ПСИХОЛОГИЧЕСКАЯ НАУКА И ОБРАЗОВАНИЕ

PSYCHOLOGICAL SCIENCE AND EDUCATION

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Содержание

Dear readers!

We present to your attention the final issue of 2025 of the journal "Psychological Science and Education" (No. 6), which includes research in the fields of developmental psychology and education. The articles are organized into two traditional sections — "Educational Psychology" and "Developmental Psychology" — as well as a section titled "Discussions and Discourses".

In the section "Educational Psychology," the concept of designing a digital educational system is presented, aimed at individual work of primary school students on mathematical mistakes.

The section "Developmental Psychology" begins with the article devoted to analyzing the structure of professionally important qualities of specialists in guardianship and trusteeship agencies. The thematic block continues with studies on the condition of primary school students affected by combat actions, the relationship between the level of peer acceptance among students in inclusive classrooms and their self-esteem, as well as the features of engagement and text comprehension when preschool children read books using augmented reality technologies. The issue also includes works exploring the correlation between smartphone dependence and adolescents' engagement in theatrical activities, the impact of different types of educational materials on learning characteristics, and the role of subjective life assessments in the development of adolescents' intellectual and academic abilities.

The section is concluded with articles discussing attitudes towards manifestations of ostracism in student environments, individuality and personhood in the context of digitalization, as well as the interrelations and intercultural differences in tolerance and existential characteristics of student youth, based on examples from Russia and Armenia.

The section "Discussions and Discourses" features the analytical article on the development of the subject-spatial environment as a factor ensuring the safety of preschool children in educational institutions.

We hope that the materials in this issue will be useful to researchers, practicing professionals, and everyone interested in contemporary trends in developmental psychology and education.

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Научная статья | Original paper

Digital educational system design for individual work on mathematical errors of primary school students

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Abstract

Context and relevance. Currently, the possibilities and limitations of using digital technologies, including artificial intelligence, in education are being actively discussed and researched. One of the important areas of research in this field is the development of digital tools for individualization (personalization) of the educational process in schools. **Objective.** The goal is to justify and develop a digital educational system for individual work with primary school students on their mathematical errors. **Hypothesis.** The use of a digital educational system in the learning process, which allows primary school students to monitor the process of completing a mathematical task, will allow for the prompt identification and correction of possible errors, improve the quality of subject matter acquisition, and promote the development of interest in mathematical knowledge. **Methods and materials.** The pedagogical foundation of the digital educational system being developed is based on research into the phenomenon of mathematical errors, identifying their types, their causes, and methods for eliminating them. The psychological foundation of the design is based on L.S. Vygotsky's theory of the zone of proximal development and J. Bruner's concept of scaffolding. **Results.** The concept of the proposed digital educational system, "Smart Notebook," is described as follows: it will be able to analyze students' progress in solving math problems, detect errors, compare them with a database of common mistakes, identify its causes, and tailor hints and supporting tasks to each student's needs to eliminate these causes. The Smart Notebook will consider students' abilities by offering tasks within their zone of proximal development. A peer, a virtual assistant, will aid the student according to a pre-planned scenario, with various support options. **Conclusions.** The digital educational system can be used in pedagogical education to prepare primary school teachers to work on subject-specific mathematical errors.

Keywords: individualization of learning, zone of proximal development, digital educational system, smart notebook, primary school students

Проектирование цифровой образовательной системы индивидуальной работы над математическими ошибками младших школьников

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Резюме

Контекст и актуальность. В настоящее время активно обсуждаются и исследуются возможности и ограничения использования цифровых технологий, в том числе искусственного интеллекта, в образовании. Одним из важных направлений исследований в данной области выступает разработка цифровых средств индивидуализации (персонализации) образовательного процесса в школе. **Цель.** Обосновать и разработать цифровую образовательную систему индивидуальной работы над математическими ошибками младших школьников. **Гипотеза.** Использование в учебном процессе цифровой образовательной системы, обеспечивающей младшим школьникам возможность контролировать процесс выполнения математического задания, позволит оперативно выявлять и исправлять возможные допущенные ошибки, повысит качество усвоения предметного материала, будет способствовать развитию интереса к математическому знанию. **Методы и материалы**. С педагогической позиции теоретическую основу разрабатываемой цифровой образовательной системы составляют исследования феномена математических ошибок, выделения их типов, причин появления, методики работы по их устранению. С психологической позиции теоретическую основу проектирования составляют учение Л.С. Выготского о зоне ближайшего развития и концепция Дж. Брунера о скаффолдинге. **Результаты**. Описана концепция проектируемой цифровой образовательной системы «Умная тетрадь». Этот инструмент будет способен провести анализ процесса решения обучающимся математического задания, обнаружить допущенные ошибки, соотнести их с базой ошибок, выявить причины ошибок, подобрать для конкретного обучающегося подсказки и вспомогательные задания, позволяющие устранить причины допущенной ошибки. Умная тетрадь будет учитывать возможности ученика, предлагая ему задания в зоне ближайшего развития. Помогать ученику будет сверстник — виртуальный ассистент — по запланированному сценарию с вари-

антами помощи. **Выводы**. Цифровая образовательная система может быть использована в педагогическом образовании при подготовке учителя начальных классов к работе над предметными математическими ошибками.

Ключевые слова: индивидуализация обучения, зона ближайшего развития, цифровая образовательная система, умная тетрадь, младшие школьники

Introduction

In the current situation of the country's development, the role of mathematical and natural science education in ensuring technological sovereignty is increasing. However, an analysis of primary general education practices shows that a significant proportion of students experience difficulties in mastering the subject area of 'Mathematics and Informatics' and in developing scientific literacy (Margolis, 2021). Many schoolchildren often lose interest in studying mathematics and natural sciences at the very beginning of their education (Council Meeting..., 2025), which leads to a decline in the quality of education (Isaev, Margolis, 2023; Working with Children..., 2024). The importance of this problem for the state and plans to solve it were evidenced by the Russian Federation Government's approval of a comprehensive plan of measures to improve the quality of mathematics and natural science education until 2030 (Comprehensive Plan of Measures..., 2024).

One important way to address difficulties in learning mathematics and low motivation among students is to develop tools for primary school pupils to work on their mistakes individually. For primary school teachers, the ability to quickly diagnose learning difficulties in specific students, identify their causes, and work to eliminate them

is becoming an essential component of professional competence (Isaev, Margolis, Safronova, 2023). The importance of individual work on mathematical errors lies in the fact that such work allows not only to correct mistakes, but also to form a deeper understanding of the subject being studied in students. Systematic analysis of errors, classification and development of strategies to eliminate them can significantly improve the quality of mathematics education.

However, in the traditional classroom system, where frontal teaching methods dominate, it is extremely difficult, if not impossible, for teachers to work with students individually. A common method used by teachers to deal with mathematical errors is to have students revisit the topic without identifying the causes of their mistakes.

Approaches to individualisation, differentiation, and personalisation of the educational process have been proposed over a long period of psychological and pedagogical research in Russia and abroad (Sirotyuk, 2004; Bernacki, Greene, Lobczowski, 2021).

The range of individual characteristics that should be considered when organising training is quite broad (needs, interests, personal experience, learning style, etc.), as are the aspects of the educational process that need to be worked

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out in order to take them into account (pace, sequence of training, content of assignments, methods of assessment, support, etc.).

One of the leading areas of individualisation (personalisation) is the development of adaptive learning technologies that use data on learner characteristics, including prior knowledge, errors and strategies used during task completion, etc., to dynamically adapt learning material and forms of interaction with learners (Aleven et al., 2017; Martin et al., 2020).

In recent decades, the prospects for implementing adaptive learning have been linked to the use of digital learning technologies, including artificial intelligence (Gligorea et al., 2023; Tan et al., 2025). Significantly, adaptive tools demonstrate particular potential in improving the quality of learning in subjects with a formalised structure (mathematics, basic scientific literacy).

An important and growing area of research that requires further attention is the use of digital adaptive learning systems to support self-regulated learning (Khalil et al., 2024). Knowledge tracing is the use of data from the analysis of learners' learning interactions (exercise completion, task responses) to assess their knowledge status (i.e., unexplored and learned) (Liu, 2022; Shen et al., 2024).

One of the most promising areas of scientific research and applied solutions is the analysis of student errors while completing tasks, followed by the selection of tasks (exercises, prompts). A significant number of such solutions of varying types and scales are already being implemented in widespread educational practice abroad. These solutions diagnose errors, generate prompts, and select personalized tasks and exercises (ALEKS, ASSISTments, DreamBox).

The widely popular Khan Academy is an educational platform that features challenges, educational videos for different user roles — student, teacher, parent — and step-by-step hints that guide students to the answer after making a mistake.

In Russia, such solutions have also become widespread in the rapidly growing online learning sector. One of the most interesting examples is Yandex Textbook, a domestic service offering lessons for elementary and middle school students with automatic answer checking. If you make an incorrect answer, you can open a hint and solve the problem again. Hints can contain step-by-step explanations; for example, after three incorrect answers, you can move on or continue solving the problem with the hint. When solving problems, a character accompanies the text and "reacts" to the student's correct and incorrect solutions.

The potential and limitations of educational and technological solutions in this area are the focus of research (Stephens-Martinez and Fox, 2018; Munshi et al., 2023; Jangra et al., 2025; Zerkouk et al., 2025). Developing methodological and technological solutions that would allow for the typology of student errors and the selection of tasks and prompts to eliminate the cause of the error remains a pressing issue.

The purpose of the study presented here was to provide a psychological and pedagogical justification and develop a digital educational system for individualized work on mathematical errors in primary school children. This system is capable of working with all students within and outside of class by providing real-time feedback during independent task completion. The concept is to design a digital system that is grounded in theoretical ideas from cultural-historical psychology and activity theory and that utilizes the ability to construct a child's zone of proximal development (ZPD) when solving mathematical problems in a digital environment. The digital system will serve as a space in which the ZPD is constructed through prompts that correlate with types of assistance (scaffolding) and guide the child step-by-step through the task. The virtual assistant will serve as a peer, a "smarter companion," as defined by L.S. Vygotsky.

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The design of the digital educational system is based on the following **hypothesis**: the use of a digital educational system in the educational process, which provides primary school students with the opportunity to control the process of completing mathematical assignments, will allow for the prompt identification and correction of possible errors, improve the quality of assimilation of subject material, and will promote the development of interest in mathematical knowledge and subject-related thinking.

Materials and methods

From a pedagogical perspective, the theoretical basis for the digital educational system being developed for individualized work on mathematical errors is based on research into the phenomenon of errors, identifying their types, their causes, and methods for eliminating them. Research on mathematical errors has a long tradition in global pedagogical, psychological, and methodological literature (Sanina, Sokolov, 2021; Sokolov, 2023).

Of fundamental importance for the digital system for individual work on mathematical errors being developed is the inclusion of their typology developed by R. Ashlock et al. (Ashlock, 2010; Radatz, 1979; Brown et al., 2016; Watson et al., 2018; Kakoma et al., 2021; Fiori et al., 2025), which represents a systematic approach to classifying errors made by students when learning a new topic in mathematics. Understanding these errors helps teachers develop more effective teaching strategies and adjust teaching methods. Their analysis is an important stage in the teacher's work, allowing them to identify not only systematic errors but also students' misconceptions about mathematical concepts. This stage can be used to develop diagnostic tools to help teachers identify gaps in the knowledge of younger students. The typology mentioned above can be adapted for different levels of education and different areas of mathematics.

When developing a digital educational system for individualized work on mathematical errors in primary general education, two types of errors were considered: conceptual and procedural errors. The former are students' misunderstanding of basic concepts or the incorrect application of concepts and rules. The latter are errors in the use of mathematical formulas. The primary focus of the digital system on correcting mathematical errors is on the first type.

From a psychological perspective, the theoretical basis of the developed digital educational system for individual work on mathematical errors is formed by L.S. Vygotsky's teaching on the zone of proximal development (Vygotsky, 1991; Margolis, 2020) and J. Bruner's concept of scaffolding (Margolis, 2020).

In this article, I.A. Kotlyar and M.A. Safronova present an analysis of three concepts from cultural-historical psychology and the cultural-historical theory of activity: zone of proximal development, learnability, and scaffolding. These concepts describe the reality of child development as it interacts with adults. The relationships between these three concepts and the scope of their application to solving learning problems are described. Scaffolding is an adult's actions toward a child (Wood, 1976), constructing the child's ZPD space. Learnability is a child's ability to learn new things by advancing within their zone of proximal development with the help of an adult, within the scaffolding they construct. Learnability is an important characteristic of a child's actual development (Kotlyar, Safronova, 2011).

The authors understand the complexity of transferring communication and interaction processes to a digital environment (not the full spectrum of interaction can be replicated in a digital system). However, since the Smart Notebook is designed as a teaching tool, live interaction between the student and teacher is not replaced by working with it. This tool is initially designed as a way to individually assist young

students in solving mathematical problems and mastering essential arithmetic operations, as a space built specifically for them and within their zone of proximal development.

The "Smart Notebook" digital system (web application) will address the issue of individualizing the learning process for primary school students when working on mathematical errors in their subjects. It will enable prompt monitoring of the problem-solving process and conduct individualized developmental assessments not only after the problem-solving process is completed but also while it is ongoing, opening up significant potential for improving the quality of education.

Results

The pilot version (prototype) of the "Smart Notebook" digital system (see Fig. 1), being de-

veloped at Moscow State Pedagogical University, is based on the "Subtraction" topic in the primary school curriculum. Arithmetic operations are traditionally a core component of the "Mathematics" course in primary general education. The topic of "Subtraction" is an integral part of the mathematics curriculum (On Approval of the Federal Law, 2021; On Approval of the Federal Law, 2023). Upon completion of this topic, primary school graduates should be able to perform written subtraction with multi-digit numbers up to a million using addition tables and a written subtraction algorithm.

Teaching written calculations (column) should be based on a well-established understanding of place values and mental calculation techniques. The transition to written calculations, including written subtraction, should be subject-based, accompanied by case studies
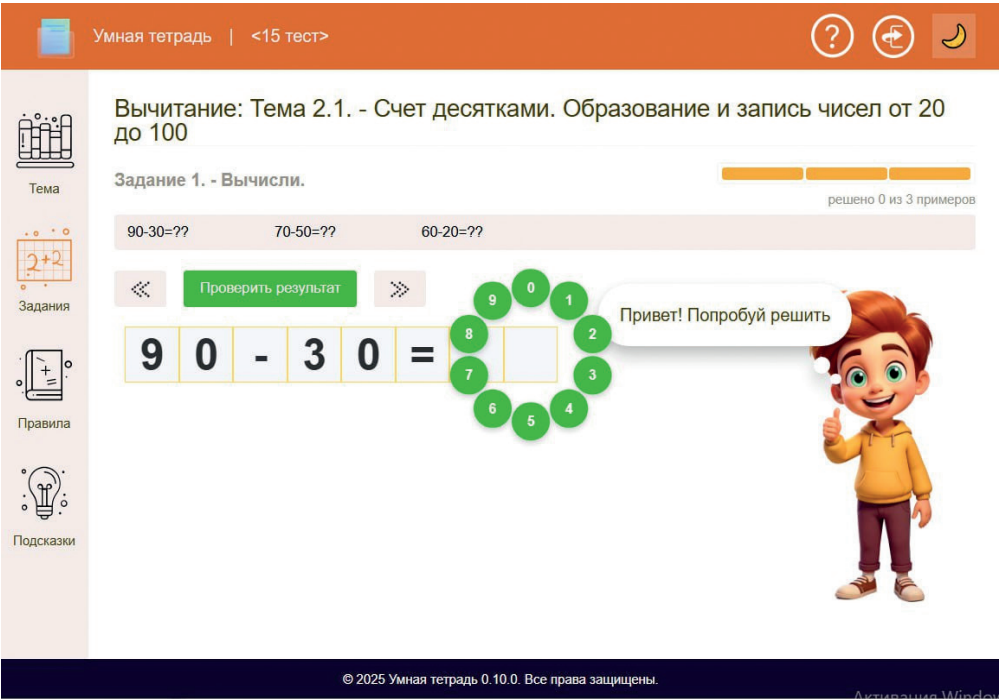
Fig. 1. Screenshot of the "Smart Notebook" web app prototype

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to develop meaningful generalizations and the construction of an algorithm for performing the action, involving the students themselves. If the focus of teaching written subtraction is on developing the skill of step-by-step execution of the algorithm without establishing an adequate connection between its steps and the mathematical essence of the actions being performed, numerous errors will inevitably arise. In other words, it is necessary to ensure an understanding of the essence of the algorithm, which provides the key to its meaningful application.

We've broken the topic of "Subtraction" into teaching units that correspond to traditional approaches to teaching the arithmetic component of a primary general education mathematics course. By a teaching unit, we mean a portion of the educational material that represents a coherent element in its semantic meaning and fulfills a specific function in achieving the stated objectives in mastering the subject.

When designing assignments for each teaching unit, we followed general rules. Assignments are presented to students sequentially, in order of increasing difficulty. Below is a brief description of each assignment.

Task 1 is a traditional, basic-level task that directly applies the learned calculation technique. It requires the student to directly apply a rule. However, Task 1 is important for diagnosing any deficiencies in the student's skills. Depending on the error made during the task, it can be assumed that a particular difficulty is associated with a gap in mastering one of the previous topics. In some cases, typically when the calculation technique involves multiple operations, Task 1 is divided into two stages. First, Task 1.1 is presented, in which the student must perform the operation in its expanded form, demonstrating the ability to correctly perform each individual operation. Then, Task 1.2 is presented, in which the student must perform the operation in its collapsed form. We consider both stages to be a single, basic-level Task 1.

Task 2 requires the student to apply the learned rule in a slightly modified situation. The task may require the student to perform a reverse action instead of a forward one. For example, the basic-level task "Calculate 40 — 7" could be transformed into "Insert the missing number so that the equation becomes true: $40 - \square = 33$ or $\square - 7 = 33$." Task 2 may ask the student to find a simple pattern in a series of problems to solve. We assume that the student who completed Task 1 was able to sufficiently address their existing skill gaps. Therefore, Task 2 is less significant in terms of identifying the student's skill deficits. Errors in this task are likely related to an insufficiently developed skill in using the learned calculation method. If errors in the task are not corrected, a hint is offered first, followed in some cases by the correct answer or solution, and in others by a transition to help.

Task 3 requires the student to demonstrate generalization of the calculation technique being mastered. This could be a task involving "fairytale" numbers, a task requiring reconstruction of the learned method of operation, or the recognition of a more complex pattern in a series of solved examples. If the student cannot solve Task 3 or solves it incorrectly, they are not demonstrating generalization. In this case, they are first offered a hint, and then the correct answer to the task or its solution.

When completing tasks, children will inevitably make mistakes. For each task, we describe the most likely types of errors. Depending on the error the child made, we analyze the solution process — establishing a connection between the error and the skill gap that led to it, thus identifying the causes of the error.

The scaffolding process for student interaction with the digital system occurs as follows. If a child makes a predictable error, they are directed to practice it in one of the previous topics. If this is the first task in which we test basic computational skills, we direct the student to the topic in which we find a gap. If it is a more

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complex task, we first provide a hint, and if the hint fails, we provide the correct solution. This type of support for students interacting with the Smart Notebook distinguishes it from existing digital educational systems.

We examined the main student errors in the "Mathematics" course for primary general education, using the topic "Subtraction" as an example in our article (Sokolov, 2023). The "Smart Notebook" contains a system of hints and assistance for students depending on the difficulty level of the task.

The first type of assistance for completing a Basic Level 1 task is that after entering the answers to the task, which typically contains several individual examples, the student receives feedback indicating which examples were answered correctly and which were incorrect. If there are any errors, they are prompted to correct them. If there was only one error and it is corrected, we assume the error is random, and the student can move on to the next tasks.

If there were more errors and they were corrected, then the assistance consists of asking the student to repeat a similar task in order to develop a more stable skill in using the calculation technique being mastered.

If a student is unable to independently correct errors in a task, they are asked to perform the error using a dynamic numerical model. A dynamic numerical model is a software feature that presents the student with a visual object model of a given number, in the form of a visual representation of the number of place values. The model allows the student to interact with the visual object model, i.e., perform an arithmetic operation based on its object-based basis. If this type of prompting fails to correct the error, assistance is provided in the form of a detailed description of the rule underlying the arithmetic operation. The rule is accompanied by an example and, in most cases, a test task, the completion of

which will confirm the student's understanding of the calculation procedure. After this type of assistance, the student is again asked to correct the errors in the task and then repeat the same task.

In cases where a student makes an error that is in the register of possible errors, he is directed to the topic corresponding to the error he made.

The first type of assistance for more complex tasks 2 and 3 is similar to that for task 1: the student is given information about correct and incorrect answers and asked to correct them. Since more complex tasks are offered to students after successfully completing the basic task, we believe it is inappropriate to use assistance in the form of presenting a rule. In some cases, additional skill gaps may be discovered during task 2 that were not identified in task 1. In such cases, the student is directed to the topic corresponding to the gap. In other cases, the student is first offered a hint and then the correct answer to the task or its solution.

The Smart Notebook task support system we've described allows students to complete tasks within their ability, while also highlighting any errors they've made, ensuring they're corrected, or, in some cases, demonstrating the correct solution. In other words, the digital system ensures students learn within their zone of proximal development.

Let's consider the capabilities of the "Smart Notebook" digital system to analyze the problem-solving process, identify the causes of errors, and select hints and additional tasks to fill skill gaps. We will use the example of a student completing the second-grade mathematics course unit "Calculation Techniques for Cases of the Type 60–24." To successfully complete the assignments on this topic, the student must first possess the skills developed during the study of several previous topics: Topic 1 "Counting by Tens. Subtraction of the Type 50–20"; Topic 2 "Subtraction of the Type 35–30, 35–5" (based on representing a number as a sum of place val-

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ue addends); Topic 5 "Calculation Techniques for Cases of the Type 30–7".

Task 1.1.

Write the calculations using the example:

90 – 43 = (90 – 40) – 3 = 50 – 3 = 47:

70 – 28 = (70 – □) – □ = □ – □ = □

60 – 36 = (60 – □) – □ = □ – □ = □

Solution:

70 – 28 = (70 – 20) – 8 = 50 – 8 = 42

60 – 36 = (60 – 30) – 6 = 30 – 6 = 24

As we can see, the correct execution of the calculation technique consists of several operations: 1) represent the number 28 as the sum of the place value addends 20 + 8 (a skill developed in Topic 2); 2) perform the subtraction 70 – 20 (Topic 1); 3) perform the subtraction 50 – 8 (Topic 5). In completing task 1.1, the student must perform the operation in expanded form and demonstrate the ability to correctly perform each of the operations.

Let's consider possible errors in completing task 1.1. In compiling the error list, we relied on R. Ashlock's typology of mathematical errors and on the results of testing the tasks on elementary school students.

1) Conceptual error — the inability to factor a two-digit number into the sum of its place-value addends.

For example, 70 – 28 = (70 – 2) – 8.

Any numbers other than the correct ones (20 and 8) will indicate this error in the solution record. If the error is not corrected after the digital system reports an incorrect operation, the student will be referred to Topic 2 to correct the identified gap.

2) Conceptual error in subtraction of the form 50 – 20.

Например, 70 – 28 = (70 – 20) – 8 = 68 – 8.

For example, 70 – 28 = (70 – 20) – 8 = 68 – 8.

A marker for this error will be any number in the solution except the correct one: 50. All numbers written to the left of this number are correct. If the error is not corrected after the

digital system reports an incorrect operation, the student will be referred to Topic 1 to address the identified gap.

3) Conceptual error. Errors in subtraction of the type 50 – 8.

For example, 70 – 28 = (70 – 20) – 8 = 50 – 8 = 30.

The error marker will be any number in the solution except the correct one: 42. All numbers written to the left of this number are correct. If the error is not corrected after the digital system reports an incorrect operation, the student will be referred to Topic 5.

After working through all the identified gaps, the student still cannot correct their errors, they will be prompted to perform an action using a dynamic number model. An image of the number 70 will appear, represented by 7 tens, from which the student must interactively subtract 2 tens and 8 ones.

Finally, the last type of help will be a detailed description of the rule for subtracting one round two-digit number from another two-digit number, also containing an example and a test task.

After all the work has been completed, the student will be asked to repeat task 1.1.

Write the calculations using the example.

90 – 43 = (90 – 40) – 3 = 50 – 3 = 47

80 – 42 = (80 – □) – □ = □ – □ = □

50 – 27 = (50 – □) – □ = □ – □ = □

Task 1.2.

Calculate:

80 – 47 = □

70 – 32 = □

60 – 56 = □

100 – 24 = □

In Task 1.2, the student must perform an operation in a reduced form.

Let's look at possible errors in completing Task 1.2.

1) Errors in knowledge of the addition table:

For example, 80 — 47 = 34 or 80 — 47 = 23.

We assume that the most common manifestation of a computational error is a discrepancy

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between the entered answer and the correct one by one. In this example, this would be 10 – 7 = 4 or 8 – 4 = 3. In such cases, we assume a computational error and send the student to the number composition simulator, where they will be presented with several tasks of the following type: 10 = 8 + □, 10 = □ + 3 (the composition of the number 10), or 8 = 4 + □, 8 = □ + 2 (the composition of the number 8).

2) Procedural error: 80 – 47 = 47.

The child calculates: 80 – 47 = 80 – 40 + 7 = 47.

The student makes an error in subtracting two-digit numbers from one round number: instead of subtracting 7, they add it. This error is related to the current teaching unit; the student will be asked to correct it using the dynamic number model.

If Task 1.2 contained errors, the student will be asked to repeat Task 1.2 after correcting them.

Calculate:

70 – 36 = □
60 – 43 = □
80 – 74 = □
100 – 52 = □

Task 2.

Guess the rule used to create Table 1.

Using this rule, fill in the blanks with numbers.

Table 1

Assignment for the student

Minuend	90	80	70		50		
Subtrahend	68	57	46	35			
Difference				25	26		

Answer (table 2):

Table 2

Answer

Minuend	90	80	70	60	50	40	30
Subtrahend	68	57	46	35	24	13	2
Difference	22	23	24	25	26	27	28

This task requires the student to perform not only the direct operation but also the inverse: find the minuend, find the subtrahend, and establish a simple pattern in a series of given examples. In this case, each successive minuend decreases by 10, and the subtrahend by 11, resulting in an increase in the difference by one.

Possible errors in completing task 2.

1) Errors in knowledge of the addition table:

For example, 90 – 68 = 23 (the child calculates: 10 – 8 = 3) or 90 – 68 = 12 (the child calculates: 90 – 60 = 20).

The student will be sent to a simulator to practice the composition of the number 10 or 9.

2) All other possible errors are addressed in tasks 1.1 and 1.2. If uncorrected errors are still present in the first five columns, the student will be asked to work with a dynamic number model and presented with the rule for subtracting one round two-digit number from another two-digit number.

3) If there are uncorrected errors in the last two columns, the student is first shown a hint, then the correct solution.

Hint: "Notice how the minuend changes, and how the subtrahend changes."

Task 3.

Figure 3 shows a fragment of consecutive fairy-tale numbers:

$$\beta\ \gamma\ \omega\ \psi\ \phi$$

Fig. 2. Fairy-tale numbers

Calculate:

$\psi 0 - 26 = \square$
$\omega 0 - \gamma 3 = \square$
$\phi 0 - \omega 4 = \square$

Solution:

$\psi 0 - 26 = \beta 4$
$\omega 0 - \gamma 3 = 7$
$\phi 0 - \omega 4 = 16$

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"Fairytale" numbers are a technique often found in mathematics textbooks based on the D.B. Elkonin-V.V. Davydov system (Aleksandrova, 2023; Davydov, 1996). They allow one to assess whether a student has mastered a particular method of operation at the level of substantive generalization. Problems of this type are undoubtedly of a higher level of difficulty. Solving problems with "fairytale" numbers allows students to advance their educational trajectory, as they offer the opportunity to discover patterns hidden when performing arithmetic operations with ordinary numbers. In this topic, such a generalization is the fact that the number of tens of the difference will always be $n + 1$ less than the number of tens of the minuend, where n is the number of tens of the subtrahend. If a student gives an incorrect answer, they are offered a hint and then the correct solution.

Clue:

«$\psi 0 - 26 = \psi 0 - 20 - 6 = \gamma 0 - 6 = \cdots$

The digit ψ is 2 times greater than the digit γ, so ψ tens minus 2 tens is γ tens.

Continue solving the problem yourself."

Discussion of results

We have described the concept of the planned digital educational system "Smart Notebook." It can be concluded that it will be able to analyze the student's process of solving a math problem, detect errors, compare them with a database of errors, identify the causes of the errors, and tailor hints and auxiliary tasks to the specific student to eliminate the causes of the error.

The smart notebook will take the student's abilities into account, offering them tasks within their zone of proximal development. A peer — a virtual assistant — will assist the student according to a pre-planned scenario with support options. If the child consistently experiences difficulty completing complex tasks, such tasks will either not be offered in the future or will be offered based on the student's own choice.

Conclusion

1. The "Smart Notebook" digital educational system, developed as a web application, is an adaptive learning solution aimed at individualizing mathematics instruction for primary school students. The system's theoretical foundations are based on R. Ashlock's typology of mathematical errors, L.S. Vygotsky's concept of the zone of proximal development, and J. Bruner's scaffolding concept.

2. The system analyzes the problem-solving process, identifies errors, and provides assistance to students through an interactive virtual assistant. The virtual assistant offers hints to students as they solve problems. For teachers, the system provides detailed statistics for each student, including error types and progress, allowing for individualized learning paths and differentiated approaches during group work.

3. The Smart Notebook can be used in the educational process as a teacher's assistant, including during independent math assignments for primary school students. It will facilitate a differentiated approach to teaching, allowing the teacher to quickly adapt the learning process to the individual needs of primary school students in solving math problems, both during class, including dividing students into groups based on their levels, and during independent work.

4. Such a digital educational system can be used in pedagogical education when preparing primary school teachers to work on subject-specific mathematical errors.

Limitations. The limitations of the methodological, teaching, and technological aspects of the digital system — the "Smart Notebook" web application — will be determined based on the results of the ongoing pilot study in primary schools. Specifically, opportunities will be identified for identifying the most relevant topics for expanding the task banks, optimizing the system's functionality, and the types of assistance provided by the virtual assistant.

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Vladimir L. Sokolov — literature review; manuscript writing; model description.

All authors participated in the discussion of the results and approved the final text of the manuscript.

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Сафронова М.А. — анализ литературы; анализ цифровых систем; написание и оформление рукописи.

Соколов В.Л. — анализ литературы; написание рукописи; описание модели.

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ПСИХОЛОГИЯ РАЗВИТИЯ (ВОЗРАСТНАЯ ПСИХОЛОГИЯ)

Научная статья | Original paper

The structure of professionally important qualities of child welfare specialists and analysis of their predictors

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Abstract

Context and Relevance. The article is devoted to the development of a structure for professionally important qualities of specialists from guardianship and custody authorities and factors influencing their formation. The contradictory nature of requirements for these professionals' essential qualities stems from the need to comply with strict legal norms while simultaneously adopting an empathetic and flexible approach towards clients' needs. **Objective**. To develop an integrated structure of professionally important qualities and analyze predictors that determine the formation of these qualities. **Hypothesis**. The structure of professionally important qualities reflects the specifics of work for specialists from guardianship and custody authorities, demonstrates good psychometric characteristics, and shows significant predictive power regarding overall emotional intelligence level, subjective well-being, and procedural self-efficacy. **Methods and Materials.** A total of 2036 specialists from 85 regions of Russia participated in the study, with an average age of 44,02 ± 9,36 years, including 1500 specialists and 536 managers. Factor analysis and confirmatory factor analysis were used to assess the structure of professionally important qualities. Factors influencing this structure were identified using: author-developed questionnaire on professional qualities, Emotional Intelligence Questionnaire "EMIN", Subjective Wellbeing Scale, Uncertainty Response Scale, Russian version of Self-Efficacy Scale. **Results.** The structure of professionally important qualities demonstrated excellent fit to data, internal consistency, external validity, and high reliability. Despite differences in formal job responsibilities between leaders and specialists, they share a common psychological core of professionally important qualities. **Conclusions.** The developed structure reveals substantial predictive power related to general levels of emotional intelligence, subjective wellbeing, and procedural self-efficacy, enabling more effective training methods and support systems tailored specifically to key psychological and emotional aspects of practitioners' work.

Keywords: structure, professionally important qualities, specificity of the model, guardianship and custody authority personnel, predictors

Структура профессионально важных качеств специалистов органов опеки и попечительства и анализ факторов влияния

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Резюме

Контекст и актуальность. Статья посвящена проблеме разработки структуры профессионально важных качеств (далее — ПВК) специалистов органов опеки и попечительства и факторам, влияющим на их формирование. Противоречивость требований к профессионально важным качествам работников органов опеки и попечительства определяется необходимостью соблюдения строгих правовых норм и эмпатичного и гибкого подхода к потребностям клиентов. **Цель**. Представить авторское видение интегрированной структуры профессионально важных качеств специалистов и выявить предикторы, которые обуславливают формирование этих качеств. **Гипотеза**. Структура профессионально важных качеств отражает специфику деятельности специалистов органов опеки и попечительства, ее составляющие обладают хорошими психометрическими характеристиками, она показывает значительную предсказательную силу общего уровня эмоционального интеллекта, субъективного благополучия и процедурной самоэффективности. **Методы и материалы**. В исследовании участвовали 2036 специалистов из 85 регионов России, средний возраст — 44,02 ± 9,36 лет, из них 1500 специалистов и 536 руководителей. Структура профессионально важных качеств оценивалась с помощью факторного и конфирматорного анализа. Для обнаружения факторов влияния использованы: авторский опросник профессионально важных качеств, опросник эмоционального интеллекта «ЭМИН», шкала субъективного благополучия, шкала реагирования на неопределенность, русскоязычная версия шкалы самоэффективности. **Результаты.** Структура профессионально важных качеств специалистов органов опеки и попечительства подтвердила хорошее соответствие данным, ывнутреннюю и внешнюю валидность и отличную внутреннюю согласо-

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ванность. Руководители и специалисты, несмотря на внешние различия в должностных обязанностях, обладают единым психологическим ядром профессионально важных качеств. **Выводы**. Структура ПВК показывает значительную предсказательную силу общего уровня эмоционального интеллекта, субъективного благополучия и процедурной самоэффективности и позволяет разработать более эффективные методы подготовки и поддержки специалистов, учитывая ключевые психологические и эмоциональные аспекты их работы.

Ключевые слова: структура, профессионально важные качества, специфика структуры, специалисты органов опеки и попечительства, предикторы

Introduction

Modern society faces numerous challenges in protecting children's rights and supporting families in difficult life situations. In this context, the role of specialists from guardianship and custody authorities (hereinafter referred to as GCA) and their professional preparedness to effectively fulfill their duties is particularly important.

The professional status of GCA specialists is rather contradictory. On the one hand, they belong to the category of civil servants[1], endowed by law with the authority to "prevent violations of children's rights, protect their interests, and ensure social and other state guarantees...," thereby implementing social policy in general (Urazbaeva, 2016). On the other hand, they are specialists providing assistance to individuals, families, or groups in difficult situations. In other words, GCA specialists act both as representatives of state authority and as social workers. In their professional activities, they face a dilemma: on one side, the requirement for strict performance of official duties, and on the other, the need for a sensitive attitude towards the needs of those requiring help. This creates a situation of uncertainty regarding tasks, methods, and areas of responsibility. The contradiction influences public expectations, which demand both strict legal solutions and simultaneously accuse specialists of inaction, overstepping authority, excessive control and punitive measures, as well as a lack of empathy. As a result, specialists are constantly under pressure from society

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[1] Decree of the Government of the Russian Federation dated May 16, 2025 No. 1217-r "On the Concept for Improving the Activities of Guardianship and Custody Authorities in Relation to Minors." URL: http://government.ru/docs/all/158995/ (accessed: August 8, 2025).

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and social institutions, which blame them for erroneous decisions (Oslon et al., 2024), leading to professional burnout and psychological health issues among them. A significant personnel shortage has become a consequence of that (16% vacancy rate as of 2024).

This situation has created a need for better selection and the development of pathways for both personal and professional growth of GCA workers, taking into account the dual nature of their activities (as civil servants and helping professionals).

Empirical research emphasizes the importance of the connection between values, motivation, and personality traits of civil servants. Within an empirical study based on a system approach, characteristics such as "responsibility," "flexibility," and "intellectual efficiency" contribute to the development of an internally motivated personality of civil servants (Boyarkin, 2008; Aamodt, 2022; Cobanu, Androniceanu, Lăzăroiu, 2019; Henderson et al., 2021). Within the concept of aptitude as a "generalized psychological formation existing as a system of personal variables, attributes, or qualities" (Borodina, Korchemny, 2019), key predictors of professionally important qualities (hereinafter referred to as PIQs) for civil servants include speech-thinking, emotional-volitional, and communicative qualities. This highlights the significance of diagnostics in personnel selection. Diagnostics is conducted through personal-professional characteristics, which underscores the need to develop these qualities in potential candidates.

Research based on the concept of organizational proactivity has shown that the proactivity and initiative of civil servants play a key role in their ability to adapt and enhance their work efficiency (Lepekhin, Lebedeva, Kruglov, 2020; Grubert, Steuber, Meinhardt, 2022; Meng et al., 2019).

Contemporary research indicates that the PIQ predictors in civil servants include: a high capacity for self-learning and planning, com-munication competence, legal and information literacy, managerial abilities, work motivation, restraint, level-headedness, and integrity. Priority qualities for civil servants are considered to be intelligence, cultural behavior, diligence, discipline, consistency, fairness, and care for subordinates. Self-regulation skills are important for overcoming difficult situations, and the level of interpersonal trust within an organization contributes to employee motivation (Afonin, Afonin, Solodilov, 2020; Kalgin, Kalgina, 2018; Panarin, 2002; Petoyan, Velikodnaya, 2023; Puzanova, Semenova, 2017; Ryabova, 2019; Khaidov, 2013).

In international (Demirel, Sadykova, 2021; Hökkä, Vähäsantanen, Paloniemi, 2020) and domestic (Kozub, 2024; Sabyna, 2023) research, emotional intelligence (EI) is considered a systemic predictor that contributes to increasing workplace trust, team trust, alignment of value orientations, identification of individual and organizational goals and priorities, and psychological well-being.

Empirical research on predictors of PIQ in helping professionals, based on the theory of prosocial activity, highlights altruism, morality, empathy, resilience, responsibility, absence of prejudice and subjective bias (Shermazanyan, 2015; Meng et al., 2019), and emphasizes the development of "positive" empathic processes (Karyagina et al., 2017). Key predictive indicators of PIQ include ability to handle stress, tolerance, altruistic orientation, striving for self-knowledge and development, and lack of fear of criticism (Bykova, 2015; Sorokoumova, Isaev, 2013).

Civil servants and helping professionals differ in their emphasis on PIQs, which is related to their professional duties. While the former prioritize managerial and organizational abilities, the latter prioritize empathy and readiness to support clients.

Thus, the professional activity of GCA specialists requires a unique combination of

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qualities characteristic of both civil servants and helping professionals. This creates a problem of uncertainty but also opens opportunities for developing an integrated framework of their PIQs.

To apply this model in practice, an analysis of the predictors of PIQs that determine the formation of these qualities in GCA specialists is necessary. This became the comprehensive practice-oriented goal of this study. We hypothesized that the structure of PIQs would reflect the specifics of GCA specialists' activities, demonstrate significant predictive power of the general level of EI, subjective well-being, and procedural self-efficacy, and that its components would possess good psychometric characteristics.

Materials and methods

To identify the PIQs, an expert survey was conducted with specialists and managers of regional GCA offices with varying experience and status from 5 federal districts of the Russian Federation. They were asked to list, in any order, the most important professional qualities from their perspective. Subsequently, the project experts selected the most frequently mentioned qualities and compiled the questionnaire «Psychologically Important Qualities of a Guardianship and Custody Authority Specialist» (Appendix A), which was evaluated in regional GCA departments.

Research tools and procedure:

• The proprietary questionnaire "Psychologically Important Qualities of a Guardianship and Custody Authority Specialist" allows for the identification of psychologically important qualities and includes a set of personal and professional characteristics (N = 35). These characteristics determine the specialist's ability to effectively perform duties, interact with colleagues and clients, and cope with emotional and professional workloads in their work, which impacts overall effectiveness. Respondents were asked to rate

the degree to which each PIQ was developed in them on a 5-point scale, where: 1 point = minimally prominent, 5 points = maximally prominent. For example, the ability to patiently listen to an interlocutor, the ability to initiate and maintain a conversation, the ability for effective and conflict-free interaction with groups of people of different levels, etc.;

• The emotional intelligence questionnaire "EMIN" (Lyusin, 2004);

• The Warwick-Edinburgh Mental Well-being Scale, or WEMWBS (Osin, Leontiev, 2020);

• The Uncertainty Response Scale (Odintsova, Radchikova, 2025);

• Russian version of the self-efficacy scale, adapted in 2024 by the authoring team of V.N. Oslon, M.A. Odintsova, G.V. Semya, U.V. Kolesnikova and awaiting publication in the Journal of Organizational Psychology.

