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cultural-historical PSYCHOLOGY

Anniversary Issue of the journal Cultural-Historical Psychology: Twenty Years of Scholarly Dialogue

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К 20-летию журнала «Культурно-историческая психология» Слово главного редактора

— Что старше 75, но все еще младенец?
— Культурно-историческая психология.
Сет Чаклин

Наука делается журнальными статьями, а не монографиями.
Владимир Петрович Зинченко

В 2025 году журнал «Культурно-историческая психология» отмечает свое 20-летие. В 2005 году вышли два первых номера нашего журнала. У истоков издания стояли В.П. Зинченко, В.М. Мунипов, В.В. Рубцов, А.А. Марголис и Б.Г. Мещеряков[1]. Журнал является детищем Кафедры ЮНЕСКО «Культурно-историческая психология детства» МГППУ.

С 2025 по 2014 год журнал возглавлял В.П. Зинченко, с 2014 по 2023 год — Б.Д. Эльконин, с 2023 г. по настоящее время — В.В. Рубцов. Всегда рядом до последних своих дней был наш «добрый гений», заместитель главного редактора Б.Г. Мещеряков, удивительно надежный, ответственный, понимающий и инициативный. А представительными лицами журнала стали члены его редколлегии, ведущие психологи разных поколений: Л.Ф. Обухова, Н.Н. Нечаев, Т.В. Ахутина, Н.Г. Салмина, Е.Т. Соколова, В.А. Петровский, Д.А. Леонтьев, В.Т. Кудрявцев, К.Н. Поливанова, А.Б. Холмогорова, Н.Н. Толстых, Е.П. Белинская, А.Л. Венгер, М.В. Фаликман, А.А. Шведовская и другие В последние годы в состав редколлегии продуктивно влились А.Д. Майданский, Т.Ю. Базаров, С.Г. Косарецкий, А.В. Конокотин. И, конечно, «портрет» журнала создают его постоянные авторы.

«Культурно-историческая психология» — международный журнал, он издается на двух языках: русском и английском. В состав его редколлегии входят известные исследователи из-за рубежа: А.-Н. Перре-Клермон (Швейцария), М.Дж. Рид (Великобритания), Г.Р. Дэниелс (Великобритания), М. Дафермос (Греция), С.С. Фидальго (Бразилия).

20 лет, по нынешним временам, — немалый срок для научного издания. Правда, если напомнить о том, что в этом же году отмечается 70-летний юбилей классического старейшего психологического издания — журнала «Вопросы психологии» (он стал первым форпостом культурно-исторической и теоретико-деятельностной психологии в научной периодике), то наш возраст покажется молодым. Как молода и сама культурно-историческая психология.

Но хронология мало что говорит, если за ней не прочитывается история. А история свидетельствует о том, что на стыке веков, на изломе тысячелетий идеи творца культурно-исторической психологии Л.С. Выготского и его школы, выросших внутри нее самостоятельных школ А.Р. Лурии, А.Н. Леонтьева, А.В. Запорожца, Д.Б. Эльконина, П.Я. Гальперина, школ их продолжателей В.В. Давыдова, Л.Ф. Обуховой, М.И. Лисиной, Н.Н. Поддьякова, Л.А. Венгера, Ж.М. Глозман и других приобрели особое значение для понимания того, что творится с человеком в новой исторической социальной ситуации его развития (сегодня это не только категория возрастной психологии!) и как он творит новую реальность жизни людей в рамках различных социокультурных практик. Этим и вызвана новая волна интереса к идеям культурно-исторической психологии во всем мире. Здесь находит подтверждение мысль Выготского о том, что подлинная психология человека может изучаться именно в контексте радикальных социально-исторических трансформаций, в эпоху которых жил и творил сам Выготский.

Через личность главного героя Выготского — Гамлета проходит линия исторического разлома времен, и ему (как и Гамлету) «на себе» предстояло восстановить распавшуюся связь времен. Но, по словам одного из

[1] О замысле журнала см.: Зинченко, В.П., Мещеряков, Б.Г., Рубцов, В.В., Марголис, А.А. (2005). К авторам и читателям журнала. *Культурно-историческая психология, 1*(1).

учителей Выготского, литературоведа Юлия Айхенвальда (и Выготский с ним соглашался), «Гамлет — в толпе» (в публике). Поэтому сегодня его нужно искать не на сцене — он как бы размыт («распределен») в людях, человеческих общностях, складывающихся в первой трети XX века. Это не только не отменяет, но и обостряет необходимость понимания природы феномена Личности, которая аккумулирует и преобразует в человеческие новые силы накопленную общественную энергию (Э.В. Ильенков).

Так получилось, что потенциал культурно-исторической психологии, проходивший столетнюю «творческую инкубацию» в теоретических и экспериментальных исследованиях, ставших классикой, оказался по-настоящему востребованным в широкой социальной жизни, где он, кстати, и закладывался Выготским. Сама психология, по его выражению, стала той «высокоорганизованной практикой», внутри которой, по его характеристике, вызревает новое фундаментальное знание, когда размываются границы «теории, эксперимента и практики», равнопрочно приобретающих форму исследования.

Журнал не может остаться равнодушным к этому обстоятельству: он является не только «смотром сил», но и лабораторией, полигоном развития психологической мысли, опирающейся на культурно-исторический и деятельностный подход — психологию XXI века.

Интерес к культурно-исторической психологии в мире значительно вырос, по сравнению с XX веком, а ее идеи реализуются в самых различных областях: от образования (в котором он сохранялся традиционно) до социальной работы, медицины, психотерапии и психологического и организационного консультирования и эргономики. Примечательная статистика: с 2005 по 2024 год в странах БРИКС наибольшее число публикаций по культурно-исторической психологии зафиксировано в следующих странах: Бразилия — 488 публикаций; Россия — 479 публикации; Южно-Африканская Республика — 173; Китай — 110 публикации; Иран — 88 публикаций. Следом идут Индонезия, Индия, и ОАЭ, хотя их показатели значительно ниже[2]. При этом лидируют США — 774 публикации.

Совсем недавно увидел свет тематический выпуск нашего журнала (2025, № 3(21), посвященный развитию культурно-исторической психологии в странах БРИКС. Только в Бразилии работает 154 исследовательские группы, которые реализуют в своей деятельности идеи культурно-исторической психологии, 140 из них созданы на базе федеральных образовательных учреждений, что свидетельствует об интересе государства в поддержке работы в этом направлении[3].

При этом журнал «Культурно-историческая психология», включенный в базы Web of Science CC (ESCI) и Scopus (CiteScore: Q1 SNIP: 2 SJR: Q1), лидирует в топе тематических изданий[4].

Это радует, но и налагает колоссальную ответственность за качество новых публикаций. Культурно-исторический подход — достояние отечественной науки, он определяет современную ситуацию в мировом психологическом сообществе.

Поздравляем с юбилеем всех тех, кто делает журнал «Культурно-историческая психология», и тех, кто его читает. Окончательная судьба научного издания решается в инстанции читательской мысли. Прежде всего — молодой исследовательской мысли читателей XXI века, строителям новейшей психологии, которым во многом адресован журнал.

Культурно историческая психология — молодая наука для молодых,

В.В. Рубцов,
Академик РАО, доктор психологических наук, профессор,
главный редактор журнала «Культурно-историческая психология

[2] Шведовская, А.А., Пономарева, В.В., Корнеев, А.А., Самородов, Н.В. (2025). Ландшафт культурно-исторической психологии в странах БРИКС+: библиометрический анализ. *Культурно-историческая психология, 21*(3).

[3] Престес, З., Тунес, Э., Бек, М.Т. (2025). Распространение культурно-исторической теории Л.С. Выготского в Бразилии. *Культурно-историческая психология, 21*(3),

[4] Шведовская, А.А., Пономарева, В.В., Корнеев, А.А., Самородов, Н.В. (2025). Ландшафт культурно-исторической психологии в странах БРИКС+: библиометрический анализ. *Культурно-историческая психология, 21*(3).

