending on the degree of decrease in their intelligence. They also indicate that it is more difficult for children with intellectual disabilities to understand and use various conventional gestures in communication.

The Study of Gestures in Communication Situations in Children with Intellectual Disabilities in the Dynamics of Psychological Impact

To study the current state and dynamics of the development of the ability to recognise and understand gestures in situations in the process of psychological impact, the factor analysis of the principal component method with the use of varimax rotation was used. To test the applicability of factor analysis to the selected variables, the Kaiser-Meyer-Olkin measure of sample adequacy and Bartlett's sphericity criterion are used. The Kaiser-Meyer-Olkin measure of selective adequacy and the Bartlett test are presented in Table 6.

Table 6: Kaiser-Meyer-Olkin Measure of Selective Adequacy and Bartlett Test

Criterion	Value	
Kaiser-Meyer-Olkin measure of selective adequacy	0.875	
Bartlett's criterion for sphericity	Approximate χ^2	11,796.147
	Statistical properties	2775
	p-value	< 0.001

The criterion for the adequacy of the Kaiser-Meyer-Olkin sample is a value that describes the degree of applicability of factor analysis to a given sample. The measure of the Kaiser-Meyer-Olkin sample adequacy is 0.875 – high adequacy of factor analysis for this sample. Bartlett's sphericity criterion is a multidimensional normality criterion for the distribution of variables. Apart from normality, the test verifies whether the correlations differ from 0. A p-value of less than 0.05 indicates that the data is acceptable for factor analysis.

Four factors were identified based on the interpretation of their content, the Cattell criterion, according to which the number of factors is determined by the inflexion point on the graph before it reaches a

gentle straight line after a sharp decline in eigenvalues, the eigenvalues of the selected factors are greater than 1. The scree plot is presented in Figure 7.

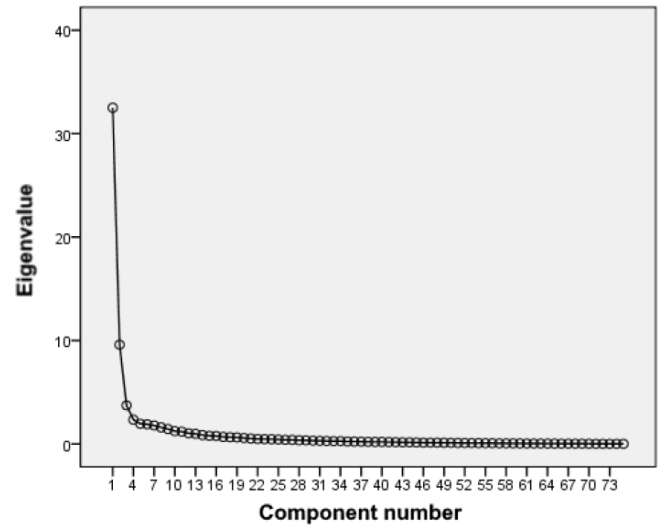


Figure 7: Scree plot.

Four highlighted factors explain 64.221% of the total variance of the analysed indicators. The contribution of factors to the total variance of the studied indicators is presented in Table 7. The graphical structure of the factors is presented in Figure 8.

Table 7: Contribution of Factors to the Total Variance of the Studied Indicators

Factor	Sums of squares of rotational loads	
	% variance	Cumulative %
1	23.68	23.68
2	19.28	42.97
3	12.49	55.46
4	8.764	64.22

For the studied "factor 1", the load was divided into the following indicators: PD invitation (0.758), R prohibition (0.723), PD dismay (0.726), PD interest (0.747), R interest (0.724), PD joy (0.705), PD delight (0.782), R delight (0.746), PD length demonstration (0.746), PD volume demonstration (0.788). The contribution of this factor to the total variance of the initial traits was 23.68%. The name of the factor: "The emotional-personal component of non-verbal communication." This component reflects the inextricable link between emotions and personal behaviour in children.

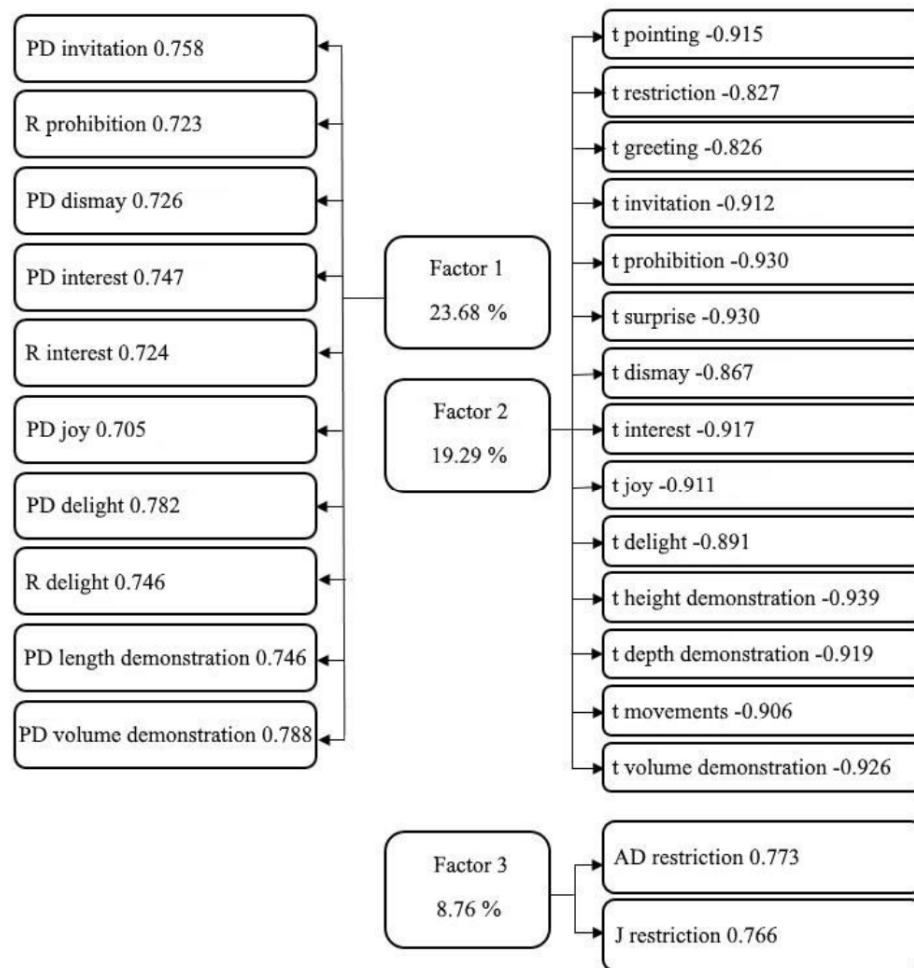


Figure 8: The factor structure of the results of the experimental psychological study of gestures in a situation.

List of abbreviations: PD — picture description; AD — action description; R — recognition; J — justification.

For the studied "factor 2", the load was distributed on the response time indicators for the following cards: indication (-0.915), restriction (-0.827), greeting (-0.826), invitation (-0.912), prohibition (-0.930), surprise (-0.930), dismay (-0.867), interest (-0.917), joy (-0.911), delight (-0.891), height demonstration (-0.939), depth demonstration (-0.919), movement (-0.906), length demonstration (-0.909), volume demonstration (-0.926). The contribution of this factor to the total variance of the initial traits was 19.29%. This factor is called the "Cognitive component of non-verbal communication", since it included gestures associated with the cognitive activity of students aimed at assessing the object.

For the studied "factor 3", the load was divided into the following indicators: AD restriction (0.773), J restriction (0.766). The contribution of this factor to the total variance of the initial traits was 8.76%. This factor is called "The behavioural component of non-verbal communication", since this gesture is primarily a

behavioural response aimed at interacting with other people. After obtaining estimates of the values of factors, a comparative analysis of the obtained estimates of the level of development of the considered components of non-verbal communication was performed with the use of analysis of variance. Considering the Bonferroni correction for multiple comparisons, the probability of a type I error was $\alpha = 0.017$. The average values of the components of non-verbal communication are presented in Figure 9.