Methods: Factor analysis (principal component analysis followed by Varimax rotation), confirmatory factor analysis (CFA), Cronbach's alpha; Kolmogorov-Smirnov test; Student's t-test, with effect size calculated using Cohen's d; Pearson's correlation coefficient (r); linear regression analysis. SPSS Statistics 27.0 software was used.

Study participants. The study involved 2036 specialists from guardianship and custody authorities from 85 regions of Russia, average age 44,02 ± 9,36 years (median = 45 years). The total number included specialists (N = 1500) and managers (N = 536).

Results

The initial item pool consisted of 51 statements. Through several successive cycles of factor analysis (principal component analysis with Varimax rotation), we eliminated items that cross-loaded onto multiple factors with loadings exceeding the established threshold or that compromised factor interpretability. As a result of this procedure, the final version of the instrument

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was reduced to 35 statements. Factor analysis of the 35 items allowed us to identify 6 factors, explaining 61,66% of the total variance:

1. Client-oriented mindset and professional ethics (10 items, 17,51%).

2. Communicative and analytical aptitude (7 items, 13,07%).

3. Client interaction competence (7 items, 11,37%).

4. Verbal communication proficiency (4 items, 7,095%).

5. Psychological hardiness (4 items, 6,33%).

6. Professional integrity and accountability (3 items, 6,18%).

The six-factor structure provided the clearest, most logical, and theoretically sound model. Each factor clearly corresponded to the constructs underpinning our methodology. The decision to retain six factors was based on a combined consideration of statistical criteria and substantive meaning, which is standard and recommended practice in psychometric research.

The results of the confirmatory factor analysis demonstrated a good fit of the data to the proposed structure (CFI = 0,926; TLI = 0,919; RMSEA = 0,0514 [0,0498; 0,0531]; SRMR = 0,0412), thereby confirming the six-factor PIQ structure.

Evidence for internal validity comes from the obtained positive correlations among the subscales, suggesting they belong to a single construct. The correlation coefficients ranged from $r = 0,473$ to $r = 0,708$. The strongest relationships were found between the "Professional integrity and accountability" and "Client-oriented mindset and professional ethics" subscales ($r = 0,708$), and between "Communicative and analytical aptitude" and "Client interaction competence" subscales ($r = 0,706$), reflecting their conceptual connection. The absence of excessively high correlations ($r > 0,80$) indicates that the subscales are not redundant.

All subscales demonstrated good to excellent internal consistency: "Client-oriented mind-

set and professional ethics" ($\alpha = 0,917$); "Communicative and analytical aptitude" ($\alpha = 0,891$); "Client interaction competence" ($\alpha = 0,849$); "Verbal communication proficiency" ($\alpha = 0,769$); "Psychological hardiness" ($\alpha = 0,802$); "Professional integrity and accountability" ($\alpha = 0,804$).

Testing the external validity of the six-factor PIQ structure revealed weak to moderate positive correlations for all PIQ subscales with intrinsic, integrated, and identified motivation (ranging from $r = 0,151$ to $r = 0,309$), and weak negative correlations with external motivation and amotivation (ranging from $r = -0,145$ to $r = -0,258$). Moderate positive correlations were found between PIQ subscales and subjective well-being (from $r = 0,326$ to $r = 0,483$), weak to moderate positive correlations with all self-efficacy indicators (from $r = 0,274$ to $r = 0,417$), weak correlations with cognitive responses to uncertainty (from $r = 0,141$ to $r = 0,277$), weak to moderate correlations with readiness for change (from $r = 0,190$ to $r = 0,323$), and weak to moderate negative correlations with emotional responses to uncertainty (from $r = -0,186$ to $r = -0,334$). Multiple moderate positive correlations were found between PIQ components and all EI subscales (from $r = 0,274$ to $r = 0,478$). Thus, a specialist's PIQ is directly related to their ability to cope with uncertainty, professional motivation, subjective well-being, and emotional intelligence.

The confirmation of the psychometric properties of the PIQ structure for GCA specialists provides a basis for identifying differences between specialists and managers, as the former primarily perform helping professional functions, while the latter perform civil service functions.

Significant differences in all PIQs were found between specialists and managers. Managers demonstrated higher scores than specialists in "Client-oriented mindset and professional ethics" ($4,53\pm0,40/4,47\pm0,46$): t(2034) = -2,56, p = 0,01, d = -0,129. They also rated themselves higher on "Communicative and analytical apti-

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tude" (4,24±0,45/4,04±0,53): t(2034) = −8,19, p = 0,000, d = −0,38; "Client interaction competence" (4,27±0,43/4,17±0,51): t(2034) = −4,36, p = 0,000, d = −0,20; "Verbal communication proficiency" (4,20±0,54/4,14±0,61): t(2034) = −2,41, p = 0,016, d = −0,11; "Psychological hardiness" (4,31±0,50/4,17±0,57): t(2034) = −4,78, p = 0.000, d = −0,23; "Professional integrity and accountability" (4,62±0,42/4,53±0,53): t(2034) = −3,613, p = 0,000, d = −0,18.

Statistically significant differences between the groups, accompanied by small effect sizes, indicate their limited practical applicability.

These results show that professional status is a weak criterion for the level of PIQ development among GCA specialists. It is possible that individual variations in PIQ are more strongly determined by work experience, age, professional motivation, ways of responding to uncertainty, emotional intelligence, and subjective well-being.

To identify key predictors of PIQ among GCA specialists, a linear regression analysis was conducted. A direct stepwise method (with inclusion) was used, which allows for the selection of only those predictors that significantly influence the dependent variables. When constructing the regression models, all theoretically significant PIQ predictors (emotional intelligence, motivation, subjective well-being, self-efficacy, responses to uncertainty, age, and work experience) were included in the analysis (see Table). The analysis showed that the most significant predictors for client-oriented mindset and professional ethics are: overall EI level, procedural self-efficacy, cognitive responses to uncertainty, intrinsic motivation, and subjective well-being. The greatest contribution comes from overall EI level, while the smallest comes from subjective well-being. The most significant predictors for communicative and analytical aptitude were: overall EI level, subjective well-being, and procedural self-efficacy. The predictors for client interaction competence were:

interpersonal EI, subjective well-being, procedural self-efficacy, and readiness for change. At the same time, the most substantial contribution comes from interpersonal EI, and the smallest from readiness for change. The most significant predictors for verbal communication proficiency are: overall EI level, subjective well-being, and procedural self-efficacy. Overall EI level makes the greatest contribution to the assessment of verbal qualities.

The predictors for psychological hardiness are: subjective well-being, overall EI level, readiness for change, support-seeking behavior, and identified motivation. Emotional responses to uncertainty make a negative contribution to psychological hardiness. The greatest contribution to psychological hardiness comes from subjective well-being, the smallest from identified motivation.

The predictors for professional integrity and accountability were: procedural self-efficacy, overall EI level, cognitive responses to uncertainty, and subjective well-being. Procedural self-efficacy makes the most significant contribution to professional integrity and accountability.

Thus, overall emotional intelligence, subjective well-being, and procedural self-efficacy are the most significant predictors of the PIQs we have identified for GCA specialists. Despite the inclusion of work experience and age in the initial models, they did not demonstrate a statistically significant contribution (p > 0,05) to any of the dependent variables when controlling for other factors. This indicates that their relationship with PIQs is mediated by other, more significant variables included in the model.

Discussion

Based on factor analysis, a six-factor PIQ structure for GCA specialists was developed. This structure was confirmed to have good fit with the research data, demonstrated internal and external validity, and showed excellent inter-

Table

Results of the regression analysis for predicting professionally important qualities (N = 2036)

Indicator	Standardized regression coefficient β	Regression coefficient b	Level of statistical significance p
Client-oriented mindset and professional ethics			
Intercept (constant)		2,620	<0,001
Overall level of EI	0,223	0,007	<0,001
Procedural self-efficacy	0,172	0,034	<0,001
Cognitive responses to uncertainty	0,146	0,016	<0,001
Intrinsic motivation	0,105	0,017	<0,001
Subjective well-being	0,108	0,006	<0,001
Adjusted R-squared = 0,281; Durbin-Watson = 1,977			
Communicative and analytical aptitude			
Intercept (constant)		2,065	<0,001
Overall level of EI	0,286	0,011	<0,001
Subjective well-being	0,199	0,013	<0,001
Procedural self-efficacy	0,170	0,041	<0,001
Adjusted R-squared = 0,294; Durbin-Watson = 1,966			
Client interaction competence			
Intercept (constant)		2,162	<0,001
Interpersonal EI	0,303	0,022	<0,001
Subjective well-being	0,170	0,011	<0,001
Procedural self-efficacy	0,113	0,025	<0,001
ГReadiness for change	0,101	0,009	<0,001
Adjusted R-squared = 0,283; Durbin-Watson = 1,988			
Verbal communication proficiency			
Intercept (constant)		2,460	<0,001
Overall level of EI	0,233	0,010	<0,001
Subjective well-being	0,126	0,010	<0,001
Procedural self-efficacy	0,116	0,031	<0,001
Adjusted R-squared = 0,179; Durbin-Watson = 1,930			
Psychological hardiness			
Intercept (constant)		2,384	<0,001
Subjective well-being	0,209	0,015	<0,001
Overall level of EI	0,173	0,007	<0,001

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Indicator	Standardized regression coefficient β	Regression coefficient b	Level of statistical significance p
Emotional responses to uncertainty	−0,140	−0,009	<0,001
Readiness for change	0,113	0,012	<0,001
Support-seeking behavior	0,103	0,015	<0,001
Identified motivation	0,075	0,014	<0,001
Adjusted R-squared = 0,319; Durbin-Watson = 1,911			
Professional integrity and accountability			
Intercept (constant)		2,715	<0,001
Procedural self-efficacy	0,200	0,045	<0,001
Overall level of EI	0,143	0,005	<0,001
Cognitive responses to uncertainty	0,152	0,019	<0,001
Subjective well-being	0,137	0,009	<0,001
Adjusted R-squared = 0,214; Durbin-Watson = 2,015			

nal consistency for all its components. The minimal differences between managers and specialists indicate they share a common psychological core of PIQs, pointing to a unified professional environment despite external differences in job responsibilities.

The most significant predictors of PIQs for GCA specialists are overall emotional intelligence, subjective well-being, and procedural self-efficacy. This fact reinforces the conclusion about the need to integrate personal characteristics into the personnel professional development process (Karyagina et al., 2017).

The role of emotional intelligence in the work of civil servants and helping professionals is confirmed in numerous studies (Sabyna, 2023; Demirel, Sadykova, 2021; Hökkä, Vähäsantanen, Paloniemi, 2020).

Procedural self-efficacy (i.e., the ability to fulfill obligations to clients while remaining objective and avoiding personal judgment, as well as

the skill to revise goals in the face of setbacks) is highlighted by researchers as an important predictor of PIQs for helping professionals (Pedrazza et al., 2013; Jawahar, Mohammed, 2022; Kolesnikov, 2021).

The fact that subjective well-being is a predictor of PIQs for civil servants is supported by the research of D.M. Zinovieva (Zinovieva, Yunda, Dolgopolova, 2010).

In our study, intrinsic motivation serves as a predictor for the formation of client-oriented values, which aligns with the concept of an intrinsically motivated personality (Boyarkin, 2008) and is corroborated by findings in a number of other studies (Arinushkina, 2016; Afonin, Afonin, Solodilov, 2020; Panarin, 2002; Petoyan, Velikodnaya, 2023; Puzanova, Semenova, 2017; Ryabova, 2019; Sorokoumova, Isaev, 2013; Khaidov, 2013).

Identified motivation plays a significant role in the psychological hardiness of GCA special-

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ists, which corresponds with the conclusions of research on civil servant motivation (Donnikov, Durnovtseva, 2024).

Overall, the obtained results underscore the need to develop an individualized approach to the selection and training of GCA specialists. This could include implementing the developed psychodiagnostic tool for assessing PIQs. This will help enhance the overall effectiveness of GCA operations, which fully aligns with the challenges faced by modern society in protecting children's rights and supporting families in crisis situations.

Conclusions

Modern society has presented GCA specialists with a number of serious challenges related to child protection and family support. Their work is simultaneously a state function and a social one, creating a tension between the necessity to adhere to strict legal norms and the need for an empathetic and flexible approach to each case. Therefore, in developing a PIQ structure, the important task is not the synthesis of roles, but the formation of an integral professional identity for GCA specialists, unified by a common professional field, coupled with the psychometric validation of the

components within this structure. Our research confirmed the following assumptions:

1. The developed PIQ structure, which reflects the specific nature of GCA specialists' work and combines managerial and "helping" functions, is valid and reliable. It represents not a theoretical construct, but a ready-to-use tool for human resources work.

2. The PIQ structure demonstrates significant predictive power for overall EI level, subjective well-being, and procedural self-efficacy. This allows for the development of more effective training and support methods for GCA specialists, taking into account key psychological and emotional aspects of their work. Future research will focus on studying the long-term effects of EI and other PIQ predictors on career advancement and professional burnout among specialists.

Limitations. The absence of comparisons with other professional groups does not allow us to claim the absolute uniqueness of this structure, although it does support its validity and internal consistency for this particular group. Not all possible predictors of professionally important qualities and their impact on the professional success of child protection specialists have been examined.

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Appendix

Appendix A. Questionnaire "Professionally Important Qualities of Child Guardianship and Custody Specialists". https://doi.org/10.48612/MSUPE/e7en-ahkn-3v68

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Научная статья | Original paper

Psychological consequences of traumatic experiences related to hostilities in primary school students: perspectives of parents and teachers

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Abstract

Context and relevance. The problem of the psychological well-being of children who have experienced the consequences of hostilities has gained particular importance, especially for younger school-age children, whose psyche is especially vulnerable to the effects of stressful factors due to a critical period of development. **Objective.** To study the psychological consequences of traumatic experiences and the current psychological state of younger schoolchildren affected by hostilities, basing on assessments by paired significant adults. **Hypotheses.** 1) The content of traumatic experiences and their psychological consequences in children of grades 1–4 differ depending on the extent to which their places of residence are or were involved in the consequences of hostilities. 2) Assessments by significant adults are informative regarding the severity of maladaptation manifestations, signs of post-traumatic stress disorder (PTSD), and the child's psychological coping resources; they are complementary to each other and can be used for screening the condition of younger school-age children who have been affected to varying degrees by military actions. **Methods and materials.** The study involved 5046 adults, including 2524 teachers, class supervisors of primary school classes in general educational institutions, and 2524 parents (legal guardians and other close relatives) of children aged 6 to 12 years attending grades 1–4. An author's screening questionnaire was used to evaluate the condition of children who experienced the consequences of military actions. Parents completed a parental version of the mentioned screening tool to describe the children's condition, as well as a trauma experience questionnaire (N.V. Tarabrina). **Results.** The study identified significant consequences of traumatic experiences in younger schoolchildren affected by military actions, based on assessments by teachers and parents. **Conclusions.** The analysis of assessments by significant adults allowed for forming a general understanding of the severity and prevalence of maladaptation manifestations and PTSD signs in children from regions differently affected by the consequences of military actions and the traumatic events they experienced, as well as the intensity of psychological resources mediating the impact of traumatic events on the psyche of younger school-age children. The obtained data on the condition of children from regions affected to varying degrees by military actions confirmed the necessity of considering the regional factor.

Психологические последствия травматического опыта, связанного с боевыми действиями, у младших школьников: взгляд родителей и педагогов

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Резюме

Контекст и актуальность. Проблема психологического благополучия детей, переживших последствия боевых действий, приобрела особую значимость, в особенности детей младшего школьного возраста, психика которых особенно уязвима к воздействию стрессовых факторов ввиду критического периода развития. **Целью** представленного в статье исследования были определение характера и выраженности психологических последствий пережитого травматического опыта и оценка актуального психологического состояния младших школьников, пострадавших в результате боевых действий, на основе парных оценок значимых взрослых (родителей (законных представителей, иных близких родственников) и педагогов). **Гипотезы**. 1) Содержание травматического опыта и его психологические последствия у детей младшего школьного возраста различаются в зависимости от степени вовлеченности региона проживания в последствия боевых действий. 2) Оценки значимых взрослых информативны в отношении выраженности проявлений дезадаптации, проявлений посттравматического стрессового расстройства (далее — ПТСР) у ребенка, а также психологических ресурсов совладания со стрессом, дополняют друг друга и могут быть использованы для скрининговой оценки состояния детей младшего школьного возраста, в той или иной степени пострадавших в результате боевых действий. **Методы и материалы**. В исследовании приняли участие 5046 взрослых, из них 2524 педагога, классных руководителей начальных классов общеобразовательных организаций и 2524 родителя (законных представителей, иных близких

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родственников) детей в возрасте от 6 до 12 лет, обучающихся в 1–4 классах. Использовалась авторская скрининговая анкета для оценки состояния детей, переживших последствия боевых действий. Родители использовали для описания состояния детей родительскую версию указанной скрининговой методики, а также анкету травматического опыта (Н.В. Тарабрина). **Результаты.** Исследование позволило выявить значимые последствия травматического опыта у младших школьников, пострадавших в результате боевых действий, на основе оценок педагогов и родителей. **Выводы**. Результаты анализа оценок значимых взрослых позволили сформировать общее представление о выраженности и распространенности проявлений дезадаптации и проявлений ПТСР у детей на территориях, в разной степени вовлеченных в последствия боевых действий, и переживаемых ими травматических событиях, а также о выраженности психологических ресурсов, опосредующих влияние травматических событий на психику детей младшего школьного возраста. Полученные данные о состоянии детей из регионов, в разной степени пострадавших в результате боевых действий, подтвердили необходимость учета регионального фактора.

Ключевые слова: травматический опыт, боевые действия, посттравматическое стрессовое расстройство (ПТСР), психологическая дезадаптация, обучающиеся, младший школьный возраст, родители (законные представители), педагоги

Introduction

Armed conflicts and their consequences create serious obstacles to the development and prosperity of human communities. Children are especially vulnerable in these conditions, as their development at all levels — from physical to personal and social — can be disrupted. This poses particular challenges to the education system and complicates the formation in a child of a sense of safety and a basic trust in the world, which are the most important conditions for psychologically healthy development and maturation.

Traumatic experiences related to warfare have a negative impact on a child's psyche: they increase anxiety levels, provoke the onset of post-traumatic stress disorder (hereinafter PTSD), and hinder learning and social adaptation. The prevalence of PTSD in certain samples can reach 90%, especially under prolonged exposure to a military conflict. For example, one study notes that PTSD frequency in some groups of children can be as high as 90% under long-term conflict conditions (Carpiniello, 2023).

E. Alisic emphasizes that the very concept of PTSD and most of the methods for its diag-

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nosis were developed for adults. Meanwhile, the consequences of trauma experienced by children go far beyond PTSD, manifesting, for example, in regressive behavior, fears (including fear of losing loved ones), guilt, etc. The recovery process after trauma in children is qualitatively different: their cognitive and emotional spheres are still developing, which affects their situation appraisal, emotion regulation, and overall development. To gain a more complete understanding of the problem of childhood trauma and its consequences, Alisic suggests using various "sources" of information: assessments by the children themselves, their parents, and other significant adults such as teachers (Alisic, 2011).

M. Fennig and M. Denov analyzed children's direct experiences, focusing on how the children themselves interpret and describe events. They showed that children affected by conflicts are not merely passive victims; they are actively coping with their traumatic experiences, using a variety of adaptation and development strategies (Fennig, Denov, 2024). The researchers point to the necessity of developing programs aimed at a child's recovery after trauma and at fostering the child's active stance and agency (Cavazzoni, Fiorini, Veronese, 2022).

A study involving schoolchildren in Malaysia showed that a high level of PTSD symptoms is more frequently observed in younger schoolchildren than in adolescents (Ghazali et al., 2025). In addition, younger schoolchildren affected by military conflicts have a higher risk of developing depressive disorders (Benjet et al., 2020).

I.N. Zakharova *et al.* studied the impact of stress experienced by younger school-aged children living in the city of Luhansk and those evacuated to other regions of the Russian Federation on their emotional and cognitive

spheres. All the children examined showed signs of chronic stress. Most of the children who had not left the Luhansk People's Republic (LPR) in the past year were found to have severe stress, with fears related to death, fire, and open combat operations. The majority of the children were afraid when receiving medical help, and were afraid of the dark and of nightmares (I.N. Zakharova *et al*, 2021). I.B. Ershova and co-authors also note increased fatigue, rapid exhaustion and unstable attention, reduced short-term memory capacity, and the presence of intrusive fears of injury and death (Ershova *et al*, 2019). Re-experiencing of the traumatic event, sleep disturbances, irritability, and heightened excitability were also observed (Ershova *et al*, 2017).

For children with traumatic experiences, the beginning of primary school can become especially challenging and require additional support and attention from teachers due to possible problems with attention, memory, and the ability to complete school tasks, as well as behavioral and emotional characteristics (such as obstinacy/withdrawal, conflict-proneness/unsociability, emotional instability) that arise as a consequence of the trauma (Jednaszewski, 2025).

Most authors analyzing the effects of traumatic events related to warfare on children's psyches focus on emotional and cognitive disturbances. There is a lack of studies that take a comprehensive look at the psychological consequences of trauma experienced by a child — keeping both the multi-level negative consequences (such as manifestations of maladaptation and PTSD symptoms) *and* the child's psychological coping resources in focus simultaneously, based on comparing assessments of the child's state by significant adults.

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Materials and methods

The goal of the present study was to determine the psychological consequences of traumatic experiences and the current psychological state of primary school students affected by hostilities, based on paired assessments by significant adults (parents (legal guardians or other close relatives) and teachers). The essence of this approach lies in using complementary evaluations from these two groups, who observe the child in different spheres of personal functioning. This approach allows for mass screening of children's status without their direct participation in diagnostics, in order to organize subsequent targeted assessments of those children who, based on the adults' evaluations, turn out to be at risk.

The research hypotheses were: 1) The content of traumatic experiences and their psychological consequences in children of grades 1–4 differ depending on the extent to which their places of residence are or were involved in the consequences of hostilities. 2) Assessments by significant adults are informative regarding the severity of maladaptation manifestations, signs of posttraumatic stress disorder (PTSD), and the child's psychological coping resources; they are complementary to each other and can be used for screening the condition of younger school-age children who have been affected to varying degrees by military actions.

The study employed questionnaires for parents and teachers that were developed on the basis of a *Screening Methodology for assessing the condition of children affected by hostilities* (hereinafter "screening methodology"). These questionnaires are aimed at evaluating indicators of the child's maladaptation in five fundamental spheres of personal functioning: psychophysiological, emotional, cognitive, behavioral, and communicative, as well as composite indicators of overall maladaptation and of the child's psychological resources for coping with stress. The criteria for the levels of maladaptation in the applied screening methodology include: *Level I:* 1,0 point — no manifestations of maladaptation (norm); *Level II:* 1,01–2,0 points — isolated symptoms and signs of maladaptation (mild maladaptation); *Level III:* 2,01–3,0 points — moderate signs of maladaptation (moderate maladaptation); *Level IV:* 3,01–4,0 points — pronounced signs of maladaptation (Ulianina *et al*, 2024).

Parents used the parent version of the screening methodology to describe their children's condition, and teachers used the teacher version. The differences between the versions concern the setting in which the child is evaluated: at home vs. at school. Parents were also presented with a list of events (developed for this study) to inventory the child's traumatic experiences both related and unrelated to hostilities, as well as the *Parental Questionnaire for Assessing Children's Traumatic Experiences* (Tarabrina, 2001). This questionnaire includes scales reflecting the severity of manifestations according to individual PTSD criteria: A (experiencing intense emotions caused by a serious threat to life or health), B (intrusive re-experiencing of the trauma), C (avoidance of stimuli subjectively associated with the traumatic events, and avoidance of activities that were previously appealing), D (presence of arousal symptoms that were not present before the traumatic event), F (impairment in several significant areas of life functioning), as well as a total score summarizing criteria B through F. For this study, the following cut-off values were

proposed for categorizing levels based on the total PTSD score: 0 points — no PTSD symptoms (*Level I*); 1–15 points — presence of some PTSD symptoms (*Level II*); more than 15 points — multiple PTSD symptoms (*Level III*).

Analysis was conducted using IBM SPSS Statistics 27.0. The following statistical methods were applied:

• Descriptive statistics: number of respondents and prevalence of potentially traumatic events in the child's experience, by region (%).

• Nonparametric tests: 1) Paired comparisons of parent and teacher evaluations were performed using the Wilcoxon signed-rank test for related samples; 2) Prevalence of traumatic events by region, inter-regional comparisons of the prevalence of traumatic experience, levels of maladaptation, and PTSD were performed using Pearson's χ^2 test.

• Correlation analysis: Spearman correlation coefficients were calculated between (1) the maladaptation and psychological resource indicators obtained from parent (legal guardian) and teacher assessments, and (2) the maladaptation and psychological resource indicators from parent and teacher assessments and the PTSD criteria/overall index, as well as the composite indicators reflecting the children's traumatic experience.

Results

A total of 2524 pairs of significant adults participated in the study, assessing children aged 6 to 12 years in grades 1–4. The pairs consisted of parents (or other legal representatives; hereafter all referred to as "parents") — among them 2399 identified as the mother, 81 as the father, and 44 as other family members of the student — and the

homeroom teachers of elementary school classes.

In LPR (Luhansk People's Republic; 644 pairs), Zaporizhzhye region (222 pairs), Kherson region (446 pairs), and Bryansk region (342 pairs), the study participants were teachers and parents of children who had suffered as a result of hostilities. In the Republic of Crimea (255 pairs), the participants were teachers and parents of minors who were among the internally displaced from territories of active fighting as well as from neighboring countries. In Kemerovo oblast — Kuzbass (615 pairs), among others, data are presented on the condition of children from families of participants (veterans) of the special military operation. **Table 1** presents the demographic characteristics of the minors whose condition was assessed by the significant adult pairs

Data on the prevalence of traumatic experiences among the students, obtained from the parent questionnaires, are presented in Table 2.

The most common type of traumatic experience unrelated to hostilities was *parents' divorce*, as well as *loss of contact/breakup with friends*. Among the potentially traumatic events related to hostilities, the most frequently mentioned were: being in a firing zone, seeing/hearing explosions, hiding in a shelter, and forced displacement.

Out of the 2524 children for whom responses were obtained from both teachers and parents, 50,4% have some traumatic experience (N = 1272). In 40,6% of the total number of children, this experience was in some way related to hostilities (N = 1031).

The results of a comparative analysis of children's maladaptation indicators based on the teacher and parent questionnaires —

Table 1

Demographic characteristics of students whose condition is described by adults in a parent-teacher pair (%)

Region of the Russian Federation	Number of pairs of parent and teachers participated in the study	Gender distribution, %		Grade distribution, %			
		Male	Female	1	2	3	4
LPR	644	48,3	51,7	25,0	20,7	28,4	25,9
Zaporozhye region	222	50	50	19,4	34,7	25,7	20,3
Kherson region	446	50	50	19,3	30,0	23,8	26,9
Crimea	255	56,90	43,10	18,0	22,4	27,1	32,5
Bryansk region	342	48,80	51,20	22,5	25,4	33,0	19,0
Kuzbass	615	51,50	48,50	28,5	25,0	25,0	21,5
Total	2524	50,5	49,6	23,3	25,4	27,0	24,2

Table 2

Distribution of potentially traumatic situations among students of 1–4 grades (%)

traumatic events	LPR	Zaporozhye region	Kherson region	Crimea	Bryansk region	Kuzbass	Total
Not related to combat operations							
parents' divorce	5,4	6,3	5,8	5,9	2,6	3,1	4,7
bullying	1,4	0,5	1,1	3,1	2,3	2,0	1,7
Losing, breaking touch with friends	1,2	0,5	4,7	9,0	2,6	2,4	3,1
Related to combat operations							
Loss, destruction of house or place of residence	0,6	0,5	1,3	8,6	0,0	0,2	1,3
living in a temporary accommodation facility	0,2	0,0	0,2	5,5	0,0	0,0	0,6
Forced relocation to another country or region	2,5	3,2	4,5	30,6	0,3	0,5	5,0
Hiding in a shelter	2,0	13,1	7,6	14,5	50,0	0,0	11,3
saw the explosions	1,7	8,6	5,6	11,8	5,8	0,0	4,2
heard explosions	20,7	60,8	40,4	32,5	75,4	0,2	31,3
was in the firing zone	1,7	16,2	2,9	15,7	24,6	0,0	7,3
Survived the death of relatives	5,3	1,8	3,6	4,7	2,9	4,1	4,0
learned about the death of acquaintance, including child	1,7	0,5	2,0	4,3	4,7	4,4	3,0

which allow assessment of the degree of similarity or divergence between teachers' and parents' evaluations of the child's maladaptation and the presence of psychological resources in each child — are presented in **Table 3**.

It was found that the only relative agreement between parent and teacher evaluations of children's maladaptation was in the behavioral sphere. The observed discrepancies in evaluations concerning maladaptation in the other spheres are expected, since teachers assess the child during social interactions with peers and teachers, whereas

parents assess the child in an informal family setting.

The interrelations between the severity of maladaptation manifestations and the children's psychological resources, as obtained from the surveys of teachers and parents, are presented in **Table 4**.

Owing to the large sample size, all correlation coefficients turned out to be highly significant, so effect sizes were calculated using Cheddock's scale. Statistically significant (predominantly small and moderate) correlations were found between the evaluations by significant adults of the children's malad-

Table 3

**Comparative analysis of indicators of children maladaptation based
on a survey of pairs of teachers and parents**

Indicators	Ranks	Number of observations	Wilcoxon's Rank Criterion	
			Z	p
Psychophysiological sphere	A	1030	−6,85	<0,001
	B	753		
	C	740		
Emotional sphere	A	1143	−9,42	<0,001
	B	755		
	C	625		
Cognitive sphere	A	1022	−2,37	0,018
	B	904		
	C	597		
Behavioral sphere	A	863	−0,46	0,642
	B	817		
	C	843		
Communicative sphere	A	1025	−10,91	<0,001
	B	633		
	C	865		
General indicator of maladaptation	A	1294	−7,326	<0,001
	B	1013		
	C	216		
The general indicator of psychological resources	A	935	−8,892	<0,001
	B	1363		
	C	225		

Note: A — Negative ranks — parents' estimations higher than in teachers'; B — Positive ranks — parents' estimations lower than in teachers'; C — Matching observations — parents' estimations equal to teachers'.

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Table 4

**Correlations between indicators reflecting the severity of maladaptation by areas
and psychological resources of children based on estimations of significant adults**

version of screening methodology for teachers	Version of screening methodology for parents Indicator of maladaptation by spheres and psychological resources of children						
	Psychophysiological	Emotional	Cognitive	Behavioral	Communicative	General indicator of maladaptation	General indicator of psychological resources
Psychophysiological	0,12**ос	0,11**ос	0,11**ос	0,09**	0,06**	0,12**ос	−0,08**
Emotional	0,18**ос	0,22**ос	0,17**ос	0,14**ос	0,14**ос	0,22**ос	−0,12**ос
Cognitive	0,19**ос	0,16**ос	0,35**с	0,24**ос	0,17**ос	0,28**ос	−0,14**ос
Behavioral	0,18**ос	0,16**ос	0,30**ос	0,25**ос	0,21**ос	0,27**ос	−0,15**ос
Communicative	0,15**ос	0,14**ос	0,24**ос	0,22**ос	0,21**ос	0,24**ос	−0,13**ос
General indicator of maladaptation	0,21**ос	0,21**ос	0,31**с	0,24**ос	0,20**ос	0,30**ос	−0,16**ос
General indicator of psychological resources	−0,18**ос	−0,17**ос	−0,27**ос	−0,21**ос	−0,17**ос	−0,25**ос	0,20**ос

Note: «**» — correlation is significant at the p < 0,01 level (two-sided), «ос» — small correlation significance (0,1–0,3), «с» — medium correlation significance (0,31–0,5), by the Cheddock scale.

aptation manifestations and psychological resources. Higher indicators based on parent evaluations corresponded to higher indicators based on teacher evaluations.

Based on the criteria for classifying different levels of maladaptation proposed above (see "Materials and Methods" section), we analyzed the distribution of maladaptation levels among children in the studied regions according to parent evaluations (Fig. 1) and teacher evaluations (Fig. 2). Differences in the distribution of maladaptation levels by region show a greater level of statistical significance according to the data from teacher evaluations ($\chi^2 = 46,942$, $p \leq 0,001$) than according to parent evaluations ($\chi^2 = 25,815$, $p \leq 0,040$).

To assess the intensity of traumatic experiences and PTSD symptoms in the children, the "Parental Questionnaire for Assessing Children's Traumatic Experiences" was used (Tarabrina, 2001). The criteria for categorizing levels are presented in the Methods section. The levels of severity of PTSD symptoms in the children are shown in Fig. 3.

Among students from LPR and Kuzbass, in more than 50% of cases parents reported no PTSD symptoms in the children, and the number of identified cases of pronounced PTSD symptoms was around 2%. In contrast, the results of parent questionnaires for students in Zaporizhzhya, Kherson, Bryansk regions, and Crimea indicated a predominance of children with some PTSD symptoms. The

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Fig. 1. The levels of maladaptation of students, based on version of screening instrument for parents

Fig. 2. The levels of maladaptation of students, based on version of screening instrument for teachers

percentage of children with multiple PTSD symptoms in these regions was also higher. The differences in the distribution of PTSD symptom severity levels by region are statistically significant ($\chi^2 = 71,860$, $p \leq 0,001$).

Finally, we examined the interrelations between the severity of the child's PTSD symptoms, maladaptation, and personal psychological resources for coping with stress on the one hand, and the composite indicators reflecting the presence and "variety" of traumatic experience the child has lived through on the other. The results of the correlation analysis using Spearman's coefficient are presented in **Table 5**.

The results indicate that the composite indicators of traumatic experience, both related and not related to hostilities, have significant (predominantly small and moderate) positive correlations with virtually all the metrics of the instruments used to assess children's maladaptation and the severity of PTSD symptoms.

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Fig. 3. The levels of PTSD manifestations in children, based on results of parental questionnaire for assessing children traumatic experiences, proposed by N.V. Tarabrina (2001)

Table 5

Correlations between indicators of traumatic experience, PTSD, and psychological resources of child

Groups of methods	Indicators, scales	Sum of child's traumatic experiences connected with hostilities	Sum of child's traumatic experiences not connected with hostilities
Version of screening instrument for parents	Child's maladaptation indicators, by spheres		
	Psychophysiological	0,26**ос	0,22**ос
	Emotional	0,38**с	0,24**ос
	Cognitive	0,16**ос	0,21**ос
	Behavioral	0,11**ос	0,19**ос
	Communicative	0,12**ос	0,20**ос
	General indicator of maladaptation	0,28**ос	0,26**ос
	Indicator of child's psychological resources		
	General indicator of psychological resources	−0,19**ос	−0,12**ос

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Groups of methods	Indicators, scales	Sum of child's traumatic experiences connected with hostilities	Sum of child's traumatic experiences not connected with hostilities
Parental questionnaire for assessing children's traumatic experiences	criterion A	0,30**ос	0,24**ос
	criterion B	0,29**ос	0,27**ос
	criterion C	0,26**ос	0,20**ос
	criterion D	0,32**с	0,21**ос
	criterion F	0,09**	0,18**ос
	General indicator of PTSD symptoms	0,33**с	0,27**ос
Version of screening instrument for teachers	Child's maladaptation indicators, by spheres		
	Psychophysiological	0,04*	—
	Emotional	0,17**ос	0,06**
	Cognitive	0,05*	0,09**
	Behavioral	—	0,08**
	Communicative	—	0,08**
	General indicator of maladaptation	0,09**	0,09**
	ndicator of child's psychological resources		
	General indicator of psychological resources	—	–0,09**

Note: «*» — correlation is significant at the p < 0,05 level (two-sided), «**» — correlation is significant at the p < 0,01 level (two-sided), «ос» — small correlation significance (0,1–0,3), «с» — medium correlation significance (0,31–0,5), by the Cheddock scale.

In other words, greater trauma exposure is accompanied by increased manifestations of maladaptation and PTSD.

Discussion of results

The traumatic experiences of primary school students living in territories that have been affected to varying degrees by hostilities can be conditionally divided into those *related* to hostilities (being in a shelling zone or in immediate proximity to it, loss of loved ones, destruction/loss of home) and those *unrelated* to hostilities (parents' divorce, loss of social ties). The high percentage of children with such traumatic experiences, as revealed by the parent survey, points to the significance of the problem; however, it does not fully reflect its scale, since the questions asked were about the *types* of events (multiple choice from a given list), not their frequency.

The study of regional differences in the severity of maladaptation and PTSD manifestations showed that children in Zaporizhzhye, Kherson, Bryansk regions and Crimea have a higher prevalence of maladaptation manifestations and PTSD symptoms than children in LPR and Kuzbass. It is important to note that in Crimea the participants were students who

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moved to the republic from regions affected by hostilities, fleeing shelling and destruction. Kuzbass is the only region in this study geographically distant from the war zone, so the lower levels of maladaptation and PTSD manifestations were expected. At the same time, the relatively low levels found in children from LPR may reflect a *habituation effect* under conditions of prolonged living in close proximity to a combat zone.

The correlation analysis results showed significant positive relationships between the composite indicators of children's traumatic experience and the severity of their maladaptation and PTSD symptoms. Thus, greater trauma exposure is accompanied by heightened maladaptation and PTSD manifestations. In contrast, the children's psychological resources are negatively correlated with the volume of traumatic experience, which confirms their buffering role in mitigating its negative effects. At the same time, the trauma experienced by the child depletes the child's psychological resources, reducing the effectiveness of coping with traumatic events.

The analysis of parent and teacher assessments revealed statistically significant discrepancies in the perceived severity of children's maladaptation signs in most spheres. However, the correlation analysis indicates that high parent ratings correspond to high teacher ratings, and vice versa. It was also found that teachers rate the manifestations of children's maladaptation in other spheres of functioning lower than parents do.

Considering the child's maladaptation through the eyes of significant adults allows one to see the child's state and functioning from different angles and in different conditions: teachers observe children in the process of learning and interacting with peers, while parents observe them in a family and informal setting. Furthermore, teachers are focused on the children's educational and social development aspects, whereas parents are more sensitive to emotional and personal manifestations. The evaluation of a child's psychological resources by significant adults may need to be adjusted for social desirability; however, such evaluations can be relied upon when analyzing cases of markedly deficient or insufficient resources. The presence of such a deficiency — combined with pronounced signs of maladaptation — should serve as a warning signal for the teachers and psychologists working with these children.

Research designs for assessing children's condition, including those based on evaluations by parents and teachers, have been proposed by other authors as well (Alisic, 2011). The present study has shown that a rapid assessment of the condition of children affected by hostilities can be carried out based on expert evaluations by significant adults. These assessments make it possible to identify risk groups, which include children with Level IV maladaptation and Level III PTSD symptom severity, who require professional attention and in-depth individual diagnostics. However, these assessments do not allow for a comprehensive understanding of the prevalence of maladaptation and PTSD manifestations in younger schoolchildren affected to some degree by hostilities.

Conclusion

Our study revealed that children who have experienced the consequences of hostilities face a wide range of traumatic events. Most often, children see and hear explosions and find themselves in shelling zones. Such experiences were found to be closely associated with manifestations of maladaptation and PTSD in the child, while simulta-

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neously depleting the child's psychological resources that are necessary for effective coping with stress.

The negative consequences of the traumatic experiences were evaluated by a pair of significant adults (a teacher and a parent) in the contexts in which they observe the child — at home and at school. This approach allows one to assess how similar the child's adaptive/maladaptive behaviors are across settings, and whether they are situation-specific or pervasive. PTSD manifestations, however, were evaluated only by the parents/legal guardians. Although the obtained figures are substantially lower than those reported by other authors, they indicate a need for psychological assistance and for the development of assessment tools that can be used in mass examinations of children.

The results of our study provide a general picture of the spectrum of traumatic events children experience, the severity and prevalence of maladaptation and PTSD manifestations, and the psychological resources the child has for coping with stress that mediate the negative impact of traumatic events. These findings support the utility of a design that relies on surveys of significant adults — parents/legal representatives and teachers working with the children — for conducting a screening assessment of the psychological state and psychological consequences of traumatic experiences in younger school-age children related to hostilities.

It is important to take these data into account when developing targeted psychological assistance programs for children who have experienced trauma related to hostilities, considering both the degree of involvement of the region of residence in the consequences of hostilities and the severity of the diverse psychological consequences observed in the child.

Prospects for further research may be associated with: (1) taking into account actual data on the intensity of hostilities in the child's area of residence at the time of assessment; (2) considering the family situation and health status when analyzing the psychological consequences of the traumatic experience; (3) in-depth study of the characteristics of the traumatic experience, maladaptation manifestations, and psychological coping resources; (4) evaluating the dynamics of children's state who have been affected to some degree by hostilities; (5) considering the psychological state of the significant adults and their role in the process of coping with the traumatic experiences of children in this age group.