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DEVELOPMENTAL PSYCHOLOGY
ПСИХОЛОГИЯ РАЗВИТИЯ

Научная статья | Original paper

Cognitive psychology of childhood — the invaluable heritage. On the 100th anniversary of L.A. Venger's birth

A.L. Venger[1], **E.I. Zakharova**[2] ✉, **O.A. Karabanova**[2], **T.D. Martsinkovskaya**[3]
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Abstract

Context and relevance. The works of L.A. Venger continued the tradition of studying thinking, laid down in Russian psychology by L.S. Vygotsky and A.V. Zaporozhets. At the same time, his research combined Russian psychology of cognitive development with the ideas of foreign scientists, primarily J. Piaget and J. Bruner. The novelty and significance of L.A. Venger's views is that he focused on the dynamics of the formation of perception and the formation of sensory standards in early and preschool age, combining in his programs theory with the practical development of diagnostic methods and, at the same time, the formation of children's thinking. **Objective** is to analyze the origins, the theoretical and practical value of L.A. Venger's theory, and its significance for modern developmental psychology, including its theoretical knowledge and practical ideas. **The method of analysis** was the hermeneutic and historical-psychological reflection of L.A. Venger's works. **Results**. The article reveals and summarizes the content of the methodological, theoretical, and applied aspects of L.A. Venger's theory of cognitive development in children. It discusses its origins and the considerable novelty in the interpretation of sensory standards, the orientation in problem-solving processes, and the search for and use of information obtained during orientation. The works of L.A. Venger and his colleagues contain enormous potential for both diagnostics and developmental education of preschoolers and primary school students. The significance of L.A. Venger's cognitive theory of childhood for the theory and practice of modern psychology has been demonstrated. **Conclusions**. In the modern world, where both sensory standards and the ways of their representation and perception have changed, it is necessary to continue the direction in developmental psychology laid down by L.A. Venger and his colleagues.

Keywords: cognitive development, preschooler, sensory standards, perceptual action, mediation, visual modeling, orienting-research action

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Когнитивная психология детства — бесценное наследие. К 100-летию Л.А. Венгера

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Резюме

Контекст и актуальность. Работы Л.А. Венгера продолжили традицию изучения мышления, заложенную в отечественной психологии Л.С. Выготским и А.В. Запорожцем. В то же время его исследования соединили отечественную психологию когнитивного развития с идеями зарубежных ученых, прежде всего Ж. Пиаже и Дж. Брунера. Новизна и значение взглядов Л.А. Венгера — в том, что он сфокусировал внимание на динамике становления восприятия и формирования сенсорных эталонов в раннем и дошкольном возрасте, соединив в своих программах теорию с практической разработкой методов диагностики и, одновременно, формирования мышления у детей. **Целью** является анализ истоков, теоретической и практической ценности теории Л.А. Венгера и ее значения для современной возрастной психологии, ее теории и практики. **Методом анализа** стала герменевтическая и историко-психологическая рефлексия трудов Л.А. Венгера. **Результаты.** Раскрыто и обобщено содержание методологических, теоретических и прикладных аспектов теории когнитивного развития детей, разрабатываемой Л.А. Венгером. Показаны ее истоки и принципиальная новизна в трактовке сенсорных эталонов, ориентировки в процессе решения задач, поиске и использовании полученной при ориентировке информации. Работы Л.А. Венгера и его сотрудников содержат огромный потенциал, как для диагностики, так и для развивающего обучения дошкольников и младших школьников. Доказано значение когнитивной теории детства Л.А. Венгера для теории и практики современной психологии. **Выводы.** В современном мире, где и сенсорные эталоны, и способы их представленности и восприятия изменились, необходимо продолжать направление в возрастной психологии, заложенное Л.А. Венгером и его сотрудниками.

Ключевые слова: познавательное развитие, дошкольник, сенсорные эталоны, перцептивное действие, опосредствование, наглядное моделирование, ориентировочно-исследовательское действие

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Introduction

In April 2025, the Faculty of Psychology at Lomonosov Moscow State University held a roundtable discussion dedicated to the 100th anniversary of Leonid Abramovich Venger, a leading scholar and prominent representative of the Russian school of psychology. His name often remains overshadowed by his outstanding teachers — A.V. Zaporozhets, A.N. Leontiev, and P.Ya. Galperin. It is time to remember that Leonid Abramovich's work contributed to the development of concepts regarding the mechanisms of development of basic cognitive functions during ontogenesis, and the operationalization of the functional content of a child's cognitive abilities paved the way for the development of diagnostic tools and developmental programs for preschool-aged children (Venger, 1969; Venger, 1976; Venger, Agayeva, Venger, 1986). The results of this reflection and the synthesis of L.A. Venger's contributions were presented in the context of his impact on modern developmental psychology by his students and followers, to whom he dedicated many years of work at the "Laboratory of Preschool Psychology." As participants emphasized, L.A. Venger's ideas are deeply integrated into the scientific consciousness of contemporary researchers and form the theoretical basis of their work, although sometimes his original contribution risks becoming obscured. This underscores the importance of reiterating the key principles he introduced to Russian psychology. Doing so will prevent us from becoming"Ivans who forget their ancestors"[1] and

[1] Transcript of T.D. Martsinkovskaya's speech.

will contribute to a thorough understanding of the origins of the scientific ideas we continue to develop.

Theoretical background

Leonid Abramovich's theoretical position was formed on the basis of a deep understanding of foreign psychology. An extremely erudite individual, he draws on the tenets of Gestalt psychology, cognitive psychology, and Jean Piaget's genetic concept, which determined the focus of his own scientific interests. His interest in sensory processes stems from Gestalt psychology, which views perception as the foundation of cognitive development. Koffka's works, which discussed the analysis and differentiation of images in the surrounding world, are reflected in Leonid Abramovich's discussions of sensory standards and perceptual modeling (Venger, 1976). A special place in the formation of his views is occupied by the idea of structuring space, creating a schema of the surrounding field of action during the process of solving a cognitive problem, developed in the works of V. Keller (Martsinkovskaya, 2009). The use of schemas (thought processes) in foreign cognitive psychology has become a crucial tool for processing information. This tradition defines the systems approach in the works of L.A. Venger, which also emphasizes the importance of the joint, holistic functioning of all cognitive processes working toward solving a problematic situation. In forming the conceptual apparatus of his own concept, the scientist introduces the categories of schematic thinking, modeling (construction) of a complex object, the components of which are the processes of analysis (identification of the elements that make up the figure) and synthesis of something new through the creation of a new system.

The work of J. Piaget, who defines mental development through the processes of assimilation and accommodation (Piaget, 1994), plays a special role in the development of his own scientific position. This approach to development as a qualitative transformation of a holistic cognitive structure allows us to speak not of isolated images reflecting the world around us, but of a holistic cognitive system — a system that transforms as we gain knowledge of the surrounding world[2].

L.A. Venger's discussed areas of scientific thought are framed from the perspective of a cultural-historical approach, which is actively developing in Russian psychology. The scientist clearly defines his theoretical position, relying on the works of L.S. Vygotsky, A.N. Leontiev, and A.V. Zaporozhets (Vygotsky, 1983; Vygotsky, 1984; Zaporozhets, 1967; Zaporozhets, 1986; Leontiev, 2020). He becomes a representative of the Russian psychological school, clearly emphasizing its advantages[3].

Fundamentally new possibilities open up when examining cognitive processes and perception, particularly as a special type of human activity with a specific structure. Leonid Abramovich emphasizes that the quality of a sensory product is determined not by the properties of the influencing object, but by the content of the subject's cognitive activity. In this regard, he calls for a focus on analyzing the content of this activity and the nature of the tools used by the subject. Emphasizing that the most important feature of the qualitative uniqueness of human activity is its instrumental nature, the scientist raises the question of the sensory standard as a kind of tool, the use of which elevates perception to a qualitatively new level of development.

In the works of L.A. Venger, we find the development of L.S. Vygotsky's ideas on the psychological content and structure of higher mental functions from the perspective of the activity approach. Where L.S. Vygotsky speaks of the sign as a psychological tool that fundamentally alters the structure of mental functions and transforms natural mental functions into higher ones, L.A. Venger substantiates the role of the model as a means of reflecting the essential features of an object and organizing cognitive activity as the basis for the formation of a person's universal ability to mediate (Venger, 1969; Venger, 1976; Venger, Agaeva, Venger, 1986).