The diagram above suggests that depending on the diagnosis, the assessments of the level of the actual development of non-verbal communication components qualitatively differ. Upon answering in the process of analysing pictures on the presented visual stimuli, children with mild mental retardation predominantly gave the following answer options: no response or an absurd interpretation; wrong interpretation; listing of what was seen in the picture. In children with mixed specific disorders of psychological development, the

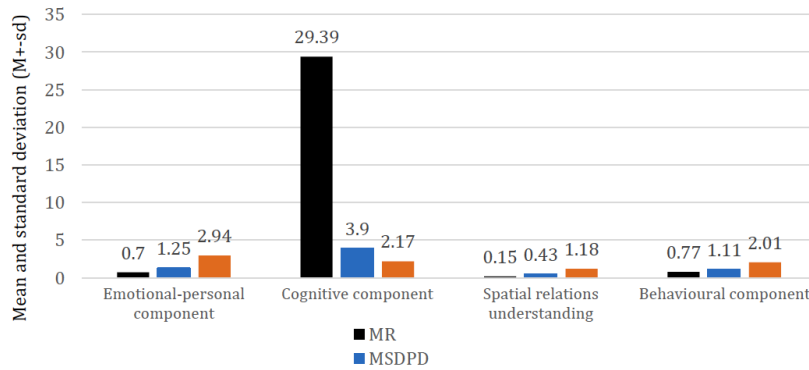


Figure 9: Average values of the components of non-verbal communication in the surveyed first-grade students.

Table 8: Comparative Characteristics of the Components of Non-Verbal Communication in Children

	Group 1 (MR) (M±sd)	Group 2 (MSDPD) (M±sd)	Group 3 (ND) (M±sd)
Emotional-personal component	0.7 ± 0.84*	1.25 ± 0.74**	2.94 ± 0.84***
Cognitive component	29.39 ± 21.81*	3.9 ± 3.98**	2.17 ± 1.87***
Behavioural component	0.77 ± 1.21	1.11 ± 1.23**	2.01 ± 1.24***

Notes: * — statistically significant differences in groups 1 and 2 (p < 0.017).
 ** — statistically significant differences in groups 2 and 3 (p < 0.017).
 *** — statistically significant differences in groups 1 and 3 (p < 0.017).

following answers prevailed: wrong interpretation or general answer; correct re-enumeration of people's actions, ignoring gestures, the context of the situation (Table 8).

In children with a normative level of intellectual development, responses of a general nature were mainly noted, which can be attributed to a variety of situations of non-verbal communication and outside the context of non-verbal communication. They had errors in the interpretation of the actions of one of the communication partners. Comprehension of the gesture was demonstrated in the form of single words or unstructured utterances.

As the table above indicates, children with a normative level of intellectual development have statistically significantly (p < 0.017) higher indicators of the development of non-verbal communication components when compared with groups of children with mild mental retardation and with mixed specific disorders of psychological development.

Groups of children with mild mental retardation and with mixed specific disorders of psychological development differ only in the level of severity of emotional-personal and cognitive components. They also have an equally insufficiently developed understanding of prohibitions, due to which impulsive

behaviour is noted, as well as ignorance of educational influences. At the next stage, the obtained estimates of the components of non-verbal communication before and after the psychological impact were compared. The results comparing the dynamics of changes in groups are presented in Figures 10-12.

As the above diagram suggests, the level of development of the emotional-personal component of non-verbal communication increased in all groups. The quality of answers in the group with mild mental retardation improved 4.5 times, in the group with mixed specific disorders of psychological development – 2.5 times, in the group of normatively developing children – by 35.7%.

The level of development of the cognitive component in the groups with mild mental retardation and normatively developing children increased, in the group with mixed specific disorders of psychological development it slightly decreased (see Figure 11). Thus, in the group with mild mental retardation, the average response time decreased by 68.15%, in the group of normatively developing children by 78.9%, in the group with mixed specific disorders of psychological development the response time increased by 11%, which may be due to with their characteristic fatigue—especially given that this

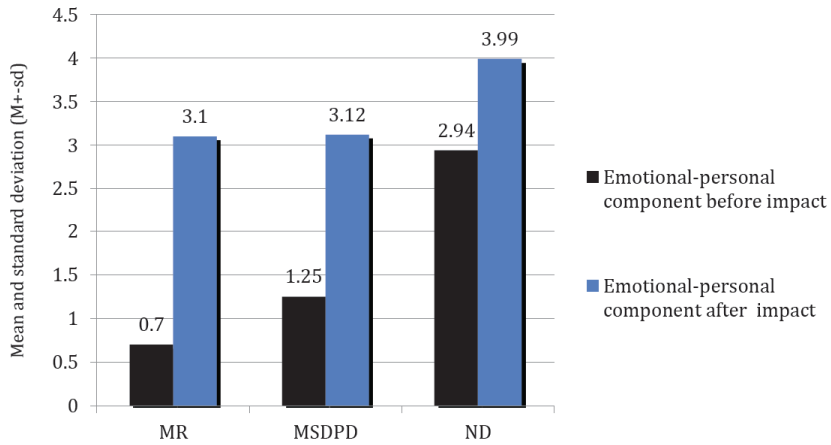


Figure 10: Dynamics of changes in the emotional-personal component in the studied groups.

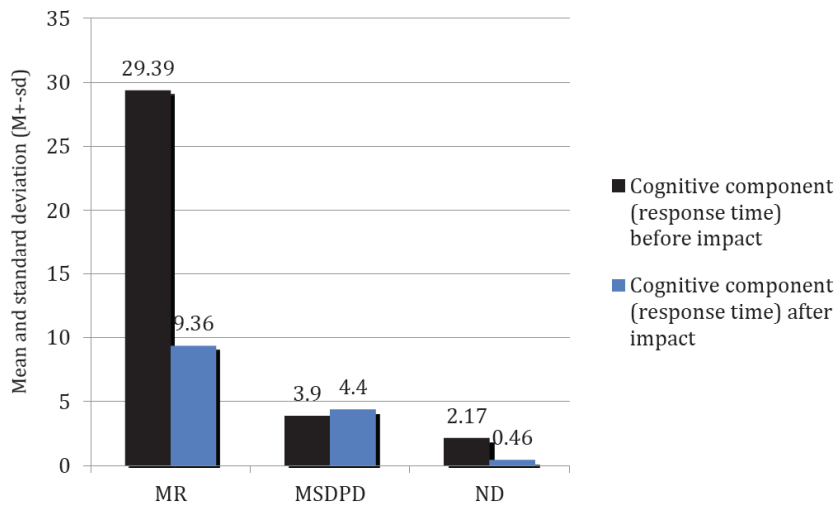


Figure 11: Dynamics of changes in the cognitive component.

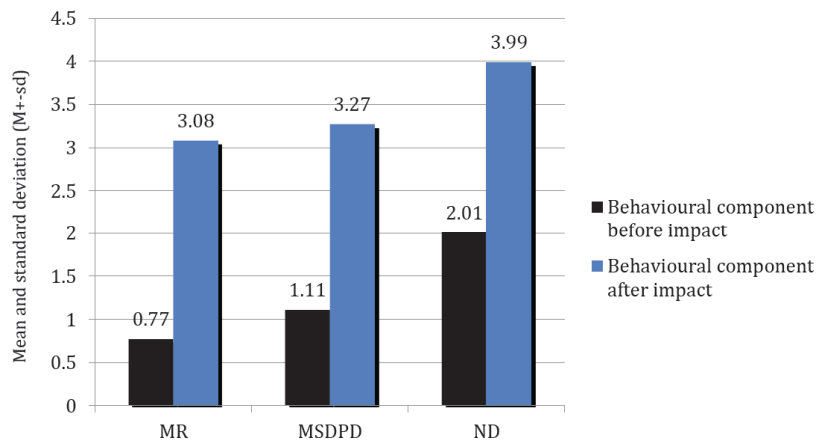


Figure 12: Dynamics of changes in the behavioural component.

difference does not reach the level of statistical significance.

The level of development of the behavioural component of non-verbal communication increased in

all groups. The quality of answers in the group with mild mental retardation improved 4 times, in the group of mixed specific disorders of psychological development – 3 times, in the group of normatively developing children – 2 times (see Figure 12). In

Table 9: Dynamics of Changes in the Groups' Understudy

Component	Group 1 (MR) (M±sd)	Group 2 (MSDPD) (M±sd)	Group 3 (ND) (M±sd)
Emotional-personal component before impact	0.7 ± 0.84	1.25 ± 0.74	2.94 ± 0.84
Emotional-personal component after impact	3.1 ± 1.22*	3.12 ± 0.83*	3.99 ± 0.03*
Cognitive component before impact (response time)	29.39 ± 21.81	3.9 ± 3.98	2.17 ± 1.87
Cognitive component after impact (response time)	9.36 ± 14.66*	4.33 ± 5.75	0.46 ± 0.66*
Behavioural component before impact	0.77 ± 1.21	1.11 ± 1.23	2.01 ± 1.24
Behavioural component after impact	3.08 ± 1.36*	3.27 ± 0.81*	3.99 ± 0.08*

Notes: * — differences are statistically significant ($p < 0.05$) before and after psychological impact.

general, the dynamics of changes in the levels of development of the considered components of non-verbal communication in the groups of the surveyed are presented in Table 9.