Limitations. The study was based only on assessments of significant adults, objective indicators (academic success, data on behavior and general health of students, etc.) were not taken into account.

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Ethics statement

All participants were informed about their participation in the study, familiarized with the goals, objectives and methods of the study, and expressed their voluntary informed consent to participate in the study.

Декларация об этике

Все участники были проинформированы о своем участии в исследовании, ознакомлены с целями, задачами и методами исследования, выразили добровольное информированное согласие на участие в исследовании.

Научная статья | Original paper

The relationship between the level of acceptance of schoolchildren in inclusive classes and their self-esteem

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Abstract

Context and relevance. To implement inclusion, it is not enough to organize joint education of children with different educational needs. It is necessary to create conditions that ensure acceptance of everyone, participation, support and accessibility of education. **Objective.** To study, in the context of joint education of schoolchildren with different educational needs, the relationship between the level of their acceptance of each other in the class as a whole, and the indicators of the personal development of students — self-esteem and the level of aspirations in the class as a whole. **Hypothesis.** The hypothesis of the study is the assumption of the existence of a connection between the level of acceptance of schoolchildren among each other in the class as an indicator of class inclusiveness and the level of their self-esteem and aspirations in general across classes with a certain level of acceptance. **Methods and materials.** The study, which was conducted in 2024, involved 1713 students from 57 fourth grades and 1525 students from 52 eighth grades from 55 schools in six regions of Russia. The sample included 230 students with disabilities (7,1%) studying in joint classes with normotypical students. The level of student acceptance was studied using the Sociomonitoring Service software and methodological complex; the parameters of student self-esteem were measured using the Dembo–Rubinstein method as modified by A.M. Prikhozhan. **Results.** Data analysis revealed the presence of three types of classes with different levels of acceptance among fourth graders (high — 9%, insufficient — 77%, low — 14%) and among eighth graders (high — 13%, insufficient — 63%, low — 23%). In fourth and eighth grades with a higher level of acceptance, a smaller proportion of students with low self-esteem and low aspirations was observed. In classes with a high level of acceptance, low self-esteem was not observed among students with disabilities. There were statistically significant differences between classes of different types in terms of levels of self-esteem and aspirations. **Conclusions.** It has been shown that in classes with a high level of acceptance of each other by students, there is a higher level of self-esteem and aspirations, which favors their personal development, which demonstrates the significant role of acceptance in achieving an inclusive educational environment. It is recommended that schools pay more attention to ensuring an accepting environment in classrooms as one of the key conditions for inclusion.

Связь уровня принятия школьниками друг друга в инклюзивных классах и их самооценки

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Резюме

Контекст и актуальность. Для реализации инклюзии недостаточно организовать совместное обучение детей с разными образовательными потребностями. Необходимо создать условия, которые обеспечивают принятие каждого, участие, поддержку и доступность обучения. **Цель.** Выявить в условиях совместного обучения школьников с различными образовательными потребностями связь уровня их принятия друг другом в целом по классу с показателями личностного развития учеников — самооценкой и уровнем притязаний в целом по классу. **Гипотеза исследования.** Между уровнем принятия школьниками друг друга в классном коллективе как показателем инклюзивности класса и уровнем их самооценки и притязаний в целом по классам существует определенная связь. **Методы и материалы.** В исследовании, проходившем в 2024 г., приняли участие 1713 обучающихся из 57 четвертых классов и 1525 обучающихся из 52 восьмых классов 55 школ шести регионов России. Выборка включала 230 учеников с ограниченными возможностями здоровья (7,1%), обучавшихся в совместных классах с нормотипичными детьми. Уровень принятия обучающихся изучался с использованием программно-методического комплекса «Социомониторинг Сервис», параметры самооценки обучающихся измерялись по методике Дембо–Рубинштейн в модификации А.М. Прихожан. **Результаты.** Анализ данных выявил наличие трех типов классов с разным уровнем принятия среди четвертых классов (высоким — 9%, недостаточным — 77%, низким — 14%) и среди восьмых классов (высоким — 13%, недостаточным — 63%, низким — 23%). В четвертых и восьмых классах с более высоким уровнем принятия наблюдалась меньшая доля учеников с низ-

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кой самооценкой и низким уровнем притязаний. В классах с высоким уровнем принятия не наблюдалось низкой самооценки у обучающихся с ограниченными возможностями здоровья. Имели место статистически значимые отличия между классами разных типов по уровням самооценки и притязаний. **Выводы.** Показано, что в классах с высоким уровнем принятия школьниками друг друга наблюдается более высокий уровень самооценки и притязаний, благоприятствующий их личностному развитию, что демонстрирует существенную роль принятия в достижении инклюзивности образовательной среды. Рекомендовано школам уделять больше внимание обеспечению принимающей обстановки в классах как одному из ключевых условий инклюзии.

Ключевые слова: социальные отношения, совместное обучение, инклюзия, принятие, самооценка, личностное развитие, социомониторинг

Introduction

The practice of educational inclusion in the education system of the Russian Federation has been developing over the past fifteen years.

As noted in international documents regulating the implementation of the Convention on the Rights of Persons with Disabilities (2006), joint education of students with disabilities in itself, without the creation of the necessary conditions, does not lead to their inclusion in the educational process (General Comment, 2016, p. 4).

This makes it relevant to study the conditions of inclusion, which is the subject of this article.

Public and scientific discourse on the effectiveness or ineffectiveness of inclusive education often focuses on issues of accessibility of the environment, the development of adapted programs, the professional level of teachers, and the staffing of educational organizations which, of course, is of great importance, but at the same time insufficient attention is paid to social relations in educational institutions (Indenbaum, 2023).

There is also insufficient attention to the assessment of personal achievements of schoolchildren, which are closely related to the development of their social competencies, including the formation of accepting relationships.

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To create an inclusive environment, specially organized activities are needed, aimed at creating a favorable psychological climate, a friendly, accepting environment, which can positively influence the personal development of schoolchildren.

An inclusive environment, in contrast to a non-inclusive one, is characterized by the presence of students with different educational needs (EN).

In this regard, an important indicator characterizing an inclusive environment is the focus of classmates on communicating with each other, despite the differences between them due to the diversity of special educational needs (SEN).

This indicator, which can be defined as the acceptance by the team of each teacher, including students with special educational needs, should be considered as one of the criteria of an inclusive environment along with the criteria of participation, accessibility and support.

It has been shown (De Bruyn et al., 2009), that the level of acceptance of a student, determined by the positive attitude of his peers towards him, affects the risk of becoming a victim of bullying and the potential aggressiveness of the child: the less a child is accepted by others, the greater the risk of his aggression towards others and the risk of becoming a victim of aggression depending on the combination with other factors

Thus, a high level of acceptance by children of each other, regardless of their characteristics, can be seen as an essential condition and, at the same time, a result of the inclusive process.

According to the results of studies conducted in the conditions of individual educational organizations (special schools), students with disabilities, especially with intellectual disabilities, had inflated self-assessment and poorly differentiated level of aspirations in a situation of insufficient experience of communication in a wider society and, as a consequence, problems in building interpersonal relationships with peers outside of school.

According to the same data, in the environment of comprehensive schools such children had low self-esteem and aspirations, which led either to their aggressive behavior or to isolation from others and withdrawal into themselves and, as a result, to isolation from their peers.

At the same time, in an inclusive class, adolescents with mental disabilities develop the ability for social comparison and reflection better than in special (correctional) schools, which creates conditions for the formation of adequate self-assessment in them.

Modern research has shown that students with learning disabilities who face challenges in the school environment in mainstream schools not only have lower levels of academic achievement but also a lower level of experienced well-being and an increased risk of bullying, which affects their level of self-assessment, experiences of loneliness, and mental

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health risks such as anxiety and depression (Williams et al., 2024; Touloupis, 2024)

Self-esteem is closely related to the social status of a teenager in a group: the higher his self-assessment, the higher his social status in the group, and vice versa.

Children who are perceived negatively by their peers develop lower self-assessment, which often leads to their antisocial behavior and negative consequences that affect the psychological climate of the class as a whole.

The implementation of criteria of acceptance, accessibility, support, and participation is closely linked to the formation of a favorable psychological climate, which should be inherent in an inclusive school or class.

An inclusive psychological climate is based on social-emotional acceptance, which is formed through the process of communication between students. organized through clear rules for interaction in a team, support in learning and personal development, inclusion in interactions in different compositions of study groups, support for a positive perception of oneself and others (Lyskova, 2019; Margas, 2023).

However, without regular, meaningful communication between students, acceptance remains just an abstract idea.

It is through daily acts of communication — playing together, helping with homework, working on shared projects, and talking during recess — when students overcome barriers, get to know each other, develop empathy, and come to a deep, sincere acceptance of the individual characteristics of each member of their group.

This transforms an inclusive classroom from a simple coexistence of different children into a real community based on respect and mutual understanding.

The parameters of mutual acceptance of students were studied in schools of the Novosibirsk region using the methodology of "Sociomonitoring" (Ryapisova, Tchepel, 2013). During the analysis, classes with a high level of acceptance (38%), an average level (50%) and a low level (12%) were identified.

In our planned study using the "Sociomonitoring" method, the indicators of the level of students' acceptance of each other in general across classes (Khabarova et al., 2004) were studied in their connection with the parameters of self-esteem, which are significant for the personal development of students, according to the study of A.M. Prikhozhan.

The level of acceptance, as a criterion of inclusiveness, and the levels of self-esteem and aspirations were chosen by us as parameters to evaluate an inclusive educational environment (Evaluation of an inclusive educational environment 2024).

The key point for this work is that the social relations in an inclusive class are based on acceptance of the other with his individual differences.

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Based on this, this study assumed that there is a certain connection between the level of acceptance of all students in the class and the level of self-assessment and aspirations of students

Identifying this connection was the goal of this study. As far as we are aware, it has not been studied by anyone, which allows us to say that our research is novel.

Materials and methods

Methodological framework. This study is grounded in the cultural-historical theory of L.S. Vygotsky, which conceptualizes psychological development as a socially mediated process, shaped through interaction with significant others, cultural tools, and communication. From this perspective, personal development is viewed as the result of internalizing social experience and gradually forming self-regulation and individual agency.

Sampling

The sample consisted of pilot schools participating in the national implementation of the inclusive school model in Russia. These schools were selected by the Federal Center for General and Additional Inclusive Education at the Moscow State University of Psychology and Education (Samsonova et al., 2025).

Schools selected classes based on whether they offered co-educational instruction for students with various educational needs (students with disabilities, gifted students, students whose native language of instruction is not Russian, etc.): 109 classes in total, including 57 fourth-grade and 52 eighth-grade students. The sample included 3238 students — 1713 fourth-grade students and 1525 eighth-grade students — from 55 schools, representing 11,7% of the total number of schools in six regions of Russia. The inclusion of adolescents of different ages (fourth and eighth grades) in the sample allows for a comparison of the relationship between group acceptance and self-esteem across these age ranges. The number of students with disabilities in the entire sample was 230 (7,1%). Empirical data collection was conducted in 2024.

The empirical base included general education schools in six regions of the Russian Federation:
• Donetsk People's Republic
• Kaliningrad Region
• Krasnoyarsk Region
• Lipetsk District
• Stavropol Region
• Khanty-Mansi Autonomous Okrug — Yugra.

Research methods:

1. Self-Assessment and Aspirations

To assess personal development and aspiration levels, the study used the Dembo–Rubinstein self-assessment method, as modified by A.M. Prikhozhan.

Normative data for 4th and 8th-grade students were used based on age-specific thresholds:

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• For students aged 10–11: normative self-assessment range is 65–85 points

• For ages 12–14: 64–82 points

Aspirations in our sample were somewhat elevated compared to original norms:

• 4th grade: 84–96 points

• 8th grade: 80–95 points.

2. Peer Acceptance

To measure the level of peer acceptance in inclusive classrooms, we employed the Sociomonitoring Service (Khabarova et al., 2004), a software-and-methodology complex (SMC) designed for efficient large-scale data collection and analysis.

Students completed a "communication frequency card", where they rated how often and how positively they interact with each of their classmates:

• +3 — Very frequent, like close friends

• +2 — Frequent, like good acquaintances

• +1 — Rare, but pleasant

• –1 — Rare, with discomfort

• –2 — Actively avoid communication

• –3 — Consider communication entirely inappropriate

These scores were used to calculate:

• Acceptance by others: average of points each student received (S/j)

• Acceptance of others: average of points each student gave to others (S/i)

Students were ranked, and based on score distribution, three class profile types were identified:

• Type 1: High acceptance across most students (majority above +1)

• Type 2: Mixed acceptance (some scores between +0,4 and +1)

• Type 3: Low acceptance, frequent rejection (many scores below +0.4)

Statistical Analysis. Data analysis was conducted using SPSS v.26.0, applying:

• One-way ANOVA

• Kruskal-Wallis non-parametric test

• Descriptive statistics

• Frequency analysis

Results

Based on the analysis of peer acceptance levels in inclusive classrooms, three distinct class profile types were identified, each reflecting a different level of inclusivity:

• Type 1: High level of peer acceptance

• Type 2: Insufficient level of acceptance

• Type 3: Low level of acceptance.

These profiles were determined using the "Sociomonitoring Service" and were visually represented in Figures 1–3.

Distribution of Class Types
Among 4th-grade classes:

• 9% (6 classes) were classified as Type 1

• 77% (49 classes) as Type 2

• 14% (9 classes) as Type 3

• Among 8th-grade classes:

• 13% (8 classes) — Type 1
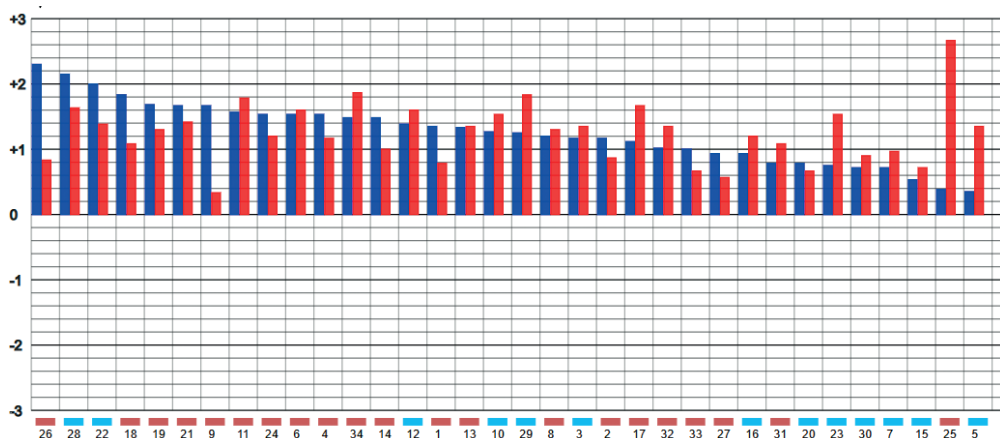
Fig. 1. An example of a class profile with a high level of student acceptance of each other
the blue bars indicate the level of acceptance of each group member by others;
the red bars reflect the student's level of acceptance of other group members

- 63% (38 classes) — Type 2
- 23% (14 classes) — Type 3

In Type 1 classes, the range of mutual acceptance scores was from +0,4 to +2,8, and no students experienced social exclusion, indicating a high level of inclusivity.

In Type 2 classes, scores ranged from −1,2 to +1,9, showing a more uneven distribution — some students were included, while others were only partially accepted.

In Type 3 classes, the range was −2,0 to +1,6, with notable instances of peer re-
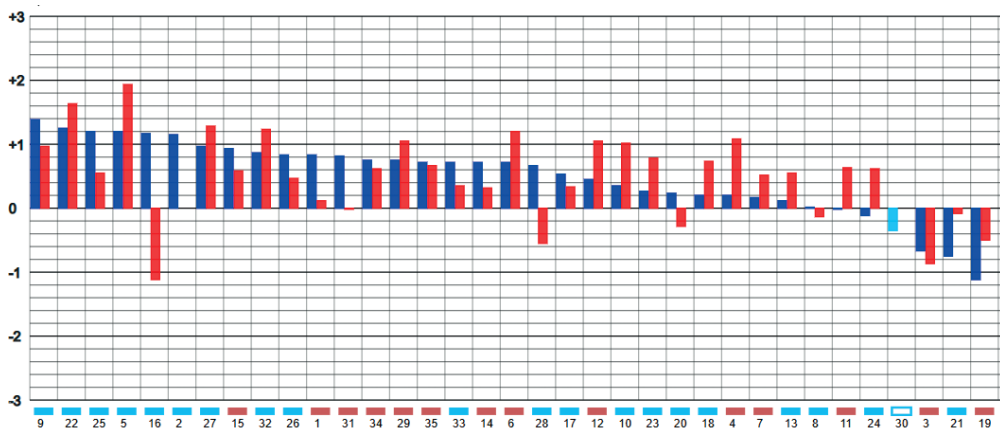
Fig. 2. An example of a class profile with a level of student acceptance that is insufficient for inclusion
the blue bars indicate the level of acceptance of each group member by others; the red bars reflect
the student's level of acceptance of other group members

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jection, social isolation, and lack of close interactions — indicating serious challenges in mutual acceptance.

At the same time, the majority of the class has no desire to interact with their classmates and rejects them (red bars with negative values). Taken together, this indicates serious problems with social acceptance within the class.

When comparing the results obtained using the Sociomonitoring and Dembo-Rubinstein methods, certain trends can be noted in the distribution of students with low, medium, and high levels of self-esteem and aspirations across class types (Table 1).

Students with unfavorable personality development are fewer in
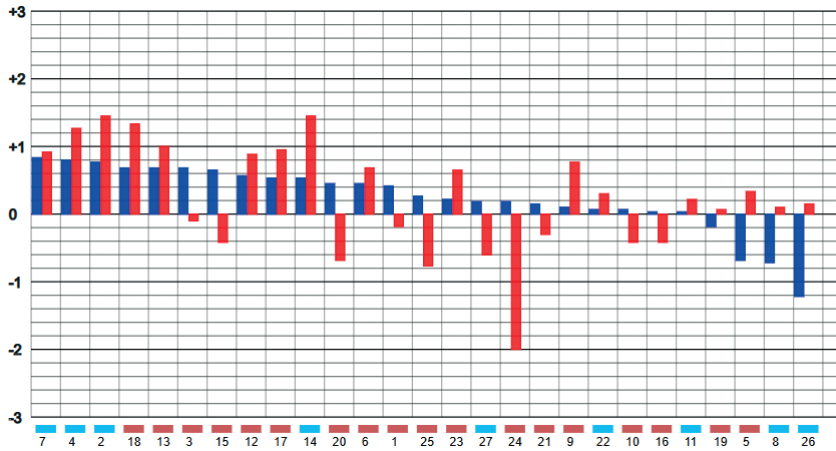
Fig. 3. An example of a class profile with low levels of student acceptance of each other:
the blue bars indicate the level of acceptance of each group member by others;
the red bars reflect the student's level of acceptance of other group members

Table 1

**Distribution by class type of students who have low, medium
and high levels of self-esteem and aspirations**

Class type* — N of classes (Ni / N, %), (NSt — sample of students; NSWD — / students with disabilities in a sample)	Self-esteem, N_i (N_i / N, %)			Aspiration level, N_i (N_i / N, %)		
	Low	Medium	High	Low	Medium	High
first type of fourth grades: N = 6 (9%); N_{St} = 140, N_{SWD} = 13 (9,3% of 140)	17 (12%) N_{SWD} = 0	99 (71%) N_{SWD} = 9	24 (17%) N_{SWD} = 4	26 (19%) N_{SWD} = 0	90 (64%) N_{SWD} = 10	24 (17%) N_{SWD} = 3
second type of fourth grades: N = 49 (77%); N_{St} = 1118, N_{SWD} = 89 (8,0% of 1118)	267 (24%) N_{SWD} = 29	589 (53%) N_{SWD} = 50	262 (23%) N_{SWD} = 10	259 (23%) N_{SWD} = 28	557 (50%) N_{SWD} = 41	302 (27%) N_{SWD} = 20

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Class type* — N of classes (Ni / N, %), (NSt — sample of students; NSWD — / students with disabilities in a sample)	Self-esteem, N_i (N_i / N, %)			Aspiration level, N_i (N_i / N, %)		
	Low	Medium	High	Low	Medium	High
3-й тип 4-х кл. / third type of fourth grades: N = 9 (14%); N_{St} = 264; N_{SWD} = 28; (10,6% of 264)	98 (37%) N_{SWD} = 19	116 (44%) N_{SWD} = 9	50 (19%) N_{SWD} = 0	124 (47%) N_{SWD} = 19	103 (39%) N_{SWD} = 5	37 (14%) N_{SWD} = 4
1-й тип 8-х кл. / first type of eighth grades: N = 8 (13%); N_{St} = 187; N_{SWD} = 6 (3,2% of 187)	25 (13%) N_{SWD} = 0	125 (67%) N_{SWD} = 4	37 (20%) N_{SWD} = 2	35 (19%) N_{SWD} = 0	106 (57%) N_{SWD} = 5	45 (24%) N_{SWD} = 1
2-й тип 8-х кл. / second type of eighth grades: N = 38 (63%); N_{St} = 836; $N_{SWD ы}$= 50 (6,0% of 836)	223 (27%) N_{SWD} = 16	399 (48%) N_{SWD} = 24	214 (25%) N_{SWD} = 10	239 (29%) N_{SWD} = 19	385 (46%) N_{SWD} = 21	210 (25%) N_{SWD} = 10
3-й тип 8-х кл. / third type of eighth grades: N = 14 (23%); N_{St} = 376; N_{SWD} = 37 (9,8% of 376)	110 (29%) N_{SWD} = 18	180 (48%) N_{SWD} = 15	86 (23%) N_{SWD} = 4	135 (36%) N_{SWD} = 14	180 (48%) N_{SWD} = 19	61 (16%) N_{SWD} = 4

Notes: * — type of classes by level of acceptance: 1 type — high, 2 type — insufficient, 3 type — low.

classes with high levels of student acceptance, while these indicators of unfavorable personality development are more pronounced in classes with insufficient and especially low levels of acceptance. Among fourth-grade classes, 9% showed high levels of student acceptance (Type 1), while among eighth-grade classes, the figure was 13%. These classes also showed higher levels of self-esteem and aspirations. Moreover, in these classes, even students with low self-esteem are not rejected by the group. It is important to note that students with disabilities in Type 1 classes (high levels of acceptance) do not have low self-esteem in either fourth or eighth grades (Table 1).

Classes of different profile types differ statistically significantly in self-esteem and aspiration levels among both fourth- and eighth-grade students,

according to the results of a one-way Kruskal-Wallis nonparametric analysis of variance (Table 2). Furthermore, it can be noted that the median and mean rank values for class types 1 and 2 differ from each other to a lesser extent than from the corresponding values for class type 3.

As can be seen from Table 3, pairwise comparison of indicators using Dunn's test with Bonferroni correction reveals differences in the level of self-esteem and in the level of aspirations between the fourth grades of types 1 and 2 and the classes of type 3 at a significance level of 0,05. For the eighth grades, differences in the level of self-esteem are statistically significant only between the classes of types 1 and 3, and in the level of aspirations both between the classes of types 2 and 3, and between the classes of types 1 and 3. At the same time, the classes of types 1 and 2 do not differ significantly

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Table 2

Descriptive statistics of self-esteem and level of aspirations of students depending on the type of class profile by level of acceptance*

Indicator	Type of class profile	Sample size, N		Middle rank	Median	Standard deviation
		Valid	Missed			
Fourth grades						
Self-esteem	1	141	0	865,41	74,00	9,46
	2	1272	46	852,53	74,71	14,04
	3	258	1	738,45	71,71	17,76
Kruskal-Wallis Test	H = 12,562; df = 2; **p = 0,002**					
Level of aspirations	1	140	1	872,63	92,00	7,32
	2	1243	75	858,23	92,66	10,65
	3	255	4	601,57	85,00	14,79
Kruskal-Wallis Test	H = 64,320; df = 2; **p < 0,001**					
Eighth grades						
Self-esteem	1	186	0	803,87	74,64	10,11
	2	999	18	761,45	73,57	14,07
	3	323	0	704,56	71,43	14,45
Kruskal-Wallis Test	H = 6,894; df = 2; **p = 0,032**					
Level of aspirations	1	186	0	768,63	90,00	9,63
	2	981	36	750,92	89,00	12,69
	3	293	30	637,93	85,00	13,57
Kruskal-Wallis Test	H = 17,963; df = 2; **p < 0,001**					

Notes: * — type of classes by level of acceptance: 1 type — high, 2 type — insufficient, 3 type — low; statistically significant differences in Kruskal-Wallis Test at p < 0,05 are highlighted in bold.

Table 3

Pairwise comparisons of classes with different level of acceptence using Dann's test or Dunn-Bonferroni method*

Profile types of the compared classes	Criterion statistics	Standard deviation	Standard criterion statistics	p-value	Corrected p-value[a]
Fourth grades					
Self-esteem					
3–2	114,079	32,946	3,463	0,001	**0,002**

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Profile types of the compared classes	Criterion statistics	Standard deviation	Standard criterion statistics	p-value	Corrected p-value[a]
3–1	126,964	50,534	2,512	0,012	**0,036**
2–1	12,885	42,828	0,301	0,764	1,000
Level of aspirations					
3–2	256,660	32,494	7,899	0,000	**0,000**
3–1	271,067	49,719	5,452	0,000	**0,000**
2–1	14,407	42,138	0,342	0,732	1,000
Eighth grades					
Self-esteem					
3–2	56,896	27,873	2,041	0,041	0,124
3–1	99,315	40,082	2,478	0,013	**0,040**
2–1	42,419	34,775	1,220	0,223	0,668
Level of aspirations					
3–2	112,992	28,057	4,027	0,000	**0,000**
3–1	130,698	39,510	3,308	0,001	**0,003**
2–1	17,706	33,703	0,525	0,599	1,000

Notes: * — type of classes by level of acceptance: 1 type — high, 2 type — insufficient, 3 type — low; [a] — Bonferroni correction for multiple tests has been applied to the values; statistically significant differences at p < 0,05 are highlighted in bold.

from each other either in self-esteem or in the level of aspirations.

Discussion of results

Our pilot study identified three types of classrooms based on the level of student acceptance using the "Sociomonitoring" method.

According to the authors of this method, Type 1 classrooms provide a social environment favorable to all children, where the value of human relationships is paramount; students support each other and derive satisfaction from interactions and collaborative activities within the classroom.

Type 2 classrooms typically prioritize academic achievement; students are divided into groups based on their academic performance, within which they primarily interact, with little contact with students from other groups. Thus, social stratification is evident within the classroom, with potential for conflicts, clashes of interest, increased social tension, and attempts to change the current situation. In Type 3 classes, the teacher imposes strict, authoritarian norms on children's behavior, aimed at maintaining discipline in the classroom and excluding interaction between children during lessons. Children are confined to narrow boundaries and forced to suppress their own behavioral and emotional reactions (Khabarova et al., 2004).

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Our data are consistent with these descriptions by the developers, in that Type 1 classes with high levels of acceptance have a significantly lower proportion of students with low self-esteem and low aspirations than classes with insufficient and especially low levels of acceptance (Types 2 and 3). Students with disabilities in Type 1 classes do not have low self-esteem.

Our study found statistically significant differences in self-esteem and aspirations in both 4th and 8th grades with different levels of acceptance (Table 2). Statistically significant differences were observed only between classes of types 1 and 3, and 2 and 3, but not between classes of types 1 and 2 (Table 3).

The proportion of classes with a high level of acceptance, where it can be assumed that the homeroom teacher has succeeded in creating an inclusive culture of inclusion of every student, conscious participation in the life of the group, and acceptance of all by all, is 9% in fourth grades and 13% in eighth grades. The development of an inclusive culture in educational organizations aims to create a favorable psychological climate aimed at the well-being of all students. This culture orients all participants in educational relationships toward the creation of a school community based on inclusive values (Booth, Einscow, 2007; Shemanov, Ekushevskaya, 2018; Bozhani et al., 2025). The presence of an inclusive culture in Type 1 classes is confirmed by the fact that

students with disabilities in these classes have average or high self-esteem, rather than low self-esteem.

Most classes are characterized by a level of acceptance insufficient for inclusion (Type 2), where some students experience exclusion. This type includes 77% of fourth-graders and 63% of eighth-graders. Some classes had extremely low levels of acceptance (Type 3 — 14% of fourth-graders and 23% of eighth-graders).

Comparative Insights

A 2011–2012 study by Ryapisova and Chepel in Novosibirsk found that:
• 38% of classes were Type 1
• 50% were Type 2
• 12% were Type 3

In contrast, our current results show a decline in inclusive classroom profiles (Type 1: only 9% in 4th grade, 13% in 8th grade). This decline may be due to:
• Different sample compositions
• Shifts in sociocultural conditions
• Staff shortages and reduced support infrastructure

Regardless of the cause, the findings highlight the urgent need to purposefully cultivate inclusive environments, particularly by fostering a welcoming psychological climate in classrooms.

Final Remarks. Research by Yudina and Alekhina (2021) further confirms that while children may show a positive emotional attitude toward classmates with disabilities, they may still avoid interaction. True inclusion goes beyond attitude

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and requires active participation and acceptance in daily peer interactions.

The findings emphasize the urgent need to strengthen inclusive culture at both the school and classroom levels — where acceptance, support, and psychological well-being become central elements of the learning environment.

Conclusion

This study demonstrates that the level of peer acceptance in inclusive classrooms is closely associated with the self-assessment and aspiration levels of students — including those with special educational needs (SEN). A supportive psychological climate, as observed in Type 1 classes, fosters more positive self-perception and reduces developmental risks for all students.

Key conclusions:
• Inclusive culture exists in only 9% of 4th-grade and 13% of 8th-grade classes.
• All students with SEN in Type 1 classrooms showed average or high self-assessment, with none reporting low levels.
• Most classes were of Type 2 (insufficient acceptance), and a significant portion were Type 3 (low acceptance), where social exclusion and peer rejection were present.

• The presence of students with disabilities alone does not determine classroom acceptance levels, emphasizing the role of the teacher and school culture in fostering inclusivity.

Implications:
• Creating an inclusive school environment requires intentional efforts to build positive peer relationships and ensure emotional safety for every child.
• Teachers play a pivotal role in shaping classroom culture through their attitudes, practices, and interactions.
• Schools must prioritize the development of inclusive values alongside academic objectives.

Limitations. In this pilot study, the average level of mutual acceptance among students was considered as an indicator of acceptance, which requires confirmation in further studies. It would also be interesting to compare the obtained data with the results of an analysis of the academic performance of schoolchildren in the studied classes, as was done in earlier research on schools in the Novosibirsk region. All of this could deepen the understanding of the social development context in the inclusive education of schoolchildren with different educational needs.

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Contribution of the authors

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Shemanov A.Yu. — data analysis; annotation, application of statistical and mathematical methods for data analysis; manuscript writing and design.

Alekseeva M.N. — application of statistical and mathematical methods for data analysis; data collection and analysis; visualization of research results.

All authors participated in the discussion of the results and approved the final text of the manuscript.

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Быстрова Ю.А. — планирование исследования; проведение эксперимента; анализ данных; написание и оформление рукописи; контроль за проведением исследования.

Самсонова Е.В. — идеи исследования; планирование исследования; проведение эксперимента; анализ данных; написание и оформление рукописи.

Шеманов А.Ю. — анализ данных; аннотирование, применение статистических и математических методов для анализа данных; написание и оформление рукописи.

Алексеева М.Н. — применение статистических и математических методов для анализа данных; сбор и анализ данных; визуализация результатов исследования.

Все авторы приняли участие в обсуждении результатов и согласовали окончательный текст рукописи.

Конфликт интересов

Авторы заявляют об отсутствии конфликта интересов.

Ethics statement

The study was conducted by educational psychologists at the schools which had obtained informed consent from parents to conduct psychological measurements on their children.

Декларация об этике

Исследование проводилось педагогами-психологами школ, имеющих информированное согласие родителей на проведение психологических замеров у их детей.

Научная статья | Original paper

Reading books with augmented reality to preschool children: The relationship with engagement and text comprehension

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Abstract

Context and relevance. The spread of digital technologies is affecting children's reading practices, including through the emergence of books with augmented reality (AR) elements, which alter the nature of a child's interaction with text. **Objective.** This study aims to identify the relationship between the use of augmented reality technology in books while reading to preschool children and their engagement in the reading process as well as their comprehension of the text. **Hypothesis.** Books featuring augmented reality technology attract children's attention and involve them in the reading process but distract them from the content of the text being read. **Methods and materials.** The study involved 120 children (60 boys and 60 girls) aged 5–7 years (M = 75,17 months, SD = 6,16 months) from the preschool division of ANOO "Khoroshevskaya School" (Moscow). The children were randomly assigned to three equally sized and gender-balanced groups: they were read books without illustrations, with traditional illustrations, and with AR illustrations. Nonparticipant observation and structured interviews were used as research methods. **Results.** The highest level of activity (questions, comments) was observed in the group using books with AR elements. The greatest activity (questions, comments) during the reading process was observed in the group where children were read a book with AR elements. However, a significant portion of children's remarks focused on visual and sound effects rather than the text content. Notably, none of the children in this group asked questions about unfamiliar words, despite observable difficulties in understanding them.

Keywords: augmented reality, preschool age, AR books, text comprehension, reading process

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Чтение детям дошкольного возраста книг с дополненной реальностью: связь с вовлеченностью и пониманием текста

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Резюме

Контекст и актуальность. Распространение цифровых технологий влияет на практики детского чтения, в том числе через появление книг с интерактивными элементами дополненной реальности (AR). **Цель.** Выявить характер связи между использованием технологии дополненной реальности в книгах при чтении детям дошкольного возраста и их вовлеченностью в процесс чтения и пониманием прочитанного текста. Г**ипотеза.** Книги с технологией дополненной реальности привлекают внимание детей и вовлекают в процесс чтения, но отвлекают от содержания читаемого текста. **Методы и материалы.** В исследовании участвовали 120 детей (60 мальчиков и 60 девочек) 5–7 лет (M = 75,17 мес., SD = 6,16 мес.) из дошкольного отделения АНОО «Хорошевская школа» (г. Москва). Дети были случайным образом распределены на три равные по численности и полу группы: им читали книги без иллюстраций, с традиционными иллюстрациями и с AR-иллюстрациями. Использовались методы невключенного наблюдения и формализованной беседы. **Результаты.** Наибольшая активность (вопросы, комментарии) в процессе чтения наблюдалась в группе, где детям читали книгу с элементами AR. При этом значительная часть детских высказываний была связана с визуальными и звуковыми эффектами, а не с содержанием текста. Ни один ребенок из этой группы не задал вопросов по поводу незнакомых слов. **Выводы.** Книги с AR-элементами привлекают внимание детей и побуждают их к активности в процессе чтения, но визуальные и звуковые эффекты могут отвлекать ребенка от содержания, смещая внимание с текста и сюжета на визуальные эффекты.

Ключевые слова: дополненная реальность, дошкольный возраст, книги с дополненной реальностью, понимание текста, процесс чтения

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Introduction

The acquisition of reading skills is a critical stage in every child's development. On the one hand, it reflects the maturation of specific mental functions; on the other, it serves as a key instrument of socialization by providing access to the cultural heritage of humanity. Consequently, the development and support of reading skills have consistently remained a central concern of educational systems.

Research conducted over recent decades has documented a decline in reading interest among younger generations (VCIOM, 2024). This trend is not limited to Russia but has also been observed in other countries (HarperCollins Children's Books, Farshore, 2024; Clark et al., 2024).

In Russia, efforts to address this issue are currently being undertaken at various levels. Taking into account the developmental characteristics of contemporary children and drawing on the best examples of children's literature, including modern works, reading practices are being developed both in educational institutions and within families. Numerous initiatives — library-based, museum-based, and others — aimed at fostering children's interest in reading are actively supported. Programs promoting high-quality literary works and encouraging family reading are being implemented. The National Program for the Support and Development of Reading (2006) has been established, and work is underway on the Program for Supporting Children's, Youth, and Family Reading Based on Traditional Values and Considering Modern Technologies (2024).

Such sustained attention to this issue is обусловлено the fact that core reading competencies begin to develop at an early age — when a child first encounters a book, listens to an adult reading aloud, and explores illustrations. In the preschool period, adult-led reading becomes a distinct, purposeful activity, as reflected in the Federal Educational Program for Preschool Education (Order of the Ministry of Education of the Russian Federation, November 25, 2022, No. 1028).

The concept of a "reader" is applicable to preschool children even if they have not yet mastered independent reading. At this age, reading skills encompass the ability to perceive and comprehend literary texts through listening and interaction with the book, forming the foundation for later independent reading (A.V. Zaporozhets; D.B. Elkonin). A crucial component of this skill is reading competence, which includes motivation to read, text comprehension, and the establishment of an emotional connection with literature (Solntseva, Ezopova, Kaganets, 2023).

The development of a reading individual is primarily determined by the formation of motivation toward the reading process. As a structural component of reading competence, motivation emerges earlier than other components. In young children, enjoyment of reading is largely associated with illustrations and shared interaction with an adult. The reading process requires sustained attention as well as volitional and cognitive effort, which poses significant challenges for young children and becomes feasible mainly toward the end of the preschool period. By this time, intrinsic motivation may already support children's engagement in reading, while sustained focus on the content contributes to the development of reading interest (Akulova, Gurovich, 2012).

A key condition for the development of the motivational component of reading competence in preschool children is the emergence of a positive emotional response associated with book perception and shared reading with an adult. Experiencing pleasure from interaction with a literary text lays the foundation for a stable interest in reading and for the further development of reading activity (Ezopova, Solntseva, 2022).

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In preschool age, reading motivation often relies on external stimuli that facilitate engagement in the process, such as illustrations, visual and tactile elements, and various special effects (e.g., sounds and smells). For this reason, considerable attention is devoted to the design of children's books. Today, book design includes not only illustrations and interactive features but also opportunities associated with digital technologies, which have become an integral part of modern children's lives.

The digitalization of childhood has already affected traditional childhood practices — play, productive activities, reading, and others — endowing them with new characteristics that, in turn, influence child development. A number of studies have demonstrated that the developmental profiles of contemporary preschool children, who actively engage with digital technologies from an early age and prefer visual and interactive modes of information acquisition, differ substantially from those of their peers at the beginning of the 21st century (Klopotova, 2017; Soldatova, Vishneva, 2019; Denisenkova, Fedorov, 2021; Bukhalenkova, Almazova, Gavrilova, 2023).

Despite extensive discussion, the digitalization of childhood has not yet led to unequivocal conclusions. As in any domain, the introduction of digital technologies reveals both advantages and limitations. When such technologies are widely used in children's books (e.g., e-books, interactive books, augmented reality books), producers emphasize their educational and developmental potential. However, research indicates that these technologies are often insufficiently adapted to the age-related and psychological characteristics of young children (Bai et al., 2022; Chen, Huang, 2025). Interactive elements may overload children's perceptual systems and distract them from the main text. This concern is also emphasized by Christ et al. (2019), who stress the necessity of adapting digital books to children's developmental needs. At

the same time, interactivity attracts children and helps sustain their attention (Sun, Roberts, Bus, 2022). Overall, the positive and negative effects observed in children's interaction with digitally enhanced books are primarily determined by the degree of thoughtful design, alignment with age-specific characteristics, and the nature of early childhood reading practices (Klippen, Kucirkova, Bus, 2021). In an effort to maximize appeal, producers often transform books into objects of entertainment, thereby modifying traditional shared reading practices based on adult reading aloud and joint examination of illustrations.

Concerns have been raised that an increasing emphasis on external motivation for reading — through additional features (e.g., puzzles, hidden elements, movable parts, gamification) and special effects (e.g., sounds and smells) — may turn reading primarily into a form of entertainment. In such cases, it becomes difficult to engage children's age-appropriate cognitive capacities and volitional efforts necessary for meaningful involvement in the reading process, which presupposes focused listening (Strouse, 2017). Excessive multimedia content in children's books may also reduce the quality of adult–child interaction during shared reading and divert attention away from textual meaning.

At the same time, the use of digital technologies in education and reading is becoming increasingly widespread. Books with additional features, particularly those incorporating digital content, are popular among preschool children (Kozhevnikova, Diner, 2021), as interactivity and the opportunity to gain diverse sensory experiences are especially appealing to them. In recent years, children's books featuring augmented reality (AR) illustrations have gained rapid popularity. These books combine traditional printed illustrations with access to digital audio and video content. To view AR illustrations, a digital device (smartphone or tablet) is used. When a child or adult points the device's camera at a page of a printed book for which additional content has

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been created, a dedicated application displays this content on the screen. Compared with traditional printed books, interaction with AR books differs substantially: readers hold a digital device over the printed book and observe how static illustrations acquire motion, accompanied by additional video and audio effects absent from the printed version. This effect attracts children and helps sustain their attention. Several studies have shown that children interacting with AR books demonstrate higher levels of engagement, maintain attention for longer periods, and more frequently initiate rereading (Şimşek, 2024; Du, Sanmugam, Barkhaya, 2024).