A series of experimental studies conducted under the direction of L.A. Venger established the fundamental patterns of the formation of universal mediation ability in childhood. The initial stage of its development is the child's acquisition of a system of sensory standards (color, shape, etc.) and the formation of corresponding perceptual actions for examining the sensory qualities of objects using them (ages 3—4). The acquisition of sensory standards proceeds sequentially, beginning with the initial acquisition of standards independently of one another, with differentiation predominating, based more on the principle of distinction. Then comes systematization through the establishment of connections and mutual transitions (for example, colors and their shades, creating a continuum of transitions). It is precisely this systematization that opens the child's door to the use of standards to form a holistic sensory picture of the world. The development of perceptual actions proceeds within the logic of movement from the one-to-one identification of an object's properties with a sensory standard to the construction of an object's sensory properties using multiple sensory standards. While each standard cannot be individually identified with the object's sensory properties, their combined use, based on establishing similarities and differences, allows the child to construct an image of the object — in other words, to create, based on orientation, a new sensory quality that is not identical to any of the sensory standards used. This makes the child a true subject of perceptual activity: from the "applicator" of a ready-made standard and the execution of a learned method of action, the child progresses toward

[2] Transcript of T.D. Martsinkovskaya's speech
[3] Transcript of E.I. Zakharova's speech

the "creator" of a new means of perceiving an object's sensory properties. In this way, L.A. Venger responds to the traditional criticism leveled at proponents of the strategy of purposeful formation of mental actions and concepts developed in the works of P. Ya. Galperin. The essence of the opponents' criticism boils down to the fact that such a strategy limits the child's mental development to the mere assimilation of predetermined models, leaving no room for creativity. The infinite diversity of the world a child explores obviously makes it impossible to fully equip them with a set of ready-made tools to successfully solve all cognitive and perceptual problems. The acquisition of a standard as a means of exploratory and exploratory activity aimed at understanding the world opens up space for genuine creativity in the child's creation of their own tools for understanding the world based on the sociocultural standards they have learned.

During the second stage of developing the ability to mediate, the child masters the act of visually modeling the properties of objects and the relationships between them, including spatial, temporal, and logical ones. The ability to represent the modeled relationships in a generalized form develops (5—7 years). L.A. Venger identifies three vectors of development of the ability to visually model. The first is the expansion of the substantive range of modeled relationships — from spatial to temporal and logical relationships. The second vector is from the creation of individual models to increasingly generalized models reflecting the essential properties of an entire class of objects and situations. This suggests an analogy with L.S. Vygotsky's position on the development of sign meanings — from complexes oriented toward the actually objective, individual properties of objects to concepts based on systematicity and the identification of the essential subject characteristics of an object. The increase in the generalization of models leads to the transformation of the form of models from the iconic form, preserving the external similarity with the object, to the conditional-symbolic, when the conventional form of the sign is sufficient to designate the object or its property, expanding the boundaries of the possibilities of generalizing the phenomena of reality by reflecting them in visual models. Finally, the third vector characterizes the functional development of modeling actions — from the actions of simple substitution (from 3 years) to the use of conditional-schematic models that have a semantic or conventional connection with the substituted object, as well as from the creation of models to the use of models as a means of orientation in solving problems of a cognitive or pragmatic nature (Venger, Pilyugina, Venger, 1988; Venger, 1976; Venger, Agaeva, Venger, 1986). The dynamics of the development of modeling actions is universal, which is confirmed by the facts of the development of play actions (Elkonin, 2025). In the early stages of play development, substitution is initially unrestricted, but the substitute and the thing being substituted are loosely connected, creating instability in the substitution. Subsequently, the boundaries of substitution are determined by the ability to perform a play action with the substitute, i.e., based on similarity according to the principle of the iconic model. Subsequently, substitution is carried out based on a word with a stable meaning, i.e., based on a semantic connection, i.e., based on a conditional-schematic model. The general logic of the development of substitution in play and constructive activities testifies to the emergence and development of a truly general cognitive ability — a universal capacity for mediation (Beloshistaia, 2018).

L.A. Venger points to the dynamic unity of two processes — model creation and model application. Moreover, as established during experimental development, in some cases, model application precedes model creation and is a necessary condition for successfully mastering the skill of model creation. Why? There are two possible explanations. First, using a model to solve problems creates motivation and meaning for creating models as a means of solving them, ensuring that the child identifies the model's orienting function. Second, the practice of using a model, testing it as a means of solving a cognitive task, allows the child to identify the requirements for the model in accordance with the function it performs. Visual modeling, as a form of exploratory activity specific to preschool age, fundamentally transforms the child's cognitive position. In his concept of three types of learning and their corresponding three types of orientation, P.Ya. Galperin indicated that the third type of learning and its corresponding third type of orientation, aimed at mastering sociocultural means of analyzing objective reality, provide a developmental effect by mediating the child's cognitive position (Galperin, 2023). Visual modeling forms the basis for transforming the child's cognitive position and instrumentally equipping it with sociocultural standards. The effect of experimental learning, documented in a series of studies by L.A. Venger, which acts as an increase in the learning ability of preschoolers, ensured by the formation of generalized methods of action with sociocultural means — sensory standards and models, acting as a means of orientation in new problem situations, is a convincing confirmation of the importance of visual modeling as a mechanism for the formation of general cognitive abilities of the child (Venger, Venger, 2010; Venger, Pilyugina, Venger, 1988; Mead, 1988; Venger, Dyachenko, Agaeva, 1995; Venger, Mukhina, Markova et al., 1976; Venger, Davidchuk, Bure et al., 1977; Pirlik, Fedoseeva, 2022).

A crucial principle, brilliantly realized in L.A. Venger's experimental research, is that the content of mental action can only be investigated during its development. Consistent with the ideas of L.S. Vygotsky and P.Ya. Galperin, the scientist implements a genetic research method that allows for the identification of the structure of cognitive action at the stage of its external, material realization. Since an established cognitive action, having an ideal form, becomes virtually inaccessible to objective research, it makes sense to study it when it is realized in its genetically original, material form. Having successfully implemented

this principle in his study of children's sensory abilities, Leonid Abramovich succeeds in capturing the act of correlating the object's property (shape, size) with learned patterns of the main variations of this property — sensory standards. As an action develops, its qualitative transformations occur: from the physical association of an object with a standard through external motor operations (placing, applying, etc.) to association with the standard in the realm of perception. In this case, the actual movements of the standard and the object are replaced by gaze movements. Finally, a transition occurs to the execution of the action on an ideal plane, where the child's established concepts serve as standards, and gaze movements that allow for the association of the object with the standard are reduced.

The result of experimental research into the content and genesis of perceptual action is an understanding of any cognitive action as orienting, "...considering the process of perception itself as a unique orienting-exploratory action, performing the functions of examining the object and creating its image, through which the subject controls their behavior" (Zaporozhets, Venger, Zinchenko, Ruzskaya, 1967, p. 5).

Summarizing the results of a long-term cycle of research conducted under his supervision, L.A. Venger points out that the work of the laboratory he headed made it possible to substantiate the targeted formation of general cognitive abilities in the conditions of public preschool education as the main path of developing the child's cognitive abilities (Venger, Mukhina, Markova et al., 1976; Venger, Venger, 2010; Rubtsov, Isaev, Konokotin, 2022; Belova, 2024). The effects characteristic of experimental learning were established and proven — the alignment of children who took part in the training at a high level of development of cognitive abilities (sensory and intellectual) while maintaining individual differences. Indication of the sufficiency of the conditions of public preschool education, i.e., not the conditions of individual training, but the conditions of training in a kindergarten group, for achieving a developmental effect seems significant. This allows us to expand and enrich our understanding of the child's zone of proximal development, which can be effectively realized not only in the dyadic interaction of a social adult as a bearer of sociocultural experience with a child, but also in the space of purposeful construction of joint activities of a social adult in a children's community as a co-event that opens the way for development (Slobodchikov, Isaev, 2013). Recognition of the role of communication with peers in the formation of a child's cognitive abilities resonates with both M. Mead's position on the importance of cofigurative culture in modern society, where children teach each other (Mead, 1988), and with the assertion about the role of cooperation between a child and peers for his mental development and overcoming egocentrism of thinking in the concept of J. Piaget (Piaget, 1994). The study of the patterns and characteristics of interactions between a child and peers in the course of solving cognitive problems for the formation of the zone of proximal development is a prospect for further research (Rubtsov, Isaev, Konokotin, 2022; Shur, Zuckerman, 2022; Zuckerman, Obukhova, Bilibina, 2024).