Thus, the psychological impact significantly ($p < 0.05$) improved the main components of non-verbal communication (emotional-personal, cognitive, behavioural) in all groups, except for the cognitive component in the group of children with mixed specific disorders of psychological development in which there is no change. The best positive dynamics is noted in the group of children with mild mental retardation, which is due to the fact that these children had practically no understanding of what communication is in situations. Therefore, purposeful work on these aspects of non-verbal communication in a team in such children turned out to be quite effective.

The lack of positive dynamics in the group of subjects with mixed specific disorders of mental development in terms of the response time is associated with both their characteristic fatigue as a whole and with other reasons related to the child's subjective perception of the situation of the

experimental psychological study. Because even children of the group with mild mental retardation, for whom severe fatigue is also typical, demonstrated positive dynamics. The results of a comparative analysis of groups by the level of development of the studied indicators after psychological impact are presented in Table 10.

After the psychological impact, the level of expression of the main components of non-verbal communication in the continuum from mild mental retardation to the normative level of intellectual development remained. Children with a normative level of intelligence development have statistically ($p < 0.017$) higher indices in all components of non-verbal communication compared to groups of children with mild mental retardation and with mixed specific disorders of psychological development. In addition to that, the groups of children with mild mental retardation and with mixed specific disorders of mental development do not differ statistically ($p > 0.017$), which can be explained by the similar level of intellectual development in both groups of children, considering, different dynamics of development and prognosis.

Table 10: Comparative Characteristics of the Components of Non-Verbal Communication in Children after Psychological Impact

	Group 1 (MR) (M±sd)	Group 2 (MSDPD) (M±sd)	Group 3 (ND) (M±sd)
Emotional-personal component	3.1 ± 1.22	3.12 ± 0.83**	3.99 ± 0.03***
Cognitive component	9.36 ± 14.66	4.33 ± 5.75**	0.46 ± 0.66***
Understanding spatial relationships	2.98 ± 1.3	3.35 ± 0.8**	3.93 ± 0.25***
Behavioural component	3.08 ± 1.36	3.27 ± 0.81**	3.99 ± 0.08***

Notes: * — statistically significant differences in groups 1 and 2 ($p < 0.017$).

** — statistically significant differences in groups 2 and 3 ($p < 0.017$).

*** — statistically significant differences in groups 1 and 3 ($p < 0.017$).

DISCUSSION

Non-verbal communication in children with intellectual disabilities is an understudied issue in scientific literature. However, some researchers consider the importance of non-verbal communication and the possibilities for its study. *Do gestures pave the way? A systematic review of the transitional role of gesture during the acquisition of early lexical and syntactic milestones in young children with Down syndrome*, the authors consider communication problems in children with Down syndrome. The authors note that problems with expressive speech are common in children with Down syndrome. For normally developing children, gestures play an important part in supporting the transition from monosyllabic to two-word statements. The authors also noted that there is no review of the role of gestures in supporting the development of expressive speech in children with Down syndrome. This systematic review aims to synthesise the current state of empirical evidence on the role of gestures during the acquisition of early lexical and syntactic skills in young children with Down syndrome. A systematic literature search was performed with the use of Pubmed, Scopus, PsycINFO, and Web of Science databases. A total of 12 studies met the inclusion criteria. The results of the study indicated that children with Down syndrome exhibit the same gestures and go through the same early stages of expressive speech development as children with normal intellectual development. However, in children with Down syndrome, developmental stages lag significantly, and, most importantly, the stage of additional combinations of gestures and words is rarely observed. Incorporating verbal communication and gestures into everyday communication between a child with Down syndrome and its parent can facilitate the child's transition from monosyllabic to two-word statements. The authors emphasise the need to include such activities in early language intervention programmes [12].

The following article investigates delays in speech development in young children. The authors note that delays in speech development increase the risk of autism spectrum disorders. The purpose of the study was to investigate the two types of gestures, such as deictic gestures and traditional gestures. The results indicated that early speech retardation is associated with a reduction in deictic and traditional gestures in the observation context. It is important to note that the use of deictic gestures was associated with the development of expressive speech in children with and

without delayed speech. Deictic gestures play an important part in the development of expressive speech in babies, including those with delayed speech development. The authors note that directly determining the type and function of gestures in early intervention can be important in facilitating the development of speech skills in children [13].

The next study discusses speech pathologies in children who have certain deviations. The authors review the Strategic Plan for the American Speech and Hearing Association, The Path to Excellence. This study attempts to bridge the gap by redefining the panoptic view that most children who have speech delays "catch up" with their peers. The authors also note that one should not overlook children who still have a speech disorder. Late development of language skills can affect children's socialisation and school readiness and may put some children at risk of life-long disability. The early intervention programme has an established infrastructure. The parental intervention aims to eliminate risks and maximise protective factors [14].

This study reviews some of the research-developed early intervention models that have been applied and tested in real-life preschool programmes. In this study, educators implemented a modular social communication intervention, JASPER, into their curriculum. Sixty-six preschool children with autism from twelve grades were selected for immediate education. For children, indicators of major deficits (initiation of joint interaction, joint attention and language gestures, play skills) and standardised cognitive indicators were improved. Teachers conducted evidence-based interventions with significant reductions in significant deficits in children with intellectual disabilities [15].

CONCLUSIONS

Data of the study showed that, depending on the level of intelligence or, more precisely, on the diagnosis given to the child, there are differences in the dynamics of development of components of non-verbal communication. Children with mild mental retardation display lower results than children with mixed specific disorders of psychological development and children with a normative level of intellectual development. Evaluation of the dynamics of changes demonstrates that children with mild mental retardation improve their performance with a comparatively higher intensity than children from other groups.

Intellectual underdevelopment in children with clinical diagnosis F70 – mild mental retardation becomes a determinant of a decrease in the indicators of the cognitive component of non-verbal communication. In turn, the development of the behavioural and emotional-personal components of non-verbal communication acts as a means of compensating for the existing violation. According to the data of empirical research and expert assessments of teachers and parents, the proposed programme of psychological influence aimed both at the development of these components of non-verbal communication, and at activating the compensatory capabilities of children, allows them to interact with their social environment more successfully. It is important to note that the system for assessing the components of non-verbal communication developed in the course of the study also demonstrates its effectiveness in diagnosing and assessing the characteristics of non-verbal communication in children.

Thus, it is important to note that children of primary school age with mild mental retardation significantly differ from normatively developing peers in their characteristics of the development of non-verbal communication, as well as from peers with mixed specific disorders of psychological development. Decreased intelligence makes it difficult to understand, recognise, and use various means of communication. The purposeful psychological impact, focused on the development of all aspects of non-verbal communication, based on the specific ability to use conventional gestures associated with the representation of another person of their emotional state, as well as aimed at activating social, behavioural reactions, helped to improve the communication skills of primary school children with varying degrees of intelligence decline.

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Features of Non-Verbal Communication of Children with Intellectual Disabilities and Differences from their Normatively Developing Peers

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Abstract: *Objective:* The study aimed to study the specific features of non-verbal communication in children with intellectual disabilities in the dynamics of psychological impact.

Background: In the 21st century, in terms of diagnostics and the implementation of psychological influences, the problem of identifying the features of the communication skills of children with intellectual disabilities becomes very significant and urgent. At present, intellectual disabilities are understood as a heterogeneous group of intellectual impairments, different in clinical manifestations, but based on the criterion of a decrease in cognitive development. A comparatively large number of works are devoted to the study of the features of the communication skills of children with intellectual disabilities. However, the research on their non-verbal communication skills is rather small.

Method: The experimental research was conducted in three stages – first, the initial level of development of the abilities of recognition, naming and use of various communicative, modal and descriptive-pictorial gestures was measured.

Results: After that, for ten lessons with children, the program "Lessons of non-verbal communication at school" was carried out, after which abilities were tested repeatedly. Parents and teachers were also interviewed twice.

Conclusion: The study was carried out based on educational institutions outside school hours. The study involved 128 children from 6 schools in St. Petersburg. Non-verbal communication of children with mild mental retardation in comparison with normatively developing peers and with mixed specific psychological disorders is characterised by a lower level of development of cognitive, emotional-personal and behavioural components. Moreover, the most pronounced is the underdevelopment of the cognitive component, which is associated with the peculiarities of the impairment of intelligence. The study also showed that the emotional-personal and behavioural components are at a more preserved level of development in children with intellectual disabilities, which can be interpreted as the compensatory ability of the child's psyche.

