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Educational Management and Special Educational Needs

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Introduction

This book continues the series of studies reflected in the first book on the special educational needs of children *Education of Children with Special Needs: Theoretical Foundations and Practical Experience in the Selected Works of Russian, Belarus, and Polish Scholars* (**eBook ISBN** 978-3-031-13646-7) published in 2021.

According to the results of studying the educational component of learning opportunities of today's primary school children with intellectual disabilities, the book presented traits of students reflecting their learning opportunities and resources within school education.

Personal educational achievements of 7–8-year-olds with sensory impairments are studied to assess their personal educational achievements (the study involved 278 students with visual impairments from 32 regions of Russia). The research results can be used to develop teaching and learning programs for 7–8-year-olds with sensory impairments.

In terms of preschool education and early childhood development, the results of the study conducted in 2018–2021 on the basis of the "Scientific Medical Research Center for Children's Health" of the Ministry of Health of Russia made it possible to clarify the typology of cognitive development of preschoolers with brain lesions and determine the individual content of correction and pedagogical work.

The study titled "Cognitive Development of Preschool Children with Hearing Impairments" presents the outcomes of testing a diagnostic set of tasks to determine the level of cognitive development of children with hearing impairments at the final stage of preschool education.

The book presents the latest research on early childhood development: studies on children with Down syndrome and children who are blind are featured. Thus, 80% of surveyed parents raising children from 1 to 4 years old with Down syndrome note that their children have behavior difficulties, which can seriously inhibit the child's socialization and development process. Recommendations for identifying precursors to behavioral difficulties in children with Down syndrome at an early age are provided. The latest findings on the development of young children who are blind are presented. Reaching is a key accomplishment in the early motor and cognitive development of blind children. The appearance of reaching in the behavior of a

blind child indicates their understanding of the object's constancy. The book analyzes the main positions of researchers who took part in the discussion on the role of sound in the development of reaching in blind children, initiated by the study of Selma Fryberg in 1977.

The study on the possibilities of studying the "revival complex" in the early diagnosis of autism spectrum disorders and identifying the risk of their formation analyzes the existing diagnostic tools sensitive to detecting the risk of their formation in the child's infancy. These diagnostic methods do not sufficiently use the possibilities of a systemic assessment of the first forms of a child's interaction with the immediate environment, in which a combination of difficulties of his or her affective and social development is found in the most vivid form.

In terms of the development of research methodology to improve the quality of education for children with special educational needs, let us highlight the chapter on the integrated approach in speech therapy examination and the unified system for assessing the quality of speech therapy care at different stages of comprehensive support of education, development, and rehabilitation of children. The continuity of monitoring the quality of speech therapy support for children with speech disorders based on the developed system at all stages of their comprehensive rehabilitation, education, and development is considered. The book identified the ways to optimize interdepartmental interaction based on a unified system for assessing the quality of speech therapy care and ways to optimize interdepartmental interaction based on a unified system for assessing the quality of speech therapy care.

An important methodological result reflected in the book is the analysis of practices for working with gifted children with disabilities and identifying the giftedness of children with disabilities. The latest results of monitoring practices for identifying gifted children with disabilities in the Russian Federation are provided.

The book develops the methodology and provides a contemporary scientific image of children with motor disabilities. Clinical, psychological, and pedagogical peculiarities and special educational needs reveal the prospects for further research to identify factors that potentially determine the developmental type of a child with motor disabilities and their socialization skills. It may provide a framework for improving the system of special educational and upbringing conditions for children with motor pathologies and improving the content and features of psychological and pedagogical support for different nosological groups of children with MSDs.

The book provides a typology of autistic disorders in childhood. The allocation of groups is significant for a differentiated approach to the psychological diagnosis of autism spectrum disorders, an assessment of the dynamics of mental development in autism, as well as a consistent formulation of the tasks of correctional work.

In terms of education management and history of education, of particular significance are the results obtained based on archival materials from the State Archive of the Russian Federation (introduced into scientific circulation for the first time) in terms of the formation of the system of education, study, and support of children with disabilities in Soviet Russia.

