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TESTING ACADEMIC ACHIEVEMENTS: EXPERIENCE OF COMBINATION OF PEDAGOGICAL, PSYCHOLOGICAL AND LOGOPEDIC CRITERIA OF ASSESSMENT OF LEARNING SKILLS AND HIGHER PSYCHOLOGICAL FUNCTIONS OF CHILDREN WITH ONCOLOGICAL DISEASES

Abstract. The article deals with the problem of investigation of learning skills and higher psychological functions of children with oncological diseases. The authors suggest an idea to integrate different diagnostic approaches (neuropsychological, pedagogical and logopedic ones) in a single diagnostic instrument. The test, which was called "Test of Academic Achievements", is based on a principally new approach to diagnostics due to its orientation towards the specificity of children with oncological diseases. Presupposing hierarchical organization of assessment of the state of learning skills, the test allows the pedagogue to follow the dynamics of the real level of achievements in more detail and to plan the future work with patients with reference to the results obtained. The test consists of a number of assessment scales in mathematics, Russian, reading and development of speech, each of which includes some test assignments. The state of the visual, spatial and auditory perception, the volume of short-term memory, switching over and concentrating attention, and the functions of programming and control are used as the main neuropsychological criteria. The basic logopedic criteria include the state of phonemic awareness, the volume of the active and passive vocabulary, the skills of grammatical structuring and speech programming, etc. The state of fine motor skills and the synchronization of movements in the eye-hand system are also taken into account.

Keywords: learning skills; schoolchildren; learning activity; neuropsychology; higher psychological functions; logopedics; psycho-diagnostics; psychological tests; academic failure; academic achievements; oncology; oncological diseases.

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Programs of assessment of the quality and level of acquisition of school knowledge are being developed both in Russia and abroad nowadays. Diagnostic programs may be provisionally divided into final and processual. The first reflect the level of acquisition of knowledge, skills and habits at the moment of completion of a course of study; the second are held in the process of learning and are expected to show how well the pupil copes with the program and whether the program is effective enough. The first kind of programs includes, for example, the model program of the National Survey of the Quality of Education for the study of the quality of education in separate academic subjects [3]. Similar programs abroad include, for example, the US National Assessment of Educational Progress (NAEP) and international programs like the *Programme for International Student Assessment* (*PISA*), Trends in International Mathematics and Science Study (TIMSS), and others. The processual programs of assessment of school skills possess higher sensitivity to minimal changes and dynamic specificity of education.

The Curriculum-Based Measurement (CBM) [*see:* 14; 16; 9; 18] is a method of monitoring the pupil's progress through direct and systematic evaluation of the basic skills (reading, writing and math).

Nevertheless, both final and processual tools are aimed at the educational constituent and cannot answer the question about the causes of the pupil's learning difficulties.

The question about the assessment of school skills in patients with oncological diseases (the main ideas of the Test of Academic

Achievements (TAA) were reflected in the project of the modern hospital schools (Project "LearnKnow") and were published in the Russian Journal of Children Oncology and Hematology [4]), undergoing a long course of inpatient treatment or rehabilitation, stands apart. In this case, the main problems are caused by the presence of cognitive and speech deficiencies due to the specificity of the condition and treatment. The traditional methods of school skills assessment cannot be used in this case as they absolutely ignore the state of the patients' higher psychological functions. Neuro-psychological and logopedic sections of the test, in their turn, due to the initial focus on the state of higher psychological functions but not on the level of acquisition of concrete school skills, are unable to solve this problem too. And the work at hospital schools is based, as a rule, on the approved methods and theories of diagnostics and rehabilitation which cannot always be used for children with oncological diseases or undergoing rehabilitation due to excessively individualized peculiarities of each patient.

In spite of the examples of active cooperation between the pedagogue and the psychologist/neuro-psychologist in assessment of school skills, such collaboration has not been implemented yet at the level of diagnostic method which would regard the real pedagogical material of an educational program through the prism of the psychological functions involved in the solution of concrete learning problems. Analysis of the school program and concrete knowledge, skills and habits, and assessment of the degree of formation of the corresponding psychological functions and design of the rehabilitation program can allow determining the targets of intervention and optimizing the process of diagnostics and rehabilitation of the basic school skills (reading, writing and counting) in children with oncological diseases, as well as in typical "underachievers" of a general education school.