Keywords: Children with special educational needs, students with intellectual disabilities, school curriculum, inclusive education, communication between students.

INTRODUCTION

Communication is the most important factor in the formation of a personality, one of the main types of human activity, aimed at knowing and evaluating oneself through interaction with other people. As L.S. Vygotsky and other researchers believed, the development of the human psyche occurs only in joint activities and communication [1-4]. At the same time, communication includes not only the ability of a person to use natural language but also the use of all possible means of expression by a person of his internal, psychological states, images, thoughts and feelings in order to communicate them to other people. Thus, the communication process includes the use of natural, artificial languages, as well as such means of expressing human psychology and influencing other people, which are not associated with natural and artificial languages. A comparatively large number of

works are devoted to the study of the features of the communication skills of children with intellectual disabilities [5-8]. For children with complex disabilities, communication takes on special importance; however, 20-25% of children never master verbal speech, although they can understand simple instructions and learn the meaning of some gestures, which allow them to compensate to some extent for speech deficiencies [9, 10]. Thus, the use of non-verbal communication for many children remains the only option for the implementation of communication, and, ultimately, development. Consider some of the methods of non-verbal communication offered for working with children with severe speech impairments that remain with the impaired musculoskeletal system; combined impairment of intelligence and early childhood autism, *et al.* [11-13].

As a result of numerous modern psychological and medical studies, it has been revealed that there are a number of contradictions between:

- theory and practice of medical psychology. This contradiction is expressed in the fact that in the

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implementation of programs of psychological impact, the emphasis is shifted to the development of social behaviour, but conceptual approaches to the study of the psyche as a poly structural and multifunctional phenomenon are not sufficiently considered;

- the problem of non-verbal communication of children with intellectual disabilities and methods of psychological influence, which implies an emphasis on the formation of specific communication skills without optimal use of the compensatory potential of non-verbal means of communication with others, aimed at the development of non-verbal communication of primary school children with intellectual disabilities during the period of adaptation to school;
- the significance of this problem and the insufficient number of methods, technologies of psychological influence to improve their communicative resources and potential in socialisation in working with children of primary school age with intellectual disabilities.

All of the above made it possible to formulate the research problem – to identify the features of non-verbal communication in children with intellectual disabilities and to test the program of psychological influence to increase the effectiveness of psychological assistance to such children in the process of schooling.

MATERIALS AND METHODS

Students of the first grades of educational institutions of the city of St. Petersburg were the sample of the study. In total, the study involved 128 children – first-grade students (average age – 7.4 years; 47 girls, 81 boys). As a result, the study sample consisted of first-grade students of the following schools in St. Petersburg: state budgetary educational institution School No. 7 of the Krasnoselsky district of St. Petersburg, state budgetary educational institution boarding school No. 22 of the Nevsky district of St. Petersburg, state budgetary educational institution School No. 131 of the Krasnoselsky district of St. Petersburg, state budgetary educational institution school No. 502 of the Kirovsky district of St. Petersburg, state budgetary educational institution general educational institution school No. 663 of the Moskovsky district of St. Petersburg, the state budgetary educational institution, secondary school No. 237 of the Krasnoselsky district of St. Petersburg.

Taking into account modern trends in the development of clinical psychology, the following theories, principles and approaches have been identified:

- the principle of the unity of consciousness and activity, which determines the practical activity of a person as a reflection of the functions of his psyche;
- the systematic approach, which made it possible to consider mental retardation as an integral element, a special state of the psyche, characterised by underdevelopment of the intellect [14];
- the dynamic functional approach to the personality structure of K.K. Platonov;
- the structural-dynamic approach that allows considering the three-component structure of the features of non-verbal communication, including cognitive, emotional-personal and behavioural components [15];
- the evolutionary approach to understanding the relationship between non-verbal and verbal communication in the process of ontogenesis;
- the principle of determinism, which establishes the relationship between behaviour and communication with internal psychological phenomena in the cognitive, emotional-personal and behavioural spheres;
- the theory of compensation [3] contributing to the understanding of the development of the potential of children with mental retardation in the process of targeted psychological impact.

During the dissertation research, the following methods were used: clinical and psychological method, experimental psychological method, as well as the method of expert assessments. To process and analyse the data, the computer program “Statistical package for social sciences” (IBM SPSS Statistics) version 22 was used. Various methods of mathematical and statistical processing of indicators of communication development were used: Student's t-test, factor and variance analyses.

RESULTS

Based on the obtained factor assessments, groups of children with intellectual disabilities and the

Table 1: Differences between Groups of Children with Intellectual Disabilities and the Normative Intellectual Level in Terms of the Ability to Recognise and Understand Gestures before Psychological Impact

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Cognitive component	15.53 ± 12.87*	2.11 ± 1.80*	< 0.01
Emotional-personal component	3.48 ± 0.16*	2.29 ± 0.82*	< 0.01
Behavioural component	3.8 ± 0.13*	3.37 ± 1.22*	> 0.05

Note: * – statistically significant differences were found for children from this group in comparison with the assessments for this parameter before psychological impact.

normative level of intelligence for a number of measured parameters were compared. The group of children with intellectual disabilities included children with diagnoses of mental retardation (MD) and mixed specific disorder of psychological development (MSDD). The assessments of these parameters were compared before and after the psychological impact. The parametric Student's t-test was used for comparison. The comparison was conducted in order to search for general and specific characteristics of the surveyed groups, to assess the differences in the effectiveness of psychological influence for different groups of children. In the course of study of the ability to recognise and understand gestures, the groups were compared according to factor assessments before the start of psychological influence. The comparison results are presented in Table 1. It was found that children with intellectual disabilities spend significantly more time on recognising and identifying stimulus gestures than children with a normative level of intelligence. On a qualitative level, the responses of children with intellectual disabilities correspond to the assessment "no response, inadequate interpretation of people's actions, a justification for the wrong naming of a gesture". These children are characterised by a specific understanding of the gesture, difficulties in correlating the gesture and social situations. It was found that groups of children differ in the cognitive and

emotional-personal components of non-verbal communication; no significant differences in the behavioural component were found.

When comparing the groups after psychological exposure, significant differences were found in comparison with the assessments before psychological exposure in all parameters. Children with intellectual disabilities have become much better at recognising various gestures and have learned to relate them to social situations. Differences arose between the groups in the cognitive, emotional-personal components and in the behavioural component. Corresponding differences were found in the group of children with a normative level of intellectual development. The data obtained are presented in Table 2.

The data obtained indicate that the developed and implemented program is highly effective in correcting the characteristics of non-verbal communication in children with intellectual disabilities. This is also confirmed by the high possibilities of correction in this group of children. The program was found to be effective both for these children and for peers with a normative level of intelligence.

In the course of the study of the ability to recognise and understand gestures in different situations, the groups were compared according to factor

Table 2: Differences between Groups of Children with Intellectual Disabilities and the Normative Intellectual Level in Terms of the Ability to Recognise and Understand Gestures after Psychological Impact

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Cognitive component	7.61 ± 10.87*	0.49 ± 0.72*	< 0.01
Emotional-personal component	1.5 ± 0.08*	0.54 ± 0.50*	< 0.01
Behavioural component	1.59 ± 0.07*	0.58 ± 0.59*	< 0.01

Note: * – statistically significant differences were found for children from this group in comparison with the assessments for this parameter before psychological impact.

Table 3: Differences between Groups of Normatively Developing Children and Children with Intellectual Disabilities in Terms of the Ability to Recognise and Understand Gestures in Situations before Psychological Impact

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Emotional-personal component	0.97 ± 10.87	2.94 ± 0.84	< 0.01
Cognitive component	3.32 ± 0.08	2.17 ± 1.87	< 0.01
Understanding of spatial relations	0.29 ± 0.06	1.18 ± 0.94	< 0.01
Behavioural component	0.94 ± 0.05	2.01 ± 1.24	< 0.01

assessments before psychological impact. The comparison results are presented in Table 3. It was found that the assessments of children with intellectual disabilities in recognition of gestures in various situations are significantly lower than those of children with a standard level of intelligence. Statistically significant differences were found for all studied components.

When answering the cards shown, children with intellectual disabilities mainly gave the following answer options: no answer or an absurd interpretation; misinterpretation. In normatively developing children, responses of a general nature were mainly noted, which can be attributed to a variety of situations of non-verbal.