The book presents the results of comparative research on developing and managing education for children with special educational needs in China. The book

provides a retrospective analysis of the practice of summer schools and applied form of teacher training in China, as well as the analysis of funding and regulatory framework to optimize the management of special education in terms of teacher training, including the development and implementation of a standard of professional competencies for teacher training in pedagogical universities in China in the direction of special education.

The problems of ungraded schools and the organization of education of children with special educational needs as part of the organization of a system of special conditions and organization of differentiated education of children with special educational needs in Russian ungraded schools are considered. The book presents the results of monitoring all ungraded schools of the Russian Federation in 85 subjects of the Russian Federation in terms of the quality of education of children with special educational needs studying in these schools. Additionally, the book analyzes the quality of education in selected ungraded general educational organizations (remedial schools) for students with disabilities. The results of the education quality assessment of 32 separate ungraded general education organizations for students with disabilities are given. The results of the development of ungraded schools in the Omsk Region are given as an example of perfect practice. Based on the monitoring study results, conclusions were drawn about the necessity to develop programs for the inclusive development of ungraded schools and extrapolate the best regional practices.

Thus, the book systematizes the latest (cutting-edge) findings on the clinical, psychological, and pedagogical features of today's children with special educational needs (SEN) and expands the scientific understanding that characterizes such children. The book aims to develop a system of education and assistance for children with SEN, including children with locomotor disabilities, intellectual disabilities, autism spectrum disorders, and hearing and visual impairments. The indicated goal is achieved through the systemic and complementary research presented in four parts of the book.

The analyzed works consider the general range of problems related to the management of special education of children with SEN, presents the best practices of different regions, and provides meaningful recommendations. The presented findings remain fragmented; there is no unity in views on the system of education, training, and support for children with SEN. The book focuses on practice and real results achieved during real work with children. A foundation is laid for improving the system of special educational conditions for children with various nosologies. The problem of organizing the education of children with SEN in Russia and China, including in ungraded schools (including rural schools and schools in hard-to-reach areas), was considered. At the national level, the practice of using individual educational trajectories in working with children with SEN in general educational institutions is introduced; adapted and individualized educational programs for children with SEN are developed and implemented.

The Institute of Special Education, whose researchers authored the chapters of this book, celebrates its 100th anniversary in the fall of 2023, remaining the leading scientific center in Russia in the field of special education and psychology.

The book is intended for heads of educational authorities, parents, specialists working with children with special educational needs, psychologists, teachers, methodologists, specialists in the field of inclusive education, and students and teachers in special education of pedagogical and psychological departments of higher education institutions.

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Contents

Part I
Early Childhood Education and Development for Young Children with Special Educational Needs

This part focuses on early childhood education and development for young children with SEN. The part specifies the typology of cognitive development of preschool children with brain lesions to determine the individual content of corrective and pedagogical work. It offers expert advice on identifying precursors of behavioral disorders in young children with Down syndrome through analysis of video footage of mother-child interactions. The newest results of the early development of children who are blind (development of reaching in children who are blind) are presented. The part also presents the results of the approbation of a diagnostic set of tasks aimed at determining the level of cognitive development of children with hearing impairments at the final stage of preschool education. A new diagnostic approach and best practices for identifying autism spectrum disorders and their risk in young children based on the analysis of such a significant phenomenon of mental ontogenesis as the "revival complex" is presented.

Characteristics of the Cognitive State Structure of Preschoolers with Brain Lesions

Svetlana B. Lazurenko, Yulia G. Semenova, Ilshat N. Nurlygayanov, and Elena M. Vladyko

Abstract This paper presents a qualitative characteristic of the intellectual states and ways of solving the test tasks according to D. Wechsler's WPPSI method by children with brain lesions. The analytical data were obtained from a group of 105 preschool children who, according to their scores, were combined into three sample groups: (1) those with borderline state of cognitive development, (2) those with mild cognitive impairment, and (3) those with significant cognitive impairment. Factor analysis revealed a connection between the type of intellectual task and the way of its solution, the nature of brain lesion. The authors determined phenomenological behavior features, confirming the need to adapt the diagnostic procedure for children with organic brain lesions.