The diagnostic tool worked out by the team of authors has received the name of the **Test of Academic Achievements** (TAA). It integrates the data of the pedagogical, psychological, neuro-psychological, defectological, and logopedic diagnostics. The given interdisciplinary tool is based on dialogue between specialists in the areas which focus, both in research and practice, on the problem of assessment of school skills and the state of higher psychological functions.

The Test of Academic Achievements (TAA) is aimed at assessing the level of the learning skills acquisition of primary school pupils in mathematics, Russian, reading and speech development. The test consists of a number of assessment scales in mathematics, Russian,

reading and development of speech, each of which includes some test assignments.

The scales have been defined on the basis of the Codifier of expected outcomes of acquisition of the basic educational program of primary general education in mathematics, Russian and reading for conducting the procedures of assessment of the pupils' learning achievements, worked out by the Moscow Center for the Quality of Education of the Moscow Department of Education on the basis of the Federal State Educational Standard of primary general education (Order of the Ministry of Education and Science of the Russian Federation of October 6, 2009) and taking into account the Expected outcomes of primary general education in mathematics, Russian and reading and the model Program of primary general education in mathematics, Russian and reading. For the purposes of data procession optimization and ensuring further correlation with the criteria of psychological and logopedic diagnostics, the Codifier has been modified.

The choice of test questions and tasks is done on the basis of neuro-psychological and logopedic criteria the deficiency of which was revealed while providing practical support for children with irregular psychological development, delays of speech and psychological development, and focal lesions of the brain. The state of the visual, spatial and auditory perception, the volume of short-term memory, switching over and concentrating attention, and the functions of programming and control are used as the main neuropsychological criteria. The basic logopedic criteria include the state of phonemic awareness, the volume of the active and passive vocabulary, the skills of grammatical structuring and speech programming, etc. The state of fine motor skills and the synchronization of movements in the eye-hand system are also taken into account.

The table of results is filled in on the basis of the TAA questionnaire answers. The questionnaire peculiarity consists in its level-sensitive organization: the child is offered a task matching the program of the current grade. If the task is too difficult to cope with, it is replaced by a simpler task one level down, corresponding to the same skill but on the material of the previous grade. Thus, testing within one topic presupposes identification of the real level of acquisition of the given topic or its section. As a result of the questionnaire approbation, we plan to correlate the acquisition of a concrete topic (or topic cluster) with the deficiency of certain psychological functions diagnosed separately within the framework of generally used or approbated procedures.

Thus, the TAA method in its final variant contains an album with the stimulus material for each grade (currently, there are 4 albums – one for each primary school grade); teacher's guide (including an instruction, answers and decoding criteria); table of correspondence between psychological functions and separate topics and their sections; training materials aimed at restoration and rehabilitation within the framework of separate topics and their sections, as well as the correspondence table between the test assignments and the primary school general education programs.

According to the authors' intention, the Test of Academic Achievements can be first of all recommended for:

– hospital school teachers who need to compare the school skills of the pupils with the state of higher psychological functions;

– primary general education school teachers to conduct testing at the end and beginning of the school year to identify the pupils' achievements and failures, and to reveal both the mistakes connected with inadequate acquisition of the topic and the unspecified mistakes showing the need to send the child to a specialist: doctor, psychologist (including the neuropsychologist), or logopedist;

– secondary school teachers to test the pupils' acquisition of the basic knowledge in Russian and math;

– training the pupils to pass intermediate and final graduate examinations.

The data obtained via testing can be also used by the specialists of psycho-medico-pedagogical commissions to support the diagnoses "dysgraphia", "dyslexia", "dyscalculia", "school skills formation disorder", etc., to make a decision about the forms of training and the conduct of the procedures of assessment and examination in the corresponding subjects. In addition, the test is addressed to psychologists (neuropsychologists), rehabilitation pedagogues (logopedists) to reveal the at-risk children and to provide special help and special education. It may be also useful for the parents who will be able to treat their child's problems objectively and consult psychologists and logopedist in good time.

The test approbation is being carried out at the Therapeutic-Rehabilitation Scientific Center "Russkoe pole" of the Dmitry Rogachev National Medical Research Centre of Pediatric Hematology, Oncology and Immunology (Chekhov District, Village of Grishenki) and in the course of the project "LearKnow" realization on the base of the Dmitry Rogachev National Medical Research Centre of Pediatric Hematology, Oncology and Immunology (Moscow) and the Federal State Budgetary Institution Russian Children's Clinical Hospi-

tal of the Ministry of Healthcare of the Russian Federation (Moscow).