Sensory model

A special place in L.A. Venger's research is occupied by his discussion of a unique means of perceptual action — the sensory model. Considering criticism from linguistics scholars who critically assessed L.S. Vygotsky's use of the category "psychological tool as a sign," Leonid Abramovich speaks of a psychological tool. Focusing on the analysis of mental action, the scientist discusses the nature of the used psychological tool, linking its use to the mental operation (what to do with this tool). At the first stages, the sensory model has a real material form (a pre-model). It lacks exactness and universality, being applied situationally and in a limited space. Systematic use of the model leads to a generalized representation, an abstract form, detached from a specific physical object. Finally, models can be combined into a common system in which they are interconnected. Thus, considering the complex process of developing a "color body," we can say that a child initially becomes familiar with a specific color (for example, blue), but very quickly comes to understand that there are many blue colors. They differ from one another according to three dimensions (tone, saturation, and lightness), and full perception and categorization are possible only after constructing the entire system, which represents an organized space — a model.

Leonid Abramovich gives great importance to modeling activities. It is here that we see the systematic work of human cognitive abilities. When a girl puts her doll to bed after spanking it, she is modeling her life experience. Speaking about the study of the content of models characteristic for preschool age, L.A. Venger focuses on the quality of the child's cognitive processes. He described the phenomenon of didactic play, in which the action unfolds not spontaneously, but in a form suggested by an adult. Such play can be used as an age-appropriate method of teaching a child (Pirlik, Fedoseeva, 2022). The forms and functions of children's play remain the focus of scientific research in our time (Vachkov, Vachkova, 2025).

From image to schema

The discussion of the transition from a mental image, as a form that enables mental action, to a model is of particular interest to L.A. Venger. Considering the process of using a sensory model as a tool for differentiating surrounding objects, we must speak not about a single phenomenon, but about an integrated system — a model, a schema. The scientist notes that we often use different terminology to describe the phenomena under study. This is the natural state of science. It is important to establish where we agree, what is com-

mon in our understanding of the phenomenon. When discussing the development of schematic thinking in preschoolers, one can find analogies with the reasoning of J. Piaget, who examines the process of coordination and grouping at this age. However, a distinctive feature of L.A. Venger's ideas is the emphasis on the child's active participation in creating a model, constructing a holistic picture of the world, which will guide their behavior. The transformation of the sensory model leads to the formation of a schema, which becomes the prototype of a concept. The emergence of a verbal-logical form of the model's existence (scheme) becomes the next link in the genesis of cognitive activity. Thus, it can be argued that L.A. Venger made a significant contribution to the understanding of the cognitive development of early and preschool-aged children, creating a special branch of scientific psychology — the cognitive psychology of childhood. It is called cognitive psychology not only because cognitive development was the focus of L.A. Venger's theoretical and applied research, but also because the perception of information underlies this development. This is a fundamentally new modern approach, consonant with the ideas of cognitive psychology.

A new approach to diagnostics that became the key to uncovering the content of correctional and developmental work

Discovering the content of a child's cognitive actions and defining the logic of their genesis opened the way for the creation of an original system of psycho diagnostics. L.A. Venger notes the fundamental limitations of existing approaches to diagnosing a child's cognitive abilities, due to the fact that the analysis of the successful solution of proposed problems is based on the analysis of the products of the sensory process. The tasks presented to the respondent allowed for the recording the content of the sensory effect and the characteristics of the perceptual image, but not the process and conditions of their occurrence. Uncovering the genesis of a child's sensory abilities made it possible to evaluate the method of problem solving and the nature of the used tools. Analysis of the process of solving a test problem allows us to determine which mental processes are available to the child and in what form they are carried out. This makes it possible to determine the stage of development of a cognitive action, which does not so much characterize the "mythical abilities of the child" as it allows us to evaluate the path they have traveled and understand what tools should be used to equip them in joint activities with an adult.

Created under the guidance of L.A. Venger diagnostic methods, on the one hand, fully comply with the requirements of the normative approach to psycho- diagnostics, and on the other hand, contain structural components that allow focusing on the qualitative analysis of the action being performed. The creative team led by L.A. Venger clearly gravitates toward a qualitative, significant analysis of activity. Thus, the "Polyanka" method (R.I. Bardina, L.A. Venger) proposes tasks grouped according to the progressive principle of complexity, and a key for assessing the success of task completion (Venger, 1978). However, it is possible to assess the child's level of visual-figurative thinking development without using a point assessment, since the complexity of tasks occurs not through a quantitative expansion of possible solution options, but through the qualitative uniqueness of orientation toward one or two systems of reference points, toward the immediately upcoming action or toward the general scheme of task execution, allowing for anticipatory orientation (running two steps ahead).

The methods themselves enable completing tasks at varying levels of sensory maturity. For example, a child can identify the shape of a figure with a slot on a game board either through physical search or by using the perceptual image of the object. In either case, it is possible to develop an individual development program for a specific child.

This principle is embodied in original educational programs for developing the mental and artistic abilities of preschoolers. The internationally recognized "Development" program aims to equip children with cognitive and creative tasks (Preschool Educational Program "Development," 2016; Venger, Dyachenko, Agaeva, 1995). In constructing this developmental program, the authors are guided by the concept of the generalized nature of a child's mental abilities. Considering that mediation is a "generic" distinctive property of the human psyche, a strategy is developed for the child's mastery of perceptual modeling techniques, which subsequently allow these techniques to act as a general mental ability.

Conclusion

L.A. Venger's psychological concept fits seamlessly into the theory of childhood development which developed in global science in the 20th century. The principles of Gestalt psychology and J. Piaget's genetic psychology are reflected in L.A. Venger's programs and diagnostic methods. At the same time, the scientist's own theoretical position is built within the logic of the cultural-historical approach of L.S. Vygotsky and A.N. Leontiev. Leonid Abramovich, developing the theory of higher mental functions from the perspective of an activity-based approach, substantiates the role of the model as a means of reflecting the essential features of an object and organizing cognitive activity, serving as the basis for developing a universal human capacity for mediation. L.A. Venger's research made it possible to implement the basic principle of diagnostics. In the tradition of Russian psychology, assessing a child's developmental level is carried out solely for correction purposes. The development of diagnostic tools aims to capture the problem-solving method accessible to a specific child. This allows, based on the concept of the general logic of the genesis of cognitive actions, the development of an individualized program to improve their cognitive abilities.

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Contribution of the authors

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

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The authors declare no conflict of interest.

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Научная статья | Original paper

Movement language as a means for preschoolers to embody a motor-plastic image. On the 100th anniversary of L.A. Venger's birth

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Abstract

Context and relevance. The main content of the article is preceded by a description of how one of the directions in the author's research originated, which began in the laboratory of L.A. Venger, in line with the study of the development of model tools by preschoolers in the development of cognitive abilities, and then cognitive and artistic—creative abilities, productive imagination in the laboratory of O.M. Dyachenko. The main content of the article is the consideration of the problem of the embodiment of motor and plastic images by children aged 3—7 in the context of the development of their figurative and plastic creativity (performing and composing). The use of the language of movements as a means of embodying images (characters within the framework of the plot) is used in creative tasks of conscious and arbitrary semantic formation and is based, on the one hand, on the personal experience of non—verbal communication of children, and on the other, on purposeful teaching of the language of movements according to the author's methodology. One of the characteristic features of this technique is the development of methods of paired figurative—plastic interaction, which are models of non-verbal communication, however, the development of these models, unlike "cognitive models" (schemes), involves detailing in recreating and living the features of behavior from the perspective of a character. **Objective.** On the 100th anniversary of L.A. Venger: to show the influence of his scientific ideas on the formation and development of new modern areas of psychological and pedagogical research, as well as the development of these ideas based on the material of the author's new research directions. **Methods and materials.** The content of the article is based on the materials of the author's previous Russian-language publications on this issue. In particular, a brief description is given of diagnostic methods that make it possible to assess the effect of developing figuratively plastic creativity in children aged 3—7 (embodying images of characters interacting according to a given plot) based on teaching them the language of expressive movements. **Results.** The results of some studies are briefly described: according to the indicators "structural expressiveness of the image" and "plastic expressiveness of the image", according to which the dynamics of the development of arbitrary expressive movements in preschoolers was found, as well as: a study of composing and performing types of ffiguratively plastic creativity of preschoolers of different ages. **Conclusions.** The scientific influence of L.A. Venger, his theory of the development of cognitive abilities in preschoolers using cultural means (etalons, models) have become the primary source for the development of many new areas of modern psychological and pedagogical research.