Keywords Preschool age · Wechsler test · Psychological and pedagogical diagnostics · Organic brain lesion · Intelligence · Ontogeny · Psychometric methods

1 Introduction

The number of people with mental disorders worldwide is gradually increasing due to several medical and social factors, including deteriorating environmental conditions, the population's aging, and the development of medicine. According to

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statistics, the prevalence of mental retardation ranges from 1% to 2.5% of the global population, indicating the need to develop effective strategies for prevention, comprehensive rehabilitation, and education of people with intellectual disabilities. Timely and regular comprehensive medical, psychological, and pedagogical assistance in early childhood and preschool age is a condition for developing the potential mental capabilities of children with mental retardation, forming independence and social behaviors, and, consequently, successful integration into society. The trajectory of education and type and content of training are determined based on the conclusions of specialists of the medical, psychological, and pedagogical commission, formulated by the results of a set of diagnostic techniques that help identify current achievements and potential opportunities for preschool children in cognitive development and assess the functional abilities of perception and motor sphere. Traditionally, to characterize intellectual development during the psychological and pedagogical examination, specialists use the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) test [2, 4, 5]. This method consists of two groups of subtests with nonverbal and verbal tasks arranged in ascending order of difficulty [1]. A clear system of scaling and determination of IQ makes it possible to use the test in various social conditions, regardless of education level and cultural, racial, and linguistic differences in a sample group of preschool and school children [1, 7, 9]. A child's intellectual potential is assessed by a set of indicators that show the conformity or nonconformity of the actual way of thinking with the age norm, typical for most children of a given age in the population [2, 4]. The final quantitative result in the form of the coefficient of intellectual development is one of the criteria for assigning a child to a particular category of mental dysarthogenesis and choosing an educational route and program of study in kindergarten. According to the quantitative assessment of the child's responses, the coefficient of his or her cognitive development has a different state, reflected in the psychological and pedagogical characteristics. The interest in this method is evidenced by thousands of publications that have appeared in journals, monographs, and annual reviews of tests in different countries [3, 7, 8, 9]. Several reasons explain the method's popularity. It covers a large age range and allows for dynamic observation of the process of a child's cognitive development. Despite all its merits, the psychometric approach is currently criticized by scientists [5, 6]. A number of issues are being debated. The first issue is the absence of qualitative analysis of individual parameters of a child's cognitive activity (i.e., motivation, planning, mode of activity, criticality, etc.), which promotes a more accurate understanding of the nature and essence of psychophysiological disorders. Next is the objectivity of the results of assessing the intellectual state of children with limited functioning and life activity. Evidence is given for the low reliability of the quantitative measurement of intellectual achievement in children with difficulties related to the processing of visual information, low social competence, and communication disorders. There are the following reasons for optimizing the examination procedure by eliminating the tasks that do not provide high accuracy and reliability of the results, which will reduce the time of the examination without reducing the quality:

- The imperfection of the method for examining children with disabilities;
- The number of diagnostic errors due to the inability to reflect the differences in the quality and speed of children performing simple and more complex tasks, identify the actual way of thinking, give a qualitative characteristic of a child's activity, and compare it with the coefficient of intelligence became.

Simultaneously, a brief diagnostic procedure for quick and approximate differentiation of test subjects leads to a loss of essential information about the cognitive activity of a child. To increase reliability and validity and expand the scope of application, most researchers advocate for standardizing the method on representative homogeneous groups composed based on age and developmental disabilities. The new version of the Wechsler Children's Scale contains significant changes to the procedure and test content. In the latest version, tasks can be presented from the first and the more difficult tasks 4–5; it is possible to move backward from more difficult to simple tasks and provide help in the form of clarifying questions and detailed explanations of the conditions. Despite repeated adaptation of the method to the current needs of the diagnostic practice, considering scientific and technological progress, it still cannot scale levels or accurately differentiate ways of thinking and the degree of its decline. The proposed options for scoring and grading do not have even an approximate psychological and pedagogical characteristic of a child's cognitive activity of a particular category, as well as his or her behavior in completing diagnostic tasks. Published articles contain quantitative values and only rarely have a brief description of the activity of a child with developmental disorders, psychological phenomena, and typology of deviations, as well as dynamic changes in cognitive activity at different age stages during its active formation. The above factors became the basis for studying the intellectual states of preschool children with organic brain lesions because they represent the most numerous group among children with mental developmental disabilities, differentiating the results according to the leading way of thinking, compiling a descriptive psychological and pedagogical description of cognitive activity of children with different coefficients (quantitative assessment) of cognitive development, identifying tasks of the highest diagnostic value, and formulating suggestions for optimizing testing procedures when examining children with an organic brain lesion.