When comparing the groups after psychological exposure, significant differences were found in comparison with the assessments before psychological exposure in all parameters. Children with intellectual disabilities received significantly higher scores in recognising and using gestures in various situations. Differences arose between the groups both in the cognitive and emotional-personal components and in the behavioural component. Corresponding differences were found in the group of children with a normative

level of intellectual development. The data obtained are presented in Table 4.

The findings confirm the earlier conclusion that the conducted program is highly effective in the development of non-verbal communication in children with intellectual disabilities. This is also confirmed by the high possibilities for correcting various aspects of non-verbal behaviour both in the group of children with intellectual disabilities and in the group of children with a normative level of development.

The study assessed children's non-verbal communication abilities based on expert assessments of teachers and parents. Expert assessments were carried out using questionnaires, the data on which were analysed and summarised using factor analysis to form generalised assessments of various parameters. A comparison was made between groups of children with intellectual disabilities and normatively developing children according to these parameters.

According to the results of expert assessments of parents, it was found that parents of children with intellectual disabilities and parents of children with a normative level of development have similar assessments of the communicative orientation, they

Table 4: Differences between Groups of Children with Intellectual Disabilities and the Normative Level of Intellectual Development in Terms of the Ability to Recognise and Understand Gestures after Psychological Impact

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Emotional-personal component	3.11 ± 10.87*	3.99 ± 0.03	< 0.01
Cognitive component	6.84 ± 0.08*	7.46 ± 0.66	< 0.01
Understanding of spatial relations	3.16 ± 0.06*	3.93 ± 0.25	< 0.01
Behavioural component	3.17 ± 0.05*	3.99 ± 0.08	< 0.01

Note: * – statistically significant differences were found for children from this group in comparison with the assessments for this parameter before psychological impact.

Table 5: Differences between Groups of Normatively Developing Children and Children with Intellectual Disabilities According to Expert Assessments of Parents of Non-Verbal Communication Abilities before Psychological Impact

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Communicative focus	2.9 ± 9.87	3.11 ± 1.14	> 0.05
Needs for communication	3.9 ± 0.02	3.56 ± 1.26	> 0.05
Parents' directivity	2.69 ± 0.03	2.80 ± 0.88	> 0.05
Intra-family interaction	2.1 ± 0.01	2.96 ± 1.56	< 0.01

have an equally expressed need for communication. The obtained differences are presented in Table 5. Parents of children of both groups are equally directive in the upbringing of children. At the same time, significant differences were found in the level of family interaction. Parents of children with intellectual disabilities are less focused on communicating with a child, spending leisure time with him, pay less attention to teaching their child communication skills.

It can be concluded that children with communication disorders receive less experience of interaction in the social environment, in the parental family, which they need to overcome existing communication disorders [2]. At the same time, given the absence of differences in communicative orientation, the need for communication with parents, a lower level of intrafamily interaction in families of children with intellectual disabilities may indicate frustration of the needs of the social level, which creates a risk of disruption in the functioning of a family.

According to the results of expert assessments after the program of psychological influence, a significant dynamics of the level of intrafamily interaction in the

families of children with intellectual disabilities was established. The data are presented in Table 6. There are several reasons for this. On the one hand, as it was shown earlier, children have increased ability to communicate, which contributed to their own activity in communication, which affected relationships with parents. On the other hand, the parents themselves, in the course of observing the child's changes and communicating with a psychologist in the process of research and conducting a program of psychological influence, realised the need to communicate with a child to help him in establishing contacts with peers. Thus, it can be concluded that the program tested in this study is not only effective for the development of communication skills in children with intellectual disabilities but also contributes to the harmonisation of family relationships, which is especially important for optimising the social development of a child. The program of psychological influence helps to harmonise this environment so that a child can further develop in it as in a natural one, without the constant support of specialists.

Expert assessments of parents of children with a normative level of intellectual development did not show significant dynamics, but it should be noted that

Table 6: Differences between Groups of Children with Intellectual Disabilities and a Normative Level of Development According to Expert Assessments of Parents of Non-Verbal Communication Abilities after Psychological Influence

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Communicative focus	3.06 ± 10.87	3.36 ± 0.68	< 0.01
Needs for communication	3.79 ± 0.08	3.62 ± 0.95	> 0.05
Parents' directivity	2.81 ± 0.06	2.90 ± 0.79	> 0.05
Intra-family interaction	2.42 ± 0.05*	3.00 ± 1.37	< 0.01

Note: * – statistically significant differences were found for children from this group in comparison with the assessments for this parameter before psychological impact.

Table 7: Differences between Groups of Children with Intellectual Disabilities and the Normative Level of Intellectual Development According to Expert Assessments by Teachers of Non-Verbal Communication Abilities before Psychological Impact

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Cognitive component	2.7 ± 7.87	2.79 ± 1.21	> 0.05
Emotional-personal component	3.41 ± 0.05	3.48 ± 1.21	> 0.05
Egocentrism	3.62 ± 0.13	3.16 ± 1.04	< 0.01

they were at a high level even before the program of psychological influence.

According to the results of an expert assessment by teachers of children's abilities for non-verbal communication, a significantly higher level of egocentrism was found in children with intellectual disabilities. The results of the assessment are shown in Table 7. The assessments of the cognitive and emotional-personal components differ little in different groups. The found differences in egocentrism in different groups of children can be explained by the previously found differences in the level of intrafamily interaction in the expert assessments of parents. As a rule, children with attention-deficit on the part of their parents find a decrease in the ability to look at what is happening from the perspective of another person, to understand other people, and to establish communicative contact with them. Egocentrism is an age-related normative property of the thinking of children, but at the same time, it can create difficulties for a child to adapt to other social systems outside the family, as this requires each time to see the situation from different angles.

According to the results of the expert assessment by teachers after the program of psychological influence, the absence of statistically significant

dynamics in the assessments of egocentrism was found, but at the same time, the smoothing of differences in these assessments between the group of children with a normative level of intelligence and the group of children with developmental disorders was found. The results are shown in Table 8. Taking into account the age normality of children's egocentrism, equalising this assessment with the assessments of normatively developing children can be considered as a significant result of the program. It should be noted that there was a significant dynamic in teachers' assessments of the emotional-personal component. Comparison of teachers' expert assessments of children's non-verbal communication abilities indicates the effectiveness of the program in this area as well.

Based on the results of the conducted comparisons, it can be concluded that the performed program of psychological influence is highly effective. As its main advantages, it should be emphasised the multidimensionality of its significance in terms of the personal development of children. According to the data obtained and described above, the program contributes to the development of various components of non-verbal communication in children – the development of its cognitive, emotional-personal, behavioural components. At the same time, the effectiveness of the program in harmonising relations

Table 8: Differences between Groups of Children with Intellectual Disabilities and a Normative Level of Development According to Expert Assessments by Teachers of Non-Verbal Communication Abilities after Psychological Influence

Comparison parameter	Average value, group 1 (children with intellectual disabilities) (M±sd)	Average value, group 2 (children with a normative intellectual level) (M±sd)	Significance level of differences (p)
Cognitive component	2.89 ± 9.87	3.04 ± 0.86	> 0.05
Emotional-personal component	3.36 ± 1.08*	3.62 ± 0.59*	< 0.01
Egocentrism	3.55 ± 1.16	3.41 ± 0.66	> 0.05

Note: * – statistically significant differences were found for children from this group in comparison with the assessments for this parameter before psychological impact.

between children and parents was confirmed. From the data obtained, it follows that the ongoing program helps to fill the communication deficit in families. This aspect of the effectiveness of the program seems to be especially important since it is the harmonisation of the natural family parental environment that is the key to the normative development of the child with both the normative level of intelligence and intellectual disabilities. The program contributes to the correction of children's egocentrism, which is especially important for the adaptation of a child in society, including in the children's team. This aspect is of particular importance for children of primary school age since social maladjustment at this age can lead to the impaired learning activity and, thus, the frustration of the leading need, the implementation of which is already difficult in children with intellectual disabilities.

It should be emphasised that the data obtained on the current state and dynamics of various indicators indicate the correction potential not only of the program itself but also of children with developmental disorders. This is especially important because children with intellectual disabilities tend to receive less attention as less capable of change. The data obtained indicate the opposite. The conclusions drawn testify not only to the effectiveness but also to the relevance of the ongoing program of psychological influence.