An analysis of existing research indicates that, to date, there is insufficient empirical evidence to draw definitive conclusions regarding the impact of AR technologies in children's books on preschoolers' text comprehension, attitudes toward reading, and reading motivation (Klopotova, Smirnova, 2024). Moreover, available findings are often inconsistent (Son, Butcher, 2024; Savva, Higgins, Beckmann, 2022; Chang et al., 2023).

The aim of the present study was to examine the nature of the relationship between augmented reality technology in children's books, children's engagement in the reading process, and text comprehension. We hypothesized that the use of AR illustrations in children's books would attract children's attention to the book and the reading process while simultaneously distracting them from the textual content.

The theoretical framework of the study is grounded in the cultural-historical approach (L.S. Vygotsky; D.B. Elkonin), within which the development of reading activity is conceptualized as a form of shared cultural practice between the child and the adult, as well as in contemporary research on reading competence (Solntseva, Ezopova, Kaganets, 2023).

Thus, the present study aims to refine and extend current understanding of the relationship between augmented reality technology and key components of preschool children's reading activity, including engagement in the reading process and text comprehension.

The assessment of children's engagement in reading based on their questions and comments has long been used in psychological and educational research (Moschovaki, Meadows, 2005; Lepola et al., 2023; Son et al., 2023). Children's activity during reading — in the form of questions and comments — can be considered an indicator not only of engagement but also of text comprehension. By asking questions and making comments, children demonstrate active cognitive processing of the material. It has been shown that children who more frequently ask questions and provide comments during adult-led reading better reproduce content and demonstrate higher levels of comprehension (Moschovaki, Meadows, 2005). More recent studies have likewise indicated that interactive engagement during shared reading, including questions and comments, is positively associated with text comprehension outcomes (Son et al., 2023).

Materials and methods

Within the framework of the study aimed at identifying the impact of augmented reality (AR) technology in children's books on children's engagement in the reading process and text comprehension, three book formats were examined: books without illustrations, books with traditional printed illustrations, and books with augmented reality (AR) illustrations.

The experimental material was the book by N. Landa Basya: A Cat's Diary. Sequel*,* which met the objectives of the study, including the presence of AR illustrations and the possibility of reading the text without displaying them. Children were read one story, Carolina the Brave, which contained four traditional printed illustrations that could also be presented in an augmented reality format. None of the participants had been previously familiar with the text. The reading session lasted approximately 15–20 minutes. The story

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featured four main characters (a cat, a horse, a cow, and a grandmother) and included several words unfamiliar to the children, such as milk pail*,* cowshed*,* and fresh milk*.*

Participants

The experiment was conducted in the preschool department of the Autonomous Non-Commercial Educational Organization "Khoroshevskaya School" in Moscow and involved 120 children (60 boys and 60 girls) aged 5 to 7 years (M = 75,17 months, SD = 6,16 months). All participants were randomly assigned to three groups equal in size and gender composition (40 children per group):

• EG1 (N = 40): reading a book without illustrations;

• EG2 (N = 40): reading a book with traditional printed illustrations;

• EG3 (N = 40): reading a book with printed illustrations supplemented by AR illustrations.

Based on pedagogical assessment conducted within the framework of the preschool educational program Inspiration*,* no significant differences were found between the groups in terms of speech development or the formation of reading-related skills.

Procedure

Reading sessions were conducted by a preschool teacher who regularly worked with the participating children. In EG1, children were read the text printed on A4 sheets. In EG2, reading was accompanied by traditional printed illustrations. In EG3, in addition to printed illustrations, the teacher demonstrated AR images using a tablet at the corresponding moments in the text.

All sessions took place in the afternoon during free activity time. Each of the three experimental groups was divided into small subgroups of 4–5 children, with whom the teacher worked sequentially.

During the reading process, the researcher conducted non-participant observation, record-ing children's questions and comments. After the reading session, each child participated in an individual structured interview aimed at assessing their attitude toward the reading process. During the subsequent month, the book remained freely accessible in the group to observe the maintenance of children's interest over time.

Measures

To assess text comprehension and attitudes toward reading, a diagnostic toolkit was developed, including a non-participant observation checklist for the reading process and a structured interview protocol for children.

Children's engagement in the reading process and comprehension of the text were assessed based on their observable activity in the form of questions and comments related to the text. All questions and comments were recorded by the experimenter in the observation protocol during adult-led reading.

Children's questions and statements were evaluated according to the following parameters:

• the total number of questions and comments related to the read text expressed by each child;

• differentiation between questions/comments related to the content of the book and those related to the book format (AR);

• questions and comments concerning unfamiliar words (milk pail*,* cowshed*,* fresh milk**).**

A child was considered active if, during the observation, they expressed engagement with the book content through at least one question or comment.

Children's attitudes toward the book were assessed during the structured interview, which included questions aimed at identifying whether the child liked the book and whether they would like to have such a book at home. Attitudes were evaluated quantitatively based on "yes/no" responses and qualitatively based on the arguments provided by the child.

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To achieve the study objectives, an expert evaluation of the diagnostic toolkit was conducted. Experts were specialists in the field of preschool education. The observation checklist and interview protocol were submitted for review to assess their correspondence with the study objectives related to examining children's engagement and text comprehension. Evaluation criteria included age appropriateness and relevance to the research goals. The assessment was conducted using a three-point scale (0/1/2). Items receiving fewer than 5 points across the three expert ratings were revised in accordance with expert recommendations. The final version of the toolkit, approved by all experts, was used in the empirical study. Expert evaluation ensured the content validity of the instruments employed (Hessmann, Sheronov, 2013).

Following the empirical phase of the study, qualitative and quantitative analyses of the collected data were conducted using methods of mathematical statistics, including Pearson's chi-square (χ^2) test.

Results

Analysis of non-participant observation results

At the overall level of engagement during the reading process, differences were observed across experimental subgroups in the proportion of children who demonstrated active involvement with the text content in the form of questions and comments. In experimental group EG1, 45% of participants (n = 18) exhibited activity; in EG2, this proportion increased to 72% (n = 29); and in EG3, to 90% (n = 36). According to the results of Pearson's chi-square (χ^2) test, the proportion of active participants in EG1 was significantly lower than in EG2 (p < ,001). The difference between EG2 and EG3 did not reach statistical significance (p = ,086).

The number of questions and comments per child in EG3 was substantially higher than in EG1 and EG2. In EG1 and EG2, children's questions and comments were exclusively related to the content of the book (e.g., "So is Carolina a cat or a horse?", "What is a cowshed?", "What was the cat's name?"). In contrast, in EG3, 58% of children (n = 23) asked questions and made comments that were not related to the textual content. These statements concerned the augmented reality format itself, including the demonstration process, the movements and sounds of the characters, or were unrelated spontaneous remarks (e.g., "How do they make it come alive?", "Can our books be animated like this?", "That's funny").

Nevertheless, even when accounting for these content-irrelevant statements, the subgroup in which children were read a book with augmented reality illustrations demonstrated nearly twice as many content-related questions and comments per active child compared to EG1 and EG2 (see Table 1).

Observations conducted over the month following the reading session showed that children displayed active interest in the book with augmented reality illustrations primarily during the first few days. Subsequently, over the course of the month, children did not return to the book on their own initiative. It was found that 20% of children in EG2 (n = 8) and one child (2,5%) from each of EG1 and EG3 recalled the book. Application of Pearson's chi-square test indicated that these differences between groups were statistically significant (p ≤ ,01).

Requests to reread the book were expressed by one child (2,5%) in EG1 and by three children (7,5%) in EG2.

Analysis of structured interview results

During the interview, all children who participated in the experiment (N = 120) reported that they liked the book. However, analysis of their arguments allowed for differentiation in attitudes toward the read book. Three types of responses were identified: vague responses (the child stated that the book was liked but could not

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Table 1

Results of non-included observation «Reading comprehension. Child monitoring card»

Group	Content-related questions and comments				Non-content-related questions and comments		
	Number of children who asked questions or made comments	Количество вопросов		Number of children noticing unknown words	Number of children who asked questions or made comments	Количество вопросов	
		Всего	Questions per child			Всего	Questions per child
EG1 (N = 40)	45% (n = 18)	n = 22	1,2	23% (n = 9)	0	0	0
EG2 (N = 40)	72% (n = 29)	n = 35	1,2	43% (n = 17)	0	0	0
EG3 (N = 40)	90% (n = 36)	n = 80	2,2	0	58% (n = 23)	n = 39	1,7

explain why, or provided nonspecific answers such as "because" or "it's good"); content-based responses (the child referred to the story content, e.g., "everyone won," "I like stories about animals"); and format-related responses, referring to the illustration format (e.g., "I liked the pictures," "it's a beautiful book").

The highest proportion of vague responses was observed in EG1, where 60% of children (n = 24) provided such answers, which was significantly higher than in EG2 (22,5%, n = 9) and EG3 (22,5%, n = 9). Statistical analysis using Pearson's chi-square test revealed significant differences between the groups at p < ,05.

In EG2, the majority of children (77,5%, n = 31) identified the content of the book as the primary reason for their positive attitude. In the other two groups, such responses were considerably less frequent: 40% in EG1 (n = 16) and 17,5% in EG3 (n = 7). Pearson's chi-square analysis indicated significant differences between groups (p < ,001).

Only children in EG3 (65%, n = 26) referred to the book's design features as the basis for their positive evaluation, mentioning aspects such as "living pictures" and "everything moves."

Conversely, only in EG1 were there cases (15%, n = 6) in which children attributed their positive perception of the book to the teacher's manner of reading (e.g., "the teacher read well," "it was read nicely," "I liked how it was read").

The majority of children in EG1 (57,5%, n = 23) were unable to answer whether they would like to have such a book at home (referring to the book read in their experimental subgroup). Positive responses without justification were given by 22,5% (n = 9), while only 10% (n = 4) explicitly stated that they would not like to have the book.

In both EG2 and EG3, all children expressed a desire to have such a book at home. In EG2, most children (65%, n = 26) explained this desire by their interest in reading, whereas 35% (n = 14) referred to viewing the illustrations. In EG3, the pattern was reversed: the majority of children (77,5%, n = 31) wanted the book primarily to look at the pictures, while only 22,5% (n = 9) mentioned reading as the reason (see Table 2).

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Table 2

The results of the conversation with children «Attitude to the reading process»

Question		Argumentation	EG1 (N = 40)	EG2 (N = 40)	EG3 (N = 40)
Did you like the book?	**Yes**	**Indeterminate answer**	60% (n = 24)	22,5% (n = 9)	22,5% (n = 9)
		Content	40% (n = 16)	77,5% (n = 31)	17,5% (n = 7)
		Book characteristics (Illustrations)	0	0	65% (n = 26)
		Reading characteristics	15% (n = 6)	0	0
	No		0	0	0
Desire to have such a book at home	**Yes**	**No Response**	57,5% (n = 23)	0	0
		Indeterminate answer	22,5% (n = 9)	0	0
		how, view	0	35% (n = 14)	77,5% (n = 31)
		To read	15% (n = 26)	65% (n = 26)	22,5% (n = 9)
	No		10% (n = 2)	0	0

No substantial differences were identified between the three experimental groups in children's attitudes toward the reading process itself. Results of non-participant observation aimed at assessing attitudes toward reading did not reveal significant differences across groups. Isolated and statistically non-significant instances of children attempting to engage in alternative activities during reading or refusing to participate were recorded in EG2 (3 children, 7,5%) and EG3 (2 children, 5%). Pearson's chi-square analysis did not reveal significant differences between the groups (p > ,20).

Discussion

The empirical findings obtained in the present study support the proposed hypothesis that augmented reality (AR) illustrations attract children's attention to the book and the reading process while simultaneously potentially diverting attention away from the text itself.

The results indicate that when a book with AR illustrations was read, almost all children demonstrated active involvement in the form of questions and comments. In contrast, such manifestations of activity were considerably less frequent in groups where the book was read with traditional printed illustrations or without illustrations. These findings are consistent with the conclusions of Strouse et al. (2017) and Savva et al. (2022), who note that multimedia elements can enhance children's engagement in the reading process by stimulating responsiveness and encouraging dialogic interaction.

An analysis of the content of children's utterances allows for a more nuanced understanding of the nature of this activity. In EG1 and EG2, all questions and comments were related to the textual content, whereas in EG3 approximately one third of all remarks referred to the characteristics of the illustrations and the specifics of their reproduction in the augmented reality format

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(n = 39 out of N = 119). This shift in attentional focus partially corroborates concerns expressed by Son and Butcher (2024) that AR effects may distract children from semantic text processing by redirecting attention toward technical and visual features.

At the same time, even when this shift in attention is taken into account, the group in which children were read a book with AR illustrations demonstrated nearly twice as many content-related questions and comments per active child compared to the other groups. This finding suggests that reading a book with illustrations in this format not only captures children's attention but may also promote active engagement in the reading process, provided that it is accompanied by pedagogically appropriate adult mediation. A similar effect has been described by Chang et al. (2023), who emphasize the importance of integrating digital and textual components within a supportive adult–child communicative context.

Despite the high level of external engagement observed during reading in EG3, children in this group appeared less attentive to the textual content: none of the children asked questions about unfamiliar words, and the few difficulties in understanding that were observed were directly related to the comprehension of word meanings. This pattern may indicate a shift in attentional focus toward the book's visual effects rather than its semantic content.

Observations further showed that, although children were actively engaged during the reading of a book with AR illustrations, they did not return to the book on their own initiative after several days, despite having free access to it. For the majority of children in this group (65%, n = 26), the attractiveness of the book was primarily determined by its external features, whereas only 17,5% (n = 7) referred to its content, and the remaining children were unable to explain why they liked the book. By contrast, in EG2, 77,5% of children (n = 31) identified the content

as the main source of the book's appeal, compared to 40% (n = 16) in EG1.

These results are consistent with the conclusions of several researchers (Strouse, 2017; Bai et al., 2022; Chen, Huang, 2025), who point to the potential risk of replacing reading as a meaning-oriented activity with elements of interactive entertainment. While additional visual and auditory features may indeed increase children's engagement, they can also distract attention from the text and reduce the depth of semantic processing.

Conclusions

The findings of the present study indicate an ambivalent effect of augmented reality technology when used in illustrations in children's books. On the one hand, books with AR elements attract children's attention and encourage active participation in the reading process in the form of questions and comments. This supports the assumption that augmented reality has the potential to enhance children's engagement in reading. On the other hand, the results demonstrate that visual and auditory effects may divert children's attention away from textual content, shifting the focus toward special effects and book design rather than meaning. Thus, the use of augmented reality illustrations in children's reading cannot be evaluated as unequivocally positive or negative. Such illustrations may serve both a supportive and a distracting function in the reading process. As noted in previous research, their effectiveness largely depends on the quality of implementation and their alignment with the semantic content of the text. Future research may extend this line of inquiry by examining the long-term effects of books with augmented reality elements on the development of meaning-oriented reading, language development, and the formation of children's reading preferences.

Limitations. This study has several limitations that should be taken into account when

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interpreting the results. The sample included children aged 5 to 7 years, which restricts the generalizability of the findings to this specific age group. Future research should expand the age range of participants by including different subgroups of preschoolers. This would provide a more comprehensive understanding of how books with augmented-reality elements influence reading comprehension processes. The procedure used to develop the diagnostic tools allows us to speak only of their construct validity. Since Pearson's χ^2 test was used for statistical analysis, including in cases of small samples, the statistical significance obtained in this study can be interpreted only as an indicator for further research. Another limitation concerns the novelty factor: most children in the study had no prior experience interacting with augmented-reality illustrations. This may have affected their perception and engagement. Finally, the study was based on the analysis of a single AR-enhanced children's book. Such books may differ substantially in text content, visual design, and interactive features. Therefore, further research comparing different AR books is essential for a more precise identification of factors that contribute to preschoolers' engagement and text comprehension.

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Научная статья | Original paper

From screen to stage: reducing adolescents' smartphone addiction through theatrical activities in the zone of proximal development

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Abstract

Context and relevance. Smartphone addiction among adolescents is a behavioral addiction characterized by impaired control, withdrawal symptoms, and functional impairments. Despite the high prevalence of the problem among adolescents, there is currently limited targeted research on possible solutions, including the drama approach. The presented work is conducted in the tradition of the cultural-historical scientific school, based on the ideas of L.S. Vygotsky about the zone of proximal development and the concept of "perezhivanie". **Objective.** To evaluate the effectiveness of the "Digital Theater" activity technology for the prevention and correction of smartphone addiction in adolescents, to analyze the psychological and pedagogical aspects contributing to its impact. **Hypothesis**. Specially organized theatrical activities help reduce smartphone addiction among adolescents. **Methods and materials**. The study sample consisted of 81 adolescents aged 14–15 (two experimental groups and a control group). The adolescents participated in the "Digital Theater" program from February to May 2024. They took part in 24 drama sessions 90-minutes each. Participants completed pre- and post-testing procedures with Smartphone Addiction Scale (Sheynov, 2020). Additionally, qualitative interviews with adolescents were conducted (N = 18), teachers (N = 4), and parents (N = 2). **Results**. The analysis of the quantitative data allows us to conclude that there was a decrease in the tolerance indicator, as well as tendencies toward a reduction in the disruption of daily life, the overall addiction indicator, and the overuse indicator. The qualitative analysis reveals the nature of these changes, indicating that the study participants developed social interaction skills, strengthened their social relationships, preferred real communication over virtual communication, and acquired self-presentation approaches and skills as alternatives to digital methods. **Conclusions**. The "Digital Theater" activity-based technology may serve as a means to prevent and treat smartphone addiction in adolescents. The results are preliminary; further research is needed to assess the effectiveness of this model when applied to different youth groups.

Keywords: smartphone addiction, adolescents, theatrical activities, zone of proximal development, role experimentation, cultural-historical theory

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От экрана к сцене: снижение зависимости подростков от смартфона средствами театральной деятельности при работе с зоной ближайшего развития

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Резюме

Контекст и актуальность. Зависимость от смартфона среди подростков представляет собой поведенческую аддикцию с нарушением контроля, симптомами отмены и функциональными нарушениями. Несмотря на высокую распространенность проблемы в подростковой среде, адресных исследований, посвященных возможным способам ее решения посредством в том числе театральной деятельности, на сегодняшний день крайне мало. Представленная работа выполнена в традиции культурно-исторической научной школы с опорой на идеи Л.С. Выготского о зоне ближайшего развития и концепции переживания. **Целью** представленного здесь исследования было оценить эффективность деятельностной технологии «Мультимедиа-театр» как средства профилактики и коррекции зависимости от смартфона у подростков, обуславливающих ее воздействие факторов. **Гипотеза.** Специально организованная театральная деятельность способствует снижению зависимости от смартфона у подростков. **Методы и материалы**. Выборку исследования составили подростки 14–15 лет (две экспериментальные и контрольная группы общим объемом 81 человек). Подростки принимали участие в программе занятий «Мультимедиа-театр» с февраля по май 2024 г. Всего было проведено 24 сессии по 90 минут. Участники проходили входное и выходное тестирование по методике «Шкала зависимости от смартфона» (Шейнов, 2020). Кроме того, было проведено интервью с подростками (N = 18), педагогами (N = 4) и родителями (N = 2). **Результаты.** Анализ полученных количественных данных позволил зафиксировать снижение показателя «толерантность» и тенденции в снижении «интегрального показателя зависимости», показателей «нарушение повседневной жизни» и «чрезмерное использование». Каче-

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ственный анализ показал содержательный характер выявленных изменений, установив у участников исследования развитие навыков социального взаимодействия, укрепление социальных отношений, предпочтение реального общения виртуальному, формирование способов самопрезентации, альтернативных цифровым. **Выводы.** Деятельностная технология «Мультимедиа-театр» может стать способом профилактики и коррекции зависимости от смартфонов у подростков. Полученные результаты носят предварительный характер, требуются дальнейшие исследования эффективности этой модели в работе с подростками.

Ключевые слова: зависимость от смартфона, подростки, театральная деятельность, зона ближайшего развития, ролевое экспериментирование, культурно-историческая теория

Introduction

Researchers worldwide are currently observing the rapid spread of smartphones among adolescents as a key gadget to communicate, share and gather information, and entertain. According to the data in 2023, smartphone use by 12–14-year-olds has reached critical levels: 90% in Russia (Children Online, 2023) and 98% in the USA and UK (Teens, social media and technology, 2024; Wood et al., 2023). Simultaneously, the widespread adoption of these devices is often accompanied by risks in their use (Abi-Jaoude et al., 2020; Mayerhofer et al., 2024; Merkaš et al., 2024).

As for empirical data, older adolescents in Russia spend from 3.5 to 6 hours daily staring at smartphone screens, which significantly exceeds recommended screen time (Survey: Russian High School Students, 2024). Longitudinal studies confirm that smartphone addiction (hereafter SA in short) negatively impacts the quality of interpersonal relationships, it also contributes to academic procrastination and reduces academic performance and engagement in school life (Chen et al., 2024). Furthermore, smartphones serve as a multifunctional platform for accessing various potentially addictive applications (social media, video hosting, messengers, games) that leads to the problematic smartphone use behavior and complicates the development of effective interventions to deal with it (Nawaz, 2023).

In this study, smartphone addiction is considered as a behavioral addiction characterized by a loss of control over device usage, withdrawal symptoms upon cessation of use, continued excessive use despite negative consequences, and functional impairments

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in multiple life domains (Lin et al., 2016). It is important to distinguish SA from related constructs. Problematic smartphone use (PSU) describes a broader spectrum of dysfunctional usage patterns that do not necessarily reach a clinical level of addiction (Candussi, 2023), whereas excessive use is characterized primarily by a quantitative measure of screen time without the mandatory presence of compulsivity and functional impairments (Nawaz, 2024).

Despite a number of studies that suggest a compensatory function of online communication (Rudolf et al., 2024), other pieces of the research have shown that the social functions of smartphones do not lessen, but rather worsen their negative impact on adolescent mental health (Abi-Jaoude et al., 2020; Mayerhofer et al., 2024; Merka et al., 2024). This phenomenon is explained by the fact that smartphone-mediated interaction often replaces, rather than complements offline communication, which results in a deficit of deep emotional connections that are critical for psychological well-being throughout adolescence. This data justifies the need to develop programs aimed not at limiting smartphone use through external control, but at creating alternative offline practices that can compete with digital activities in terms of emotional intensity, social significance, and satisfaction of basic adolescents' developmental needs (Liu et al., 2020; Salepaki et al., 2025).

Contemporary scientific literature notes a growing interest in research in experimental programs for the SA improvement and prevention. In adolescent and youth environments, programs based on theatrical activities and various drama approaches hold a special place. As shown in several studies (Leather et al., 2019; Berghs et al., 2022; Summer, 2018), various theatrical programs help adolescents cope with behavioral addictions and related problems such as depression and

impulsivity. However, there is a significant lack of research in Russia that specifically addresses to the potential of theatrical activities to prevent and reduce dependence on a smartphone, correct addictive behaviors in adolescents.

In 2024, a research project was implemented by the Center for Interdisciplinary Research on Contemporary Childhood of Moscow State University of Psychology and Pedagogy. It was aimed at comprehensive study of the effects gained from the application of "Digital Storytelling Theater" technology in adolescent environments. One of its central objectives was to evaluate the effectiveness of this technology for the prevention and correction of SA, to figure out the factors contributing to such improvements.

In the context of studying SA, we examine theatrical activity through several characteristics that can potentially contribute to reducing SA. Firstly, role-playing provides adolescents with opportunities to explore alternative social identities and behavioral patterns in a safe environment. By adopting and enacting various roles and with the support of peers and adults, adolescents progress from their actual developmental level (which can be defined as strategies of limited social interactions, primarily mediated by smartphones) to a potential level (an expanded and significantly improved strategies of offline communication). Role-playing, if it is seen as a "psychological tool," mediates the transformation of external social interactions into internal psychological structures through emotionally rich experiences and collaborative activities, creating conditions for adolescents to re-evaluate their behavioral patterns (the idea is formulated basing on L.S. Vygotsky's concept (Vygotsky, 1978)).

Secondly, group work fosters an environment for lively and direct communication, which becomes a healthy alternative to time

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spent on smartphones. While doing creative activity in collaboration with others, interpersonal interaction skills that adolescents with SA often lack in are naturally acquired (Berghs et al., 2022; Cha et al., 2018). Such collaboration creates a unique space for mutual development, where adolescents solve problems in teams, learn to negotiate, and support each other. This experience helps them transfer soft skills such as self-regulation and cooperation into their daily lives. Positive social interaction experiences and strong offline emotional connections help avoid problematic social media use and its associated risks (Benvenuti et al., 2023).

Thirdly, emotional engagement ensures deep experience, which, according to the cultural-historical theory, is the observation of the social situation through the lens of the individual's inner world (Sinitsa, 2025). Through the emotional living into (experiencing) created images, adolescents gain access to alternative sources of emotional satisfaction different from "likes" (thumbs up) on social media, which promotes the development of emotional regulation skills (Kafetsios et al., 2017; Lepp et al., 2014).

Finally, the very process of creating a performance as a final product gives adolescents a significant sense of achievement and increases self-belief. This work requires them to concentrate for extended periods, plan, and coordinate actions — precisely the skills that are often weak and underdeveloped in adolescents with SA (Summer, 2018; Wilmer et al., 2017). The public presentation of the performance becomes a moment of social recognition based on real achievements, which helps shift self-esteem sources from the virtual to the real world.

Thus, specially organized theatrical activity within the framework of "Digital Storytelling Theater" represents a unique educational technology that creates a space for adolescents to experiment with roles, positions, and relationships. The potential of this technology in the prevention and correction of smartphone addiction is due to its ability to provide adolescents with opportunities to address a wide range of developmental tasks in the context of live social interaction.

Based on this theoretical and methodological framework, it was **hypothesized** that specially organized theatrical activity might reduce adolescents' smartphone addiction.

The article aims to explore the possibilities of applying the activity-based technology "Multimedia Theater" as a means of preventing and correcting smartphone addiction in adolescents.

Materials and methods

An innovative model of theatrical activity for adolescents "Digital Storytelling Theater"

The model is for educational, developmental, and upbringing purposes via theatrical activities in adolescence under the guidance of O.V. Rubtsova. It was developed from 2019 to 2023 by the Center for Interdisciplinary Research on Contemporary Childhood, a structural unit of Moscow State University of Psychology and Education. It is based on the idea of role-playing experimentation as the leading activity for adolescents which meets the key needs of this age period such as communication, recognition by a reference group, finding one's place in society, identity formation and others. According to the authors of the concept, a role becomes a cultural means of development, but only if it is emotionally experienced by the adolescent within a specially simulated drama (including situations of emotional involvement, internal reaction, the emergence of subjective significance of events experienced in the role, and the actions and states being played out) (Konokotin et al., 2025). In the context of "Digital Story-

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telling Theater," the educator purposefully constructs "micro-dramas" and elicits specific "experiences" from the participants of theatrical activities. Such "controlled experiences" arise in adolescents through exercises for developing improvisation and imagination, playing sketches, applying special theatrical practices, and reflective communication, etc.

The construction of "micro-dramas" and the creation of conditions for the emergence of dramatic "experiences" is a crucial component of the concept and is aimed at constructing the adolescents' zone of proximal development (ZPD). One of the most important tasks of adolescence is mastering the system of social roles as a new system of signs (Rubtsova, 2023). In this sense, the role "experiences" that arise during interaction allow adolescents to interiorize new social roles and "appropriate" them. This, from O.V. Rubtsova's perspective, is the key foundation of the ZPD. At the same time, the educator solves the task of constructing a space of help and social support for adolescents through specific techniques and exercises (improvisation, dramatic etudes and sketches, mini plays, drama-based discussions), resulting in the advancement of the ZPD for each participant as well as for the group as a whole learning unit (Zaretsky, 2024; Rubtsova, 2023).

Beyond the variety of activities offered to teenagers during the performance work, the most important principle of constructing the ZPD is the special participation of the educator, which, among the other aspects, is expressed in the rejection of the traditional "teacher-student" hierarchy in interaction: the educator is involved in joint activities with teenagers practically on an equal footing, i.e., as a full participant in the creative process (as a co-author and co-creator, experiencing dramatic "experiences" alongside other participants).

Sample

The study was conducted from February to May, 2024, at the school No. 4 in Kashira town, Moscow Region. The sample (N = 81, 36 girls and 45 boys, aged 14–15, 8th graders) consisted of two experimental groups (EG1 and EG2) and one control group (CG), which were already formed groups and classes of the same grade level.

The groups differed in a number of socio-psychological characteristics identified through observations and interviews with teachers before the experiment. The nature of interpersonal relationships in the class, patterns of smartphone use, and readiness to participate in public school activities were important parameters in analyzing the study results. A brief description of each group in the sample is provided below.

EG1 (N = 32, 13 girls and 19 boys). Before participating in the "Digital Storytelling Theater" project, adolescents in this group had strained interpersonal relationships: they did not participate in teamwork, had conflicts with peers (even in online chats and social networks), as well as with teachers. At school, they were engrossed in smartphones (always scrolling through news feeds, recording Reels and Stories), that was a strategy to hide their insecurity. In other words, smartphones were used for online self-presentation and communication, adolescents of this group were initially more accustomed to conducting relationships via digital platforms and messengers.

EG2 (N = 27, 14 girls and 13 boys) was characterized by group cohesion and high academic motivation, and a desire to acquire new experiences. Competition for the attention of peers and adults was noted in the group. Much like EG1, the adolescents tended to get distracted by life on social digital social networking services but actively helped

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them offline, including teamwork and support within this project.

CG (N = 22, 9 girls and 13 boys) had high motivation and pursued personal interests in their studies. Students lacked interest in school events and maintained business-like relationships in class and with teachers. The adolescents were active users of social networks, but used them not as a platform for communication, but as a tool for creating multimedia products or as an information resource. Unlike the adolescents in EG1 and EG2, their accounts did not contain personal photos or display events from their personal lives.

The school administration and teaching staff requested the implementation of a program aimed at providing adolescents with social support and developing social skills as a strategy for their inclusion in the offline life of the school community. According to research, such changes become possible, among other things, by reducing the time spent on mobile devices and fostering a conscious and functional approach to digital technologies (Benvenuti et al., 2023; Wan et al., 2022).

EG1 was in the focus of the research as due to the results of a previous theater project implemented in 2023, this group, unlike EG2, did not show progress in socialization indicators (according to exit testing results) (Poskakalova et al., 2024).

Based on interviews with teachers and data obtained about the classes and students within the framework of a previously implemented project, the research group of the Center for Interdisciplinary Research on Contemporary Childhood together with school teachers defined the contours of the zone of actual development and the zone of proximal development for EG1 and EG2 as independent educational units. For EG1, the zone of proximal development included: reducing problematic smartphone use, shifting the fo-

cus of interaction from virtual to real space, and increasing engagement in offline school activities. For EG2, the zone of proximal development was defined by the following directions: developing self-control and forming conscious and functional smartphone use.

Organization and progress of the study

The experimental program took four months. It consisted of 24 drama sessions, each of the session lasted one and a half hour and was held weekly. Each session included a warm-up (15-20 min.), a main block of activities (50-60 min.), and a reflection session (10-15 min.). As a result, adolescents from EG1 and EG2 created the performance named "Thank you, darlings. Memories of WWII heroes».

The main stages of the project.

1. Introduction and sharing of experiences. A safe space was created through theater games, storytelling, and discussion of personal experiences. Adolescents worked with family memories, stories, and photographs related to the World War II. The military theme allowed teenagers to focus on deep emotions and thoughts, including tragic experiences, and such approach fostered unity and understanding between generations, developed empathy and compassion.

2. Play script writing through teamwork in small groups under the guidance of teachers-facilitators. Based on interviews with relatives and WWII veterans, adolescents created a play script which was based on collected documentary evidence. They also wrote stylized war triangle-letters as artistic elements of the production.

3. Trying out different roles (acting, directing, technical) through etudes and sketches to enrich adolescents' experiences. It was important for educators to interest and involve participants in a maximum number of activities, provide opportunities to try out various

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types of artistic work, and identify deficits and internal states that hinder creativity, free acting, and self-expression.

4. Play production. Adolescents were divided into specialized groups, they took part in various artistic workshops, also exchanged roles and functions between groups. Adolescents recorded and edited 10 videos about their relatives' heroic deeds, which were integrated into the play's structure, ensuring a blend of dramatic performance and video content.

5. Reflective communication while viewing videos or dramatic etudes, writing and filling in reflective diaries, group discussions at the end of drama sessions. Teachers-facilitators worked within adolescents' ZPD through personal experiences that participants had in the "Digital Storytelling Theater" project and through the construction of micro-dramas. Teachers-facilitators were particularly focused on substituting adolescents' online activity with creative productive activity (making up stories, performing dramatic etudes and sketches, writing scripts, creating documentary videos).

6. Public presentation of the play to the audience (classmates, school teachers, parents), which completed the cycle of the project stages and provided external feedback on the results.

In their work, the research group of the Center for Interdisciplinary Research on Contemporary Childhood relied on three key components:

Drama tools and techniques. The research team used projective methods (working with war triangle-letters and family photographs, etc.), storytelling, interviews with veterans and relatives, role-playing and free improvisation for the purpose of empathy development.

Principle of forming ZPD (zone of proximal development). There were created two spaces of interaction: horizontal (collaboration with peers) and vertical (interaction with teachers-facilitators and adults) (Kotlyar, 2002). Being engaged in theatrical activities, adolescents from EG1 and EG2 worked together and though contributed to interaction, creative collaboration, liberation, and the establishment of trusting relationships. Emotionally rich experience ('perezhivanie' in Vygotskian terms) contributed to the transformation of personal conflicts into artistic representation. Working with adolescents' personal materials (family memories, stories, photographs) increased emotional involvement and developed reflection in the adolescents.

Active participation of teachers-facilitators. They flexibly structured the program content in accordance with the participants' needs, also created situations of choice, ensured psychological safety and stimulated reflection, avoiding directive methods. The drama activities and tasks were built on the principles of co-participation, voluntariness, non-judgment, and support for multiple interpretations.

Materials and methods

Theatrical activity assessment is a complex task due to the difficulty of measuring its developmental effects and their diversity (personal educational outcomes, soft skills, mental abilities). Significant effects are often delayed in time (Van De Water, 2015). Furthermore, the developmental technologies of theatrical pedagogy should be attributed to research in the field of education, meaning they are intended to explain how and why changes occurred, and such technologies are process-oriented. Therefore, analyzing the effectiveness of theatrical tools and drama-base technologies requires both quantitative and qualitative research methods, which is precisely the approach implemented in this formative experiment (Asimidou et al., 2021; Mardas et al., 2020).

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All participants in the experiment underwent pre- and post-testing by "Smartphone Addiction Scale" (Kwon et al, 2013), in Russian adaptation by V.P. Sheinov in 2020. This instrument is a validated method for assessing smartphone addiction. The authors of the method consider addiction as a behavioral addiction based on the presence of key clinical signs in loss of control, functional impairments, and withdrawal symptoms.

The test consists of 33 statements that are to be rated on a scale from "definitely yes" (3 points) to "definitely no" (0 points). In addition to an integrative indicator of addiction, the test offers six subscales: daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance. The higher the total score, the greater the manifestation of addiction or risk within the corresponding subscale.

In addition to quantitative methods, qualitative data collection methods were also used. Specifically, unstructured interviews were conducted with adolescents (N = 18), teachers-facilitators (N = 4), and parents (N = 2). An unstructured interview is a form of conversation in which the respondent takes the lead, and the researcher only provides a general direction for the conversation, without restricting participants to the rigid framework of pre-prepared questions. The interviews aimed to obtain reflective feedback from the participants on their changes and emotional experiences during the project, and an assessment of the impact of theatrical activities on various aspects of their daily lives, including the patterns of smartphone use.

The analysis of the interview materials was carried out with the use of thematic analysis and cross-verification by two researchers. Qualitative analysis allowed to comprehend deeply the mechanisms by which theatrical activities affected participants and complemented quantitative data with respondents' subjective assessments.

Results of the empirical study

Quantitative data analysis

Pre- and post-test data were analyzed using the Kruskal-Wallis, Mann-Whitney, and Wilcoxon statistical criteria, as well as the method of multiple and pairwise comparisons (with Bonferroni correction). Normality of distribution was checked using the Kolmogorov-Smirnov test. Calculations were performed in the IBM SPSS Statistics 27 statistical package.

According to the results of the quantitative study with the use of the Smartphone Addiction Scale, differences were found between the experimental groups (EG1, EG2) and the control group (CG) in the pre- and post- testing. In the first measurement, significant differences were found between the groups in the tolerance subscale using the Kruskal-Wallis test (H = 6,710, p = 0,035). Pairwise comparison analysis by group showed that in EG1 the scores were significantly higher than in CG (p = 0,031, EG1 ranks = 47,05 and CG = 30,48). Additional analysis using the Mann-Whitney test revealed significant differences in the withdrawal subscale between EG2 and CG (p = 0,032): in EG2, scores were lower than in CG (EG1 Me = 5,33 and SD = 3,63, CG Me = 7,35 and SD = 2,84, respectively).

At the end of the experiment, a difference was observed between EG2 and CG on the tolerance scale (p = 0,031), while the difference between EG1 and CG disappeared. Scores in EG2 at the end became significantly lower than in CG (ranks: EG1 = 47,38, EG2 = 31,83, CG = 42,98). No significant intergroup differences were found for any other scales.

When analyzing intragroup dynamics, i.e., comparing the scores of EG1, CG, and EG2 at the beginning and end of the project using

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the Wilcoxon signed-rank test, no significant shifts were found in any of the groups for the integral indicator of addiction (p > 0,05). However, there was a tendency towards a decrease in addiction in EG1 (p = 0,060). In EG2, the tolerance score significantly decreased (p = 0,011). A tendency towards a decrease in scores on the impaired daily life scale was also found (p = 0,071). In CG, no significant intragroup changes occurred for any of the analyzed scales.

To verify the identified trends in the experimental groups, an additional analysis was conducted. Based on the integral indicator of addiction, a variable was created that included values that were obtained in the initial measurement of EG1 and EG2. Based on this variable, groups with different levels of addiction were identified. Percentile values were calculated for three equal groups (values were 32 and 44), and then the adolescents from both experimental groups were split into three groups with low (N = 20), medium (N = 19), and high (N = 20) levels of addiction. It was found that in the group with a high level of addiction, there was a significant decrease in the integral indicator of addiction and data on the "overuse" subscale (Wilcoxon significance test, p = 0,012 and p = 0,009, respectively).

Thus, statistical analysis showed a decrease in the level of smartphone addiction in adolescents with initially high levels of addiction after 24 theater sessions. Intragroup analysis revealed a significant decrease in the tolerance score and a tendency towards a decrease in the daily-life disturbance score in EG2. In EG1, a tendency towards a decrease in the integral addiction indicator and the overuse score was revealed.

Qualitative analysis of interviews with educators and adolescents

Statistical analysis revealed a downward trend in some indicators in the experimental groups, but these trends did not reach statistical significance when compared to the control group. Interview analysis helps understand why the quantitative effects were moderate. The changes primarily occurred in the patterns of gadget use: teenagers began to relate to their devices differently, preferring real-life interaction over virtual communication. Such transformations are difficult to capture with standardized questionnaires.

To gain a deeper understanding of the changes in the participants' personal experiences, an analysis of interviews with adolescents, teachers-facilitators, and parents was conducted. It allowed to identify the main features of the observed transformations.

1. Development of social interaction skills.

Participants noted significant progress in their ability to work in a team, listen and hear each other: "*We became more outgoing and cohesive, we started to support each other*" (girl E., EG2); "*Many of us tried out themselves, communicated, and helped each other*" (girl A., EG1); "*The project teaches teamwork, to listen to each other, compromise and interact as well as to be, supportive, friendly, and understanding*" (parent M., EG1).

The teachers-facilitators emphasized:

"*For me, the most important thing was for them to learn not only to speak but also to listen to each other, hear each other, and work together. ... Over three months of work ... they became significantly more of a team*" (educator N.).

"*They prefer to discuss the results of their activities ... during breaks, after lessons ... meaning that offline communication prevailed within the project*" (educator O.).

2. Broadening and deepening social connections and strengthening offline relationships with both peers and significant adults.

Participation in the project contributed to the formation of new social connections and the deepening already existing relationships

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within the class. The adolescents stated: "*We already have a friendly class, but we started communicating more with others*" (girl V., EG2); "*... we started to become really good friends*" (boy M., EG2). Parents noted changes in their children: "*She became more open, not withdrawn. She made more acquaintances*" (parent M., EG1), "*She didn't miss a single rehearsal ... during them, the classmates became very close to each other*" (parent of girl Z., EG2). Additionally, educator X. noted that the psychological climate in EG1 improved: "*The level of conflict in the class changed as a result of participating in the project — the adolescents began to find ways to resolve conflicts, they became softer and calmer towards each other ... their communication became more mature and conscious.*"

Relationships between classes also strengthened: "*We became more communicative with parallel classes, although we absolutely did not communicate before*" (boy D., EG2); "*I saw that other classes were interacting with me very well*" (girl D., EG2). The adolescents managed to establish more trusting and harmonious relationships with adults: "*My daughter happily shared her impressions of the classes ... I helped her learn the lines with joy, watched together videos from rehearsals*" (parent of girl Z., EG2). Educator X. also highlighted the changes in EG1: "*Communication with adults became politer and more respectful in many ways ... the boys and girls learned to manage their emotions and think before expressing their opinions to adults...*"

3. Formation of alternative ways of self-presentation and social recognition.

Theatrical activity provided adolescents with a platform for self-expression and feedback, alternative to the digital environment. The experience of public speaking and realizing one's impact on the audience was particularly significant: "*Today I was impressed that we were able to evoke feelings in the audience. ... We touched the audience, even children cried, not just adults*" (boy M., EG2); "*Admiration for oneself, that you could do it, you did it*" (girl V., EG2); "*I saw that they weren't just standing on stage, they were proud of what they were doing*" (educator N.). Adolescents also noted the development of specific self-presentation skills: "*we knew how to present ourselves correctly to people, ... pronounce words correctly, with the right intonation, and formulate our thoughts well*" (girl E., EG2).