2 Materials and Methods

The research was conducted from 2018 to 2021 in the Federal State Autonomous Institution of the Ministry of Health of the Russian Federation "National Medical Research Center for Children's Health" to reveal specific intellectual states and behavioral features of children with brain lesions with different intellectual development coefficient when solving test tasks according to D. Wechsler's method. The study group consisted of 105 children aged from 4 to 7 years (average age – 5 years), of which 43 boys (41%) and 62 girls (59%), brought up in families. The studied

group underwent complex rehabilitation in a medical hospital, of whom 45 (42.8%) attended kindergarten. The inclusion criteria were (1) limited lesion of the central nervous system, (2) the absence of pathology of movements and analyzer functioning disorders, confirmed by the results of instrumental examinations, and (3) conclusions of medical specialists. The results obtained using the psychometric method were supplemented by a qualitative description of a child's behavior and activity when solving test tasks and compared with clinical data from the conclusions of medical specialists about the health and neurological status of a child, which made it possible to establish a statistical connection between biological and psychological factors and reflect it in the form of medical and social characteristics of cognitive development in preschool children with cognitive disorders caused by a brain lesion.

Quantitative and qualitative analysis of the study results made it possible to divide preschool children with organic brain lesions into three groups according to their intellectual development quotient. The smallest sample group was the one with borderline cognitive development (n = 15), including children with a total IQ of 89–70 points, with central nervous system lesions of hypoxic or ischemic genesis, as well as muscular dystonia syndrome and connective tissue dysplasia. A significant number of children with organic brain lesions (n = 27) were included in the group with mild cognitive impairment due to pathology of brain structures and systems (intracranial hypertension, intraventricular hemorrhages of degree 1–2, and epilepsy), with a total IQ from 65 to 79 points. Children of this group are characterized by a low interest in cognitive and practical purposeful activity, short-term performance, instability of emotions, and sharp mood swings. The next group is the group consisting of children with significant cognitive impairment (n = 63), combined brain lesions, and a total IQ of 50–64 points. This group also included children with an IQ of fewer than 50 points.

The next stage is the statistical processing of the results obtained. To determine the empirical structure of intellectual states, the authors applied factor analysis using the method of principal components with matrix rotation of varimax-normalized type. Data results were processed using Statistica v.10 software.

3 Results

The primary research goal is to provide a qualitative description of the cognitive activity and behavior of the test subjects with different states of cognitive development according to the scores in the subtests of Wechsler's method, which will make it possible to determine psychological and pedagogical characteristics and outline directions of correctional and pedagogical activities. Additionally, it is crucial to reveal the psychophysical regularities and connections that provide the ability to solve a certain volume and type of diagnostic tasks by the test subjects of different groups by using mathematical modeling, understand the structure of the intellectual

state and the dynamics of the ontogenetic transformation of simple ways of thinking into more complex ones, and highlight diagnostic markers of differentiation of children by the level of cognitive development. Based on the results of factor analysis, according to the Kaiser criterion, the authors identified a mathematical model of intellectual characteristics or actions that ensure successful solutions of a certain types of diagnostic tasks by the test subjects with different cognitive states (Table 1).