DISCUSSION

There are various types of non-verbal development for children with intellectual disabilities. Drama therapy and rehabilitation group practice thematic design is based on the richness and variety of styling materials that are reflected in the activities. According to the research results, the selection of materials and the thematic design of the classes correlated with the presentation of the participants' children in the classroom. For example, in the "Vampire and Companion" thematic activity, invented by the study authors, it was new for the children, and they were interested in what opened up opportunities for communication and cooperation. Therefore, in this session, children-participants performed very well in both communication and cooperation, with significant improvements in non-verbal comprehension and expression. This was also observed by employees who reported (45%) instances of communication and collaboration in sessions. Their social skills have also improved. Employees reported (63%) observed interaction situations. Throughout the process of drama therapy, the participating children showed a strong

interest in participation that was voluntary, spontaneous and enjoyable. Staff reported a 100% satisfaction rate for the children involved. In addition, the complexity of classroom activities affects the spontaneous participation of children. If a task were too difficult, which was completely "out of reach" for the participating children, their enthusiasm and participation would be limited. It is fair to say that by creating a supportive environment, children get the opportunity to see their capabilities. It can be said that the activities in this program were consistent with the level of understanding of the children and they were able to connect with them, as evidenced by the observed participation rate of 96%. The choice of materials was based on the principle of simplicity and variety, and mainly on specific materials with which children were familiar. Simple and familiar materials can prevent stress and discomfort in children due to lack of experience with materials. A varied selection of materials and teaching children to understand art materials during the course of the class contributes to the development of visual language. As part of the "desert island" thematic event, children swam to the island, planted flowers and trees there, created cute animals out of clay, built houses using small stones and colourful building blocks. Finally, the uninhabited island became an oasis for life. Some of the participating children with good language skills expressed naturally and spoke a lot in this exercise. Other children participated non-verbally, using familiar materials such as watercolours, blocks, ropes, and stones to relieve kinaesthesia and allow energy to flow with emotion and imagination [16]. In addition to this research, it is important to note that such methods of developing children with intellectual disabilities can become much more effective. By breaking down the components of creative therapy into verbal and non-verbal communication tools, one can understand how to increase the benefits of such programs. This study examines the features of non-verbal communication in children with developmental delay.

Another interesting study showed the possibilities of communication in one family of children with normal development and intellectual disabilities. It was noted that variables that provide more descriptive information about sibling characteristics and relationships, as well as parenting and family factors, are arguably more important in explaining the variability in adaptation outcomes among children [17]. However, in this study, the quality of the relationship between siblings was strongly associated with the adaptation of children

based on the reports of children and mothers and children's drawings. In particular, in line with previous research, increased negative aspects of relationships (e.g., rivalry, power, conflict) explain significant differences in externalising behaviour among children. Regardless of group membership, previous studies of children showed that sibling conflicts and children's behaviour problems were positively associated. In contrast to previous findings on the contribution of negative aspects of sibling relationships to increased internalising symptoms [18, 19], it was found that aspects of the relationship, related to problems of internalisation of children, included the presence of parents in their drawings and reports of children about rivalry (these are also related to each other, albeit with little effect). The effect of parental presence in children's drawings was consistent with the increased burden of caring for ID children. This can spill over into the sibling subsystem, leading to increased parental involvement in family relationships. The increased parental involvement shown in the figures may be motivated by parents who foresaw the importance of sibling relationships in the future when they could no longer manage the care of their ID child. In any case, the drawings suggest that parental influence is critical to sibling relationships and how ID siblings perceive and deal with a difficult situation. Negative aspects of relationships reported by mothers (avoidance behaviour) and children (conflict and competition) were negatively associated with prosocial behaviour in children. Mothers told that compassion in relationships was positively associated with prosocial behaviour. In addition, the measure of the proportion of sizes in the drawings of children was negatively associated with prosocial behaviour. The size and proximity of the figures in the family drawings provide information about aspects of family interaction and reflect the children's experience of relationships. A number of researchers have suggested that the size and position of the human figure in the drawing reflect the artists' perceptions of their social role, including feelings of inferiority in relation to the demands of the environment and a decrease in confidence in their social status. Other research supports the hypothesis that sibling relationships that provide support, communication, affection, and other positive qualities can improve prosocial competence development [20]. In essence, the quality of the sibling relationship is a form of social support associated with psychological adjustment [21]. Thus, sibling difficulties other than having a sibling with an ID are important for the adjustment of children. The structural-dynamic approach to modelling the

phenomenological content of non-verbal communication in children with intellectual disabilities will further improve the differential diagnosis of mental disorders in accordance with the international multi-axis clinical classification. Further in-depth study of the various components of non-verbal communication during its development according to the dysontogenic type will have a great impact on the optimisation of the conditions for psychological influence and psychotherapy of children with intellectual disabilities.

CONCLUSION

After psychological influence, statistically, significant differences are found when studying the severity of egocentrism. Children with a normative level of intellectual development show a higher degree of egocentrism than a group of children of primary school age with mixed specific disorders of mental development, which indicates that students from this group, as a result of psychological influence, have become more attentive to themselves and their experiences.

Based on the analysis of parents' expert assessments, no significant differences were found in the development of non-verbal communication between all the studied groups of children. This is explained by the fact that parents tend to focus on subjective expectations in adapting the child to new social conditions in the presence of insufficient special knowledge in the field of medical psychology, which led to the initial setting of higher marks regardless of the clinical diagnosis.

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ABBREVIATION

ID = intellectual disability

MD = mental retardation

MSDD = mixed specific disorder of psychological development

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Features of the Introduction in Schools of Nonverbal Communication Development Programme for Children with Intellectual Disabilities

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Abstract: *Objective:* The present study was conducted to identify the features of nonverbal communication in children.

Background: Nonverbal communication is a significant aspect of interpersonal communication. American scientists have found a strong correlation between low ability to recognise facial expressions, interpretation of postures, and gestures with communication difficulties. Experimental data indicate a positive relationship between the social status of an individual and the ability to interpret nonverbal signals. The general dynamics of the development of a child with disabilities are subject to the same laws as ordinary children. But the peculiarities of children associated with a disturbance of the intellectual sphere lead to the limitation of possibilities to obtain information from the outside world, a change in the methods of communication, difficulties of social adaptation, and impoverishment of social experience.

Method: Students of the first-grades of educational institutions of St. Petersburg were the survey sample. Several public and special schools were randomly selected in order to form the most detailed picture of the development of nonverbal behaviour in children, as well as to obtain the most representative sample for our study. A total of 128 children took part in the study – students of the first-grade (average age – 7.4 years; 47 girls, 81 boys).

Results: A programme of psychological influence was developed to optimise the nonverbal communication of children with intellectual disabilities.

Conclusion: With psychological influence aimed at the development of nonverbal communication among primary schoolers with intellectual disabilities, more intact mental functions associated with the implementation of emotional and behavioural components were taken into account.

Keywords: Students with intellectual disabilities, inclusive education, nonverbal communication methods, children with special educational needs.

INTRODUCTION

For the period from 1991 to 2000 in Russia, the frequency of diagnoses of “developmental disability” in children has increased to 139.8 per 100 thousand populations. In this context, the authors are referring to primary school-aged children according to the age periodisation of A.A. Reana. At the same time, in 75% of cases, a slight degree of decrease in intelligence was noted. Among the indicated group of children, persistent underdevelopment of cognitive activity in 75–90% is determined by organic damage to the central nervous system. An epidemiological study of the mental state of children born between 1996 and 2013 published in 2017 indicates that mental retardation occurs in 1–1.5% of those born. According to the Ministry of Education and Science of the Russian Federation, over 60% are classified as at risk of somatic and psychophysical maladjustment among primary schoolers. In 35% of them, even in preschool age, disorders of the neuropsychic sphere are found.

The number of students who do not meet the general education programme requirements has increased 2–2.5 times over the past 20 years, reaching 20–40%. The researchers emphasise that the deterioration in the health of students becomes one of the reasons for the difficulties in the development of their adaptive and communicative potentials. Children with intellectual disabilities show a decrease in the ability to use verbal and various nonverbal means of communication, which have a compensatory value for the child's successful socialisation. A sufficient number of works have been devoted to studying the causes of such violations [1-6].

As a result of numerous modern psychological and medical studies, it has been revealed that there are several contradictions between:

- theory and practice of medical psychology. This contradiction is expressed in the fact that in the implementation of programmes of psychological influence, the emphasis is shifted to the development of social behaviour, but conceptual approaches to the study of the psyche as a poly structural and multifunctional phenomenon are not sufficiently taken into account;

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- the problem of nonverbal communication of children with intellectual disabilities and methods of psychological influence [7], which implies an emphasis on the development of specific communication skills without optimal use of the compensatory potential of nonspeech means of communication with others, aimed at the development of nonverbal communication of children with intellectual disabilities in the period of adaptation to school;
- the significance of this problem and the insufficient number of methods, technologies of psychological influence to improve communication resources and socialisation potential when working with children with intellectual disabilities [8].