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The diagnostic tool described above needs a long approbation. At the same time, it is necessary to stress that the solution of the concrete applied task towards the design and approbation of the diagnostic tools for identification of pedagogical and neuropsychological deficiencies in children with oncological diseases is an urgent constituent of interdisciplinary integration aimed at meeting the educational needs of such children.

Supplement 1. A sample of a filled in table of results

PHONETICS				
Grade 4	**Grade 3**	**Grade 2**	**Grade 1**	**Entry score**
Ф. 4.1.	Ф. 3.1.	Ф. 2.1.	Ф. 1.1.	2
Ф. 4.2.	Ф. 3.2.	Ф. 2.2.	Ф. 1.2.	2
Ф. 4.3.	Ф. 3.3.	Ф. 2.3.	Ф. 1.3.	
Ф. 4.4.	Ф. 3.4.	Ф. 2.4.	Ф. 1.4.	1
Ф. 4.5.	Ф. 3.5.	Ф. 2.5.	Ф. 1.5.	
Ф. 4.6.	Ф. 3.6.	Ф. 2.6.	Ф. 1.6.	
Ф. 4.7.	Ф. 3.7.	Ф. 2.7.	Ф. 1.7.	
Ф. 4.8.	Ф. 3.8.	Ф. 2.8.		
Ф. 4.9.	Ф. 3.9.	Ф. 2.9.		
Ф. 4.10.				
				Total score:
Grade score				

Notes to Supplement 1. The sample shows that the pupil coped with task Ф. 4.1 and scored 2 points. He did not complete task Ф. 4.2 and, consequently, was given task Ф. 3.2 (which corresponds in its content to the level of the preceding grade), which he completed and received 2 scores. He did not manage to complete tasks Ф. 4.3, Ф. 3.3, Ф. 2.3 and Ф. 1.3 and received no scores for them. The pupil tested coped with task Ф. 4.4 but made some mistakes and scored 1 point. Thus, we can figure out the real level of achievement of the pupil in each topic.

Supplement 2. Sample task in Russian

PHONETICS	
Ф.4.3. 0 1 2	Insert the missing letters in the following words: Idi d( )l'she — uchi d( )l'she. Ulitsa opust( )la — pust( )t' vniz. Osel ne glu( ) — glukhar' ne glu( ).
Ф.3.3. 0 1 2	Insert the missing letters in the following words: Siamskaya k( )shka — grechnevaya k( )shka. Berezovyy ( )uchok — svyazannyy v ( )uchok. Pis'mennyy sto( ) — dozhdevoy sto( ), sto( ) sena, znak «sto( )». Redkiy ( )ort — morskoy ( )ort. Repchatyy l( )k — otkrytyy l( )k.
Ф.2.3. 0 1 2	Insert the missing vowels in the following words: Sela, pos( )dela, i opyat' poshla. Pos( )dil ded repku. U zelenoy eli vetki pos( )deli. Znachit, na dvore zima.
Ф.1.3. 0 1 2	Look and say: 1. Gde DOM? Gde DYM? 2. Gde SOSKA? Gde SOSNA? 3. Gde DOChKA? Gde TOChKA?

Note. The sample illustrates that the tasks differ in complexity depend-ing on the grade. If the person tested does not cope with the task of his grade, he is offered a task at the level of the preceding grade.

Supplement 3. Sample task in Mathematics

ЧИСЛА И ВЕЛИЧИНЫ

ЧиВ.4.3.

Water has been poured from a full jar into a glass. As a result there was less water left in the jar.
How many glasses, do you think, could be filled with the water left in the jar?

| 0 | 1 | 2 |

ЧиВ.3.3.

Only two pieces of wallpaper have been hung on one of the wall of the room.
How many more pieces of wallpaper of the same size will be needed, do you think, to cover the remaining part of the wall?

| 0 | 1 | 2 |

ЧиВ.2.3.

Three pieces of the cake have been cut.
How many pieces can the remaining part of the cake be cut into?

| 0 | 1 | 2 |

ЧиВ.1.3.

Count the beads and write down the answer.

| 0 | 1 | 2 |

Note. Tasks in mathematics are treated in a similar way: the person tested is offered tasks of the corresponding grade. If problems arise, a task from the preceding grade is given. The answer markers placed beyond the red line allow checking up right during testing.

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