Performance of Wechsler's test tasks has differences in children with different cognitive states, which is determined by the actual way of the solution of cognitive problems and the specific features of performance of individual intellectual actions:

1. Specifics of intellectual activity in a borderline state of cognitive development. The scope and degree of complexity of tasks in the method performed by children during the examination revealed a connection between the normative age form of thinking and age. Children have common psychological difficulties and qualitative psychophysiological features related to the performance of test tasks specific to the given variation of dysontogenesis. Common psychophysical features include constitutional and psychological immaturity, an unstable performance due to rapid fatigue, and an age-inappropriate level of speech development and specific speech disorders in the form of dysarthria. Children need simplification of instructions presented in a method, an explanation or demonstration of a way to achieve the goal and conditions of performance of diagnostic tasks. They need constant assistance in the form of external organization and control of their activity, without which they can lose the scheme of performing the task, make a mistake, or quit the task because of involuntary switching of attention to a bright external stimulus (e.g., a toy, a phone call, or noise outside the window). A quali-

Table 1 Results of factor analysis of the Wechsler test scores in the test subjects with different cognitive states

	Children with a borderline state of cognitive development		Children with mild cognitive impairment		Children with significant cognitive impairment	
Indicators	Factor 1	Factor 2	Factor 1	Factor 2	Factor 1	Factor 2
Awareness	0.864	0.128	0.800	0.321	0.261	0.870
Vocabulary	0.912	0.294	0.801	0.317	0.883	0.302
Arithmetic	0.664	0.324	0.808	0.436	0.473	0.807
Similarities	0.769	0.338	0.834	0.209	0.914	0.344
Comprehension	0.912	0.249	0.916	0.260	0.904	0.375
Animal House	0.032	0.934	0.100	0.939	0.452	0.788
Missing parts	0.463	0.755	0.613	0.694	0.805	0.461
Mazes	0.719	0.389	0.498	0.615	0.282	0.830
Block Design	0.515	0.687	0.492	0.756	0.782	0.601
Kohs Block Design	0.492	0.629	0.353	0.855	0.524	0.785

Source Compiled by the authors

tative description of the process of children's performance of tasks according to the method in question is confirmed by the results of factor analysis, which highlighted two dominant components in the mathematical model of intellectual characteristics. The first factor includes such indicators as "awareness," "vocabulary," "similarities," "comprehension," and "mazes," and, in general, reflects a certain level of formation of the most important intellectual ability – generalization. The second factor is determined by such indicators as "animal house" and "missing parts," which, to a certain extent, allows us to diagnose the visual-image form of thinking in this group of test subjects.

2. Specifics of the intellectual characteristics in mild cognitive impairment. To increase the efficiency of children's cognitive activity, the teacher should adapt the examination procedure and create special conditions: alternate verbal and non-verbal tasks, breaks and more time for rest, and external organization and control of activity. Due to the systemic underdevelopment of speech of levels 2–3 and dysarthria, the child's understanding of the purpose and conditions of the task is achieved only by simplifying instructions and visual demonstration of the diagram of the task. The results of mathematical modeling confirm this psychological picture. The empirical model of intellectual characteristics includes two factors. The first factor includes only verbal tasks of Wechsler's test – "awareness," "vocabulary," "arithmetic," "similarities," and "comprehension." The second factor combines such indicators as "animal house," "block design," and "Kohs block design." Such differentiation of indicators of verbal and non-verbal tests testifies to forming the visual-active form of thinking, when "thinking becomes speech, and speech becomes meaningful," which is manifested by the ability to perform practical actions on the verbal instructions and the simplest tasks of the verbal subtest.
3. Specifics of intellectual characteristics in case of significant cognitive disorders. Creation of a special examination situation is required for children in this group, regardless of their age, because they have no interest in cognitive activity and cannot perform tasks of the verbal subtest. At the request of a specialist, children find and point out the main body parts, can designate objects, actions, and some colors and shapes in words, perform a practical orientation to size, and find large and small objects by word. When communicating with an adult, they use a simple phrase without following the phonetic and grammatical structure of the word, with a gross violation of the pronunciation of many sounds. In the same group, we include children with extremely low intellectual development. Preschool children use visual and practical orientation in the environment, know the functional purpose of objects, and combine actions into a socially determined chain. The results of the factor analysis support the qualitative data. The first factor includes "similarities," "vocabulary," "comprehension," "missing parts," and "block design." The second factor includes "awareness," "arithmetic," "animal house," "mazes," and "Kohs block design." Correlations between intellectual characteristics within the factors are mainly focused on solving the simplest practical tasks and illustrate the initial level of cognitive development of children.