4. Emotional engagement.

The participants of the project experienced vivid emotions, which, within the cultural-historical approach, is a driving force for development and can replace the need for constant digital stimulation. The teacher-facilitator noted an evolution in the adolescents' perception: "*At the beginning ... they just had ordinary eyes, as if I was talking about something ordinary or something distant. ... today they connect it [the text] with personal stories and experiences*" (educator N.). The adolescents confirmed the depth of their experiences: "*I felt everything that people who ended up in the WW II could have experienced*" (boy K., EG1); "*Initially, we didn't understand all of this, that it would be so difficult and touch everyone so much*" (girl D., EG2).

Educator X. emphasized the significance of the emotions that the participants received from the project: "*The teens really wanted to get feedback and waited for a response to their participation in the project, and they themselves felt pride in the work they had done... Their emotional state contributed to a change in mood in the class, in the group.*"

5. The teacher-facilitator's work in the zone of proximal development.

The teenagers were positively influenced by the special approach of the educators, who created a supportive environment based on the principles of co-authorship and re-

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spect. "*First of all, I don't treat them [the adolescents] as children, but as actors and co-authors. ... I learn from them*" (educator N.); "*Children perceive everything that is created not by themselves as a certain directive [unresponsive and imposed]* " (educator O.).

This approach helped overcome initial barriers: "*At first ... nobody wanted to go, ... but then with each new lesson, there was more and more desire to participate*" (boy K., EG1).

6. Emergence of awareness in smartphone use.

During the project, teenagers showed changes in the focus of attention and time — from virtual to real activities:

"I *saw how the boys and girls were changing. At first, they constantly spent time with their phones in hands, even during rehearsals. But then, when they started working on the real stories of their great-grandparents, when they saw how important this work was, the phones took a backseat. They became engrossed in a real endeavor*" (educator N.); "*They started connecting to [online class chats] earlier and stopped texting constantly at night ... they became more disciplined in their gadget use*" (educator O.); "*... they are mastering a particular soft skill — the ability to manage their attention in the age of gadgets*" (educator V.).

The adolescents did both reduce their gadget use time and change passive content consumption for the active — they started to use creative smartphone applications: "*They started using digital skills... video recording, editing... in a creative burst*" (educator O.).

The amount of shared offline time increased: "*A special memory will be that we gathered together, spent time together, it was very pleasant — to see everyone assembled*" (girl V., EG2).

An increase in the adolescents' sense of responsibility is noted: "*She started to ap-proach things more responsibly*" (parent of girl M., EG1); "*... you feel the full responsibility, if something goes wrong, they will charge me first*" (boy D., EG1); "*We had behavioral problems, sometimes we were tired, we wanted to go home after all lessons, but we forced ourselves, we understood that we needed this*" (girl E., EG2).

Results of the discussion

The data obtained in the current study preliminarily indicate a potential link between adolescent participation in the "Digital Story-telling Theater" project and some changes in smartphone usage patterns. The theater sessions were aimed at developing adolescents' live communication and teamwork skills, as well as enriching their emotional experience. According to research, it is precisely these offline practices that create a real alternative to time spent on smartphones (Liu et al., 2020; Salepaki et al., 2025).

Theater tools ("sketches," training sessions, discussions) created offline situations for developing live communication and expanding social circles; given equal opportunities, adolescents preferred real interaction, which shifted their focus from the virtual to the real (Achterhof et al., 2022). Positive emotions and deep experiences in offline interactions (Kafetsios et al., 2017) allowed adolescents to gain richer communication experience, as evidenced by teachers: participants in EG1 and EG2 began to communicate more often offline at school than it was before the project.

Individual characteristics of adolescents (communication preferences, group relationships, goals of smartphone use) were taken into account when working on the development of offline communication skills. Adolescents with already developed offline skills and an instrumental attitude towards smartphones showed a decrease in "tolerance" and a tendency towards reduction "everyday life disruption," while those who used social

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media for self-expression demonstrated a tendency to decrease in integral indicator of addiction and in in the indicator of overuse; there were no changes in the control group. These data confirm the positive effect of theatrical activities on adolescent self-regulation and self-control (Summer, 2018; Dawson, Lee, 2018).

The current study shows how the process of improving offline communication skills helps to develop cooperative relationships with peers and adults. Adolescents with technological addictions have a distorted perception of intimacy in relationships, do not recognize social cues, which leads to a deterioration of offline skills and an increased sense of loneliness, drawing them into online communication (Erdem et al., 2021). At the same time, adolescents with problematic social media use employ online communication to receive socio-psychological support and experiment with self-presentation (Khusnutdinova et al., 2023). Participants in the "Digital Storytelling Theater" project widened social circles, interacting with adults of different ages and statuses (teachers, WWII veterans), they also received peer support, and experimented with roles in a safe offline environment, which contributes to reducing smartphone addiction (Ihm, 2021).

Conclusion

The results of the study partially confirmed the hypothesis about the positive impact of theatrical activity on reducing smartphone addiction in adolescents. The most stable and statistically significant effect is the decrease in smartphone usage tolerance (the need for increasing usage time), which was recorded in the experimental group EG2. In addition, statistical trends were identified towards a decrease in the integral indicator of addiction and the indicator of overuse in EG1, as well as the indicator of disruption of daily life

in EG2. An important outcome of the work was the identification of a statistically significant decrease in the level of addiction among adolescents from high-risk groups (with initially high scores of the integral indicator of addiction). Thus, the obtained results are preliminary, they indicate the potential effectiveness of the tested program based on the "Digital Storytelling Theater" technology. Furthermore, further work is needed to refine the conceptual model in the context of preventing adolescent addictions.

The observed statistical trends were compared with a qualitative analysis of interview data. Adolescents and teachers-facilitators noted significant changes in the development of social interaction skills (ability to work in a team, to listen actively each other), expansion of social connections and strengthening of interpersonal relationships, formation of alternative ways of self-presentation and gaining social recognition through public speaking, deepening emotional involvement as the basis for personal transformations. The educators managed to create a supportive environment for work in the zone of proximal development by the support of co-authorship principles, as well as by forming the awareness in smartphone use and preference for real communication over virtual communication, which suggests a comprehensive impact of theatrical activity on reducing smartphone addiction in adolescents.

The specific influence of project participation on each of the experimental groups can be noted. For adolescents from EG1 with strained interpersonal relationships and compensatory smartphone usage patterns theatrical activity created a fundamentally new experience of successful offline interaction, which was reflected in the trend towards a decrease in the integral indicator of addiction. Qualitative data confirm the substitution of virtual communication with real social con-

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nections: the teachers-facilitators noted that phones receded into the background, and participants learned to make friends.

For socially active adolescents in EG2 with competitive motivation and active use of social networks for self-presentation purposes, theater provided a more intense and authentic alternative to digital self-presentation. The decrease in the indicator of tolerance in this group demonstrates the development of adolescents' ability to regulate smartphone use and control impulsive behavior. A possible mechanism for this effect is related to the shift in the source of emotional stimulation. Theatrical activity provided adolescents with alternative, more enriching forms of obtaining positive emotions — deep experiences from public performance and recognition based on real achievements. This reduced the need for emotional reward from the smartphone.

Thus, the "Digital Storytelling Theatre" program contributed to shifting adolescents'

focus of activity from the online environment to the offline space by creating a more relevant and emotionally rich context for meeting age-specific needs.

The obtained results are of interest for further study and development of comprehensive preventive programs for reducing smartphone addiction through theatrical activities. This approach is particularly relevant in the context of the globally observed trend of placing increasing responsibility on educators for preventing the non-purposeful and excessive use of smartphones by students at school, as well as the growing social demand for effective tools to overcome related new educational challenges (Armakolas et al., 2024; Koçak et al., 2025; Łuczyński et al., 2025).

Limitations. Some of the results have a trend character (p < 0,09), which may be due to the small sample size and requires further verification on a more representative sample.

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Научная статья | Original paper

The impact of using different types of learning materials on the characteristics of learning activity: a review of current research

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Abstract

Context and relevance. Student engagement is a key factor in successful knowledge acquisition and in improving the quality of the educational process. With the growth of digitalization in education and the implementation of multimedia and interactive technologies, there is a need to systematically study the influence of different types of learning materials on learners' engagement and cognitive activity. **Objective.** The aim is to determine the nature of the relationship between engagement and the types of learning materials (multimedia, interactive, and traditional), as well as to identify the factors that influence the effectiveness of their use. **Methods and materials.** An analytical review of contemporary domestic and international studies was conducted, including experimental, cross-cultural, and psychophysiological research. Various formats of learning materials and methods for assessing engagement were considered, including self-reports, questionnaires, and psychophysiological indicators (EEG, ECG). **Results.** The analysis showed that multimedia materials contribute to increased cognitive and emotional engagement through visual and auditory stimuli, while interactive technologies strengthen students' active participation and improve academic performance. Embodied and body-oriented technologies reduce cognitive load and promote deeper assimilation of the material. The effectiveness of learning materials depends on their design, content, individual learner characteristics, and the conditions of their use. **Conclusion.** The choice of instructional formats and modes of presenting information should be oriented toward learners' age, level of preparation, and perceptual characteristics. The implementation of multimedia, interactive, and embodied technologies can significantly improve the quality of learning and student engagement; however, further research is needed to determine the most effective combinations and conditions for their use.

Keywords: student engagement, learning materials, multimedia, interactive learning, cognitive load, embodied cognition, VR/AR technologies, psychophysiological assessment methods

Влияние использования различных типов учебных материалов на характеристики учебной деятельности: обзор современных исследований

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Резюме

Контекст и актуальность. Вовлеченность учащихся является ключевым фактором успешного усвоения знаний и повышения качества образовательного процесса. С ростом цифровизации образования и внедрением мультимедийных и интерактивных технологий возникает необходимость систематически изучать влияние различных типов учебных материалов на вовлеченность и когнитивную активность обучающихся. **Цель.** Определить характер взаимосвязи между вовлеченностью и типами учебных материалов (мультимедийные, интерактивные и традиционные), а также выявить факторы, определяющие эффективность их применения. **Методы и материалы.** Проведен аналитический обзор современных отечественных и зарубежных исследований, включающих экспериментальные, кросс-культурные и психофизиологические работы. Рассмотрены различные форматы учебных материалов и методы оценки вовлеченности, включая самоотчеты, анкеты и психофизиологические показатели (ЭЭГ, ЭКГ). **Результаты.** Анализ показал, что мультимедийные материалы способствуют повышению когнитивной и эмоциональной вовлеченности за счет визуальных и аудиальных стимулов, а интерактивные технологии усиливают активное участие студентов, повышая академическую успеваемость. Воплощенные и телесно ориентированные технологии снижают когнитивную нагрузку и способствуют более глубокому усвоению материала. Эффективность учебных материалов зависит от дизайна, содержания, индивидуальных особенностей учащихся и условий применения. **Выводы.** Выбор форматов обучения и способов подачи информации требует ориентировки на возраст, уровень подготовки и особенности восприятия обучающихся. Внедрение мультимедийных, интерактивных и воплощенных технологий способно значительно повысить качество обучения и вовлеченность обучающихся, однако требуется дальнейшее исследование для определения наиболее эффективных комбинаций и условий их применения.

Ключевые слова: вовлеченность обучающихся, учебные материалы, мультимедиа, интерактивное обучение, когнитивная нагрузка, воплощенное познание, VR/AR технологии, психофизиологические методы оценки

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Introduction

One of the main challenges in education is a decline in students' interest in learning. Researchers note that due to widespread digitalization — especially the use of social networks — there is a shift from conceptual to fragmented ('clip') thinking (Bigakov et al., 2016; Girenok, 2018). Similar changes in the thinking process affect cognitive functions, including students' ability to identify causal relationships, understand textual content, interpret it, and integrate visual and verbal information. Accordingly, if the thinking process itself changes, so do the requirements for teaching materials. In this context, it is therefore important to examine different types of educational materials, as well as their relationship with the engagement of students in the educational process.

Engagement is described as a complex multidimensional construct that refers to different aspects of the educational experience (attendance, homework, school sense of belonging, etc.) and encompasses different time horizons of the learning experience (short-term affective episodes, stable dispositions, perceptions of the consequences of their decisions in the context of the educational process, etc.) (D'Mello, Dieterle, Duckworth, 2017). Such a broad definition remains poorly operationalized and conceptually ambiguous, which motivates researchers to study specific aspects of this construct (Eccles, Wang, 2012; D'Mello, Dieterle, Duckworth, 2017). Three dimensions of engagement are commonly distinguished: behavioral (external manifestations of engagement); emotional (positive and negative emotions arising in learning situations); and cognitive (orientation to a deeper understanding of the material, preference for complexity and use of self-regulation strategies) (Fredricks et al., 2004). A number of studies also distinguish psychological engagement (sense of belonging, relationships with teachers and peers, etc.), and note the relative underrepresentation of the cognitive dimension in prior research of engagement (Bondarenko, Ishmuratova, Ziganov, 2020).

Modern digital technologies are increasingly integrated into the education system and are transforming it. Research suggests that the availability of digital resources in learning per se is associated with higher engagement (Abdulganie et al., 2025). Thus, the integration of educational technologies and artificial intelligence (AI) has led to the possibility of creating adaptive educational platforms whose effectiveness in increasing engagement and improving educational outcomes (including through personalization of the process) has been demonstrated in studies (Ouyang, 2025). A recent study of active use of AI by students found that this practice leads to increased engagement at the beginning of a program, but engagement indicators decline over time (Bognar, Khine, 2025), which highlights the importance of studying process dynamics.

Self-reports remain the main method of assessing engagement. Among them, the most common is the the Multidimensional School Engagement Scale, which assesses emotional, cognitive and behavioral aspects (Wang et al., 2019) and adapted in a Russian sample (Fomina, Morosanova, 2020). Despite the ability of self-reports to capture 'invisible' aspects of engagement, they do not allow researchers to capture its dynamic nature (Kassab et al., 2023). The dynamics of engagement are manifested both in changes in motivation and interest during training, as well as in situational fluctuations depending on the type of teaching material used. Teaching materials are typically classified in the literature as follows:

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1) By presentation format of the material (text, audio, presentations and video);

2) By modality of interaction used in learning (multimedia, interactive and traditional).

Few studies focus exclusively on the presentation format of educational material, because educational practice typically combines different types of materials. Research focuses on materials depending on media used (Muir et al., 2022). Multimedia materials are digital resources delivered via devices or software that combine text, graphics, animation, audio and video information (Blinova, 2017). Interactive materials provide active participation of the students, allowing them to choose actions, interact with content and receive feedback, which makes the learning process more dynamic (Kulikova et al., 2023). Traditional materials include printed and text-based resources, such as textbooks, lectures, teaching aids, workbooks and other forms that primarily support one-way transmission of information (Shedina, Teresina, 2022).

Given the dynamic nature of engagement, continuous, unobtrusive methods for monitoring engagement and cognitive load in the educational and work environment acquire special importance. This supports the development of more precise and effective methods of human interaction with technology and helps optimize the design of safe, motivating and productive learning environments. Engagement can be assessed using psychophysiological indicators, including EEG and ECG. Key EEG metrics include: power spectrum, signal mapping, alpha/theta, beta/theta, alpha/delta ratios (Ronca, Brambati, 2024; Apicella, Arpaia, 2022; Rai et al., 2025). Using ECG, fatigue can be estimated using stress indices, indices of regulatory strain, and sympathoadrenal tone (Lischke et al., 2021; Speer, Naumovski, McKune, 2024).

This review aims to systematize and analyze scientific works on the relationship between engagement and the type of educational material (multimedia, interactive and traditional), as well as to identify the main factors that influence their relationship. Overall, studies suggest that multimedia and interactive learning materials are often associated with higher engagement in learning activities than traditional learning materials. However, the strength and direction of this association vary depending on the specific type of training material.

Engagement when using multimedia learning materials

The use of multimedia is now seen as an integral part of knowledge transfer in the educational environment (Sarowardy, Halder, 2019). Multimedia refers to the use of multiple modes of presentation of information: textual (including alphanumeric), symbolic, graphic, photographic, audio and video format, including animation. When combined with digital technologies, multimedia can facilitate understanding and improve retention of the teaching material (Guan et al., 2018). The inclusion of static and dynamic visual components enhances the teacher's oral explanations, making communication more illustrative and understandable (Alemdag, Cagiltay, 2018).

One of the most popular forms of multimedia presentation is a video lecture. Al Husseini (2024) found that students who watched video lectures exhibited a higher level of engagement than respondents who used text materials. In particular, students working with video lectures spent, on average, 30 minutes longer on assignments and interacted more actively (AL Hussaini, 2024).

Another study showed that multimedia lectures, which applied the principles of embodiment (including video presentations with a teacher on the screen), segmentation (dividing lectures into short fragments with the ability to control the pace) and signaling

(highlighting key material on the screen), contributed to the growth of all forms of engagement. In particular, there was an increase in the average viewing time, the number of completed questionnaires and the number of test attempts (Gopal, Singh, Aggarwal, 2022).

A study by Shen and Pritchard (2022) examined the effect of visual cues on cognitive engagement in educational videos. The authors identified four modes of engagement: passive, active, constructive, and interactive, grouping them into shallow and deep engagement. The results showed that visual and textual cues enhance both levels of engagement, while color contrast has no effect. Visual complexity, on the other hand, only increased deep cognitive engagement.

Of particular interest are studies comparing different types of multimedia educational materials. Reed et al. (2021) compared animations and static presentations. The results showed that animations support better learning by students of non-majors and a higher level of engagement among all participants. This was especially evident among students with training in the field of neuroscience, for whom clarity and accessibility made the materials more attractive. In general, animated materials proved to be more effective than static ones both in terms of understanding and engagement.

As noted above, self-reports and questionnaires remain the main methods of studying engagement, but psychophysiological approaches are of increasing interest. A study by Italian researchers (Ronca et al., 2025) used a neurophysiological method to evaluate educational content and its impact on cognitive processes. The subjects were presented with three types of materials — an educational video, an academic video, and an encyclopedic text, while EEG, GSR, and PPG were recorded. The use of video materials, especially with visual effects, was associated with higher engagement and lower cognitive load compared to text-based materials, while reading was accompanied by increased cognitive load and decreased attention. Correlation analyses supported an association between neurophysiological indicators and students' self-assessments.

The researchers note that, despite digitalization, the use of such educational materials remains limited due to a lack of technical equipment. In a study by E. Nsabayezu and colleagues (Nsabayezu et al., 2025), the effect of the flipped classroom with multimedia support (MSFCA) method on student engagement in studying organic chemistry in secondary schools in Rwanda was studied. The results showed that MSFCA increases engagement and motivation, but rural students reported lower levels of engagement due to limited Internet access and a lack of computers. This result highlights that the lack of infrastructure in rural schools significantly reduces the opportunities for effective student engagement.

The analysis shows that multimedia educational materials have a significant impact on the level of student engagement, creating conditions for a more active perception and assimilation of information. Compared to traditional text materials, multimedia resources demonstrate higher efficiency both in stimulating students' interest and in improving the quality of understanding the educational content. A special place is occupied by animated multimedia materials, which surpass their static counterparts both in terms of cognitive assimilation, as well as in terms of emotional and behavioral engagement.

Engagement when working with interactive learning materials

Interactive materials are educational resources that involve the student's active participation in the learning process, provid-

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ing opportunities for choice, interaction, and feedback (Kulikova et al., 2023). Although a substantial body of research of interactive materials and their impact on engagement exist, the topic is becoming increasingly relevant. This reflects the growing diversity of interactive methods with the development of technology, for example: in recent years, VR/AR environments and artificial intelligence have been actively used for training. Interactive materials can be implemented in various formats, including quests, role-playing games, case-based learning, gamification of content, immersive technologies and other approaches (Yakovleva, Yakovlev, 2014).

Most studies suggest that such a learning format increases engagement and the effectiveness of learning (for example, Balalle, 2024). However, individual techniques may have different effectiveness, depending on the material and the psychological characteristics of the students who perceive this material (Kos, Kanadli, 2025). In one study, two groups of medical students alternated between computer simulation and virtual reality simulation (Walls et al., 2024). Engagement in this study was assessed by physiological parameters: heart rate and eye movements. The researchers noted significantly higher levels of student engagement in virtual reality simulations, regardless of the content of the simulation itself.

In a study by Natalizio et al. (2024), a new approach to monitoring engagement through brain–computer interfaces is proposed. The models of intra-subject classification distinguished the states of engagement and rest with an accuracy of about 90%. The level of engagement was higher when watching the commercial compared to the horizontal video and when playing Tetris at medium and high speeds. A correlation was noted between subjective and EEG indicators: with high engagement, the power of the theta rhythm increased and activity in the alpha range decreased. The study supports the reliability of the EEG for detecting engagement in real time and the dependence of its level on the characteristics of the task and the type of stimuli.

Haerawan et al. (2024) compared traditional video lectures and video lectures with interactive elements. Students with access to interactive features had higher engagement and final grades. The most effective elements were quizzes, interactive diagrams, models and scenarios with development options. The authors report a positive association between the use of interactive elements and academic success. Similar results were obtained in a study (Xu et al., 2023): interactive elements significantly increased student engagement and academic performance. Working with an interactive whiteboard, participating in discussions, and taking notes together nearly doubled learning gains compared to a traditional lecture.

Researchers have also examined the problem of engagement using robot assistants. If children initially experience positive emotions when using robotic toys in learning, then later interest fades, which is a problem that is solved by using multiple robot agents simultaneously (Oertel et al, 2020).

In order to increase the effectiveness of training, it is also possible to include the student's movements in the work with the educational material. This approach is based on the theory of embodied cognition, according to which cognitive processes are closely related to human sensorimotor experience (Barsalou, 2008). Research shows the positive effect of using motor experience in learning foreign languages, mathematics, and other disciplines, especially when gestures are associated with the concepts being studied, repeated by students, and such practice used for a long time (Macedonia, 2019). Reducing cognitive load can be achieved by expanding

the boundaries of the body and offloading some operations to digital systems. This process involves the student's bodily experience and reduces the cognitive load. Despite the popularity of the theory of embodied cognition, few comparative studies of embodied and traditional learning using digital technologies exist. Most studies focus on describing technologies without analyzing their effectiveness in comparison with traditional learning. A systematic review reported no statistically significant differences between the approaches (Ale et al., 2022), which may be due to the chosen metrics and the short-term nature of the experiments.

It has been shown that the reliance of cognitive processes on motor experience may differ in different age periods, which must be taken into account when developing digital learning materials for children and adolescents of different ages. For example, a study where images and depicted gestures were used to teach foreign words (with students required to repeat the gestures), showed that children aged 11–12 learned words equally well in both conditions — using visual stimuli and using gestures — whereas the 13–14-year-old group showed the greatest effect when gestures were used rather than visual stimuli. This pattern is consistent with results obtained in adults (Mathias et al., 2022).

The analysis shows that interactive teaching methods have a positive effect the engagement and academic performance. Most studies note that the use of VR/AR, gamification, and collaborative tools enhances students' attention and interest, although effectiveness depends on the presentation format and the characteristics of the students. In general, the experiments demonstrate an increase in engagement in the use of interactive elements, which makes them a promising area for the development of educational practices. The integration of digital technologies also expands the possibilities of adapting educational materials to the individual needs of students, emphasizing the need for further research on the optimal forms and conditions for the use of interactive approaches.

Discussion

The analysis of the presented studies indicates the significant impact of the format of educational materials on the level of student engagement. Overall, the literature converges on the view that the use of multimedia, interactive and embodied technologies tend to enhance the cognitive, emotional and behavioral activity of students. In particular, formats such as animations and video lectures with visual elements contribute to a better understanding of the educational material and increase the time spent interacting with it. Interactive methods, including virtual and augmented reality, case learning and gamification, contribute to the growth of educational motivation and academic success, which is confirmed by both students' self-assessments and data from psychophysiological research. One of the key trends identified in the analysis is the importance of individual differences and the learning context. Thus, students without specialized training may benefit more from multimedia animations, while students with relevant experience learn the material better when combining visual and interactive components. Age also plays an important role: for students aged 11–12 and 13–14, physical interaction with educational materials has a different impact, which underlines the need for age-related adaptation of digital educational resources. The results of a large number of studies indicate that video content and interactive environments contribute to preventing cognitive overload and maintaining concentration compared to traditional text materials.

Additionally, psychophysiological methods such as EEG and ECG enable real-time tracking of engagement and cognitive load. Many studies examine engagement in the learning process using hardware methods (EEG, ECG, etc.). EEG-based engagement indices typically rely on the analysis of brain rhythms, spectral characteristics of the EEG and the topography of activity. These markers allow researchers to assess the degree of attention, cognitive load and activation, which reflects the student's engagement. EEG markers allow an objective assessment of attention and engagement, especially in real time (for example, in adaptive learning). An analysis of the functional relationship between brain regions is also used. Thus, the high coherence between the frontal and parietal areas in the performance of tasks indicates coordinated brain activity, characteristic of engagement. Fatigue (its level and dynamics) is measured on the basis of ECG indicators, such as stress and indices of regulatory strain, the sympathoadrenal tone index. Changes in HRV parameters during fatigue make it possible to objectively assess the functional state of the body and autonomic homeostasis. A decrease in indicators reflecting parasympathetic activity may serve as an early marker of fatigue onset. In this regard, HRV monitoring can be a useful tool in the prevention of overexertion and overload.

Conclusions

The review shows that the use of various types of educational materials (multimedia, interactive and traditional) has a significant impact on student engagement and the effectiveness of learning. Although some studies report no statistically significant differences between interactive and traditional teaching methods, the general trend suggests an increase in engagement and academic success when using modern digital technologies, including VR/AR, animated materials and gamified approaches. Thus, the integration of multimedia and interactive elements into the educational process, as well as the use of AI-based technologies, offers opportunities to personalize learning, increase engagement, and improve educational effectiveness. The results of the analysis emphasize the need for further research to determine the optimal forms, conditions and combinations of various types of educational materials, depending on the age and cognitive characteristics of students.

Objective methods for assessing academic engagement are developing in several directions. Biometric and physiological methods include heart rate monitoring, electroencephalography, galvanic skin reaction, and pupillary activity tracking, which reflect the level of attention and emotional state. Behavioral methods include tracking eye movements, analyzing interactions with learning platforms, and video analysis of facial expressions and speech to assess motivation and fatigue. Big data analytics and artificial intelligence methods make it possible to identify patterns of engagement and classify students by activity level. In addition, sensor technologies and wearable devices such as fitness bracelets and VR/AR environments are being used to monitor physical activity and interaction, which contributes to a more accurate assessment of engagement.

Overall, the choice of teaching formats and modes of information presentation should be guided by the students' age, level of training and perceptional characteristics. The introduction of multimedia, interactive, and embodied technologies can significantly improve the quality of learning and student engagement, but further research is needed to determine the most effective combinations and conditions for their use.

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Научная статья | Original paper

The role of subjective assessment of life in the manifestation of intellectual and academic abilities in adolescents

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Abstract

Context and relevance. Subjective assessment of life — a sense of freedom, responsibility, fulfillment and direction — is considered not only as an indicator of personal maturity, but also as a resource for cognitive activity. The theoretical basis of the study is existential analysis (V. Frankl, A. Längle). This work expands the understanding of the relationship between existential maturity and psychometric characteristics, academic success and neuropsychological markers, including interhemispheric organization of psychomotor functions. **Objective.** To identify the features of the relationship between the parameters of subjective assessment of life and the manifestation of intellectual, psychomotor, linguistic and academic abilities in adolescents aged 13–14. **Hypothesis.** It is assumed that a teenager's subjective assessment of life, associated with existential maturity, can be a predictor of high intellectual and academic results. In adolescence, these characteristics acquire special significance as indicators of personal maturity and general mental development, which is manifested in the individual configuration of academic and intellectual achievements, features of emotional self-regulation, as well as in the profile of interhemispheric asymmetry. **Methods and materials.** The study involved 39 7th-grade students (M = 13,08, SD = 0,48, 56% boys). The results were assessed according to the A. Längle existential scales, linguistic and logical tasks, psychomotor characteristics and average scores in academic subjects. **Results**. Existential characteristics of adolescents are associated with results of intelligence tests, academic performance and emotional regulation. The most pronounced connections were shown by Self-distancing and Responsibility; Freedom is associated with emotional management, Fulfilment — with inclusion in the cognitive and emotional sphere. Psychomotor analysis revealed their predominant connections with the activity of the left hand, reflecting the contribution of right-hemisphere mechanisms. **Conclusions**. Existential maturity of adolescents is an internal resource that supports cognitive, academic and emotional development. The connection of existential characteristics with right-hemisphere activity allows us to consider the subjective assessment of life as a marker of not only personal but also neuropsychological maturity, which opens up prospects for further research and the creation of practical programs to support adolescents.

Роль субъективной оценки жизни в проявлении интеллектуальных и академических способностей у подростков

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Резюме

Контекст и актуальность. Субъективная оценка жизни — ощущение свободы, ответственности, наполненности и направленности — рассматривается не только как индикатор личностной зрелости, но и как ресурс когнитивной активности. Теоретическую основу исследования составляет экзистенциальный анализ (В. Франкл, А. Лэнгле). Настоящая работа расширяет понимание взаимосвязей экзистенциальной зрелости с психометрическими характеристиками, учебной успешностью и нейропсихологическими маркерами, включая межполушарную организацию психомоторики. **Цель.** Выявить особенности взаимосвязи между параметрами субъективной оценки жизни и проявлением интеллектуальных, психомоторных, лингвистических и академических способностей у подростков 13–14 лет. **Гипотеза.** Предполагается, что субъективная оценка жизни подростка, сопряженная с экзистенциальной зрелостью, может быть предиктором высоких интеллектуальных и академических результатов. В подростковом возрасте данные характеристики приобретают особое значение как индикаторы личностной зрелости и общего психического развития, что проявляется в индивидуальной конфигурации учебных, интеллектуальных достижений, особенностях эмоциональной саморегуляции, а также в профиле межполушарной асимметрии. **Методы и материалы**. В исследовании принимали участие 39 учащихся 7-х классов (М = 13,08, SD = 0,48, 56% мальчики). Оценивались результаты по шкалам экзистенции А. Лэнгле, лингвистическим и логическим задачам, психомоторным характеристикам и средним баллам по учебным предметам. **Результаты**. Экзистенциальные характеристики подростков связаны с результатами интеллектуальных тестов, академической успеваемостью и эмоциональной регуляцией. Наиболее выраженные связи показали Самодистанцирование и Ответственность; Свобода сопряжена с управлением эмоциями, Исполненность — с включенностью в познавательную и эмоциональную

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сферу. Психомоторный анализ выявил их преимущественные связи с активностью левой руки, отражающей вклад правополушарных механизмов. **Выводы**. Экзистенциальная зрелость подростков является внутренним ресурсом, поддерживающим когнитивное, академическое и эмоциональное развитие. Связь экзистенциальных характеристик с правополушарной активностью позволяет рассматривать субъективную оценку жизни как маркер не только личностной, но и нейропсихологической зрелости, что открывает перспективы для дальнейших исследований и создания практических программ поддержки подростков.

Ключевые слова: субъективная оценка жизни, шкалы экзистенции, подростковый возраст, интеллектуальные способности, академическая успеваемость, психомоторные функции, эмоциональный интеллект

Introduction

Subjective attitudes toward one's own life reflect the level of personal maturity and the meaningfulness of existence. Within the framework of existential-analytic theory (V. Frankl; A. Längle), this attitude is described as the capacity for conscious choice, responsibility, and internal coherence, which together determine the developmental trajectory of the individual. Contemporary psychological research increasingly shifts the focus from external indicators of success to the internal foundations of maturity, autonomy, and intellectual productivity. In early adolescence (ages 13–14), these foundations acquire particular significance, as this developmental period is marked by the formation of basic mechanisms of meaning regulation that influence cognitive, academic, and emotional functioning.

Existential maturity is an integrative characteristic that reflects the development of such personal capacities as self-distancing, self-transcendence, freedom, and responsibility, as well as the derived parameters of Personality (P) and Existence (E). These indicators, operationalized in A. Längle and K. Orgler's Existential Scale (Existenzskala), are viewed as key components of inner regulation that shape the direction and quality of learning and cognitive engagement.

In Längle's model, existential fulfillment (G) represents the integrated outcome of the four existential levels and is expressed in the combined score (P + E). Fulfillment emerges when a person is able to formulate meaningful answers to the four fundamental existential motivations: "Can I be?" (1st FEM), "Do I like living?" (2nd FEM), "Do I have the right to be myself?" (3rd FEM), and "What is the meaning and direction of my life?" (4th FEM). Fulfillment reflects the depth and meaningfulness of existence and is considered an important indicator of subjective life evaluation (Krivtsova, Längle, Orgler, 2009).

According to the interpretation proposed by S.V. Krivtsova (drawing on A. Längle and V. Frankl), adolescence represents the onset of the third "major wave" in ontogenesis, associated with the third fundamental motivation — the question "Do I have the right to be myself?", which reflects adolescents' striving for self-respect and authenticity. At ages 13–14, the development of self-structures, protection of personal boundaries, and identity formation become central tasks. At the same

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time, adolescents begin to address questions regarding the future, goals, and meaning (the fourth fundamental motivation). This existential tension — an inner conflict between values and the conditions for their realization — accounts for behavioral ambivalence, emotional instability, and situational regressions. Adolescents strive for autonomy, sometimes overestimate their abilities, and often display polar traits — confidence and vulnerability simultaneously — manifested in heightened emotionality in interactions with peers and others (Krivtsova, 2015, 2016; Längle, 2022). Thus, subjective life evaluation in this period remains in a state of formation and is strongly influenced by emotional reactions, which is important to consider when assessing it.

These theoretical considerations are supported by empirical findings indicating that existential maturity functions as an integrated resource for personal and cognitive development. One study found that contemporary adolescents tend to demonstrate average levels of freedom (F), which limits their perception of available options when making decisions; self-distancing and self-transcendence are characterized by limited internal coherence and are associated with increased anxiety and depressive tendencies. At the same time, a more balanced profile of freedom (F) and responsibility (V) has been observed, which researchers interpret as reflecting adolescents' limited involvement in situations requiring serious decision-making and commitments (Medvedeva, 2024).

Further studies demonstrate links between existential characteristics and the emotional domain: existential fulfillment is associated with lower anxiety, greater positive affect, and higher emotional intelligence (Chernyavskaya, Ivanova, 2017). Other work reports that higher G is related to intrinsic cognitive motivation rather than orientation toward external approval (Chernyavskaya, 2024).

In adolescents, the Personality (P) scale is considered a factor supporting the prevention of deviant behavior and fostering harmonious personality development (Grigorieva, 2020). Several studies have established that fulfillment (G) is associated with the unfolding of abilities, learning motivation, and academic success (Malakhova, Samoylichenko, 2017; Aminov, Malakhova, Chernyavskaya, 2021). Among seventh graders, self-distancing and self-transcendence correlate positively with students' agentic position, whereas low levels of freedom (F) and responsibility (V) correspond to its negative manifestations (Gavrilyuk, Markina, 2020).

International research emphasizes conceptually similar constructs such as personal maturity and internal self-coherence. Although terminology varies, these approaches share a common focus on subjective foundations of life activity. Studies have shown that clarity of self-understanding is associated with higher levels of meaning in life (Yang et al., 2025); adolescents' academic achievement is positively related to meaning in life, with self-perception strengthening this association (Liu et al., 2025); and eudaimonic aspects of well-being — goal orientation, autonomy, and competence — serve as predictors of school performance (Clarke et al., 2023). A large-scale study (grades 4–6: n = 19443; grades 7–9: n = 15472; grades 10–12: n = 6267) also demonstrated that higher levels of life meaning are associated with more stable indicators of psychological well-being (Cai et al., 2025).

In the present study, the assessment of intellectual and academic abilities is supplemented by an objective neuropsychological approach. In particular, tapping-test motor activity reflects not only psychomotor efficiency but also interhemispheric asymmetry, which is linked to cognitive and personality characteristics (Simernitskaya, 1978; Bragina, Dobrokhotova, 1988; Khomskaya et al., 1997;

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Kabardov, 2013; Zhambeeva, 2022). The tapping test reveals the handedness profile as an indicator of functional hemispheric dominance. According to Khomskaya (1997), measures of manual asymmetry demonstrate the largest number of correlations with mental functions and emotional regulation. Recent research also indicates that motor asymmetry may shift under the influence of educational environmental factors: for example, high levels of computer use among younger schoolchildren may lead to the restructuring of lateral profiles and the development of new motor patterns, interpreted as an adaptive response to the digitalization of learning (Pankova et al., 2021).

Such parameters as self-distancing and responsibility reflect the level of voluntary regulation and resistance to external influences, which, according to neuropsychological studies, relate to patterns of interhemispheric interaction and the balance of regulatory functions of the right and left hemispheres (Khomskaya, 1997). Thus, handedness reflects not only motor characteristics but also cognitive strategies, emotional sensitivity, and regulation. This provides grounds to hypothesize associations between Existential Scale indicators and tapping-test characteristics, including the predominance of right- or left-hemispheric patterns.

The reviewed literature demonstrates consistent links between existential characteristics, personal resilience, emotional regulation, and learning motivation. However, studies exploring adolescents' subjective life evaluation using the Existential Scales remain limited (Grigorieva, 2020; Malakhova, Samoylichenko, 2017; Aminov, Malakhova, Chernyavskaya, 2021; Gavrilyuk, Markina, 2020). Most prior work has focused on adults and university samples. The novelty of the present study lies not only in examining adolescents aged 13–14 — a period of emerging autonomy and identity formation — but also

in analyzing, for the first time, the complex associations between subjective life evaluation and cognitive, emotional, psychomotor, and academic indicators.

Grounded in the existential approach (V. Frankl; A. Längle), which conceptualizes subjective life evaluation as an integrative factor that shapes cognitive, personality, and regulatory processes in adolescence, our study aimed to identify the associations between subjective life evaluation, as measured by Längle's Existential Scales, and the manifestation of intellectual, psychomotor, linguistic, and academic abilities in adolescents aged 13–14. We hypothesized that adolescents' subjective life evaluation, reflecting their level of existential maturity, would be positively associated with intellectual productivity, academic achievement, and emotional self-regulation. In early adolescence, these characteristics serve as important indicators of personal maturity and psychological development, manifesting in cognitive and academic outcomes, emotional intelligence, and profiles of interhemispheric asymmetry.

Materials and methods

The study was conducted in two stages. Stage 1 involved data collection using a set of psychodiagnostic methods, including A. Längle's Existential Scales, cognitive tasks (verbal and nonverbal), an emotional intelligence test, the tapping test, and the calculation of academic performance. The sample consisted of 39 students aged 13–14 years enrolled in the seventh grade at a school in the Moscow region (M = 13,08 years, SD = 0,48; 56% boys). The age range of 13–14 years corresponds to the onset of personal identity formation, which makes this sample particularly relevant for studying subjective life evaluation. The study was administered in a group format and conducted with written parental consent. Cases with incomplete ques-

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tionnaire responses or significant difficulties in understanding instructions were excluded. Stage 2 consisted of statistical data processing using Spearman's correlation and the Mann–Whitney U test in Statistica 10.

Instruments. 1. Linguistic tasks (Kabardov, 2013), assessing linguistic competence and verbal–cognitive characteristics: Proverbs, Antonyms, Synonyms, derivational tasks (e.g., suffix -ящий, rhymes for the word чайка), interlinguistic competence (Swahili), and the Vocabulary subtest of the Wechsler scale. 2. Academic performance — the average annual school grade. 3. Raven's Progressive Matrices — assessment of nonverbal intelligence. 4. Tapping test — four trials with each hand (10 seconds per trial) to assess motor tempo. Handedness coefficient: $C_R = ((RH — LH) / (RH + LH)) \times 100\%$ (Kabardov, 2013). 5. N. Hall's Emotional In-

telligence Questionnaire (30 items, 5 scales). 6. Existential Scales by A. Längle and K. Orgler (Krivtsova, Längle et al., 2009), adapted for adolescents (Pergamenshchik, Puzyrevich, 2011). The scales assess: Self-distancing (SD; Selbst-Distanzierung), Self-transcendence (ST; Selbst-Transzendenz), Freedom (F; Freiheit), Responsibility (V; Verantwortung) and three integrative indicators: Personality (P = SD + ST), Existentiality (E = F + V), Fulfillment (G = P + E). 7. Complex Analogies — 20 word pairs, time limit of 5 minutes. 8. Wechsler Coding — assessment of processing speed and visuomotor coordination.