All of the above made it possible to formulate the research problem – identifying the features of nonverbal communication in children with intellectual disabilities and testing the programme of psychological influence to increase the effectiveness of psychological assistance to such children in the educative process.

The modern approach to the study of developmental disability is characterised by several features. First, intellectual disability is defined not as a disease, but as a state of mental underdevelopment, since it does not represent a decrease in mental functions due to a disease, but their initial underdevelopment is due to a pathological effect on an underdeveloped brain. Most researchers agree on this [9-12]. Secondly, intellectual disability is understood as a group of pathologies of various etiologies, i.e., the term itself has a collective meaning. For example, G.I. Kaplan and B.J. Sadok considered this phenomenon a "behavioural syndrome" that does not have a single aetiology, mechanism, dynamics, prognosis and reflects society's attitude towards this group. Intellectual disability is characterised by general clinical features, the main of which is the general underdevelopment of all complex forms of mental activity, and is expressed in the malformation of cognitive processes (sensing, perception, memory, imagination, thinking, speech, attention) and the adaptive abilities of the child. The emotional-volitional sphere, motor skills, personality, in general, suffer, social behaviour changes significantly.

The intellectual defect in such children is manifested primarily by impaired thinking: stiffness, difficulty in perceiving the essential properties and signs of objects

and phenomena, inability to be distracted. They are also characterised by a weak regulatory role of thinking: they begin to perform work without having listened to the task to the end, without understanding its purpose, without an internal plan of action, with weak self-control. The attention of such children is characterised by insufficient randomness and purposefulness, narrowing of the volume, difficulties in concentration, and switching. There are also noticeable memory impairments. They are usually caused by an inability to retain perceived images or connect with past experiences, as researchers point out [13, 14]. Often, with a good ability for mechanical memorisation, a weakness of semantic and especially associative memory is observed. Mentally disabled children do not know how to use previously acquired knowledge and skills in practice. Underdevelopment of motor skills is manifested mainly by a lack of precise movements, especially small ones. Underdevelopment of speech is characteristic of intellectual deficiency, and the degree of its underdevelopment corresponds to the severity of the intellectual defect. In moderately and severely mentally retarded children, speech appears with a delay; in some of them, it does not appear at all. Almost all children have a certain kind of speech defects. Children's vocabulary is poor; speech is agrammatical.

MATERIALS AND METHODS

For the present study, a survey and analysis of the level of development of nonverbal communication of children with intellectual disabilities were conducted. In clinical psychology, mental retardation is considered from the position of studying the dynamics of the course of cognitive, emotional, and behavioural processes in conditions of dysontogenesis. When describing this phenomenon, among other intellectual disturbances, pathological manifestations of certain areas of the psyche and the entire psyche as a whole are indicated.

In the context of the study of nonverbal communication of primary schoolers with intellectual disabilities, attention will be paid primarily to mild mental retardation in children. Based on the goals and objectives of the study, not only the features of communication against the background of mental underdevelopment will be considered, but also the adaptive capabilities of children will be studied, with the help of which it is possible to compensate for the limitations that arise in the presence of an intellectual disability. The formulation of tasks and hypotheses

implies a careful choice of clinical-psychological and experimental-psychological methods that will assess the current level of development of cognitive, emotional, and behavioural components and study all the dynamic components of nonverbal communication of the surveyed first-graders.

Comparing the results obtained when studying the level of development of nonverbal communication of children in the process of direct experimental psychological work, comparison with expert assessments will provide a complete picture of the communicative sphere of the examined children. This version of the diagnostic procedure made it possible to assess the dynamics of the development of nonverbal communication in first-graders. Students of the first-grades of schools in St. Petersburg were the survey sample. The authors randomly selected several schools, ordinary and special, in order to form the most detailed picture of the development of nonverbal abilities of children in the city, as well as to obtain the most representative sample for the study.

A total of 128 children took part in the study – first-grade students (average age – 7.4 years; 47 girls, 81 boys). Among them – 30 children diagnosed with mild mental retardation (average age – 7.5 years; 11 girls, 19 boys), mixed specific developmental disorders – 53 children (average age – 7.4 years; 12 girls, 41 boys). The control group included 45 mentally healthy children (average age – 7 years; 24 girls, 21 boys). Part of the calculations was carried out for three groups separately, while part of the calculations combined a group of children with mixed specific developmental disorders and a group of children with mild mental retardation. As a result, the study sample consisted of first-grade students from schools of St. Petersburg.

RESULTS

In addition to comparing the obtained factors of three groups (i.e., primary school-aged children with mixed specific developmental disorders, with mild mental retardation and a normal level of development), the authors also compared normally developing children and the combined group children with intellectual disabilities, using Student's t-test for independent and dependent samples.

At the stage of comparing the experimental and control groups before psychological influence, the following statistically significant differences were found: in the analysis of gestures, the cognitive component of

nonverbal communication, expressed in reaction time, emotionally personal, and behavioural components (higher scores also corresponded to lower results) were statistically significantly higher in children with intellectual disabilities ($p < 0.05$), in communication situations the factors of the emotional-personal component of nonverbal communication, the behavioural component, and understanding of spatial relationships turned out to be statistically significantly higher in the group of normally developing children ($p < 0.05$), while the cognitive component corresponding to the reaction time was higher in the group of children with intellectual disabilities ($p < 0.05$).

Regarding the parents' assessments, statistically significant differences were observed only for the factor of intrafamily interaction. In children with a normal level of intellectual development, its level is statistically significantly higher ($p < 0.05$).

In relation to teachers' assessments, statistically, significant differences are found in the cognitive and emotional, and personal components ($p < 0.05$) – these indicators are statistically significantly higher in normally developing children than in children with intellectual disabilities.

After the psychological influence, the comparative analysis showed the following statistically reliable results. In the analysis of gestures, the cognitive component of nonverbal communication, expressed in reaction time, emotionally personal, and behavioural components (higher scores also corresponded to lower results) were statistically significantly higher in children with intellectual disabilities ($p < 0.05$), in communication situations factors of the emotional and personal component of nonverbal communication, the behavioural component, and understanding of spatial relationships turned out to be statistically significantly higher in the group of normally developing children ($p < 0.05$), while the cognitive component corresponding to the reaction time was higher in the group of children with intellectual disabilities ($p < 0.05$).

According to the expert assessments of parents, statistically, significant differences were also observed only in terms of the intrafamily interaction factor. In normally developing children, its indicator is statistically significantly higher ($p < 0.05$).

According to expert assessments of teachers, in relation to egocentrism, a statistically significantly higher level after psychological influence was found in

children with a normal level of intellectual development ($p < 0.050$), while no differences were found in other parameters, which indicates the similarity of assessments in children from different groups. The results obtained are presented in more detail in Tables 1 and 2.

Comparative analysis of factors before and after exposure revealed that, according to experimental data and teachers' assessments, improvements are observed in all parameters ($p < 0.05$), while the expert assessments of parents do not reveal such a difference. These results generally correspond to the

Table 1: The Result of a Comparative Analysis of Groups by Factors before the Psychological Influence

Factor	Group	Average	Std. deviation
Cognitive component of nonverbal communication*	ND	2.11	1.91
	ID	11.41	16.01
Emotional and personal component of nonverbal communication*	ND	2.37	0.88
	ID	3.40	0.57
Behavioural component of nonverbal communication*	ND	3.33	1.28
	ID	3.88	1.41
Emotional and personal component of nonverbal communication in situations*	ND	2.73	1.05
	ID	1.05	0.81
Cognitive component of nonverbal communication in situations*	ND	3.21	5.76
	ID	13.15	18.16
Understanding spatial relationships in situations*	ND	1.10	0.96
	ID	0.33	0.63
Behavioural component of nonverbal communication in situations*	ND	1.70	1.20
	ID	0.61	0.79
Communicative orientation (based on parental assessments)	ND	3.11	1.14
	ID	3.03	0.96
Communication needs (based on parental assessments)	ND	3.56	1.26
	ID	3.93	0.96
Directiveness of parents (based on parental assessments)	ND	2.80	0.88
	ID	2.71	0.95
Intra-familial interaction* (based on parental assessments)	ND	2.96	1.56
	ID	2.26	1.38
Cognitive component of nonverbal communication* (based on teacher's assessments)	ND	2.33	0.73
	ID	1.63	0.79
Behavioural component of nonverbal communication (based on teacher's assessments)	ND	1.31	0.54
	ID	1.44	0.64
Emotional and personal component of nonverbal communication* (based on teacher's assessments)	ND	1.97	0.54
	ID	1.65	0.80
Cognitive component of nonverbal communication (based on teacher's assessments)	ND	2.59	0.49
	ID	2.41	0.80
Emotional and personal component of nonverbal communication (based on teacher's assessments)	ND	2.87	0.60
	ID	2.77	0.82
Teachers: egocentrism	ND	3.36	0.66
	ID	3.44	0.87

Note: * — $p < 0.05$.