Keywords: figuratively plastic creativity of preschoolers, movement language, motor-plastic image, structural expressiveness of an image, plastic expressiveness of an image, sense formation, non-verbal communication, models of non-verbal communication, image detailing

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Язык движений как средство воплощения дошкольниками двигательно-пластического образа. К 100-летию Л.А. Венгера

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Резюме

Контекст и актуальность. Основное содержание статьи предваряется описанием того, как зародилось одно из направлений в исследованиях автора, начало которому было положено в лаборатории Л.А. Венгера, в русле изучения освоения дошкольниками модельных средств в развитии познавательных способностей, и затем — познавательных и художественно-творческих способностей, продуктивного воображения в лаборатории О.М. Дьяченко. Основное содержание статьи — рассмотрение проблемы воплощения детьми 3—7 лет образов персонажей в контексте развития у них образно-пластического творчества (исполнительского и сочинительского). Использование языка движений как средства воплощения образов персонажей (в рамках сюжета) применяется в творческих задачах осознанного и произвольного смыслообразования и опирается, с одной стороны, на личный опыт невербального общения детей, а с другой, — на целенаправленное обучение языку движений по методике автора. Одна из характерных особенностей этой методики — освоение способов парного образно-пластического взаимодействия, которые являются моделями невербального общения, однако их освоение, в отличии от «познавательных моделей» (схем), предполагает детализацию в воссоздании и проживании особенностей поведения в сюжетной ситуации с позиции персонажа. **Цель статьи**. К 100-летнему юбилею Л.А. Венгера: показать влияние его научных идей на формирование и развитие новых современных направлений психолого-педагогических исследований, а также развитие этих идей на материале новых направлений исследований автора. **Методы и материалы.** Содержание статьи опирается на материалы предыдущих русскоязычных публикаций автора по данной проблеме. В частности, дается краткая характеристика результатов диагностики, свидетельствующих об эффекте развития у детей 3—7 лет образно-пластического творчества на основе обучения их языку выразительных движений. **Результаты.** Кратко описываются результаты некоторых исследований: по показателям «структурная выразительность образа» и «пластическая выразительность образа», согласно которым обнаружена динамика развития у дошкольников произвольных выразительных движений, а также: исследование сочинительского и исполнительского видов образно-пластического творчества дошкольников разных возрастов. **Выводы**. Научное влияние Л.А. Венгера, его теории развития у дошкольников познавательных способностей с использованием культурных средств (эталонов, моделей) стало первичным источником для развития многих новых направлений современных психолого-педагогических исследований.

Ключевые слова: образно-пластическое творчество дошкольников, язык движений, двигательно-пластический образ, структурная выразительность образа, пластическая выразительность образа, смыслообразование, невербальное общение, модели невербального общения, детализация образа

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Introduction: background

I was lucky enough to come to the laboratory of Leonid Abramovich Venger in 1986 in connection with my admission to the postgraduate school of the Research Institute of Preschool Education of the Academy of Pedagogical Sciences of the USSR (organized by A.V. Zaporozhets in 1960; worked until 1992). The atmosphere of psychological research of cognitive abilities that prevailed in L.A. Venger's laboratory significantly influenced my research on dance creativity (in my pedagogical specialty) and principally was oriented on using the principles of psychological and pedagogical diagnostics, in particular, imagination (Dyachenko, 1996). (At that time, in the late 80s of the twentieth century, the use of pedagogical study of diagnostic methods with an assessment according to certain criteria was fundamentally new, in contrast to the methods accepted in Soviet pedagogy to identify the results of empirical influence.) (Gorshkova, 2020a).

At first glance, a connection between the study of cognitive abilities, which was then carried out in the

laboratory of L.A. Venger, and the study of dance creativity is not obvious, but I will note a number of provisions of the concept of the development of abilities, developed under the guidance of Leonid Abramovich, in line with which the theoretical foundations in the study of musical-movement (dance) creativity of preschoolers were formulated.

L.A. Venger's theory of the development of perception and cognitive abilities is based on the provisions of cultural-historical psychology and the theory of activity: abilities are considered as conditions for successful mastery and performance of an activity, that is mental properties that meet the requirements of an activity (Venger, 1986) and develop in the process of carrying out this activity. At the same time, the means developed in culture are used to perceive the properties of objects (sensory etalons) and to model relations between objects (visual-spatial models with the use of substituents and the establishment of relations between them that reflect the relations of objects and phenomena that are denoted by these substituents) (Venger, 1976, p. 11). The ability to substitute is a fundamental feature of the human mind, providing the ability to create, master, and use symbols and signs, without which not only science and art, but also the existence of humanity would be impossible (Vygotsky, 2021; Venger, 2010). Mastering these cultural means contributes to the emergence of visual representations, actions in the mind, the development of the ability to plan the solution of problems, including creative ones, to anticipate the likely results of one's own actions. And this is understanding, thinking and imagination (Venger, 2010).

"A child develops by means of "social inheritance", which, in contrast to biological inheritance, presupposes not the exercise of innate abilities, but the acquisition of new ones through the assimilation of social experience" (Venger, 1988, p. 4).

According to the cultural-historical theory (L.S. Vygotsky, 2021a-g; 2023), "...mental development is considered as an interweaving of "natural" and "cultural" development, consisting in the formation of higher mental functions" (Venger, 1996, p. 3), which are characterized by arbitrariness, mediation <that is, the use of means of activity> and awareness and function on the basis of the "instrumental" use of the sign. In his article, L.A. Venger wrote: according to L.S. Vygotsky, the sign "always has a social nature, is a means of social communication and <...> an instrument of the child's own mental activity as a result of the process of interiorization, transformation of the social into the individual and the external into the internal" (Venger, 1996, p. 3). L.S. Vygotsky considered speech as the main system of signs of social origin that are mastered by the child in ontogenesis; therefore, he paid special attention to the participation of speech in the cultural development of the child, in the development of his thinking: as a unit of analysis of speech thinking, he identified the meaning of the word, which performs the function of a means of carrying out thought processes.

In the laboratory of L.A. Venger, a system of tasks has been developed for the purposeful formation of perception and modeling actions, which makes it possible to consciously guide the development of children's perception (acquaintance with sensory etalons and their use for the perception of objects) and figurative thinking (acquaintance with substitution actions, the using ready-made models and the building a model in accordance with a specific situation and child's own idea. Based on them, the educational program "The Development" for kindergarten was created (Dyachenko (ed.), 1999).

And one else important position: in accordance with the requirements of modern education, "... in order to prepare a child for creativity, it is necessary to introduce elements of creativity into the assimilation of knowledge and methods of action" (Venger, 2011, p. 17).

These positions became the "guiding principles" in our study, based on the material of a type of activity (which had never been studied before in the Venger laboratory) — musical and motor creativity of preschoolers in dance — and they "refracted" in accordance with the logic of this children's activity[1].

Based on this, the development of creative abilities in children should occur in those activities that are most favorable for the development of productive imagination — the basis of creativity. L.S. Vygotsky (2021a) pointed out the motor character of child's imagination, the creation of images through actions, "through his own body". This means that creative activity should be figurative in nature; and proximity to the game, which is the "root of children's creativity" (Vygotsky, 2023), and connection with music, which has an emotionally imaginative content, can create additional favorable conditions for creativity. All three factors: figurative movement, play, and music take place in dance, but not in any dance, namely in story dance. And here, too, not any music is required, but taking into account the task of developing creativity — built on the principle of musical drama (Venger, 1996; Gorshkova, 2002), "prompting" (during creative dance) the changes and the features of personages' experiences, development of their images.