Results

The analysis revealed multidimensional associations between existential parameters and cognitive, emotional, psychomotor, and academic indicators.

Table 1

Correlation matrix of A. Längle's existential scales and psychodiagnostic indicators (N = 39)

	Existenzskala by A. Längle						
	Self-distancing	Self-transcendence	Freedom	Responsibility	Personality	Existentiality	Fulfillment
Emotional intelligence (N. Hall)							
Managing emotions						0,337	0,322
Raven's Progressive Matrices							
Series *B*	0,358						
Series *C*		0,372		0,386	0,370	0,324	0,379
Number of errors				−0,322			
Linguistic tasks							
D. Wechsler's Vocabulary subtest				0,354			
Antonyms	0,345			0,353			
Rhyme «seagull»			0,341	0,346		0,345	0,329
Wechsler coding	0,322						
Complex analogies				0,321			

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	Existenzskala by A. Längle						
	Self-distancing	Self-transcendence	Freedom	Responsibility	Personality	Existentiality	Fulfillment
School subjects							
Algebra	0,400			0,485		0,387	0,374
Biology				0,358			
Geography	0,344			0,335			
History	0,489			0,448		0,392	0,382
Social studies	0,395			0,433		0,379	0,349
Russian	0,433			0,484		0,423	0,375
Physics	0,354						
Tapping-test							
trial 3 PR				0,333			
trial 4 PR	0,341	0,386	0,397	0,344	0,441	0,394	0,466
Mean of 4 PR trials				0,408		0,366	0,359
Sum of 4 PR trials				0,408		0,366	0,359
trial 1 LR	0,383			0,328			
trial 2 LR	0,546		0,473	0,634	0,474	0,602	0,583
trial 3 LR	0,467		0,322	0,331	0,405	0,340	0,417
rial 4 LR	0,442		0,424	0,465	0,378	0,465	0,478
Mean of 4 LR trials	0,492		0,371	0,480	0,378	0,451	0,465
Difference MAX-MIN values of the LR	0,344						
Sum of 4 LR trials	0,492		0,371	0,480	0,378	0,451	0,465
Difference of the sums of the PR and LR	–0,335						
ight-handedness coefficient	–0,397						

Note: Spearman rank correlations are significant at $p < 0,05$; PR — right hand, LR — left hand.

Table 1 presents the correlation analysis of the relationships between intellectual measures and the existential scales. Raven's Series ***B*** correlated primarily with SD, which also aligns with its association with Wechsler Coding parameters, reflecting analytical reasoning patterns. Series ***C*** scores demonstrated a broader spectrum of associations across several scales (ST, V, P, E, G), indicating cognitive flexibility, while V showed a stable relationship with complex analogies. Linguistic tasks ("Antonyms", "Rhyme for seagull", and the Vocabulary subtest) were primarily associated with V and SD, underscoring their role in semantic differentiation and linguistic productivity. In contrast, F and E emphasize the importance of internal openness and meaningful engagement, contributing to creativity.

Academic performance (in algebra, history, social studies, and Russian language) was positively associated with SD and V,

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highlighting the role of internal organization and volitional regulation in learning activity. Emotional self-regulation was linked to meaningfulness and life satisfaction, particularly in the domain of emotion regulation (E and G).

According to the tapping-test results, the greatest number of correlations was found for left-hand activity (SD, F, V, P, E, and G), indicating the involvement of right-hemisphere mechanisms in the development of existential characteristics. The fourth RH trial showed strong associations with all scales, reflecting their role in sustaining performance under fatigue. Negative correlations of SD with the right-handedness coefficient and with the difference between RH and LH sums further confirm its link to right-hemisphere dominance, while the correlation with the LH MAX–MIN difference indicates an association between SD and nervous system inertia.

To examine the robustness of the findings, a group analysis (Mann–Whitney U test) was conducted; the differences for SD and ST are presented in Table 2.

Students with higher SD levels demonstrated better performance on Raven's test,

Table 2

Group analysis of differences in Self-Distancing (SD) and Self-Transcendence (ST) in psychodiagnostic indicators and academic performance

	Group 1 Self-distancing (SD) Lower level N = 16	Group 2 Self-distancing (SD) Higher level N = 15	U test	p-value	Effect size (r)
Raven's Progressive Matrices					
Total score	204,5	**291,5**	68,5	0,044	0,4
Linguistic tasks					
Antonyms	201,0	**295,0**	65,0	0,031	0,4
Rhyme «seagull»	203,5	**292,5**	67,5	0,040	0,4
School subjects					
Algebra	187,0	**309,0**	51,0	0,007	0,5
Geography	200,5	**295,5**	64,5	0,030	0,4
History	190,0	**306,0**	54,0	0,010	0,5
Social studies	205,5	**290,5**	69,5	0,048	0,4
Russian	185,5	**310,5**	49,5	0,006	0,5
Physics	201,0	**295,0**	65,0	0,031	0,4
Tapping-test, PR — right hand, LR — left hand					
trial 1 LR	196,5	**299,5**	60,5	0,020	0,4
trial 2 LR	175,5	**320,5**	39,5	0,002	0,6
trial 3 LR	197,0	**299,0**	61,0	0,021	0,4
trial 4 LR	187,5	**308,5**	51,5	0,007	0,5
Mean of 4 LR trials	184,0	**312,0**	48,0	0,005	0,5

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	Group 1 Self-distancing (SD) Lower level N = 16	Group 2 Self-distancing (SD) Higher level N = 15	U test	p-value	Effect size (r)
Sum of 4 LR trials	184,0	**312,0**	48,0	0,005	0,5
Difference of the sums of the PR and LR	**309,5**	186,5	66,5	0,036	0,4
Right-handedness coefficient	**319,0**	177,0	57,0	0,013	0,4
	Group 1 Self-transcendence ST Below level N = 15	Group 2 Self-transcendence ST Higher level N = 13	U test	p-value	Effect size (r)
Raven's Progressive Matrices					
Series *C*	166,500	**239,500**	46,500	0,020	0,4

Note: tables 2–5, Effect size (r): 0,1–0,29 — small effect; 0,3–0,49 — medium; ≥ 0,5 — large.

on the "Antonyms" and "Rhyme for seagull" tasks, as well as higher achievement in key humanities and STEM-related school subjects. This indicates that SD is associated with intellectual flexibility, linguistic intuition, verbal-logical thinking, and academic success. In addition, this group showed higher left-hand tapping scores (across all trials and aggregated measures), which may reflect right-hemisphere lateralization (Bragina, Dobrokhotova, 1988; Khomskaya, Efimova et al., 1997), linked to the development of the ability to distance oneself from immediate action.

For ST, significant differences were found only in Raven's Series *C*, which reflects dynamic visual reasoning (Yasyukova, 2005). The absence of differences on other indicators is likely related to the emotional-personal immaturity of seventh graders and supports the understanding of ST as a later stage of existential development.

Table 3 presents the differences between groups based on V and F scores. Adolescents with higher V values demonstrated better intellectual performance: on Raven's Series *C*, complex analogies, antonyms, and the "Rhyme for seagull" task, as well as higher achievement across several subjects (algebra, biology, history, social studies, and Russian). They also showed greater motor activity with both hands, which may indicate stability and well-developed self-regulation skills.

Meanwhile, students with higher F scores demonstrated better emotion regulation and greater left-hand activity (in nearly all trials), as well as higher RH activity in the 4th trial, suggesting predominant involvement of the right hemisphere with minimal contribution from the left.

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Table 3

**Group analysis of differences in Responsibility (V) and Freedom (F)
in psychodiagnostic indicators and school subjects**

	Responsibility (V) Group 1 Lower level N = 16	Responsibility (V) Group 2 Higher level N = 14	U test	p-value	Effect size (r)
Raven's Progressive Matrices					
Series *C*	186,0	**279,0**	50,0	0,011	0,5
Number of errors	**297,0**	168,0	63,0	0,044	0,4
Complex analogies	193,0	**272,0**	57,0	0,023	0,4
Linguistic tasks					
Antonyms	200,0	**265,0**	64,0	0,048	0,4
Rhyme «seagull»	199,0	**266,0**	63,0	0,044	0,4
School subjects					
Algebra	187,5	**277,5**	51,5	0,013	0,5
Biology	199,0	**266,0**	63,0	0,044	0,4
History	195,5	**269,5**	59,5	0,031	0,4
Social studies	196,5	**268,5**	60,5	0,034	0,4
Russian	183,5	**281,5**	47,5	0,008	0,5
Tapping-test, PR — right hand, LR — left hand					
trial 3 PR	196,5	**268,5**	60,5	0,034	0,4
trial 4 PR	199,0	**266,0**	63,0	0,044	0,4
Mean of 4 PR trials	184,0	**281,0**	48,0	0,008	0,5
Sum of 4 PR trials	184,0	**281,0**	48,0	0,008	0,5
trial 2 LR	159,0	**306,0**	23,0	0,0002	0,7
trial 3 LR	197,0	**268,0**	61,0	0,036	0,4
пtrial 4 LR	185,5	**279,5**	49,5	0,010	0,5
Mean of 4 LR trials	184,0	**281,0**	48,0	0,008	0,5
Sum of 4 LR trials	184,0	**281,0**	48,0	0,008	0,5
	Group 1 Freedom (F) Below level N = 14	Group 2 Freedom (F) Higher level N = 18	U test	p-value	Effect size (r)
Emotional intelligence (N. Hall)					
Managing emotions	178,5	**349,5**	73,5	0,048	0,3

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	Group 1 Freedom (F) Below level N = 14	Group 2 Freedom (F) Higher level N = 18	U test	p-value	Effect size (r)
Tapping-test					
trial 4 PR	165,5	**362,5**	60,5	0,014	0,4
trial 2 LR	162,0	**366,0**	57,0	0,009	0,5
trial 3 LR	172,0	**356,0**	67,0	0,026	0,4
trial 4 LR	156,5	**371,5**	51,5	0,005	0,5
Mean of 4 LR trials	166,0	**362,0**	61,0	0,014	0,4
Sum of 4 LR trials	166,0	**362,0**	61,0	0,014	0,4

Table 4

**Group analysis of differences in Personality (P) and Existentiality (E)
in psychodiagnostic indicators and school subjects**

	Group 1 Personality (P) Lower level N = 15	Group 2 Personality (P) Higher level N = 16	U test	p-value	Effect size (r)
Raven's Progressive Matrices					
Series *C*	188,0	**308,0**	68,0	0,042	0,4
Tapping-test, PR — **right hand**, LR — **left hand**					
trial 4 PR	170,5	**325,5**	50,5	0,006	0,5
trial 2 LR	169,0	**327,0**	49,0	0,005	0,5
trial 3 LR	172,0	**324,0**	52,0	0,008	0,5
trial 4 LR	181,0	**315,0**	61,0	0,021	0,4
Mean of 4 LR trials	183,0	**313,0**	63,0	0,026	0,4
Sum of 4 LR trials	183,0	**313,0**	63,0	0,026	0,4
Right-handedness coefficient	**294,0**	202,0	66,0	0,034	0,4
	Group 1 Existentiality (E) Lower level N = 17	Group 2 Existentiality (E) Higher level N = 17	U test	p-value	Effect size (r)
School subjects					

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	Group 1 Existentiality (E) Lower level N = 17	Group 2 Existentiality (E) Higher level N = 17	U test	p-value	Effect size (r)
Algebra	227,5	**367,5**	74,5	0,017	0,4
Biology	238,0	**357,0**	85,0	0,042	0,3
History	233,0	**362,0**	80,0	0,027	0,4
Tapping-test					
trial 4 PR	230,0	**365,0**	77,0	0,021	0,4
trial 2 LR	204,0	**391,0**	51,0	0,001	0,5
trial 3 LR	231,5	**363,5**	78,5	0,024	0,4
trial 4 LR	227,5	**367,5**	74,5	0,017	0,4
Mean of 4 LR trials	219,0	**376,0**	66,0	0,007	0,5
Sum of 4 LR trials	219,0	**376,0**	66,0	0,007	0,5

Table 4 summarizes the differences between groups based on P and E scores. Adolescents with higher P scores demonstrated better performance on Raven's Series ***C***, greater left-hand activity (in trials 2–4 and in both mean and total scores), lower right-handedness coefficients, and higher performance in the 4th RH trial.

Students with higher E scores showed better academic achievement across several subjects (algebra, biology, history) and greater tapping-test activity: higher RH performance in the 4th trial as well as higher LH activity in trials 2–4, including mean and total measures.

Differences between groups based on G are presented in Table 5. Higher fulfillment

Table 5

Group analysis of differences in Fulfillment (G) in psychodiagnostic indicators and school subjects

	Performance (G) Group 1 Below level N = 16	Performance (G) Group 2 Higher level N = 17	U test	p-value	Effect size (r)
Raven's Progressive Matrices					
Series ***C***	212,0	**349,0**	76,0	0,032	0,4
Linguistic tasks					
Rhyme «seagull»	214,0	**347,0**	78,0	0,038	0,4
School subjects					
Russian	216,5	**344,5**	80,5	0,048	0,4
Tapping-test, PR — right hand, LR — left hand					

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	Performance (G) Group 1 Below level N = 16	Performance (G) Group 2 Higher level N = 17	U test	p-value	Effect size (r)
trial 4 PR	185,0	**376,0**	49,0	0,002	0,5
Mean of 4 PR trials	213,0	**348,0**	77,0	0,035	0,4
Sum of 4 PR trials	213,0	**348,0**	77,0	0,035	0,4
trial 1 LR	213,5	**347,5**	77,5	0,037	0,4
trial 2 LR	182,0	**379,0**	46,0	0,001	0,6
trial 3 LR	192,0	**369,0**	56,0	0,004	0,5
trial 4 LR	195,5	**365,5**	59,5	0,006	0,5
Mean of 4 LR trials	189,0	**372,0**	53,0	0,003	0,5
Sum of 4 LR trials	189,0	**372,0**	53,0	0,003	0,5

was associated with better performance on Raven's Series **C**, higher scores on the "Rhyme for seagull" task, better achievement in Russian language, and higher tapping-test performance: for RH (4th trial, and mean and total scores across 4 trials) and for all LH trials (mean and total scores).

Discussion

The findings confirmed our hypothesis that adolescents' subjective evaluation of life, reflecting their level of existential maturity, is associated with higher cognitive, academic, and emotional-regulatory outcomes. These results allow us to view existential maturity as a factor integrating cognitive, personality, and neuropsychological aspects of development. The effect size estimates (r) for the identified differences showed that most effects were medium or large, which supports the substantive robustness of the results despite the limited sample size.

Existential characteristics — particularly SD and V — were associated with success in intellectual tests, linguistic tasks, and several academic subjects requiring abstract reasoning and work with complex material, confirming their role in organization and goal-directedness in learning activity. The additional associations observed for ST, P, E, and G reflect their contributions to cognitive flexibility and the ability to integrate diverse elements of information. The absence of pronounced effects on ST is consistent with Frankl's conceptualization (Längle, 2022) of ST as a later-developing capacity that emerges after SD: during adolescence, this process is still taking shape, as the foundational ability to distance oneself from immediate bodily, emotional, and situational influences may not yet be fully established. Earlier publications have noted that higher ST, V, P, E, and G scores in adolescents are linked to academic achievement, self-esteem, the ability to process significant experiences, and persistence — patterns that align with our findings for V and G (Aminov, Zhambeeva, 2015; Aminov et al., 2015). Overall, adolescents' existential maturity emerges as a factor supporting intellectual development, academic success, and the capacity for complex cognitive activity.

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The study further revealed that the ability for emotional self-regulation is closely related to existential characteristics reflecting subjective life satisfaction and meaningfulness. This is consistent with previous findings showing that higher Fulfillment in adolescents is associated with increased emotional intelligence and reduced anxiety (Chernyavskaya, Ivanova, 2017).

Group analyses complement the correlational results: students with higher F scores demonstrated better emotion regulation, indicating the role of inner autonomy and decision-making capacity in the development of emotional intelligence. This corresponds to A. L ngle's concept, in which freedom is understood as a process enacted anew in each concrete situation and grounded in inner dialogue, perception of possibilities, and alignment of choices with values and conscience. In adolescence, emotional involvement acts as the key "motor" of this process, initiating the formation of will and supporting readiness for action. The observed associations of F with emotion regulation and right-hemisphere characteristics reflect the importance of emotional engagement and holistic perception in the development of freedom. Its final stage — resolve and action — requires integrating emotional impulses with cognitive choice, which corresponds to the association found between F and creative lexical use (L ngle, 2018).

Our results support the role of motor activity as an indicator of lateral specialization (Simernitskaya, 1978; Bragina, Dobrokhotova, 1988; Khomskaya et al., 1997; Kabardov, 2020). Existential characteristics (SD, F, V, P, E, and G) were more strongly associated with left-hand activity, suggesting possible right-hemisphere involvement in their formation. Meanwhile, the 4th right-hand tapping trial correlated with all scales, likely reflecting their role in increasing tempo under fatigue (Rusalova, 2003; Kabardov, 2013). Group analyses confirmed that high levels of SD, F, and P are accompanied by pronounced "left-handedness" and signs of right-hemisphere lateralization.

The stage-like nature of the development of interhemispheric asymmetry helps explain these findings. In early childhood, the right hemisphere dominates; however, around age 10 the role of the left hemisphere increases, which is attributed to educational environments that systematically stimulate activities requiring formal-logical analysis (Farber, 1986). The right-hemisphere predominance observed in some seventh graders (SD, F, and P) suggests the preservation of holistic processing strategies during a developmental period when the shift toward left-hemisphere functional asymmetry is not yet complete (Rotenberg, Bondarenko, 1989; Kabardov, Artsishevskaya, 2012).

In the analysis of V and G (Mann–Whitney results), group differences were observed across right- and left-hand tapping indicators. The stability of FAM characteristics and self-regulation may indicate more integrated and synchronized interhemispheric regulation. Such motor organization implies cognitive maturity and the ability for volitional regulation that integrates both logical and intuitive processing styles (Kosheleva, Zhambeeva et al., 2023). Thus, existential responsibility in this context emerges not only as a personal disposition but also as a neuropsychological foundation of cognitive stability.

At the same time, it should be noted that the relationships between existential characteristics and interhemispheric asymmetry must be interpreted at this stage as preliminary and indicative of potential developmental tendencies. These findings require further investigation using additional neuropsychological and instrumental methods for assessing lateralization.

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Conclusions

The present study demonstrated that adolescents' subjective evaluation of life is associated with their intellectual, academic, and emotional-regulatory characteristics, as well as with features of interhemispheric asymmetry. The SD and V scales played a key role in predicting cognitive and academic outcomes, reflecting their contribution to the development of goal-directedness and volitional regulation. G and F were also associated with cognitive activity, emotional self-regulation, and right-hemisphere characteristics, indicating the integration of cognitive and personality processes.

In adolescence, existential characteristics can be viewed as personal regulatory factors and markers of the neuropsychological organization of cognitive processes. Existential maturity thus emerges as an internal resource linked to academic achievement and the stability of emotional–cognitive regulation. Future research should focus on clarifying the dynamics of these associations in older age groups and on developing psychological and educational support programs aimed at fostering existential characteristics as a foundation for academic success and personal growth.

Limitations. The experimental data were collected on a limited sample of adolescents from a single comprehensive school and require caution when comparing results obtained in other samples. Self-report methods may be subject to social desirability and subjective biases, although this risk was partially offset by the inclusion of objective cognitive tests. Furthermore, multiple statistical comparisons with a small sample increase the risk of random effects; the differences and correlations obtained should be considered preliminary and require confirmation in more representative samples.

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Научная статья | Original paper

Appraisal of attitudes toward manifestations of ostracism in the student environment

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Abstract

Context and relevance. Social ostracism is widely represented in the school and youth environment. Approaches to the theoretical understanding of ostracism vary, and its manifestations are multifaceted. There are few studies of ostracism in the context of educational activities. **Objective**. To identify the changes in students-pedagogues' attitudes toward ostracism following experiences of mutual assistance among students. **Hypothesis.** Specification of students-pedagogues' attitudes toward the phenomenon of social ostracism and their acquisition of mutual assistance experience leads to positive changes in their attitudes toward situations of ignoring and exclusion in group interactions, as well as shifts the balance between individual and social needs. **Methods and materials.** 280 undergraduate students of pedagogical universities (M = 21,6, SD = 2,3, 82% women), 250 people from the experimental and 30 control groups participated in the study. The position of ostracism, the attitude towards the manifestation of ostracism and the basic needs in the situation of ostracism were assessed using the author's questionnaire, modified questionnaires by C.D. Williams and D.J. Hovas; statistical data processing methods were used (descriptive statistics, z-transform, criteria $\chi2$ and McNemar, effect values: Cramer's V, coefficient φ, Cohen's g). Results. The results have showed that the manifestations of ostracism are formed in the I — Other — Others system, students' attitude towards the manifestations of ostracism changes in the process of mutual assistance, which is associated with a re-evaluation of intragroup relations and an increase in awareness of mutual influence on each other. **Conclusions.** It is shown that the appraisal of attitudes toward ostracism in the student environment decreases with the interaction of students. It is recommended to include sessions on studying the phenomenon of social ostracism in the curriculum of pedagogical universities to increase students' awareness, develop their skills in preventing ignoring and social exclusion and foster relationship-building within the group of the general education system.

Keywords: ostracism, manifestations of ostracism, needs, university, students

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Опыт взаимопомощи как средство изменения отношения к остракизму в студенческой среде

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Резюме

Контекст и актуальность. Социальный остракизм широко представлен в школьной и студенческой среде. Подходы к теоретическому исследованию феномена остракизма характеризуются разнообразием и многоаспектностью. Анализ представлений об остракизме доступен в ограниченном объеме научной литературы, а исследования, посвященные изменению отношения к нему у студентов педагогических вузов, отсутствуют. Данное исследование позволяет преодолеть имеющийся дефицит научной информации, посвященной изучению изменения отношения будущих педагогов к остракизму. **Его цель** — выявить изменение отношения студентов-педагогов к остракизму после получения ими опыта взаимопомощи. **Гипотеза**. Конкретизация отношения студентов-педагогов к феномену социального остракизма и получение ими опыта взаимопомощи приводят к положительным изменениям отношения к ситуации игнорирования и исключения во взаимоотношениях в группе, а также изменяют соотношения индивидуальных и социальных потребностей. **Методы и материалы**. В исследовании приняли участие 280 студентов бакалавриата педагогических вузов (M = 21,6, SD = 2,3, 82% женщин), из них 250 человек участвовали в экспериментальной и 30 — в контрольной группах. Позиция остракизма, отношение к проявлению остракизма и базовые потребности в ситуации остракизма оценивались с помощью авторской анкеты, модифицированных анкет К.Д. Вильямса и Д.Ж. Ховаса; применялись методы статистической обработки данных (описательная статистика, z-преобразование, критерии χ^2 и Мак-Немара, величины эффекта: V Крамера, коэффициент φ, g Коэна). **Результаты.** Результаты показали, что проявления остракизма формируются в системе «Я — Другой — Другие», отношение к проявлениям остракизма студентов меняется в процессе взаимопомощи, что связано с переоценкой внутригрупповых отношений и повышением осознанности взаимовлияния друг на друга. **Выводы**. Показано, что отношение к остракизму студентов изменяется в ситуации взаимопомощи. Рекомендовано включение в учебный процесс педагогических вузов занятий по изучению феномена социального остракизма для повышения осведомленности студентов и развития рефлексии, формирования у них навыков предотвращения игнорирования и социального

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исключения и выстраивания взаимоотношений в группе обучающихся в системе общего образования.

Ключевые слова: остракизм, проявления остракизма, потребности, вуз, студенты

Introduction

Life in modern society has numerous phenomena and events that contribute to the emergence of contradictions and conflicts, while demonstrating tendencies toward isolation, favoritism toward certain social groups, and discrimination against others. This circumstance underscores the relevance of comprehensive study of the phenomenon of social ostracism (social exclusion).

The overwhelming majority of researchers, including E.E. Boikina, V.N. Borodina, A.S. Vasilchenko, S.A. Vekilova, Yu.E. Guseva, O.A. Kichigina, E.Yu. Kurzina, I.V. Morozikova, E.V. Nikolaeva, O.V. Rudyhina, E.V. Ryaguzova, G.V. Semenova, I.B. Tershkina, and others, employ K.D. Williams' model of ostracism (Williams, 2009; Wesselmann, Wirth, Williams, 2019) as theoretical foundation for their studies. The core tenet of this model posits disrupted individual needs in conjunction with the duration of ostracism exposure. The essence of the model lies in the sequential progression of the ostracized individual through three stages: the reflexive stage, characterized by an immediate reaction to the ostracism situation at the moment of impact; the reflective stage, which mediates subsequent thoughts, feelings, and behavior; and the acceptance (resignation) stage, wherein the individual experiences a depressive state, inability to fulfill frustrated needs, potentially leading to exhaustion and alienation due to rejection by a significant social group.

The typology of ostracism developed by K.D. Williams (Williams, 2009) includes: *pseudo-ostracism*, when the ostracized individual mistakenly perceives the subject's behavior as ostracizing; *role-based ostracism*, prescribed by a specific situation and the roles performed within it; and *punitive ostracism*, employed to demonstrate disapproval from certain group members or society.

In addition to K.D. Williams' propositions, the methodological foundation for understanding the essence of the ostracism phenomenon is provided by the research of: a) D.M. Twenge (Twenge, 2017; Twenge et al., 2001), who conceptualizes it as a situation in which an individual experiences solitude due to isolation by a group or society, without the necessary presence of hostility; and b) M.R. Leary, according to whom ostracism is akin to rejection and is defined as the explicit or implicit decision by a group or individual to refuse interaction with others, impacting the behavior, motivation, and self-regulation of the rejected person (Kelly, Leary, et al., 2013).

Analysis of the current studies of the social ostracism problem by E.E. Boikina and R.V. Chirkina revealed that the ostracism situation is characterized by the disruption of several basic needs highlighted by K.D. Williams, associated with an individual's life in society,

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such as self-esteem, control, sense of belonging, and meaningfulness of existence (Boikina, Chirkina, 2020). Distinctive features of ostracism embrace: *adaptability* necessary for survival and change; *totality*, whereby any individual can become the object of ostracism an unlimited number of times at a given moment; and *perceptual imbalance*, in which the ostracizing subject does not perceive their actions as ostracism, while the inadvertently ostracized individual interprets the subject's actions precisely as ostracism (see Ulyanova, 2021). An important feature of the ostracism phenomenon is its integration with neurobiological processes, as humans belong to social species and thus poorly tolerate social isolation, which can serve as a risk factor leading to distortion of cognitive functions overall; accelerated decline in cognitive abilities; impairment of executive functions; intensification of depressive and negative cognitive processes, including bias in social cognition; and heightened sensitivity to social threats in particular (Cacioppo, Hawkley, 2009).

Interpersonal exclusion constitutes a variant of ostracism that has an unexpected and unilateral rupture or restriction of social ties at the interpersonal level (Teresjkina et al., 2021). It manifests as a commonplace and occasionally necessary societal practice of excluding the Other, conceptualized as the cancellation of interpersonal relations within the "I–Other" dyad in both real and virtual domains (Rjaguzova, 2023). The reason for the breakdown of relationships and rejection may be the identified dissimilarity or otherness with whom interaction takes place. (Semenova, Kichigina, 2022). Violation of basic needs and interpersonal relationships leads to the emergence of ostracism in educational environments.

Ostracism in educational environments

Research demonstrates that social ostracism is widely prevalent in school and university settings alongside other social phenomena. One of the leading researchers in social ostracism, E.E. Boikina, has shown that the influence of persistent social ostracism contributes to the emergence and development of antisocial behavior in early adolescent minors, with the experience of ongoing rejection being closely linked to aggressive and self-destructive behavior as well as low levels of psychological resilience (Boikina, 2023). Y.S. Chukhlanzev, R.V. Chirkina, and E.A. Kupriyanova examined a sample of adolescents aged 12–17 years, including orphans and children without parental care raised in specialized institutions. The authors identified a connection between coping behaviors among ostracized participants and their deviant behavior (Chukhlanzev et al., 2021). Social ostracism has also been found to relate to adolescents' academic self-determination and prosocial behavior (Arslan, 2021). A.I. Ageeva noted that the phenomenon of ostracism in schools is sufficiently widespread; however, it is not regarded by educators as a distinct phenomenon but rather as a stage of bullying. According to the author, this perception results in the recognition of bullying issues in certain anti-bullying projects, whereas ostracism — even when viewed as a component of bullying — is more challenging to isolate, leading to significantly less frequent implementation of preventive measures (Ageeva, 2024). Nevertheless, effective ostracism prevention requires educators to conduct awareness-raising activities among parents and students (e.g., when a new pupil joins the class). Educators must themselves understand the conditions under which ostracism may arise toward a newcomer from the group, its potential impact on the student's personality, and the associated consequences (such as suspiciousness, low self-esteem, aggressiveness, negativism, and others), while possessing the skills to manage these situations and teach others accordingly.

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I.V. Ulyanova identified a variety of ostracism situations possible within the educational system: between children, between a teacher and a child, between support staff and a child, between a teacher and a group of children, between parents and a child, and so forth (Ulyanova, 2021). L.N. Kostina and E.Yu. Kostina highlighted the causes of ostracism emerging in educational institutions toward adolescents. Specifically, ostracism may be triggered by the adolescent's appearance deviating from that of peers; health peculiarities — physical or intellectual; or personality and character traits, such as low academic performance or lack of awareness in significant topics. It should be noted that ostracism may originate from either peers or adults (Kostina, Kostina, 2021).

In educational environments, one-time instances of ostracism without humiliation of the learner's personality by the teacher are possible (Kostina, Kostina, 2021). Drawing on V.S. Mukhina's view that personality alienation exerts a dual influence, the positive effect of human alienation has been demonstrated, enabling better concentration on activities when isolated from others (Chernaya, Bodrukhina, 2020).

In pedagogical universities, awareness-raising efforts are conducted with students — future teachers — to comprehend the role and place of the ostracism phenomenon in their prospective professional activities. In a study of representations of ostracism, M.P. Asylbekova and I.B. Shaikhymuratova revealed that students conceptualize the phenomenon differently: over one-third identified it as devaluation; one-third as lack of interest; and the remainder as emotional distress. Overall, students attribute ostracism to devaluation, lack of interest, and personal characteristics. From their perspective, its consequences manifest as negative experiences and feelings of uselessness (Asylbekova, Shaikhymuratova, 2023).

In the process of education students at pedagogical universities, it is essential to consider that learners often experienced ostracism themselves during adolescence and/or early youth. Among students, there are both those who have been subjected to ostracism and those who have observed its manifestations toward others. Without reflection on their own experiences, they will struggle to fully assist others in ostracism situations and, consequently, fulfill their pedagogical role. Supporting this, L.N. Kostina and E.Yu. Kostina noted that such future professionals are unable to recognize the negative consequences of experiencing ostracism on children's personalities and their future development, thereby casting doubt on their professional competence (Kostina, Kostina, 2021).

I.V. Kazakova and O.A. Kocheulova observed that in the university educational environment, conflicts in student groups are resolved unproductively — this occurs as a mechanism of self-assertion during the formation of informal structures within the student collective through the rejection and ignoring of a participant who does not fit in — or in the "Teacher–Student" dyad. Ostracism manifests in both academic and extracurricular activities, with the authors attributing its causes to imperfections in information dissemination channels, failure to account for students' individual features, and suboptimal functioning of the university's psychological services (Kazakova, Kocheulova, 2023).

In the practice of psychological services at pedagogical universities, the following measures are employed for preventing ostracism manifestations in educational environments: conducting training sessions and organizing discussions, as well as fostering an atmosphere of respect and recognition within student groups. Key directions of this work include enhancing communicative competence, developing empathy, and strengthening the influence of values such as mutual assistance

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and support (Shaikhymuratova et al., 2023). M.P. Asylbekova and I.B. Shaikhymuratova emphasize that to increase the effectiveness of prevention, it is necessary to cultivate motivational readiness among educators for active ostracism prevention efforts, elevate their pedagogical expertise, and enhance group cohesion among learners (Asylbekova, Shaikhymuratova, 2023). At the same time, the specific features of ostracism in school settings highlight the task of developing students' understanding of ostracism (Kurzina, 2024) and its consequences (Shaikhymuratova et al., 2023) in pedagogical university curricula.

Approaches to the theoretical investigation of the ostracism phenomenon are characterized by diversity and multi-facetedness. Analysis of representations of ostracism among students at pedagogical universities is absent.

Given the foregoing, it can be concluded that approaches to conceptualizing ostracism are diverse and necessitate comprehensive analysis; however, studies of ostracism in education are rare and fragmentary. This fact underscores the need for further investigation of the phenomenon within educational environments.

In the educational environment, we define ostracism as a form of social exclusion of a student (in school) or a college/university student from the collective, manifesting as systematic ignoring, isolation, and refusal to interact by peers, teachers, or administration. Ostracism can be overt (open rejection, mockery) or covert (silent boycotting, exclusion from groups and projects). Most often, ostracism is employed to maintain group norms or protect the "status quo" in the classroom or student group. We posit that attitudes toward ostracism manifestations develop according to the schema: I–Other–Others and can change through targeted interaction among learners, which served as the foundation for our study, wherein the experience of mutual

assistance among student-pedagogues becomes a means of such transformation.

Research program

Objective is to identify changes in student-pedagogues' attitudes toward ostracism following their acquisition of mutual assistance experience.

Hypothesis. Specification of students-pedagogues' attitudes toward the phenomenon of social ostracism, coupled with their acquisition of mutual assistance experience, leads to positive changes in their attitudes toward situations of ignoring and exclusion in group interactions, as well as alterations in the balance between individual and social needs.

Materials and methods

Sample. The study involved 280 undergraduate students from pedagogical universities (M = 21,6, SD = 2,3, 82% female), comprising 250 participants in the experimental group (EG) and 30 in the control group (CG). The EG and CG were formed using random selection.

Methods. The study employed an introductory narrative (the story of girl Sonya about ostracism manifestations in school) and three questionnaires. The questionnaires assessed ostracism position, attitudes toward ostracism manifestations, and basic needs in ostracism situations embrace:

1. Authorial questionnaire "Assessment of Ostracism Experience in School" (20 questions, 5 per position).

2. Modified K.D. Williams questionnaire "Questionnaire on Ostracism Manifestations in the Student Environment" (6 questions with 3–4 response options).

3. Modified D.J. Hovas questionnaire "Basic Needs Questionnaire" (9 statements with a binary "yes/no" response scale).

The authorial questionnaire accounted for four positions of attitudes toward ostracism:

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I–Other, Other–Other, I–Others, Others–Others. An inverse Likert scale was used, where 1 ball indicated strong ostracism manifestation and 5 indicated weak[1]. The other two questionnaires were modified for the study's objectives, drawing on K.D. Williams and I. van Beest's "Need Threat Scale" in ostracism situations (2014) and D.J. Hovas's "Basic Needs Scale" (2012). The modified K.D. Williams questionnaire required selection of one option per question, while the D.J. Hovas one employed a dichotomous scale, where respondents agreed or disagreed with each statement. The content of the original questionnaires was substantially adapted considering: a) the learner demographic (university students); b) the educational environment; c) the student group context. The questionnaire on ostracism manifestations in the student environment incorporated items exploring ostracism as information reflecting the sequence of events and its manifestations. These items illustrate key components of youth self-awareness, their attitudes toward ostracism manifestations, and relational tendencies within student groups.

Procedure and research stages. The research procedure comprised three stages:

1. *Preparatory stage.* Presentation of a case study (Sonya's story from school life) and completion of the authorial questionnaire "Assessment of Ostracism Experience in School." We assumed that students' school experiences and prior encounters with ostracism in the past would facilitate recognition of the phenomenon in the current student environment. The stage's objective was to identify ostracism situations.

2. *Experimental stage*. Execution of mutual assistance tasks in groups of 10–15 participants using modified K.D. Williams and D.J. Hovas questionnaires before and after the experiment. Students were assigned to provide mutual help, with recipients and providers selected randomly (students drew lots). Mutual assistance tasks titled "Help for a Classmate" were implemented during practical sessions. Following the instruction to "assist group classmates," students identified real issues among group members — personal problems, family difficulties, academic challenges, or interpersonal conflicts with peers. The group pinpointed problems, defined mitigating or resolving tasks, and then individually addressed them through mutual support. In our view, assistance to group mates directed attention toward the Other and their needs, potentially altering evaluations of attitudes toward ostracism and needs — both one's own and those of group mates. The control group (CG) received no mutual assistance tasks. The stage's objective was to assess changes in evaluations of ostracism manifestations following student mutual assistance.

3. *Concluding stage*. Summarization of research findings.

Data analysis employed statistical methods (descriptive statistics, z-transformation, χ^2 and McNemar tests, effect sizes: Cramer's V, phi coefficient, Cohen's g).

Results

Descriptive statistical analysis of the authorial questionnaire revealed shifts in the I–Other position (question: "I am ready to support a classmate even if they went against the majority"): M = 2,01, SD = 0,77, and I–Others position (question: "I feel part of the class rather than isolated"): M = 1,93, SD = 0,72, indicating respondents' reluctance to defend an isolated classmate and preference for remaining on the sidelines. Lower scores on

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[1] For example, in question 1 "I am ready to support a classmate even if they went against the majority" (I–Other position):
1 — It is better not to intervene to avoid getting targeted myself; 5 — I will always stand by those who are excluded.

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the inverse scale evidence uncertainty and a sense of relational distance. Meanwhile, respondents did not perceive the class as either closed and fragmented with everyone for themselves, or conflict-ridden; nor as friendly with mutual classmate support, or cohesive (Other–Other, Others–Others positions), suggesting equivalent responses despite the problem's presence and stereotypical perceptions of classroom relationships and the class as a whole group. Personal school experiences underscored the topic's sensitivity for respondents, with ostracism residing in a zone of reduced recognition. Ostracism development was registered in the I–Other schema link without progression to the Other–Others link. The experiment targeted identification of transitions from I to Other and from Other to Others.

No differences were found between the experimental group (EG) and control group (CG) prior to the experiment across the two methodologies ("Ostracism Manifestations in the Student Environment" /K.D. Williams/ and "Basic Needs Questionnaire" /D.J. Hovas/) using χ^2 and McNemar tests (p > 0,05), except for the question 7 in the D.J. Hovas questionnaire ("*I felt influential in control (influential in the group)*"), where affirmative responses were more frequent in the CG (p = 0,014). This difference persisted post-experiment (p = 0,002).

The results of the K.D. Williams methodology using z-distribution analysis of response proportions pre-experiment in the EG showed that responses to the ostracism definition question ("*What does ostracism mean*?") most frequently identified it as "unlawful action toward a group member" (42,8%), compared to "perceiving someone as hostile" (39,2%) and "intolerance and dislike toward someone" (18%). Post-experiment, perceptions of ostracism as an unlawful action strengthened (54,8% of responses), while other options weakened (30,8% and 14,4%,

respectively). Differences were statistically significant for hostility (p = 0,019) and unlawful action (p = 0,002). For the question "*How do you feel about relationship issues in student groups where ostracism toward someone may occur*? *What is your attitude*?", most respondents selected "equal attitude toward all, regardless of traits or conditions" — 65,2% and 69,6% pre- and post-experiment. Other responses received fewer selections. Differences across responses were not statistically significant (p > 0,05), except for the option regarding possible ostracism if a classmate is unpleasant — it declined post-experiment from 16,6% to 10,8% (p = 0,046). No pre-post differences emerged in the EG for this question (χ^2 = 6,633, p = 0,083). See Table 1. For the question "*Evaluate statements about the nature of interpersonal relationships in your student group,*" priority was given to the response regarding equal rights of students at the university — 59,6% and 66% respectively. Differences for this and other response options were statistically nonsignificant (p > 0,05). The results for the question "*Do you allow for the possibility of ostracism toward your classmate*?" indicated that the preferred response was "I cannot allow such a situation toward anyone" — 57,6% and 66,8% in the EG (p = 0,065, no differences). Response distributions for the question "*Do you believe that certain classmates influence the manifestation of ostracism toward someone*?" showed no substantial fluctuations, except for the response "Yes, I allow for such a situation where certain classmates significantly influence ostracism manifestations in the group toward specific students," which more than doubled — from 14,4% to 32,4% (p = 0,0001), indicating greater reflection on group mates' mutual influence. Despite equal opportunities for behavior in interpersonal relationships (p > 0,05), every student in the group reported personal experiences of ostracism and its manifestations — responses to the question:

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"Yes, I experience constant hostility or avoidance toward myself from classmates." These indicators decreased post-experiment from 20,8% to 13,2% (p = 0,015). Additionally, students acknowledged that they themselves might behave this way toward group mates (following the principle "The best defense is offense!"). Among the four response options to the question "*Have there been instances when you experienced feelings of hostility or avoidance from classmates toward yourself*?", statistically significant changes occurred in two: "Yes, I allow for such a possibility" (p = 0,032) and "Yes, I can allow for such a situation on par with other classmates" (p = 0,046). Post-experiment, these indicators declined by 1,5 times (14,4% vs. 8,8% and 15,6% vs. 9,6%).