Contracted notations: ND — children with normal intellectual development; ID — children with intellectual disabilities.

Table 2: The Result of a Comparative Analysis of Groups by Factors after Psychological Influence

Factor	Group	Average	Std. deviation
Cognitive component of nonverbal communication*	ND	0.48	0.70
	ID	6.03	7.19
Emotional and personal component of nonverbal communication*	ND	0.52	0.50
	ID	1.43	0.54
Behavioural component of nonverbal communication*	ND	0.56	0.59
	ID	1.66	1.06
Emotional and personal component of nonverbal communication in situations*	ND	3.98	0.05
	ID	3.11	0.97
Cognitive component of nonverbal communication in situations*	ND	0.52	0.75
	ID	6.24	10.23
Understanding spatial relationships in situations*	ND	3.93	0.24
	ID	3.22	1.02
Behavioral component of nonverbal communication in situations*	ND	3.97	0.13
	ID	3.07	1.22
Communicative orientation (based on parental assessments)	ND	3.36	0.68
	ID	3.13	0.83
Communication needs (based on parental assessments)	ND	3.62	0.95
	ID	3.81	0.85
Directiveness of parents (based on parental assessments)	ND	2.90	0.79
	ID	2.78	0.89
Intra-familial interaction* (based on parental assessments)	ND	3.00	1.37
	ID	2.52	1.27
Cognitive component of nonverbal communication* (based on teacher's assessments)	ND	2.55	0.93
	ID	2.27	0.82
Behavioural component of nonverbal communication (based on teacher's assessments)	ND	1.54	0.46
	ID	1.65	0.47
Emotional and personal component of nonverbal communication* (based on teacher's assessments)	ND	2.34	0.59
	ID	2.33	0.85
Cognitive component of nonverbal communication (based on teacher's assessments)	ND	3.11	0.55
	ID	2.97	0.79
Emotional and personal component of nonverbal communication (based on teacher's assessments)	ND	3.49	0.70
	ID	3.33	0.81
Egocentrism* (based on teacher's assessments)	ND	3.76	0.53
	ID	3.41	0.79

Note: * — $p < 0,05$.

Contracted notations: ND — children with normal intellectual development; ID — children with intellectual disabilities.

data obtained by comparing the three groups. It is also important to emphasise that the development of the emotional and personal component of communication in children with intellectual disabilities, according to the expert assessments of teachers, also confirms the effectiveness of the influence.

The experience of introducing a programme of psychological influence on the development of nonverbal communication in children with intellectual disabilities made it possible to formulate certain practical recommendations for specialists working in the field of medical psychology.

1. Within the framework of psychological diagnostics of children with intellectual disabilities in order to assess the adaptive potential and individual opportunities for socialisation, it is important to study the developmental features of individual components of their nonverbal communication.
2. Psychological influence aimed at the development of nonverbal communication is planned not only taking into account the current level of the child's intelligence, but also its developmental dynamics in the process of targeted psychological influence.
3. Psychological assistance to children with disabilities is difficult and insufficient without the inclusion of technologies for the development of their communicative abilities, in particular, components of nonverbal communication.
4. The developed programme of psychological influence on the nonverbal communication of children with intellectual disabilities requires the development of their abilities in gestures recognition, designed to express their own emotional states and behavioural interaction, which increases the potential for adaptation to various social conditions and strengthens the formation of their vital interaction skills with people.
5. The empirical results obtained in the course of research suggest their application in the differential diagnosis of the communicative development of children with varying degrees of intellectual disability.
6. Developed and tested for effectiveness the programme of psychological influence to harmonise the development of nonverbal communication components is focused on the use in the work of clinical psychologists who provide assistance to children with intellectual disabilities. The programme tested in the framework of the study assumes an effective solution of tasks for the compensatory development of nonverbal communication in children with intellectual disabilities.

As part of the empirical study conducted, the authors managed to study the nonverbal communication of children with varying degrees of mental deficiency using a structural-dynamic approach,

which made it possible to divide the sphere of nonverbal communication of a child into cognitive, emotional and personal and behavioural components.

DISCUSSION

The object of the study was to explore how family interactions can provide context for primary school children with intellectual and learning disabilities to develop social skills that can help them communicate with peers. As expected, children with disabilities found it more difficult to deal with family problems than their peers without disabilities. Children with intellectual disabilities tended to use fewer problem-solving skills and were less engaged in interactions [15]. However, regardless of disability status, the mothers' behaviour contributed to the development of the child's competent behaviour. Notably, mothers' positive problem solving, criticism, and active listening were associated with more active and engaged child problem solving, while mothers' directiveness was associated with worse problem solving and child involvement. Although fathers' behaviour was generally similar to that of mothers, only critical fathers' behaviour was associated with competent, proactive problem solving by children, and the effect was largely attributed to the families being compared [16].

These results are important for demonstrating the connection between family interactions and social adaptation of children outside the family during this period of development when peer interaction becomes more important and complex. The findings are also important for expanding family-peer bonds for children with intellectual and learning disabilities who are at high risk of peer difficulties. Specific, meaningful relationships between parental and child behaviour were broadly consistent with the familial processes assumed for children's learning and development of competent interpersonal skills. Notably, the association in which mothers who showed high levels of problem-solving behaviour had children who also showed high levels of problem-solving was consistent with a behavioural symmetry pattern where parents model competent behaviour that the children copy. There was also support for the learning process through additional forms of interaction. It is noteworthy that high rates of active listening by mothers in the form of seeking children's opinions and generalising their statements were associated with the more active participation of children in the discussion [17]. This pattern of complementary behaviour is consistent with the type of reciprocal parent-child discourse that has been

identified in children with disabilities who have shown effective solutions to prosocial problems. Together, these symmetrical and complementary associations offer models of family interaction in which mothers model problem solving, ask for and confirm children's participation in the discussion, and children freely express their opinions and ideas about how to solve the problem. This type of parent-child exchange is consistent with the "horizontal" style of parent-child relationships that children can bring to their peer interactions.

PECS (Picture Exchange Communication System) is recognised as an effective tool for improving communication in children with autism. A peer study has shown that PECS training can significantly increase children's spontaneity. In this paper, we consider how exactly PECS training increased this communicative spontaneity. That is, the authors wanted first to investigate whether increased spontaneity is limited to communication using graphic symbols or whether PECS also affects the spontaneity of speech/vocalisation by children. Second, to find out if spontaneous communication enhancement was only used for instrumental purposes (such as snacking) or if children also spontaneously initiated communication for more social purposes as a result of PECS training. Third, to identify factors that could mitigate the effect of PECS learning and therefore predict which children might benefit most from learning. The Poisson regression analysis was used to examine the spontaneous communication of children using different communication modalities and different functions and to test the interaction between the intervention and the original variables. The naturalistic and relatively detailed measurement of the results indicated that it was possible to accurately analyse how PECS improved the spontaneity in children [18]. A small number of previous interventional studies have examined the communication patterns of children but have not focused solely on spontaneous, unhindered communication. The present analysis showed that while PECS training did result in children spontaneously communicating more with picture cards, it also resulted in increased spontaneity in children's speech use and a combination of picture card use and speech. The training appears to have increased spontaneous requests for items or help, but not spontaneous requests for social routines or comments. This programme cannot be complete without the development of methods for integrating nonverbal communication into a full-fledged educational process

in mixed classes. For this, in the course of the study, the authors tried to develop all aspects of nonverbal communication for children with developmental disabilities.

CONCLUSION

Clinical psychologists can apply the main content of the programme of psychological influence on the development of nonverbal communication in children with intellectual disabilities in the process of adaptation to new learning conditions and communication as part of an integrated approach in interaction with other specialists working with children.

The results of the empirical study can be included in the content of student courses for the preparation of clinical psychologists who introduce the technology of non-medical psychotherapy into their practice. The empirical data obtained in the study will be useful in the following applied areas of specialists' activity:

- in teaching, in improving the professional competence of clinical psychologists when working with children with intellectual disabilities;
- for the practical work of clinical psychologists in the field of differential diagnosis and psychological influence aimed at developing the components of nonverbal communication in children with intellectual disabilities.

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