The main issue is the means of embodying dance images. Such a means is not just individual dance movements, but the language of movements (dance and pantomime), which is understood as a certain system of expressive movements through which children can arbitrarily and consciously embody images of various characters, interacting with each other in accordance with the plot of the dance.

[1] It is worth explaining that in the late 80s of the twentieth century, there was no such activity name in the Soviet preschool education, as well as the activity itself. Traditionally, the creativity of preschoolers in dance has been considered (and is most often still considered) as one of the types of children's musical activity within the framework of the development of musical-rhythmic movements, and it was understood very narrowly — as a combinatorics of learned dance movements, meaningless in themselves, but reflecting the peculiarities of the sounding music: tempo, dynamics, metro-rhythm, general character.

In the course of mastering the language of movements, "natural" origins and "cultural" acquisitions are intertwined: primary expressive reactions (screaming, crying, expressions of comfort/discomfort), designed to ensure the survival of the infant, become the starting point for the subsequent development and expansion of the child's cultural experience of non-verbal communication methods that occur unconsciously, by imitation (Rubinstein, 2021). The fact that children unconsciously use non-verbal means of communication (including due to the fact that movements and gestures often occur simultaneously with verbal speech) is one of the reasons why they are not used by children in dance creativity.

Purposeful mastery of the movement language as a cultural means of communication and creativity is carried out through specially organized learning, during which children are convinced that movements of dance and pantomimes, dance compositions can convey entire stories (similar to how it takes place in the art of ballet) (Krasovskaya, 2025). That is, movements and gestures have a generalized figurative content; mastering them, children realize that with the help of movements they can express emotions (sadly—funny, etc.), character traits of personages (courage—fearfulness, cunning—simplicity), manner of movements (ponderous—light; angular—smooth), features of appearance (big—small), etc. Based on the generalized figurative content (plot) of the dance, the features of the music (specially selected for this plot), the child searches for and finds movements that match the meaning, using cultural means which are examples of ways of action, movements with certain "meanings"; using them, the child can convey an emotional and figurative meaning, understandable to others (people of the same culture).

It is significant that in his work on the article included in the general laboratory collection of articles (Word and Image ..., 1996), Leonid Abramovich directly influenced the accuracy of the conceptual apparatus: he proposed calling dance and pantomime movements not "signs", but "units" of the movement language. And he emphasized the role of adult speech (describing an imaginary situation, experiences, and character of a character) so that the child could understand how images are embodied in the story dance, and could independently choose movements, guided by their generalized figurative meanings and the meaning of the plot situation according to the musical drama of dance.

In order for children to perceive and use movements as a language, so that they could "speak" in the movement language, linking them into "speech" sequences — "messages", they were mastering the ways of paired musical-movement interaction for subsequent use in story dance. In fact, these were communication models built as fragments of a dialogue: replica—response. However, unlike visual-spatial models (diagrams, drawings, graphic plans that reveal essential relationships between objects, without details), models of pair interaction (in story dance) need in detailing of the transmission of characters relationships, only then the emotional meaning of the "dialogue" was revealed, which is very important for opening the context of non-verbal communication.

In the course of the study, an attempt was made to formulate a definition of dance creativity — with a distinction between its "compositional" and performing types — as a meaningful and arbitrary use of the movement language (dance and pantomime) as the main means of embodying images in a story dance. This was developed in subsequent studies (shown later in this article).

The study of this problem and the creation of a methodology for developing creativity in dance among preschoolers (Gorshkova, 2002) marked the beginning for further research in various directions (see figure).

One of these areas is described in more detail later in the article.

O.M. Dyachenko, a student and successor of L.A. Venger as head of the laboratory, suggested to me that, as part of the preparation for the second issue of the program 'The Development,' an experimental investigation be conducted into the development of movements in preschoolers. This contributed to the emergence of the idea of developing figurative and plastic creativity in children aged 3—7 years, based on learning the movement language, and led to the development of the program 'The Expressive Movement' for working with children from the younger to the preparatory school group."After experiencing a life-threatening situation and near-death in virtual reality, suicidal thoughts and desires will disappear, as the potentially life-threatening situation has been lived through.

Research on the development of figuratively plastic creativity in preschoolers (basic concepts and provisions)

The term "figuratively plastic creativity" has been proposed as a working term since 1994, when research was conducted on the development of creativity in children aged 2—7 by teaching them the language of expressive movements (Gorshkova, 2018). Children's figuratively plastic creativity is most fully represented in a special kind of artistically playful activity of preschoolers aimed at creating images of characters through expressive movements and bodily plasticity (without accompanying spoken role phrases). A sign of figuratively plastic creativity is the expressiveness of the embodiment of the image, which includes the invention of motor-plastic methods for an image transmission and its emotionally expressive performance. Based on this, there are differences between "compositional" and performing figuratively plastic creativity, which in preschoolers is improvisational in nature, in other words, composition occurs during performance.

"Compositional" creativity is understood as the invention by a child of ways to build a motor-plastic image, implying the selection of movements, their peculiar combination, connection in sequence, the uniqueness of the trajectory of movement in space (on the "stage

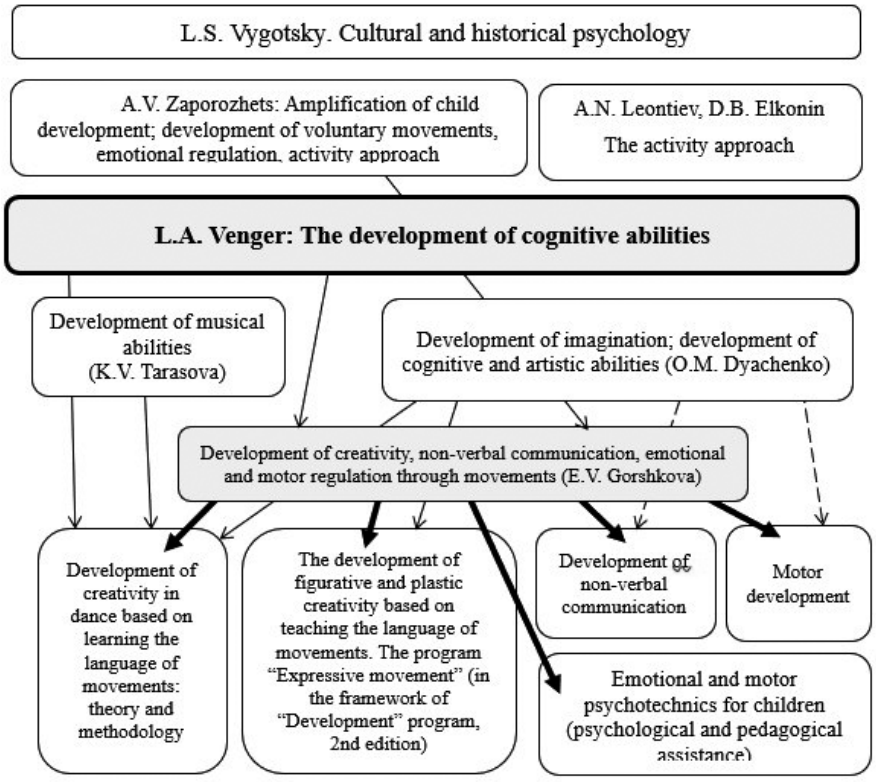

Fig. Scientific influences on the origin of the new directions of psycho-pedagogical studies of movement, creativity, and interaction through movements: bold arrows indicate the author's research directions; the thin and dotted arrows indicate different extent of influence on their formation from other approaches, such as the one of L.A. Venger and his colleagues.

platform") during the improvisation of an imaginative-motor composition — provided that these components correspond to a given content, plot. The criterion of "compositional" creativity may be the originality of these components, which is revealed when comparing the child's constructed motor-plastic image with his previous attempts and/or with the "solutions" of other children in the same task) (Gorshkova, 2018, 2020a, b).