Thus, post-experiment, reflection on potential mutual influence intensified — for response options to the question: "Yes, I allow for such a situation where certain classmates significantly influence ostracism manifestations in the group toward specific students" — from 14,4% to 32,4% of cases (p = 0,0001); alternatively, instances of failing to notice such situations decreased from 46% to 36% (p = 0,023).

Analysis of D.J. Hovas' questionnaire results using z-distribution revealed significant differences across all statements (p = 0,0001), except for "I felt ignored (assessment of exclusion/inclusion status)" (p = 0,074), although this indicator decreased post-experiment from 54% to 46%. Proportion difference evaluation demonstrated that student response shares statistically predominated for items such as: "I felt part of the group" (68,8%), "I felt satisfied with myself in self-esteem" (81,2%), "I felt likable" (86,4%). Conversely, lower proportions were observed for: "I felt superfluous in group belonging" (30,4%), "I felt invisible in meaningful existence" (22%), "I felt no one would notice if I left the group" (29,6%), "I

felt influential in control" (26%), "I felt like a leader" (18,8%).

The primary results of the comparative analysis of the EG pre- and post-experiment for both questionnaires (M1 & M2) are presented in Table.

Analysis of K.D. Williams' questionnaire results using the χ^2 criterion demonstrates that mutual assistance among group mates reduces ostracism manifestations and alters attitudes toward it. Significant findings emerged for questions on ostracism ($\chi^2 = 9,852$, p = 0,07), the possibility of ostracism toward a classmate ($\chi^2 = 10,284$, p = 0,016), and the influence of certain classmates on ostracism manifestations toward someone ($\chi^2 = 22,873$, p = 0,0001) — corresponding to questions Q1, Q5, and Q6 in the table. Cramer's V effect sizes for these items exceeded those of others. Changes indicated a small effect boundary typical of educational interventions (effect size 0,1–0,2), while for question Q6 ("*Have there been instances when you experienced feelings of hostility or avoidance from classmates toward yourself*?"), the effect size exceeded 0,2 and surpassed other questions.

Regarding changes in basic needs per the D.J. Hovas methodology, McNemar's criterion analysis –attributable to inclusion in mutual assistance activities — revealed significant differences across all needs (p = 0,0001), except the final statement. Effect sizes, expressed via phi coefficient and Cohen's g, were higher post-experiment compared to the K.D. Williams methodology, exhibiting medium to above-medium effects and even large effects (0,4–0,7). This suggests frustrated needs among students in ostracism situations and their potential fulfillment within the student environment.

Changes in attitudes toward ostracism in EG are presented in Figure.

The results of the study indicate that comprehension of the ostracism phenomenon

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Table

**Differences in the results of the experimental group before and after the experiment
and effect size according to two methods (M1 and M2) (N = 250)**

Method	Question	χ^2	p	Effect Size		
				Cramér's V	phi coefficient (φ)	Cohen's g
M1 (K.D. Williams)	B1 / Q1	9,852	**0,007**	0,14		
	B2 / Q2	6,633	0,083	0,115		
	B3 / Q3	2,003	0,366	0,063		
	B4 / Q4	6,258	0,099	0,112		
	B5 / Q5	10,284	**0,016**	0,143		
	B6 / Q6	22,873	**0,0001**	0,214		
M2 (D.J. Hovas)	B1 / Q1	66,694	**0,0001**		0,517	0,392
	B2 / Q2	61,361	**0,0001**		0,495	0,376
	B3 / Q3	119,512	**0,0001**		**0,691**	**0,56**
	B4 / Q4	70,297	**0,0001**		0,53	0,408
	B5 / Q5	139,862	**0,0001**		0,748	0,624
	B6 / Q6	176,191	**0,0001**		**0,84**	**0,728**
	B7 / Q7	88,889	**0,0001**		0,596	0,48
	B8 / Q8	144,857	**0,0001**		**0,761**	**0,624**
	B9 / Q9	3,077	0,074		0,111	0,08

Notes: M1 — modified K.D. Williams method, M2 — modified D.J. Hovas method. For M1, χ^2, p-value, and Cramér's V are provided; for M2, χ^2, p-value, and the phi coefficient (φ), Cohen's g are given.
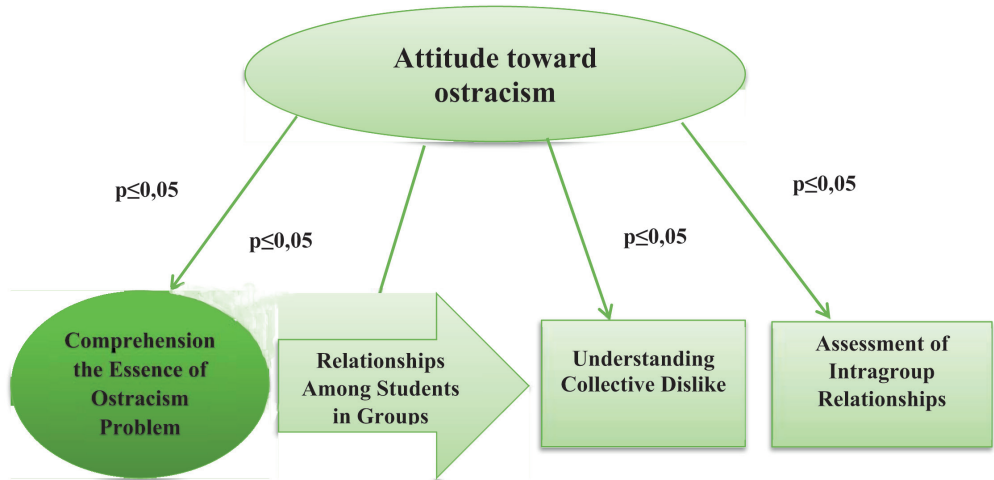

Fig. The results of a study changing attitudes towards ostracism and its manifestations
in a student groups (N = 250)

and shifts in attitudes toward it correlate with altered evaluations of intragroup relationship dynamics. The control group (CG) exhibited no statistically significant shifts, suggesting

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that the observed effects are attributable to the experimental intervention rather than natural mood fluctuations. Furthermore, postt-experiment, endorsements of ostracism acceptability toward classmates for personal reasons increased ($p = 0{,}0001$), while admissions of potential ostracism from others, hostility, or intolerance directed toward oneself decreased ($p = 0{,}016$), evidencing the efficacy of the student intervention. Consequently, in the experimental group (EG), fixation on "I–Other" positions diminished, fostering orientations toward "Others" (the group). Significant transformations occurred in basic needs: belonging, sympathy, and self-esteem needs intensified, whereas dominance needs and sensations of worthlessness or invisibility declined. The hypothesis — that specification of student-pedagogues' attitudes toward social ostracism, combined with mutual assistance experience, yields positive changes in responses to ignoring and exclusion in group interactions and rebalances individual versus social needs — was confirmed.

Discussion

Obtained data indicate that alterations in intragroup relationship evaluations, coupled with the emergence of group perceptions as a cohesive community rather than a disparate collection of individuals, are linked to substantive comprehension of ostracism and transformations in its conceptualization. This confirms that practical sessions with pedagogical university students reshape representations of social ostracism and intragroup relational dynamics.

In I.V. Morozikova's study, student- pedagogues' conceptions of the social ostracism phenomenon were examined. Findings revealed that a portion of students viewed prevention and mitigation of school ostracism as an internal regulatory matter within the classroom group (Morozikova, 2023).

Our study demonstrates that guiding students toward reflection on ostracism and their own intragroup interaction experiences through mutual assistance fosters autonomous discovery of personal space, delineates personality development trajectories, bolsters the self-concept, and serves as a primary criterion for characterizing the student's social milieu. This process heightens attentiveness to the Other and Others, thereby attenuating needs for control and self-assertion at others' expense while transforming ostracism representations. These shifts likely stem from initially constructing pathways from I to Other and Others, grounded in personal values and meanings.

The research results have shown that learners not only altered their conceptions regarding the possibility of intragroup regulation of ostracism situations but also acquired personal experience of such regulation. During the period of reflecting on the ostracism problem from various positions, new approaches to self-manifestation toward the Other and Others, specific activities, and situations emerge, which delineate the character of individual-group interactions in the future.

Thus, student interactions through mutual assistance promote reflection and heightened attentiveness to the Other and Others, as participants gain not only theoretical knowledge about ostracism regulation possibilities but also practical experience thereof.

Conclusions

Student responses to questions concerning personal safety and social integration (the questions 1 and 3 in authorial questionnaire) confirm the presence of ostracism and social isolation experiences. Post-experiment, the experimental group (EG) exhibited a stable positive effect:

— increased perceptions of support and safety,

— improved evaluation of the student group atmosphere, and

— significant enhancement of satisfaction with basic social needs.

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In the EG, attitudes toward ostracism and intragroup student interactions transformed. Mutual assistance contributed to reduced acceptability of hostility and intolerance from others toward oneself, heightened awareness of influence on ostracism manifestations within the group ($p < 0,05$), and improved perceptions of social needs ($p < 0,0001$). Findings affirm that engaging student-teachers in conscious, active participation to address peers' issues yields positive shifts in ostracism situation evaluations within group relationships, fulfills social needs, and mitigates associated risks. No changes occurred in the control group (CG), indicating that observed transformations resulted from the experiment rather than external factors or natural group dynamics. Thus, the research objective was achieved, and the hypothesis confirmed.

Further development of ostracism studies in pedagogical university educational environments could involve applying mutual assistance experiences gained during pedagogical practice in schools to identify additional means of altering attitudes toward social ostracism situations, thereby preventing their emergence in student settings.

Limitations. The research is exploratory in nature. The predominance of female students was also a limitation, the use of questionnaire methods, and the small size of the control group.

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Научная статья | Original paper

The individuality of a person in the context of digitalization: an overview of modern research and approaches

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Abstract

Context and relevance. In the context of pronounced civilizational changes associated with the processes of globalization, digitalization, accompanied by socio-cultural changes in the values structure, education, and the specifics of communication, the relevance of the problem of preserving and developing human individuality is increasing. **Objective** of the review is to identify the facts of the positive and negative impact of digitalization on the process of developing the individuality of children and adolescents. **Method**. Analysis and synthesis of data presented in scientific publications devoted to the study of this topic. **Conclusions**. With uncertain, insufficiently researched socio-psychological and socio-cultural consequences of digitalization, there is a high probability of destructuralization of the main spheres of human life, loss of his individuality and subjectivity in relation to the social, socio-cultural and subject environment. In particular, it was found that children and adolescents at risk of digital addiction have problems related to the deformation of the Self-image and its boundaries, communication problems, value-semantic and emotional-volitional, cognitive changes, relatively more pronounced features that can be interpreted as a violation of the integrity of individuality. To prevent such changes, special work is important, anticipating the introduction of digitalization in education.

Keywords: individuality, children, adolescents, civilizational changes, globalization, digitalization, digital environment, digital addiction, features of children and adolescents at risk of digital addiction, development of individuality and subjectivity

Индивидуальность человека в условиях цифровизации: обзор современных исследований и подходов

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Резюме

Контекст и актуальность. В условиях выраженных цивилизационных изменений, связанных с процессами глобализации, цифровизации, сопровождающимися социокультурными изменениями в системе ценностей, в образовании, специфике коммуникаций, возрастает актуальность проблемы сохранения и развития индивидуальности человека. **Цель** обзора — выявление фактов позитивного и негативного влияния цифровизации на процесс развития индивидуальности детей и подростков. **Метод**. Анализ и обобщение данных, представленных в научных публикациях, посвященных изучению данной темы. **Выводы.** При неопределенных, недостаточно исследованных социально-психологических и социокультурных последствиях диджитализации велика вероятность деструктурализации основных сфер жизни человека, утраты его индивидуальности и субъектности в отношении социальной, социокультурной и предметной среды. В частности, установлено, что у детей и подростков с риском цифровой зависимости имеются проблемы, связанные с деформацией образа Я и его границ, коммуникативные проблемы, ценностно-смысловые и эмоционально-волевые, когнитивные изменения, относительно более выражены особенности, которые можно интерпретировать как нарушение целостности индивидуальности. Для предотвращения таких изменений важна особая работа, предваряющая внедрение цифровизации в образование.

Ключевые слова: индивидуальность, дети, подростки, цивилизационные изменения, глобализация, цифровизация, цифровая среда, цифровая зависимость, особенности детей и подростков с риском цифровой зависимости, развитие индивидуальности и субъектности

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Introduction

The modern world is changing rapidly in technological, social and spiritual terms. The system of values that is significant to individuals is transforming, and lifestyles and living conditions are becoming standardized. It also affects a person's personality: they gradually lose the unique character traits and individuality that make them who they are. The problem of developing individuality in conditions that contribute to its disintegration (deindividualization) has been identified by a number of renowned domestic and foreign psychologists, such as G. Le Bon, E. Fromm, R. Ziller, F. Zimbardo, A.V. Petrovsky, G.M. Andreeva, V.I. Slobodchikov, E.I. Isaev, V.V. Zenkovsky, S. Frank, etc., and is becoming more and more relevant. Different researchers point to various factors as determinants of the disintegration of individuality. These include the power of the crowd, which begins to act as an independent subject, subordinating the personality; the refusal to take responsibility for actions, especially in virtual communication; underdeveloped self-awareness and reflection, including a lack of need for them; and the need to belong to a group and receive its approval. The processes of deindividualization are caused by the global socio-anthropological crisis, which manifests at an individual level as infantilism, aggressiveness, limitations, a need for stimulation and an inability to concentrate (Frolova, 2013; The Age of Digital Interdependence, 2019, etc.). Researchers studying personality and individuality have noted that deindividualization is currently more intense. This raises the question of what causes the loss of individuality in modern socio-cultural conditions, and how and to what extent individuality can develop and exist in these conditions (Bolshunova, Ustinova, 2024; Frolova, 2013; Rezvitsky, 2019).

Individuality in the context of digitalization: an exploration of the issues

The problem of individuality and its development has traditionally been of interest to Russian psychologists. Works by B.G. Ananyev, E.A. Golubeva, V.S. Merlin and other differential psychologists present research on individuality, which contains personal, psychological and subjective content (Ananyev, 1968; Merlin, 1986; Golubeva, 2005; Kabardov, 2020; Bolshunova, Ustinova, 2024). In domestic psychology, the understanding of individuality, where personality acts as one of its substructures, is historically conditioned.[1] Due to historical circumstances, Christian (Orthodox) psychology largely dominated Russian psychology in the nineteenth and early twentieth centuries. At the same time, Christian psychology is characterized by an appeal to the individual soul. This is because the soul is immortal, in communion with God, and able to take responsibility for what happens in one's life and in the world. It is also worth noting the views of the Russian philosopher, theologian, psychologist, and educator V.V. Zenkov, who defines individuality as the "spiritual core of a person or personality" and "a living, creative force that determines psychological development" (Zenkov, 1996, p. 195). Similar positions are presented in the works of N.O. Lossky, P. Florensky, and S. Frank. (Lossky, 2000; Florensky, 2001; Frank, 2007). In religious and philosophical anthropology, deindividualization is caused by alienation from God (Frank, 2007; Hoblick, 2014). This entails detaching from one's own personality, resulting in a loss of subjectivity and the ability to distinguish between the self and others. It also manifests as susceptibility to manipulation, an undeveloped sense of self and a lack of reflection. Historically, interest in individuality and its origins has also

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[1] Psychology was permanently taught in ecclesiastical educational institutions, while its teaching, together with philosophy, was restricted to a greater or lesser extent at different times in secular ones.

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been a characteristic of the natural-scientific approach to Russian psychology. (Lazursky, 1997; Pavlov, 1954; Ukhtomsky, 2002)[2].

The tradition of researching holistic individuality — integrating individual, personal, subjective and spiritual principles — continues to thrive in the schools of B G. Ananyev, B.M. Teplov, and V.S. Merlin. It is important to note that, in most Russian schools of differential psychology, individuality is not reduced to a set of qualities (biological, social, psychological, personal, etc.) that distinguish one person from another. Rather, it is understood as the unique combination of these qualities that make up a person's identity and individuality. Despite the significant contributions of W. Stern, F. Galton, A. Anastasi and others to the emergence of foreign differential psychology, personality psychology (or personology, as represented by G. Murray, S. Maddy, etc.) is more widely recognized. In this field, individuality is considered to be one of the aspects of personality. Moreover, foreign differential psychology focuses more on peculiarities and variability, and on listing differences, than on integrity and uniqueness.

Thus, in Russian differential psychology, individuality is regarded as the "core of a person" (Zenkovsky, 1996), integrating individual, personality and subject parameters (Ananyev, 1968; Merlin, 1986; Golubeva, 2005).

We understand individuality as the integrity and uniqueness of a person, implemented through the choice, design, and implementation of their life path. This development involves ascending to subjectivity (to oneself, one's authenticity) at each stage of age development, as well as an ascent to socio-cultural samples, in which the spiritual component is represented (Bolshunova, Ustinova, 2024). In B. M. Teplov's (1961) opinion, research into individuality was the most

important area of scientific psychology. In these changed socio-cultural conditions, the question of individuality and the understanding of how it develops becomes particularly important.

One such crucial change is globalization, characterized by multi-vector civilizational processes such as the unification of human development and the accentuation of ethno-cultural and national specialness. These processes also entail the degradation of subjectivity, the loss of meaning and the loss of meaning-making (Astafieva, Flier, 2013; Bolshunov, Tyurikov, Bolshunova, 2020; Korytyna, 2016; Sloterdijk, 2010). The unification processes, when accompanied by appropriate conditions such as regulation in the spheres of language, culture, life norms and values, can lead to depersonalization, the loss of cultural and individual uniqueness and specialness. This is because they are accompanied by the same phenomena within the framework of a limited 'we'.

Cultural scientists believe that spiritual life is the aspect of culture that is most resistant to aggressive globalization. Self-identity is based on cultural uniqueness, which is enshrined in language, mentality, experience and behavior. However, it is this sphere that is subject to aggressive influence, making use of all the possibilities offered by internet communications and spreading the trendy concepts of the modern person's image.

The effects of globalization are being exacerbated by two factors: digitalization and the pressure of information. The digital transformation of all aspects of society, including education, is inevitable. The technological paradigm shift affecting all areas of life, including the economy, industry, medicine, entertainment, and art, requires corresponding changes in education. However, the total digitalization of all

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[2] This includes ideas about character and its structure developed by A.F. Lazursky in the context of exo- and endopsychic relations; A.A. Ukhtomsky's research into the neurodynamic foundations of the phenomenon of "dominance in another", which describes the possibility of dialogical relations between the self and others; and I.P. Pavlov's research into the neurophysiological prerequisites of temperament and abilities.

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activities, especially those involving children, is already having an adverse psychological and sociocultural impact, as it tends to be carried out carelessly and ignorantly.[3] The risks associated with digitalization, in the broader context of this phenomenon (including informatization, virtualization, digital transformation, etc.), are not limited to legal issues such as security, privacy, information overload, etc. The emergence of a new digital environment poses more serious challenges to human life (Auzan, 2019[4]; Krupennikova, Kurbatov, 2014; The Age of Digital Interdependence, 2019; Mattern, 2021; Squires & Johnson, 2020, etc.). According to Internet World Stats, the number of internet users has increased rapidly, from 2.8 billion in 2014 to an estimated 5.6 billion in 2024. At the same time, however, humanity is not ready to face this new reality. New phenomena are emerging that need to be conceptualized in terms of their significance and impact on culture and human development. For example, there is Linguistics 2.0 (communication from keyboard to screen) and Special Communication (communication 2.0), which is characterized by the language of hostility, liberation and irresponsibility, and a lack of sensitivity to the distinction between public and intimate matters (Goroshko, 2016). Existence in the virtual world is such that self-determination and concern about authenticity are unnecessary. In fact, it is preferable to have multiple selves "scattered" across different blogs, avatars, nicknames, etc. In the digital realm, there's no requirement to be your authentic self, take responsibility, or explore the limits of your identity.

Several researchers believe that the behavioral model implemented in digital realm can easily be transferred to communication and interaction with others in real life (Fortunatov, Bokova, Egorov, 2014). This results in the same type of facilitated, superficial and irresponsible communication being actualised.

Those studying the "new digital reality", including philosophers, culturologists, political scientists, linguists, educators and psychologists, have mixed attitudes towards the consequences of digitalization. These range from negative (Fortunatov et al., 2014; Yalda et al., 2014) to mostly positive (Prensky, 2012; Berulava, 2012), and optimistic ones. The optimistic position is based on the idea that, under certain conditions, an "extended personality" emerges. This personality positively adapts to the digital environment due to digital competence, technorationalism, openness to change, and self-transcendence. It then acquires digital sociality (Soldatova, Chigarkova, Ilyukhina, 2024; Karabanova, Tikhomandritskaya, Molchanov, 2024; Soldatova, Voyskunsky, 2021; Karabanova, Tikhomandritskaya, Molchanov, 2024). However, having positive experiences of and successfully adapting to the digital environment are not sufficient conditions for developing individuality. If digital devices are introduced in a way that is inadequate from psychological and sociocultural perspectives, there is a high likelihood of irreversible changes to culture, communication, and personality. The deontologization of human life in the virtual world (Polyankina, 2020; Fortunatov, 2014), the anonymity of communication

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[3] For example, since 2008, a group of businessmen (My Generation Foundation) have persistently promoted the foresight project "Childhood — 2030". This project argues that children do not need families and that it would be better to raise them in "children's communities". It also claims that parents do not really love their children and that it would be more profitable to replace them with robot nannies, and children with robot children. Furthermore, it asserts that it is necessary to lay the genetic basis for children to be born in advance, depending on the needs of society and the demands of parents, etc.http://foresight.sfu-kras.ru/node/70. (Radchenko A., Popov S. "Childhood-2030" — the experience of conducting a foresight project in Russia // Educational Policy. 2010. № 5-6 (43–44). https://cyberleninka.ru/article/n/detstvo-2030-opyt-provedeniya-forsayt-proekta-v-rossii/viewer).

[4] Auzan A. Digital economy: the human factor // Lecture. Polit. Ru. June 25, 2019. URL: https://polit.ru/article/2019/06/25/auzan/?fbclid=IwAR1n2nK0Flk2aj8YJjqiUjzLWdVa9UK2oBtIxM4O6QWNGElyC4uYVQ9LqF4 (accessed on: 20.08.2020).

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provoking aggressive verbal behavior, trolling, and bulling, as well as the desacralization of the system of "traditional" values (Aleynikov et al., 2022, p. 292) are all possible negative consequences that have been identified. Other possible negative consequences include superconnectivity and subjectivity in the absence of the possibility to verify information, problems determining authorship and so on. (Krupennikova, Kurbatov, 2014).

Let us elaborate on the possible negative psychological consequences of digitalization if it is carried out spontaneously, without considering the specifics of the digital environment and how it is managed. The digitalization of human life can result in the restriction of personal freedom and sovereignty, the weakening or erasure of the boundaries of the "self", and the loss of trusting, intimate communication and social sensitivity. This is primarily due to the anonymity of the interacting characters. Anonymity enables one to appear rather than be, to adopt various guises and, eventually, lose one's authenticity and face. This results in the loss of the ability to make decisions and take responsibility. At the same time, modern psychologists, philosophers and cultural anthropologists (e.g. Florenskaya, 2001; Sloterdijk, 2005) have emphasized the importance of closeness, intimacy, emotionally charged interaction, care and sincerity for a person's normal psychological state and children's successful sociocultural development.

The effects of digitalisation may also be evident in cognitive processes, particularly in terms of attention (Firat, 2025). The most obvious and expected consequence is the weakening of memory productivity, since people no longer need to memorize and store information. This results in a primitivization of thought and understanding processes based on the limited information available in the realm of representations in the internal plane. Images impoverished or even distorted by the virtual environment cannot provide adequate material necessary for imagination, creativity and meaning-making to flourish. Thus, the general consequence of "moving"

into the digital world can be a simplification of one's relationships with the outside world and other people, and a poverty of one's inner world, experiences, value system and meanings (Bolshunov, Tyurikov, Bolshunova, 2019).

"Smart home", "smart city", "smart building", and "internet of things" undoubtedly make everyday life easier for people, save resources and facilitate the interaction of information between people. However, Mattern (2021) suggests that a person who is detached from the physical world gradually loses the ability to control it and be a subject in relation to it. The problem of human interaction with social robots and artificial intelligence is also relevant in connection with the above projects. The psychological aspect of the problem stems from the fact that "social robotics begins to give robots the capacity for social interaction" (Motorina, 2023, p. 40), further exacerbating the issue of the decline in human ability for genuine, intimate interpersonal communication and replacing it with simulacra. Substituting genuine human communication, which is associated with the exchange of meanings, experiences and mutual understanding, with imitation of all these things, can lead to humans losing them and significantly changing the parameters of human civilization.

Digitalization has already brought about disturbing changes in human development, particularly among adolescents and young people. One such change is the tendency to transfer the communication features characteristic of virtual environments to reality. In this regard, the reflections of P. Slooterdijk are noteworthy. He distinguishes between two modes of existence: spheres and networks (Slooterdijk, 2010). According to this theory, the network relationships created by digitalization cause people to cease being subjects and become objects of the network. While the 'sphere' (home, family and intimacy) is a relationship of intimacy, people here are open with each other. This makes them "defiantly defenseless" towards each other (Sloterdijk, 2005), creating the conditions for subjective relations in the context of human meaning. Thus,

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in people's lives, society ontologically presents two modes of existence: the subject-oriented (world-oriented, spherological) mode and the object-oriented (network-oriented) mode. Currently, the object-oriented approach is becoming the dominant one, resulting in 'the substitution of subjectivity by agency' (Bolshunov et al., 2019, p. 88). It is important to understand that the modern person's life is shaped by a new digital environment that competes with traditional ways of living and being. This environment changes many things, including habits, attitudes and views of the world and the people around us. It requires new approaches to changed conditions and, most importantly, changes our view of ourselves and our sense of uniqueness in a multitude of manifestations and relationships.

Conclusion

A review of studies on the preservation and development of human individuality in the context of pronounced civilizational changes associated with globalization and digitalization revealed that humanity lacks sufficient experience in organizing a developing digital environment. Consequently, we can conclude that the uncertain and insufficiently researched socio-psychological and socio-cultural consequences of digitalization carry a high risk of destructuralization of the main spheres of human life and of the loss of individuality and subjectivity in relation to the social, socio-cultural, and subjective environment (Bolshunova, Ustinova, 2024).

Civilizational changes raise a number of questions: what are the developmental possibilities of the digital environment; what is the nature of human subjectivity in relation to the digital environment; and what are the negative consequences of digitalization? The most significant problem is developing prevention principles and

programs for a digital environment for children of different ages. In the context of the cultural-historical approach and the historical crisis of childhood, the most important problem becomes the study of ways and methods by which adults can mediate the developmental and educational functions of the digital environment, taking into account L.S. Vygotsky's cultural-historical concept and S.L. Rubinstein's subject-oriented approach (Bolshunova, 2022).

Given the creative potential of digitalization, there is a high likelihood of developing digital co-dependency. This is characterized by toxic traits that manifest as a loss of subjectivity in relation to the digital environment, and deindividualization. Such traits include a deformed image of the self and its boundaries, communication difficulties, particularly in dialogue, and cognitive, emotional, and volitional changes. (Bolshunova, 2022). Special work is needed before digitalization is introduced in education to prevent such changes. Age-appropriate preventive programs should be used from preschool age onwards. They can be used to encourage reflection and model productive relationships with the virtual world in a context that considers value and sense. They can also be used to develop the ability to recognize attempts at manipulation and counteract them (Bolshunova, 2022). Implementing these kinds of programs involves adults fully mediating the introduction of children and adolescents to the digital world. From childhood, it is important to educate people on how to develop constructive relationships with the digital environment, making use of its developmental opportunities while avoiding dangerous interactions and promoting self-knowledge and self-development.

Limitations. As we are at the beginning of this process, there is not enough research on the impact of digitalization on individuality.

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Научная статья | Original paper

The relationship and intercultural differences in tolerance and existential characteristics of student youth (on example of Russia and Armenia)

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Abstract

Context and relevance. The article offers an analysis of the levels of tolerance and existential characteristics of student youth, highlights the differences between the levels of tolerance and existential fullness in different ethnic groups, and studies the relationship between the level of tolerance and existential characteristics of Armenian and Russian student youth. **Objective.** The aim is to study the relationship between tolerance levels and existential characteristics of student youth in different sociocultural environments — the Republic of Armenia and the Russian Federation. **Hypothesis.** The hypotheses of our study were the following: 1) We assume that there exists a relationship between the levels of tolerance and certain existential characteristics; 2) We assume that the levels of tolerance and existential characteristics are different in Armenian and Russian student youth. **Methods and materials.** The study involved 100 participants (Armenian and Russian students). The subjects were divided into 2 groups (50% each): Armenian and Russian students (M = 20,94; 16% male, 84% female). We assessed the respondents' levels of tolerance and existential characteristics using the following assessment methods: the "Index of Tolerance" questionnaire by G.U. Soldatova, O.A. Kravtsova, and O.E. Khukhlaeva; and the Existence Scale (ES) by A. Längle, K. Orgler, and S.V. Krivtsova. **Results.** According to our first hypothesis, we observed statistically significant correlations between the general level of tolerance and certain existential characteristics. According to our second hypothesis, we identified statistically significant differences in the levels of tolerance and existential characteristics in Armenian and Russian student youth. **Conclusions.** The results showed medium and low statistically significant correlations between the general level of tolerance and existential characteristics in the Russian sample, while no statistically significant correlation was discovered in the general level of tolerance and the existential characteristics in the Armenian sample. The differences between the two samples can be attributed to the differences in the sociocultural situation in the Republic of Armenia and the Russian Federation.

Keywords: tolerance, existential characteristics, existential fullness, Armenian and Russian student youth, relationship

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Взаимосвязь и межкультурные различия толерантности и экзистенциальных характеристик студенческой молодежи (на примере России и Армении)

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Резюме

Контекст и актуальность. В статье представлен анализ уровней толерантности и экзистенциальных характеристик студенческой молодежи, выделены различия между уровнями толерантности и экзистенциальной наполненности в разных этнических группах, а также изучена взаимосвязь уровня толерантности и экзистенциальных характеристик армянской и российской студенческой молодежи. **Цель** — выявить взаимосвязь уровней толерантности и экзистенциальных характеристик студенческой молодежи в разных социокультурных средах — Республике Армения и Российской Федерации. **Гипотезами** нашего исследования были следующие: 1) мы предполагаем, что существует взаимосвязь между уровнем толерантности и некоторыми экзистенциальными характеристиками; 2) мы предполагаем, что уровни толерантности и экзистенциальных характеристик различаются у армянской и российской студенческой молодежи. **Методы и материалы.** В исследовании приняли участие 100 человек (армянские и российские студенты). Испытуемые представляли 2 группы (50%, 50%): армянские и российские студенты (М = 20,94, 16% мужчин, 84% женщин). Исследование уровня толерантности и экзистенциальных характеристик личности респондентов проводилось с использованием следующих методик: опросника «Индекс толерантности» Г.У. Солдатовой, О.А. Кравцовой, О.Е. Хухлаевой; шкалы экзистенциальности (ШЭ) А. Лэнгле, К. Орглера и С.В. Кривцовой. **Результаты**. Согласно нашей первой гипотезе, мы выявили статистически значимые корреляционные связи между общим уровнем толерантности и некоторыми экзистенциальными характеристиками. Согласно нашей второй гипотезе, мы выявили статистически значимые различия в уровнях толерантности и экзистенциальных характеристиках личности у армянской и российской студенческой молодежи. **Выводы.** Результаты показали, что в российской выборке между общим уровнем толерант-

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ности и экзистенциальными характеристиками личности наблюдаются статистически значимые умеренные и слабые корреляции, в то время как между общим уровнем толерантности и экзистенциальными характеристиками личности армянской выборки корреляции отсутствует. Различия между двумя выборками могут быть обусловлены различиями в социокультурной ситуации в Республике Армения и Российской Федерации.

***Ключевые слова*:** толерантность, экзистенциальные характеристики, экзистенциальная наполненность, армянская и российская студенческая молодежь, взаимосвязь

Introduction

People in a world of cultural, religious, and ideological diversity confront situations where they do not always approve of the beliefs, values, or behavior of others. The processes of globalization stimulate this unconscious desire to differ from the uniform world. The criteria for otherness become more diverse and complex; they exit the framework of habitual racial and ethnic stereotypes, acquiring unique social, economic, sexual, gender, and other features.

The accelerating processes of globalization, the growth of pluralistic societies worldwide, and the undeniable growth of migration have brought forth the issue of multiculturalism. Multiculturalism is conceptualized in terms of positive intergroup relations and 'productive diversity', representing a rich and relevant national asset, as well as acting as a crucial condition for the development of intercultural competence and acquiring intercultural communication skills (Volkova, 2021; Johansson, 2024). Differences can be difficult to accept when they conflict with one's convictions and way of life because each person tends to believe in the legitimacy and validity of their values, beliefs, and practices. However, not all can receive confirmation, "affirmation" because of their "propositional content that implies a distinction between true and false, right and wrong, beautiful and ugly" (Joppke, 2004, p. 242). These notions foreground the problems of existential fullness — a way of life that is meaningful and purposeful, a concept of inner consent.

The relevance of our study is determined by the necessity of examining systemic intercultural differences among representatives of various ethnic and social groups in the era of multiculturalism and globalization. The relevance of the study is also determined by the significance of the problem of tolerance in a transitive world (Berry, Lepshokova, Grigoryev, 2022). In the scientific literature, the relationship be-

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tween existential characteristics and tolerance has been underexplored.

The aim of this research was to identify the interconnections between the levels of tolerance and the existential characteristics of student youth in the Republic of Armenia and the Russian Federation.

The hypotheses of our study were the following:

1) a relationship exists between the level of tolerance and certain existential characteristics;

2) the levels of tolerance and existential characteristics differ in Armenian and Russian student youth.

Theoretical and methodological framework

Our research builds upon the works of key scholars, including I. Yalom, V. Frankl, A. Längle, G.W. Allport, M. Verkeuten, and G.U. Soldatova.

In researching existential characteristics, we rely on the ideas of Viktor Frankl, who emphasizes that the deepest motivation of a person is the search for meaning, oriented towards revealing the profound aspirations of human nature.

Logotherapy (Greek logos: "word") strived to prevent the loss of meaning (Severina, Epishin, 2024; Maurits, Hatta, Suhana, 2023; Ivers, Johnson, Casares, et al., 2024; McLafferty, 2024). Frankl emphasizes the importance of freedom and responsibility of human beings — qualities that determine them as "personality". A "personality" is, according to Frankl's theoretical stance, more than a mere instinctual "psychic apparatus", and that is what makes human beings capable of "Self-transcendence". As a consequence, human beings as "personalities" are sensitive to values in the world and to potential meanings underlying their decisions and actions. As such, people do not fundamentally pursue lust (Freud) or power (Adler), but according to Frankl (1987), the deepest human motivation is the search for meaning (Omelchenko, 2023).

The modern existential theory comes from the idea that human existence takes as its foundation the four fundamental realities, the cornerstones of existence, which were hitherto defined by Yalom (1980). According to Längle, they "highlight the common existential emphasis on the tragic dimensions of human existence: freedom (or "groundlessness"), death, isolation (especially loneliness), meaninglessness or absurdity" (Längle, 2003, p. 4).

According to A. Längle, a comparison of Frankl and Yalom reveals, "Groundlessness implies the world with its supporting structure, death means having a life with growth and temporality, loneliness arises from the uniqueness of each person, and meaning relates to a contextual understanding of one's own existence and activities that are directed towards a worthwhile future" (Längle, 2003, p. 4). Each of these categories is vital to the achievement of inner consent to the subjective reality, posing a challenge to alter subjective reality until one can achieve inner consent — in other words, existential fullness. According to Frankl, existential vacuum (Frankl, 1987), exemplified by the absence of motivation and feelings of emptiness and meaninglessness, arises from following the drives of lust or power instead of the noetic search for meaning of life and values of it, truth, justice, and freedom — but in combination with responsibility (Frankl, 1987). There are four fundamental conditions for existential fullness determined by Längle as a result of his empirical and phenomenological work. These are the realities that human beings are confronted with: "The world in its fac-

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tuality and potentiality, life with its network of relationships and its feelings, being one-self: existing as a unique, autonomous person, and the future that we shape" (Längle, 2003, p. 4).

In our opinion, discussions on inner consent to reality are incomplete without the exploration of the concept of tolerance. Inner consent to reality consists in accepting the world and the people around us as they are, without denial or distortion, while the essence of tolerance boils down to forbearance, respect for other people, understanding of others' opinions, beliefs, faiths, behaviors, and traditions — in a broad spectrum, "otherness" — based on the recognition of cultural diversity. These concepts are interconnected because achieving inner consent and the right to hold one's own convictions and views is, in effect, impossible without recognizing the right of others to be different.

Numerous theories and definitions have been proposed regarding the concept of tolerance. Throughout history, philosophers have advanced the idea of tolerance time and again, but it has always remained a contested concept, the practice and limitations of which have been subject to societal debate from the time of Aurelius to the present. In The Meditations, Marcus Aurelius expressed the idea of tolerance as follows: "All men are made for one another; either then teach them better, or bear with them" (Aurelius, in the translation of Casaubon, 1692, p. 169).

Voltaire, in his Treatise on Tolerance, speaks against religious intolerance, while Jean-Jacques Rousseau devoted some of his works to analyzing human rights and tolerance. John Locke, in his A Letter Concerning Toleration (1689), grounds the understanding of tolerance on social agree-ment and the separation of personal and social lives.

Famous English philosopher Peter Nicholson states that any tolerant attitude requires conciliation with some form of otherness. In his paper "Toleration as a Moral Ideal," Nicholson defines tolerance as a relationship based on six characteristics:

Deviation — that which is tolerated differs from what is seen as the norm;

Non-triviality — the subject of deviation is not trivial;

Disagreement — the tolerating subject disagrees with the deviation on moral grounds;

Power — the tolerating subject has the power necessary to attempt to suppress the object of tolerance (or, at least, to resist or impede it);

Non-repudiation — the tolerant subject does not use their power to suppress or denounce the deviation, thereby allowing it to exist;

Goodness — tolerance is genuine, and the tolerant subject is good. (Nicholson, 1985, p. 160).

When reconciliation is successful, one must be willing to accept certain concessions (e.g., the desire to offend, suppress, or displace someone), while remaining committed to one's own beliefs. The conflict between this commitment to one's own beliefs and the acceptance of others' stances and beliefs characterizes tolerance as a moral quality, making it more complex to understand and acquire.

Psychology considers tolerance as "acceptance of others whose actions, beliefs, physical capabilities, religion, customs, ethnicity, nationality, and so on differ from one's own" (APA Dictionary of Psychology, 2023), a fair and objective attitude toward points of view different from one's own,

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mutual respect, freedom of choice, political correctness, tact, support, forbearance, forgiveness, liberalism, equality, dialogue, cooperation, and aspiration towards social integrity. Therefore, understanding tolerance requires a consideration of the aspect of dislike, disagreement, or disapproval. According to Sullivan, the term itself presupposes opposition or disagreement (Sullivan, Schmitt, 2022), in the lack of which we no longer speak of tolerance but of indifference or sympathy (Volkova, 2021).

The 'paradoxical' nature of tolerance is further highlighted when tolerance is approached as an attitude, in the social psychological meaning of the word (Sullivan, Schmitt, Goad, 2022; Schmitt, Calloway, Sullivan, Clausen, Tucker, Rayman, et al., 2021). Tolerance can be defined as the respect, acceptance, and appreciation of the rich diversity of human beings, the world's cultures, and forms of expression. Tolerance is an integral positive moral quality of a person embedded in the system of values, where forbearance of opinions, beliefs, and behavioural norms, as well as recognition of the equality and value of other people, are integral. Tolerance is characterised by interest toward others, freedom from bigotry, readiness to cooperate and coexist, and polite, laid-back speech. Tolerance determines a person's ability to act in problematic or critical situations by communicating with their environment to restore their own mental and psychological wellness, adapt, avoid confrontation, and develop positive relations within themselves and with the outer world. Tolerance results from many aspects (temperament, family dynamics, upbringing, experience, and social and cultural factors) working together to form the attitude of a human towards different (Liu, 2021). Contemporary scholars, following

Allport's approach, advocate for "a warmer degree of tolerance" (Allport, 1954, p. 425); in contrast to 'cold' tolerance, a value-based form of tolerance is articulated, which predicates not on patience (endurance) but on acceptance, respect, and recognition of all people (Verkuyten, 2022).

From the perspective of the existential-humanistic concept of personality development, tolerance in its mature manifestation is viewed as a category characterizing a conscious, meaningful, and responsible personality. This understanding of tolerance, which is not reduced to simple stereotypical actions, allows this category to be presented as a value, a life position of the individual in search of specific existential meanings of responsible decisions. From these positions, tolerance is understood as a free and responsible choice of a person, a "value-based tolerant attitude toward life" (Asmolov, 2002; Asmolov, 2011).