Performing creativity (or expressive performance of a motor-plastic image) is the representation of oneself in the role of a character, the "living" of the figurative content from the point of view of the embodied character. A sign of performing creativity is a vivid individual "manner" of performing an image, associated with the fact that the child rebuilds, changes his habitual plasticity, trying to move like an embodied character. The inclusion of the whole body in the figurative movement is also an obvious sign of creativity in performance. Teaching children to move "with their whole body", conveying an image, is an essential condition for the development of expressive, creative performance. It's important to see the differences between creative and non-creative performance. Performing a dance, a figuratively-movement exercise, the child repeats the movements shown by an adult or a peer. But the manner in which he performs these movements reveals whether he is doing it creatively or not.

Figuratively plastic creativity of preschoolers is carried out through figurative movements, or arbitrary expressive movements aimed at embodying the image of a character. The specificity of figuratively plastic creativity is that the child's body and movements are both a material and a tool, instrument for creating an image, and the child not only uses expressive movements as a means of creative activity, but also evinces his own emotions in involuntary movements: interest, joy from participating in a task or lack of self-confidence, etc. Figurative movements that convey, on the one hand, the character, the experiences of a personage, and on the other hand, the child's own spontaneous movements expressing his emotions are merged into a single stream during the improvisational realization of a creative task. (Gorshkova, 2020b).

A preschooler, especially at the age of 3—5, has difficulty separating himself from the image he creates, his own experiences from the imaginative emotions inherent in the embodied character. At this age, the child is just beginning to distinguish the imaginary situation in the game from reality, and his "movement in the semantic field", free from rigid connection with the visible field (Vygotsky, 2023), is still being formed. An arbitrary and meaningful movement-plastic embodiment of a game image gradually develops in a preschooler the ability to separate himself from the performed image — his own actions and emotions from the figurative movements and experiences of the portrayed character. Such a distinction is a necessary condition for the development of a child's ability to arbitrarily control his emotions. In other words, the control of movements and emotions, motivated by activities that are interesting to the child, develops his ability to self-regulate in general — a quality

necessary both in figuratively plastic creativity, and in any activity, behavior.

In children's creativity, the image is viewed in two ways. Initially, it acts for the child as a characteristic of the personage's properties which were given by an adult (from the outside) — with the help of a verbal story about the character himself, about an imaginary situation in which he acts, or with the help of a visual demonstration of expressive movements. This creates primary, very fragmentary and incomplete representations about the character in the child's mind. However, when a preschooler begins to embody it with the help of movements of his own body, this — due to the movemental nature of children's imagination (Vygotsky, 2021a) — becomes the main mechanism for building a holistic image-representation of what motor-plastic ways the image of a character can be conveyed and what characteristics (external and internal) the personage himself possesses. In the future, the presentations form the basis of the "program" for performing a creative task, which is refined during the trying, thanks to the additional movements and plastic nuances found. As a result, the representation of the character and the ways of its embodiment is enriched, appearing externally as an embodied image — a product of the child's creativity, accessible for the visual perception by observers (Gorshkova, 2018, 2020b).

Movement-plastic expressiveness presupposes two interrelated components: the structural and plastic expressiveness of movements and the image as a whole. This understanding is based on the position of two sides of the content of human motor skills (A.V. Zaporozhets): operationally technical, mainly manifested in urgent phasic motor acts, and personally semantic, more often expressed in posotonic components. Similarly, we can talk about the structural and plastic expressiveness of the motor-plastic image as an activity product.

The structural expressiveness of a movement is its content, informativeness, recognizable by certain supporting elements, phases, and direction of movement. It exists in culture in the generally accepted movement language, especially in gesturing, and is adopted by children by imitation of adults. As a result of the child's mastery of a particular movement, structural expressiveness acts as the child's ability to reproduce ("articulate") the structure of movement according to a cultural pattern, making the content of one's non-verbal message understandable to others. It reflects the intellectual component of cognition of the movement language.

Plastic expressiveness is manifested in subtle changes in the tonic tension of the child's muscles, depending on the content of his experiences and the degree of emotional involvement in the movement performed. This can generate semantic nuances, strokes, layered on the basis (structure) of the movement, they determine the peculiarity of the flowing of movement from one phase to another, due to which the integrity and coherence of the elements are observed. On the other hand, the plastic expressiveness of movements is the quality of their current emotional experience, semantic content, as well as the child's ability to convey their individually experienced senses to another person. Plastic modification (as a result of conscious addition of semantic load or, conversely, due to insufficiently expressive performance) can change the meaning of movement and even distort its denotation. Plastic expressiveness most often reflects the emotional component of cognition of the movement language (Gorshkova, 2020b).

The development of movementaly plastic expressiveness in preschool childhood is carried out in the process of mastering the language of expressive movements. It usually occurs in everyday life — spontaneously and mostly unconsciously — due to the child's imitative appropriation of cultural norms of non-verbal communication adopted in his immediate environment (family), therefore, it is often limited. Preschoolers learn and use the language of expressive movements most productively if they do it meaningfully, arbitrarily; the conditions for such development are created within the framework of purposeful education of children aged 3—7 years.

Results. Discussion

In an aim to study the features of figuratively plastic creativity of preschoolers and the effectiveness of its purposeful development, several diagnostic techniques have been developed, which are described in detail in publications (Gorshkova, 2020a, b, 2024). They were conducted individually with children of different preschool ages. The child was offered a task involving a certain number of fragments, each of which summarized a certain content in words (for example, it could be a short story composed of coherent episodes); the child was asked to "tell" each episode sequentially using movements — that is, to independently find and demonstrate expressive movements "so that it would be clear without words what was happening."

Diagnostic studies of the development of figuratively plastic creativity and productive imagination in preschoolers of different ages, both those who underwent purposeful training in the movement language (experimental groups, hereinafter referred to as EG) and those who did not (control groups, hereinafter referred to as CG), have shown the following.

The structural expressiveness of the image. It was found that preschoolers of all ages used several types of "solutions" (omissions of episodes when the child was standing without movement were taken into account), as well as features of movementaly plastic means (MPM), such as: clearly inappropriate movements; incomprehensible "individual signs"; structurally indefinite ("not recognized") movements; not quite suitable to the given content; recognizable and appropriate in meaning, but inaccurate in structure; cultural MPM, accurate in content and structure. The ratio of these "solutions" had marked variations in preschoolers of the different ages, which allowed us to see the age dynamics of MPM usage. The children of the experimental (EG) and control (KG) groups showed both obvi-

ous differences and some similarities in the use of MPM to embody an image.

In the experimental groups, from middle to senior— there was a sharp increase in cultural MPM, suitable in content and accurate in structure (from 29,7% children at the beginning of the middle group to 52,6% at the end of the year), while reducing (by 5—7 times) omissions of episodes and incomprehensible "individual signs". At the same time, in the control groups, the increase in the use of cultural products and the reduction of passes were observed not by leaps and bounds, but gradually from 5 to 7 years — and a year later than in EG. These differences showed that learning (in the EG) under the program "The Expressive Movement" contributed to faster development of cultural MPM, with the help of which children accurately conveyed a given figurative content (Gorshkova, 2020b).

Similar trends in EG and CG were found in the fact that approximately 20% of the "solutions" — at all ages — were movements that were suitable in terms of figurative content, but inaccurate in structure (that is, they were in the process of mastering) — apparently, this feature of movements is "intermediate" during the transition from undeveloped cultural means to mastered.

As a result, the analysis of these data showed that preschoolers at the age of 5—6 most actively learn ways of consciously, arbitrarily embodying a given figurative content through "cultural" non-verbal means.

The plastic expressiveness of the image. The obvious differences between EG and CG are revealed in the ratio of arbitrary movements expressing figurative emotions and spontaneous expressive movements conveying the child's own emotions.

In the EG, at the end of the junior and middle groups (after the first two years of study in the Expressive Movement program), arbitrary figurative movements prevailed over spontaneous ones (43,2% and 36,3%, respectively); and further, in the senior group, the proportion of arbitrary movements increased dramatically (up to 80%), and the proportion of spontaneous movements it decreased by half and then by another 1,5 times by the end of the preparatory group.