The central questions — in the name of what and for the sake of what an individual acts in a tolerant manner, which values they uphold, and what meaning such actions hold for them — do not pertain to identifying the causes underlying manifestations of tolerance (Pervova, 2022). The genuine essence of human behavior depends on the answers to these posed existential questions, and from this point of view, meaningless tolerance is pseudo-tolerance, and in some cases, intolerance disguised as socially approved behavior. Thus, tolerance in its full extent is not reduced to knowledge, abilities, skills, to individual psychological qualities, or to the conditions of the social environment. In the existential-humanistic interpretation, a person is given the possibility, the potential for realizing a healthy and constructive beginning, which is actualized through their

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choice of meaning, free, and responsible self-determination in every specific life situation.

In order to understand tolerance, it is important to proceed from the thesis that it constitutes a special and meaningful orientation toward the world and toward others. The well-known psychologist D.A. Leontiev paid special attention to identifying the relationship between tolerance for uncertainty and the semantic sphere, with personal choice when modeling the 'existential dilemma' (Leontiev, Mandrikova, 2005; Belov, Danilov, Rotman, 2023).

It should be highlighted that maintaining plural societies depends on people's willingness to allow others to live the life that they want. As summarized by M. Verkuyten, "as a key approach to achieving this, intergroup tolerance in its classical sense implies that people put up with outgroup beliefs and lifestyles that they disapprove of because these are meaningfully different, and sometimes even antithetical and incompatible with ingroup convictions and worldviews" (Verkeuten, 2022, p. 1). Of particular importance is the fact that tolerance is not the opposite of prejudice (Pervova, 2022; Verkuyten, Yogeeswaran, Adelman, 2022), and it is not the same as appreciating diversity since people tolerate what they disapprove of or object to. Tolerance reconciles critical judgement with the protection and permitting of dissenting outgroup beliefs and practices (Verkuyten, Yogeeswaran, Adelman, 2022).

Therefore, it makes tolerance a key ingredient for a diverse, equal, and open society: tolerance is "indispensable for any decent society — or at least for societies encompassing deeply divergent ways of life" (Oberdiek, 2001, p. 23). Thus, tolerance is a distinctive orientation that com-

bines disapproval of outgroup beliefs and practices with a behavioral intention to nevertheless accept — in the sense of not interfering with — these beliefs and practices (Verkuyten, Yogeeswaran, Adelman, 2022). Research on the relationship between tolerance and existential characteristics of personality has been gaining relevance recently, but there is insufficient work on this topic.

Thus, two approaches have emerged: researchers suggest that tolerance for uncertainty is a characteristic that determines a high level of meaning in life and psychological well-being, and the degree of success in a person's self-realization. According to the second approach, a high level of meaning in life represents a reflection of existential resources that allow an individual to find meaning in overcoming challenging situations (Lerner, 2023).

In our opinion, the link between tolerance and existential characteristics or resources is ambiguous and multifaceted and warrants a comprehensive examination: tolerance can be conceptualized as a factor in the development of personal existential characteristics and a stimulus for the formation and development of a meaningful, existentially rich life.

The psychological features of youth develop under the influence of the sociocultural environment in which they exist and operate. Sociocultural factors influencing the formation of youth's worldview and value orientations include family, the cultural sphere of societal life, the education system, the accepted ideology in the country, mass media, religion, and others. The perfection of socialization institutions and the maintenance of a dynamic equilibrium of the sociocultural environment in which the younger generation functions

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are of particular importance in achieving a coordinated and productive influence on the process of youth development (Sakharchuk, Bagramyan, Kiseleva, Sakharchuk, 2022). Since the description of the sociocultural environment involves a systemic analysis of basic social factors, we focus on the types of tolerance and their relationship with existential characteristics.

Armenia's monoethnic environment includes features of the worldview and outlook of people with a shared Soviet past, but there is a certain specificity: the predominance of a monoethnic population composition (ethnic minorities constitute less than 2% of Armenia's population) and intense dynamic migration processes, which result in Armenians living outside of Armenia and the presence of powerful Armenian diasporas (Armenia-Diaspora Unity, 2023; Berberyan, Berberyan, Gevorkyan, 2025; Berberyan, Bultseva, Berrios Callejas, 2024). The development of Armenian youth proceeds under conditions of entrenched ethnic and cultural unity and a close connection with traditions, family values, historical narratives, and the high significance of language and community.

Russian youth develop within a complex and multilayered sociocultural environment, characterized by historically established ethnocultural diversity, which conditions a multiethnic environment. Furthermore, the multiethnic environment combines traditional values of the past and the growing influence of globalization processes. In the context of the intersection of cultures and the dual pressure of traditional society and global discourse, the issues of tolerance and internal agreement become especially relevant.

The nature of the environment is of great importance in integration processes: societies with a more inclusive sociocultural environment strive to integrate migrants and ethnocultural minorities and are capable of effectively utilizing the benefits of cultural diversity. By contrast, an exclusive environment, which marginalizes migrants and ethnocultural minorities from social life, is more likely to contribute to the emergence and escalation of conflicts and associated social, economic, and political problems (Bultseva et al., 2021). As researchers assert, support for multicultural ideology and viewing cultural diversity as a resource for solving societal problems contribute to the inclusion of ethnocultural minorities, particularly for Armenians in Russia. Many factors with the potential to influence the inclusiveness of the sociocultural environment still need to be investigated in the future (Poole, 2021; Ospanov, Kalyuzhnova, Khlystova, Crowley-Vigneau, 2025; Bivand, Mathilde, Mjelva, 2025; Moghaddam, 2024).

Materials and methods

Sample. Data collection was carried out using an online platform; participants were recruited using the "snowball" sampling method. A total of 100 people took part in the study: the respondents were divided into two groups — Armenian (monoethnic environment) and Russian (polyethnic environment) students. The sample consisted of university students from the Russian Federation and the Republic of Armenia (RAU, RUDN University, Samara branch of Moscow City University), with Russian as their main language of academic and daily communication. Data collection in both samples was conducted in Russian. Respondents provided information about their age, gender, ethnicity, country of residence, level, and field of education. Descriptive statistics of the samples are presented in Table 1.

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Table 1

Sociodemographic characteristics

Respondents	N
Sex:	
Male	16
Female	84
Age:	
Average age	20,94
Country of residence:	
Republic of Armenia	50
Russian Federation	50
Total	100

Methods. We conducted the assessment of the respondents' level of tolerance and existential characteristics by employing the following assessment methods:

1. The "Index of Tolerance" questionnaire by G.U. Soldatova, O.A. Kravtsova, O.E. Khukhlaeva: this questionnaire is aimed at determining the general level (low, medium, or high) and aspects of tolerance. The questionnaire consists of three subscales, which correspond to three types of tolerance: Ethnic tolerance, Social tolerance, and Tolerance as a personality trait. The questionnaire consists of 22 statements that detect tolerant and intolerant attitudes towards certain ethnic and social groups, as well as intergroup communication.

2. The Existence Scale (ES) by A. Längle, K. Orgler, and S.V. Krivtsova. ES is a self-rating questionnaire aimed at estimating the levels of Existential fullness of the person with their existence. The test includes 4 main subscales: Self-distance, Self-transcendence, Freedom and Responsibility, as well as two additional subscales: Person and Existentiality. The questionnaire includes 46 statements.

Results

The analysis of the level of tolerance in the Armenian sample according to the "Index of Tolerance" questionnaire (G.U. Soldatova, O.A. Kravtsova, O.E. Khukhlaeva) (see Table 2) revealed a medium general level of tolerance (M = 87,96, SD = 8,14). Based on the acquired data, we can conclude that the respondents manifest a combination of both tolerant and intolerant traits and are likely to behave in a tolerant manner in some social situations while exhibiting intolerance in others. The scores for each subscale validate the medium results: ethnic tolerance (M = 29,16, SD = 4,49), Social tolerance (M = 29,02, SD = 3,79) and Tolerance as a personality trait (M = 29,78, SD = 3,38). Thus, the Armenian respondents showcase medium levels of tolerance toward representatives of other ethnic and social groups and minorities, as well as generally favorable attitudes and beliefs towards the world and current social processes.

The analysis of the level of tolerance in the Russian sample (see Table 2) also revealed a medium general level of tolerance (M = 94,8, SD = 11,26). As previously stated, the medium general results are shown by respondents who are characterized by

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a combination of both tolerant and intolerant traits, depending on the circumstances. These results are confirmed by the scores of the subscales. Medium mean scores are observed for the Social tolerance subscale (M = 31,44, SD = 5,06) and Tolerance as a personality trait (M = 31,2, SD = 4,07), while the subscale for ethnic tolerance (M = 32,16, SD = 5,68) revealed a high level of interethnic tolerance among Russian respondents, which indicates a positive perception of other ethnic groups and openness of attitudes toward them. This may correspond to the polyethnic environment, which provides for more frequent and already familiar interethnic contacts.

The analysis of the results of the Existence Scale (A. Längle, K. Orgler, S.V. Krivtsova) showed that in the Armenian sample (see Table 3), the level of Existential fullness (M = 180,2, SD = 28,80) is at a medium level, yet relatively low. Relatively low medium levels of general existential fullness observed in the Armenian sample may indicate an unfulfilled existence, as well as an emotional inability to engage in dialogue with life and a lack of responsible involvement in it. A thorough understanding of this result requires consideration of the Person and Existentiality subscales. Based on the combination P > E, which is

observed in the Armenian sample, it can be theorized that a person is relatively successful in dealing with themself but rather constrained in the implementation of their life. The medium results are further validated by the results of the subscales: low medium levels in the Armenian sample for the subscales Self-distance (M = 27,8, SD = 6,08), Self-transcendence (M = 64, SD = 9,86) and Freedom (M = 42,22, SD = 9,05), while the level of Responsibility (M = 46,18, SD = 10,34) is medium. These results indicate difficulties in decision-making and responding to external challenges, emotional isolation, which may manifest as apathy or indifference toward life, as well as insecurity and social dependence. Nevertheless, the result on the subscale Responsibility points to the potential to take responsibility for one's own life. These data may reflect the characteristics of a monoethnic environment, particularly the traditional family structure and social dependence, but at the same time, a striving for inner integrity.

The analysis of the results of the Existence Scale for the Russian sample (see Table 3) revealed that the level of Existential fullness (M = 196,06, SD = 31,96) is — although higher than the mean of the Armenian sample — also at a medium level.

Table 2

The general level and subscales of tolerance of the participants (N = 100) according to the "Index of Tolerance" questionnaire by G.U. Soldatova, O.A. Kravtsova, O.E. Khukhlaeva, mean

Scales	Armenian respondents N = 50			Russian respondents N = 50		
	Mean	*SD*	*SEM*	*Mean*	*SD*	*SEM*
Ethnic tolerance	29,16	4,49	0,64	32,16	5,68	0,80
Social tolerance	29,02	3,79	0,54	31,44	5,06	0,72
Tolerance as a personality trait	29,78	3,38	0,48	31,2	4,07	0,58
General level of tolerance	87,96	8,14	1,15	94,8	11,26	1,59

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The given result of general Existential fullness observed in the Russian respondents indicates growing inner openness and the ability to face the demands of the outside world, which is confirmed by the analysis of the parity of the subscales Person and Existentiality. These results receive further confirmation through the scores of the subscales. In the Russian sample, medium levels are observed for all of the subscales: Self-distance (M = 30,28, SD = 7,01), Self-transcendence (M = 67,78, SD = 10,71), Freedom (M = 45,86, SD = 9,48), and Responsibility (M = 52,14, SD = 12,79). The obtained results allow us to assume that the respondents are capable of perceiving life situations with greater clarity, and their attention transfers outward, while the ability to distance themselves from themselves develops, which allows them to assess the situation objectively. The average level on the subscale Self-transcendence indicates emotional openness and a more inclusive method of being. The result on the subscale Freedom reflects the ability to make decisions with greater ease and confidence in their correctness, and internal autonomy. The average level on the subscale Responsibility indicates an increased personal involvement in the process of constructing one's own life and accepting responsibility for the choices made. These results can be linked to the characteristics of the polyethnic environment and social autonomy.

Statistical analysis. A correlation analysis of the obtained results was conducted to reveal a possible connection between the levels of tolerance and certain existential characteristics. We performed correlation analyses using the Pearson correlation coefficient to assess the associations between variables

In accordance with our first hypothesis, we identified statistically significant moderate and weak correlation links (see Table 4) between the general level of tolerance and the existential characteristics Existential fullness (r = 0,259, p < 0,01), Self-transcendence (r = 0,341, p < 0,01), Person (r = 0,353, p < 0,01), and Self-Distance (r = 0,226, p < 0,05). In addition to this, significant correlations were found between the subscale of Ethnic tolerance and the existential indicators Self-transcendence (r = 0,343, p < 0,01), Person (r = 0,338, p < 0,01), Existential fullness (r = 0,235, p < 0,01), and Freedom (r = 0,197, p < 0,05), as well as between the subscale

Table 3

Existential characteristics of the participants (N = 100) according to the Existence scale (Existenzskala) by A. Längle, K. Orgler, and S.V. Krivtsova

Scales	Armenian respondents N = 50			Russian respondents N = 50		
	Mean	*SD*	*SEM*	*Mean*	*SD*	*SEM*
Self-distance (SD)	27,8	6,08	0,86	30,28	7,01	0,99
Self-transcendence (ST)	64	9,86	1,39	67,78	10,71	1,51
Freedom (F)	42,22	9,05	1,28	45,86	9,48	1,34
Responsibility (V)	46,18	10,34	1,46	52,14	12,79	1,81
Person (P)	91,8	13,41	1,90	98,06	14,65	2,07
Existentiality (E)	88,4	17,44	2,47	98	20,76	2,94
Existential fullness (G)	180,2	28,80	4,07	196,06	31,96	4,52

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Tolerance as a personality trait and the indicators Person (r = 0,369, p < 0,01), Self-transcendence (r = 0,365, p < 0,01), Existential fullness (r = 0,279, p < 0,01), and Self-distance (r = 0,222, p < 0,05).

For a deeper understanding of this connection, a correlation analysis was performed for each of the samples. The results of the correlation analysis (see Table 5) showed that in the Russian sample, there are statistically significant moderate and notable correlations between the general level of tolerance and the existential characteristics of Person (r = 0,382, p < 0,01) and Self-transcendence (r = 0,400, p < 0.01). In addition to this, our analysis revealed significant correlation links between the subscale Ethnic tolerance and the existential indicators of Self-transcendence (r = 0,421, p < 0,01) and Person (r = 0,355, p < 0,05), as well as between the subscale Tolerance as a personality trait and the existential indicators of Self-transcendence (r = 0,578, p < 0,01), Existential fullness (r = 0,407, p < 0,01), Person (r = 0,600, p < 0,01), and Self-distance (r = 0,370, p < 0,01).

The supposed link between the general level of tolerance and the existential characteristics of personality in the Armenian sample was not confirmed (see Table 6); revealing no statistically significant correlations. The first hypothesis of the study, therefore, received a partial confirmation.

According to our second hypothesis, we revealed statistically significant differences in the levels of tolerance and existential characteristics between Armenian and Russian student youth (see Table 7). We employed Student's t-test to identify statistically significant differences; the effect size was calculated using Cohen's d coefficient. Our analysis identified highly significant statistical differences between the levels of Ethnic tolerance (t = 2,93, p < 0,01), Social tolerance (t = 2,71, p < 0,01), and the General level of tolerance (t = 3,48, p < 0,01) in the Armenian and Russian samples.

Statistically significant differences were also found between some existential characteristics of Armenian and Russian student youth: Responsibility (t = 2,56, p < 0,05), General level of Existential full-

Table 4

**Results of the Pearson correlation analysis between tolerance indicators
and existential characteristics across all respondents (N = 100)**

Scales	Self-distance (SD)	Self-transcendence (ST)	Freedom (F)	Responsibility (V)	Person (P)	Existentiality (E)	Existential fullness (G)
Ethnic tolerance	0,191	0,343**	0,197*	0,056	0,338**	0,128	0,235*
Social tolerance	0,105	0,070	0,037	0,066	0,099	0,058	0,082
Tolerance as a personality trait	0,222*	0,365**	0,124	0,192	0,369**	0,176	0,279**
General level of tolerance	0,226*	0,341**	0,163	0,129	0,353**	0,156	0,259**

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Table 5

**Results of the Pearson correlation analysis between tolerance indicators
and existential characteristics across the Russian respondents (N = 50)**

Scales	Self-distance (SD)	Self-transcendence (ST)	Freedom (F)	Responsibility (V)	Person (P)	Existentiality (E)	Existential fullness (G)
Ethnic tolerance	0,099	0,421**	0,180	–0,051	0,355*	0,051	0,195
Social tolerance	0,005	–0,047	–0,036	–0,049	–0,032	–0,047	–0,045
Tolerance as a personality trait	0,370**	0,578**	0,144	0,223	0,600**	0,203	0,407**
General level of tolerance	0,186	0,400**	0,127	0,032	0,382**	0,078	0,225

Table 6

**Results of the Pearson correlation analysis between tolerance indicators
and existential characteristics across the Armenian respondents (N = 50)**

Scales	Self-distance (SD)	Self-transcendence (ST)	Freedom (F)	Responsibility (V)	Person (P)	Existentiality (E)	Existential fullness (G)
Ethnic tolerance	0,217	0,157	0,114	0,040	0,214	0,083	0,150
Social tolerance	0,142	0,123	0,013	0,082	0,155	0,055	0,106
Tolerance as a personality trait	–0,051	0,036	0,024	0,048	0,004	0,041	0,026
General level of tolerance	0,165	0,159	0,079	0,080	0,192	0,088	0,143

ness (t = 2,61, p < 0,05), as well as two sums of factors — Person (t = 2,23, p < 0,05) and Existentiality (t = 2,50, p < 0,05). These data confirm the hypothesis of the presence of stable significant differences in the levels of tolerance and some existential characteristics between Armenian and Russian student youth. These differences may indicate the influence of the type of sociocultural environment not only on the perception of others but also on internal agreement with the world.

Discussion

The obtained results confirm that the level of tolerance and existential characteristics of personality vary depending on the sociocultural environment. The evidence indicates that the Russian sample shows an average level of tolerance toward repre-

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Table 7

**Statistical differences in the levels of tolerance and existential characteristics
between the Armenian and Russian samples (N = 100)**

Parameter	t	df	Sig. (p value)	Mean Difference	95% Confidence interval		Standard error	Effect (Cohen's d)
					Lower	Higher		
Ethnic tolerance	2,93	98	0,0042**	–3,00	–5,03	–0,97	1,024	0,585973
Social tolerance	2,71	98	0,0080**	–2,42	–4,19	–0,65	0,894	0,541347
Tolerance as a personality trait	1,90	98	0,0608	–1,42	–2,91	0,07	0,748	0,379583
General level of tolerance	3,48	98	0,0007**	–6,84	–10,74	–2,94	1,965	0,696209
Self-distance (SD)	1,89	98	0,0618	–2,48	–5,09	0,13	1,313	0,377962
Self-transcendence (ST)	1,84	98	0,0693	–3,78	–7,86	0,30	2,058	0,367212
Freedom (F)	1,96	98	0,0523	–3,64	–7,32	0,04	1,853	0,392771
Responsibility (V)	2,56	98	0,0119*	–5,96	–10,58	–1,34	2,326	0,512481
Person (P)	2,23	98	0,0281*	–6,26	–11,83	–0,69	2,809	0,445752
Existentiality (E)	2,50	98	0,0139*	–9,60	–17,21	–1,99	3,833	0,50073
Existential fullness (G)	2,61	98	0,0106*	-15,86	-27,93	-3,79	6,084	0,521349

sentatives of other social groups, including minorities, as well as generally favorable attitudes and beliefs toward the world and people as a whole. The high level of Ethnic tolerance among Russian respondents likely stems from the characteristics of the environment: the polyethnic environment necessitates and stimulates the manifestations of tolerance in Russian youth. The homogeneity of the monoethnic environment in the Armenian sample appears to account for a more cautious and reserved approach toward other groups.

Analysis of the results from the Existence Scale showed higher scores on existential characteristics in the Russian sample compared to Armenian respondents. This may indicate greater openness, autonomy, and emotional involvement in life, which corresponds to the polyethnic context and more diverse social experience. In contrast, the Armenian sample shows a predominance

of Person over Existentiality, which may indicate developed self-understanding but less expressed external realization. This reflects the characteristics of a monoethnic culture with an emphasis on traditional and family values, which forms restrained attitudes toward "otherness".

The subscale Self-distance measures a person's ability to distance themselves from their own desires, ideas, feelings, and intentions to objectively view a situation. The results show that Russian respondents perceive situations in a clearer manner, their attention concentrates on the outward, and the distance in relation to themselves is greater. Lower results in the Armenian sample indicate a weaker manifestation of this ability due to some form of internal confusion or fixations, such as conflicts, post-traumatic states, chronic deficits, or unsatisfied needs. The subscale Self-transcendence measures free emo-

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tionality, which manifests in the ability to feel closeness, compassion, and to feel values and a deep connection. The level of Self-transcendence in Russian respondents implies average emotionality and a more involved way of existence. Thereby, the lower score on the Self-transcendence scale for Armenian respondents indicates emotional isolation and a lesser existential significance of life.

The subscale Freedom measures the ability to find real possibilities for action, build their hierarchy in accordance with their value, and thus make decisions grounded from a subjective standpoint. The low average level of Freedom in Armenian respondents indicates a weakened ability to make decisions and a level of uncertainty in those decisions, while in Russian respondents, it indicates the ability to make decisions easier and be confident in their correctness. The subscale Responsibility determines the ability to follow decisions made based on personal values, the average level indicating the potential to take responsibility and involve oneself in life processes.

The statistical data analysis revealed statistically significant differences and correlation links between the levels of tolerance and the existential characteristics of the surveyed student youth. The results of the correlation analysis confirmed the first hypothesis in part. Thus, within the overall sample, we revealed statistically significant moderate and weak correlation links between the general level and subscales of tolerance and such existential indicators as Self-transcendence, Person, Existential fullness, and Self-distance. Considering the data for individual samples confirmed our assumption about the presence of correlation links for Russian youth and refuted

it for the Armenian sample, where we discovered no significant links.

The comparative analysis of the average scores of the two samples allowed us to confirm the second hypothesis of the study. We found statistically significant differences between the indicators of tolerance and existential characteristics of Armenian and Russian student youth. The obtained data may indicate the influence of the mono- and polyethnic environment on the manifestations and interrelations of the phenomena under consideration.

The research results are consistent with data from other studies. For example, researchers point out: "Experiencing a true existential level of life helps a person to be aware of their needs and stay in touch with their feelings" (Solobutina, Miyassarova, 2019). While basic awareness of emotions and desires is available to many, only an existentially mature person is capable of integrating this awareness into the broader context of their own being and values. Accounting for existential characteristics is important for the education system: researchers emphasize that they are witnesses that ignoring crucial existential questions in education contributes to spiritual emptiness in the lives of youth and reduces educational thinking only to instrumental, pragmatic problems: formal qualification standards and the transfer of communication skills (Vindeker, Berdnikova. 2022).

Conclusions

The study's findings permit to draw a conclusion about the partial confirmation of our hypotheses; their analysis allowed:

1) to diagnose the levels of tolerance and existential characteristics of personality in Armenian and Russian student

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youth, considering the sociocultural environment. Analysis of the general level and aspects of tolerance revealed that a medium level of tolerance dominates among both samples. However, a higher level of tolerance was found in the Russian sample, especially in Ethnic tolerance, which reflects the polyethnic context and the frequency of interethnic contacts. In contrast, Armenian respondents exhibit a combination of tolerant and intolerant traits, which is explained by the monoethnic composition of the society. The results from the "Existence Scale" indicate a higher level of existential characteristics in Russian respondents compared to the Armenian sample. Russian youth exhibit greater Existential fullness, involvement, autonomy, and emotional openness, while Armenian youth showcase a greater focus on self-understanding;

2) to confirm the presence of statistically significant moderate and weak correlation links between some aspects of tolerance and existential characteristics of personality in Russian respondents. We discovered no such associations within the findings derived from the Armenian sample. Comparative analysis of the data obtained allowed us to identify significant differences in the levels and aspects of tolerance and existential characteristics between the two samples — Armenian and Russian student youth. The differences between the two samples may be due to the differences in the sociocultural situation in the Republic of Armenia and the Russian Federation;

3) to confirm the relevance of the problem under study; to ensure that research on the relationship between levels and aspects of tolerance and existential characteristics in different sociocultural environments is notably sparse, but it is in demand and necessary for resolving issues arising in the context of multicultural societies. Support for multicultural ideology and viewing cultural diversity as a resource for solving social problems contribute to the inclusion of ethnocultural minorities, e.g. Armenians in Russia, when compared with the higher characteristics of tolerance and existential features found in Russian youth. Many factors that may influence the inclusiveness of the sociocultural context still need further exploration in the future (Poole, 2021; Ospanov, Kalyuzhnova, Khlystova, Crowley-Vigneau, 2025; Bivand, Mathilde, Mjelva, 2025; Moghaddam, 2024).

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Вклад авторов

Ася С. Берберян — концептуализация; формальный анализ; исследование; методология; руководство; администрирование проекта; привлечение финансирования; написание — черновик; написание — рецензирование и редактирование.

Сатеник А. Тепанян — сбор данных; формальный анализ; написание — рецензирование и редактирование.

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DISCUSSION AND DISCOURSES
ДИСКУССИИ И ДИСКУРСЫ

Научная статья | Original paper

On the issue of the safety of the developing subject-spatial environment of a preschool educational organization

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Abstract

Context and relevance. Developing the subject-spatial environment (RPPS) as one of the components of the educational environment should be safe for students. However, the safety requirements concern only the preservation of children's life and health. At the same time, a very important psychological aspect of the RPPS and its security is overlooked. **Objective**. To consider the possibility of raising questions regarding the psychological aspect of the security of the developing object-spatial environment. **Hypothesis.** Addressing issues related to the psychological safety of child development within the preschool education system requires the establishment of scientifically supported criteria, which will help clarify the regulatory and legal aspects of governing children's development in the subject environment of a preschool institution. **Methods and materials**. Analysis of psychological and pedagogical works on the issues of the structure and organization of the developing subject environment in preschool organizations, as well as regulatory legal documents governing the activities of preschool organizations within the context of children's psychological safety. **Results.** A deficit of regulatory and scientific basis has been identified for addressing the issues of psychological safety in the spatial environment of a preschool educational organization. Overcoming existing difficulties in ensuring psychological safety is associated with the need to develop scientifically justified criteria for favorable conditions for a child's development within the preschool's educational environment. **Conclusions**. The identification and scientific substantiation of the safety criteria of the psychological aspect of the RPPS will allow preschool educational organizations to successfully solve the tasks of building and preserving a subject environment that will provide opportunities for the development of children.

Keywords: preschool education, subject-spatial environment, development, safety

К вопросу о психологической безопасности развивающей предметно-пространственной среды дошкольной образовательной организации

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Резюме

Контекст и актуальность. Развивающая предметно-пространственная среда (РППС) как один из компонентов образовательной среды должна быть безопасной для обучающихся. Однако требования к ее безопасности касаются лишь сохранения жизни и здоровья детей. При этом упускается очень важный психологический аспект РППС и ее безопасности. **Цель** — определить пути преодоления неопределенности, существующей в нормативных и научных основаниях вопроса психологической безопасности пространственной среды дошкольной образовательной организации. **Гипотеза**. Решение вопросов психологической безопасности развития ребенка в системе дошкольного образования требует установления научно обоснованных критериев, которые позволят уточнить нормативно-правовые аспекты регулирования детского развития в предметной среде дошкольного учреждения. **Методы и материалы**. Анализ психолого-педагогических работ по вопросам структуры и организации развивающей предметной среды в дошкольной организации, а также нормативных правовых документов, регулирующих деятельность дошкольных организаций в контексте вопросов психологической безопасности детей. **Результаты.** Установлен дефицит нормативных и научных оснований решения вопросов психологической безопасности пространственной среды дошкольной образовательной организации. Преодоление существующих трудностей в работе с обеспечением психологической безопасности связано с необходимостью разработки научно обоснованных критериев благоприятных условий развития ребенка в образовательной среде дошкольного учреждения. **Выводы**. Определение

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нормативных и научных оснований, четких критериев безопасности психологического аспекта РППС позволит дошкольным образовательным организациям успешно решать задачи создания и сохранения оптимальных условий развития детей.

Ключевые слова: дошкольное образование, предметно-пространственная среда, развитие, безопасность

Introduction

The issue of ensuring the safety of the educational environment has always been important for educational institutions, but recently it has become particularly acute and relevant in our country. This is due to a number of factors cited by researchers who have studied the changes that have occurred in recent decades in the current development situation and in the characteristics and qualities acquired by modern children during their development (Baeva, 2012; Kleiberg, Deulin, 2025; Smirnova et al., 2022, etc.).

Undoubtedly, the safety of the subject-developmental component of the educational environment (V. A. Yasvin, V. I. Panov, et al.) is important, especially when it comes to the environment of a preschool educational organization (hereinafter — PEO), which has its own specific features (Kukushkina, 2022, 2023). After all, this is a place where preschoolers spend quite a long time — a group of children who, due to their age characteristics, are not yet sufficiently independent or agile in moving around the space, but are active and curious.

The definition of the developmental subject-spatial environment of a preschool educational organization (hereinafter — DSSE) is given in regulatory documents — the Federal State Educational Standard (FSES) and the Federal Educational Program (FEP) for Preschool Education: it is "a part of the educational environment and a factor that significantly enriches children's development… The DSSE represents the unity of specially organized spaces — both external (the PEO territory) and internal (group rooms, specialized, technological, administrative, and other spaces), materials, equipment, electronic educational resources, and tools for teaching and educating preschool children, protecting and promoting their health, as well as materials for organizing children's independent creative activities". It is obvious that when addressing the issue of the safety of the educational environment, each element of the spatial-subject component must eliminate or minimize the likelihood of threats and risks to the life, health, and development of every child.

When considering the issue of DSSE safety, it is impossible not to note that it includes two aspects. The first one, let us call it the "physical" aspect, is determined by the need for the preschool educational organization to primarily ensure conditions for preserving children's lives and health. In fact, when

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discussing the safety of the subject-spatial environment, it is predominantly this "physical" aspect that is meant, which is undoubtedly an important and priority task for every PEO: minimizing the likelihood of children getting injured, reducing the incidence of illnesses, and eliminating negative impacts on their health. In this regard, a sufficient number of regulatory documents have been developed, which set out mandatory requirements, clear criteria, and indicators of safety. One of such governmental subordinate regulatory legal acts (along with documents on fire safety, anti-terrorism security, labor protection, etc.) are the SanPiNs — sanitary norms and rules. They contain the norms and rules according to which the activities of an educational organization should be conducted: requirements for the daily routine of pupils, organization of meals and medical services, hygiene, and the spatial-subject environment, including equipment and materials (material base, PEO territory, play and walking areas). Compliance with the requirements of these documents is strictly monitored not only by the heads of preschool institutions themselves but also by government organizations (for example, Rospotrebnadzor).

The second aspect is no less important, as it is related to the need to ensure favorable conditions for children's development. Let us call it the psychological aspect. O.M. Dyachenko noted that in a kindergarten setting, children acquire a wide range of experience in emotional and practical interaction with adults and peers in the most important areas of life for their development. And the creation of a subject-developmental environment in a group expands the possibilities for organizing and enriching such experience (Educational Work…, 2001). This becomes possible due to the fact that this component of the educational environment includes, along with group rooms and other spaces, a variety of materials and equipment "for organizing children's

independent creative activities". The DSSE acts as "the foundation for diverse, all-round developing, meaningful, and attractive activities for each child" (FSES for Preschool Education, clauses 31.1, 31.2). Each educational institution, when organizing the space (along with complying with sanitary and hygienic requirements), pays special attention to filling it with toys and play equipment, educational and methodological materials, etc., as well as to their placement in group rooms and throughout the PEO.

However, regarding the issue of educational environment safety, the "psychological" aspect is hardly mentioned in the publications we have analyzed. In this context, the question arises: what does DSSE safety mean from the perspective of preschoolers' development, and can we discuss it not only in terms of preserving children's lives and health?

The psychological aspect of the DSSE

The issues of organizing the subject environment have been addressed in quite a large number of psychological and pedagogical works (S. L. Novoselova, N. N. Poddyakov, L. Klarina, et al.) and were studied even in the early stages of the formation of Russian preschool education. Mostly, they served as the rationale for methodological recommendations for teachers on creating a spatial-subject environment that performs a developmental function.

One of the first domestic developments can be called a system of toys and didactic aids that should correspond to the age and psychological-pedagogical characteristics of children. They were intended to form the initial culture of thinking for children of early and preschool ages (S.L. Novoselova, N.N. Poddyakov).

The developmental function of the subject environment and the necessity to take

into account the age characteristics of a child ("ergonomics of childhood") were also mentioned in the Concept of Preschool Education (1989), developed under the guidance of V.A. Petrovsky and V.V. Davydov: "A high culture of interior design in relation to a child is not a luxury but a condition for building a 'developing environment'. Enriching the forms of a child's life in kindergarten requires more flexible and variable use of space" (Concept of Preschool Education, 1989).

In addition, the authors highlighted another function of the subject environment: it "should be subordinated to the goal of the child's psychological well-being… adapted to meet the needs and interests of the child themselves, so that they can constantly feel like the rightful owner of toys, move freely around the kindergarten, and enjoy the lives of the children and adults around them" (Concept of Preschool Education, 1989). That is, the subject-spatial environment is designed to provide one of the conditions for a child's development — psychological well-being.

Methodological recommendations on organizing the DSSE, developed by S.L. Novoselova (1995) and containing important conceptual provisions, played a significant role in the development of ideas about the DSSE. The foundation was the activity-age approach and "ideas about the subject nature of activity, its development, and significance for the mental and personal development of a child" (Novoselova, 1995, p. 5). Novoselova considered the subject environment to be "a powerful enriching factor of children's development" and defined it as "a system of material objects of a child's activity, functionally modeling the content of the development of their spiritual and physical appearance" (Novoselova, 1995, p. 11). According to S.L. Novoselova, the subject environment should meet "the patterns of activity development and pedagogical tasks of educating children of different ages" and represent "a system

of subject environments rich in games, toys, aids, and equipment, materials for organizing children's independent creative activities" (Novoselova, 1995, p. 11). Cultural landscapes (park, garden), subject-play environment, children's library, play library and video library, design studio, computer-play complex, and others were identified as subject environments. Subject environments should address both current and upcoming developmental tasks.

And it is very important, as S. L. Novoselova noted, that the design of the components of the subject environment must be scientifically grounded.

Studying modern works devoted to the issue of the DSSE allows us to say that the issues of organizing the subject environment remain relevant. They mostly present descriptions of pedagogical experience in organizing the subject environment in accordance with the educational program (Nurieva, 2024, etc.); reviews of approaches to organizing the DSSE and methodological recommendations (Dybina, 2015; Shakirova, 2018; Skorolupova, 2023; Gumennaya, 2025, etc.); features of creating a subject environment in combined groups (Druzhinina, 2017; Plaksina, 2006; Nikiforova, Voshchenko, 2023, etc.). Empirical studies with reliable results confirming the claims often found in publications that the DSSE influences a child's development have not been discovered. One could cite, for example, works on studying modern toys and their impact on the specifics of children's play (Smirnova, Sokolova, 2019; Klopotova, Smirnova, 2022; Klopotova et al. (2023), however, such toys are not present in the play environment of Russian kindergartens.

At the same time, the Federal State Educational Standard (FSES) and the Federal Educational Programme for Preschool Education (FEP-PE) outline the characteristics, principles, and requirements for a developmental subject-spatial environment. These

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can be seen as the results of a thorough analysis and synthesis of the practical experience of preschool educational organisations (PEOs).

Thus, when creating a developmental subject-spatial environment (DSSE), a number of parameters must be taken into account: «the local ethnopsychological, sociocultural, cultural-historical, and natural-climatic conditions in which the PEO is located; the age, level of development of children and the specifics of their activities; the content of education; the objectives of the educational programme for different age groups; the capabilities and needs of participants in the educational process» (FEP-PE, clause 31.5).

On the safety of the developmental subject-spatial environment (DSSE)

The importance of ensuring the safety of the DSSE as an integrated system of conditions — based on the notions of physical and psychological aspects — allows us to identify several problem areas.

First, the scientific validity of the principles and requirements for organising the subject environment in kindergarten.

The psychological aspect of the DSSE is determined, firstly, by creating conditions necessary for children to engage in various activities that are attractive to them, allowing them to meet their needs and demonstrate their abilities. However, it is difficult to speak with certainty about the influence of the subject environment on child development at present.

Subject environments created in preschool educational organisations (PEOs) include objects whose significance for the development of children of a certain age has been experimentally proven. For example, for children in the second junior group (ages 3–4), it is recommended to use play equipment for sensory development; toys and materials with predefined ways of use; construction sets; and simple puzzles that stimulate thinking processes (research by A.V. Zaporozhets, L.A. Venger, N.N. Poddyakov, et al.).

The principles of space organisation are based on the developmental characteristics of activities and behaviour in specific age groups. For instance, for children aged three, it is necessary to create a sufficiently large space to meet their need for active movement.

Research findings on child development only indirectly — not directly — allow us to discuss the developmental role of the subject environment and its mediated influence on preschoolers' development. This circumstance necessitates studies that would reliably demonstrate the link between the DSSE and children's mental development. Addressing this issue is already highly problematic at the design stage — for example, when forming control and experimental groups. Even if designing a study based on comparing different subject environments (e.g., Montessori groups, Waldorf kindergartens), it is difficult to neutralise the influence of other factors on child development.

Perhaps, when justifying the organisation of the DSSE, we should say that the subject environment does not directly influence children's development but creates the possibility for it through the conditions provided. This possibility is realised only through the child's active engagement with the environment's content.

Second, ensuring conditions within the DSSE for children's emotional well-being.

Undoubtedly, this task is partially addressed by «filling» the subject environment with content that allows children to choose, organise, and engage in various activities, meet their needs, and spend time enthusiastically in kindergarten. However, certain facts should be taken into account and not disregarded.

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Pedagogical recommendations for organising the DSSE specify one requirement: alignment with the objectives of the educational programme. This is implemented by including educational and play materials that correspond to these objectives (e.g., developing mathematical concepts, familiarising children with the surrounding world and professions, etc.). Given that the main educational programme (MEP) of kindergarten includes five educational areas and a rather extensive list of objectives (in accordance with the Federal Educational Programme for Preschool Education, FEP-PE), we can assume that the subject environment may become overloaded with information. Consequently, this leads to the formalisation of the DSSE organisation process and/or increased emotional tension among children.

Moreover, when creating a subject environment, it is essential to consider the impact of external characteristics on a child's well-being within it. Here, we should recall well-known foreign studies from the 1980s by W. Malke and N. Schwart, who found that often *«spatial characteristics of premises, lighting and colour solutions, and acoustic data do not take into account children's developmental features and prospects, or their differentiated needs»* (Furyaeva, 2023).

S.L. Novoselova effectively argued that when designing a subject environment, «child ergonomics» must be considered: *«such design should be carried out by specialists: architects, including landscape architects; designers, ergonomists, with the participation of psychologists, educators, and hygienists»* (Novoselova, 1995, p. 17).

Third, ensuring the psychological safety of the DSSE itself.

Based on the understanding of «safety» as *«the presence of certain conditions necessary for life, development, and activity»* (Baeva, 2024, p. 5) and the thesis that *«a safe educational environment supports a person's state of psychological safety»* (Baeva, 2024, p. 7), we can say that the psychological safety of the DSSE is determined by the conditions necessary for children's development and activity — specifically, the presence in the subject environment of opportunities to engage in activities attractive to children and ensuring their emotional well-being.

Conclusion

One of the requirements for implementing an educational programme in a preschool organisation is the safety of the DSSE: *«The safety of the subject-spatial environment implies that all its elements meet the requirements for reliability and safety of their use»* (Federal State Educational Standard, FSES, clause 3.3.46). It is clear that at the regulatory level, the need to ensure safety is закреплён primarily in the physical aspect.

The FSES and the FEP for preschool education do not impose «strict requirements for organising the DSSE and leave PEOs the right to design it independently» (FEP-PE, clause 31.3). In practice, today the psychological safety of the DSSE is not ensured in any way. There are no scientifically grounded criteria in this area of educational environment safety, nor any obligations for PEOs.

Therefore, the independent arrangement of children's «living space» by preschool organisations is a highly challenging task, which does not contribute to creating an optimal subject environment for child development. Furthermore, our analysis has shown that there is a clear deficit of scientific research and theoretical discussions on the psychological component of DSSE safety.

Hence, an urgent task in this area is to define the regulatory and scientific foundations of psychological safety in the developmental subject-spatial environment of preschool educational organisations, along with clear criteria. This will enable the successful creation and maintenance of optimal conditions for children's development within the educational environment of preschool institutions.

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