In KG, the ratio was initially reversed: more than half of the identified cases were involuntary expressive movements (manifestations of children's own emotions), and there were 3,5 times fewer arbitrary figurative movements (only 16%). Further, the proportion of involuntary expressive movements gradually decreased (10% from year to year), and the percentage of arbitrary figurative movements gradually increased, accounting for slightly more than half of all observed cases in the preparatory group.

At all stages of diagnosis, children with EG used voluntary (figurative) movements 27—40% more than children with KG, and on average 22% less often showed their own involuntary emotions.

In the conveying of figurative emotion through arbitrary expressive movements in both groups, a embodiment was superficial, without bright artistry. The proportion of these movements (at all ages) in EG is twice as high as in KG, and by the end of preschool childhood in EG its accounted for almost half of all "decisions" (46%), and in KG — 1,5 times less (29%).

Full (vivid) living of an imaginative emotion in EG (at all ages) was detected 3—4 times more often than in KG; and expressive performance of the image with the whole body (a vivid sign of plastic expressiveness) in EG was observed significantly more often than in KG: 4 times — in the middle group; 5 times — in the older group; 6 times — in the preparatory group (Gorshkova, 2020b).

The study of two types of figuratively plastic creativity (compositional and performing) took place according to the following indicators: the use of movementaly plastic means (MPM), the detailing of the character's image, the originality of the ways of conveying figurative content and the expressiveness of the image performance (Gorshkova, 2020a), — thanks to this, it was possible to identify the peculiarities of the development of his cognitive and actually creative aspects. It has been revealed that these indicators develop unevenly: those that indicate the development of motor and plastic means of image embodiment (the cognitive aspect of creativity) develop most actively, especially in the fifth year of life. The indicators of creativity are lagging behind in development. Of these, performance creativity (or the expressiveness of image performance) progresses more actively, progressively throughout preschool childhood (most children aged 5—7 showed an average level of transformation into an image, in which the figurative movement was performed partially, not "with the whole body"). The indicators of "composing" creativity developed with a noticeable lag, especially in terms of the "originality" of the embodiment of the image. A significant correlation between the indicators of figuratively plastic creativity among preschoolers indicates that the better children know the movementaly plastic means (MPM) of embodying an image (the movement language), the more expressively they are as actors and the more detailed the images they create (with elements of compositional creativity). However, the older preschoolers are, the less creatively they use movementaly plastic means, mainly reproducing cultural but stereotypical ways of embodying the image known from studying (Gorshkova, 2020a, p. 37—38).

Next, we'll consider the age-related features of the development of figuratively plastic creativity as a result of targeted training in the program "The Expressive Movement".

As a result of such teaching for ***children aged 3—4***, at the end of the year, some 4-year-olds can show fragments of expressive performing, but the emotionally plastic "living" of the figurative content remains unstable and short-lived. For example, in one fragment of a given story about a bear cub, a child can short-lived ("walking in the woods"), and in another — when "the bear cub is escaping from bees" — he runs in his usual manner. However, most often kids perform the actions of a character without reflecting his characteristic plasticity, figurative emotions. At the same time, there is a mismatch between the figurative movements of the arms, body (torso), and

one's own emotions, which are breaking through in facial expressions. So, portraying a bear cub stung by a bee, the child "wipes away tears" or rubs his nose, "crying", and at the same time on his face he has a joyful expression. As a rule, younger preschoolers, embodying the image on their own, without relying on a sample, do not include the "whole body" in the figurative movement.

The "compositional" creativity not yet manifest itself as such. There is only its simplest component — the choice of individual movements corresponding to the meaning. Most often, the character's action is conveyed in one motion, which indicates an image that looks sketchy and not detailed. This feature of the imagination of three-year-olds was revealed by O.M. Dyachenko in the diagnostic tasks for the children — drawing by a way of adding different elements to abstract figures to make subject image, "a picture" (diagnostics of "Dorisovyvanie figure"[2]) (Dyachenko, 1996). However, if we compare the results of children before and after learning using the program "The Expressive Movement", the changes in the "composition" are obvious: at the beginning of the year, 30% of children refused to perform creative tasks, and schematic images were detected in 25% of cases; at the end of the year, the vast majority of children showed a schematic image, as well as cases of the simplest detailing which is represented in movements-"complexes" (simultaneous combination of movements of the arms, legs, and body).

Systematic pedagogical work contributes to the development of all indicators of figuratively plastic creativity already in the middle group — and at a much higher level than is possible in traditional practice.

More and more ***4—5-year-olds*** (in comparison with the younger group) are able to select expressive movements that are appropriate in meaning and combine them into complexes (including in the figurative arm movement, body, facial expressions), coming up with different options; their performing expressiveness, while still fragmentary, is becoming more obvious and stable, with less reliance on a visual sample execution demonstrated by the pedagogist. It is at the middle preschool age, when children are already able to perceive qualitatively new content (figuratively plastic interaction of diverse characters), but still cannot independently use the experience gained, it is possible to lay the foundation for a leap in creativity in a year or two. An additional effect of the technique is a change in the quality of movements — they acquire naturalness, freedom, meaningfulness, arbitrariness; flexible motor skills are formed, good spatial orientation when solving movemental tasks. Children transfer the experience gained in the classroom into everyday life, using non-verbal means in communication and play. The emotional background is optimized, confidence in one's abilities and trust in others increase, and sociability develops, which has a positive effect on the atmosphere of peer relationships.

Children aged 5—6 can show fragments of figuratively plastic improvisation in accordance with a given figurative content, combining expressive movements not only in holistic expressive complexes (simultaneous performance of movements of the arms, legs, body, head, facial expressions), but also in a sequence of different movements interconnected in meaning. In other words, children develop the ability to create fragments of figuratively plastic compositions. When performing episodes of fairy tales (and integral plots), children more or less expressively convey the personages' characters, their relationships, including conflict ones, maintaining the "dual position" of the actor and acting according to the role being played, trying to convey in arbitrary expressive movements the manner of movement, character, and personage's experiences, which may vary depending on changes in the plot situation. The quality of expression becomes higher, if children more include the "whole body" in the figurative movement (Gorshkova, 2018).

By the ***end of the preparatory group***, children independently, in co-creation with a peer partner, compose (improvise) small compositions, focusing on the peculiarities of the sound of the proposed music and the verbally defined scheme of dramatic plot development (different characters — their meeting and reaction to each other — conflict or mutual helping — the end of the situation). At the same time, the partners in the pair are receptive to each other's actions, and different couples embody the plot in different ways. Children build motor-plastic images in more or less detail and show an individual manner of emotional and plastic expression and embodiment, demonstrating creative performance.

The conducted research has shown that without purposeful teaching of the language of expressive movements as the basis for the development of figurative and plastic creativity, children by the age of 6—7, using motor and plastic means to embody an image, usually reproduce cultural (generally understandable) ways, but they are stereotypical, unoriginal, without detail. Conversely, when studying under program "The Expressive Movement", children aged 6—7 (EG) — unlike their peers who did not study under this program (KG) — showed an advanced development of creativity and productive imagination.

Conclusion

Thus, the scientific influence of L.A. Venger and his theory of the development of cognitive abilities in preschoolers using cultural means (etalons, models) became the primary source for the development of many new areas of research: from researching the peculiarities of mastering the language of movements by children aged

[1] Unfortunately, it was not possible to find a short translation of the name of the technique, therefore (after describing its essence) the transliteration of its Russian-language name is given.

3—7 and on this basis developing creativity (dance, figuratively plastic) and also non-verbal communication, to identifying the peculiarities of motor development and the possibilities of psychological and pedagogical helping to preschoolers using methods of emotional-movement psychotechnics.

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Extended version of the Digital Daily Life Self-Management Scale (DDLSM-2): Integrity as a potential for adaptation and well-being

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Abstract

Context and Relevance. The digitalization of everyday life creates a new socio-technological context for personality development, necessitating an understanding of its integrity under conditions of digital mediation. This study is grounded in the cultural-historical approach and aims to develop tools for studying the integrity of the technologically extended self. The findings will contribute to understanding optimal strategies for personality development in the digital age. **Objective.** To develop and pilot the Digital Daily Life Self-Management Scale (DDLSM-2), adding a subscale for the "Integrity of the Technologically Extended Personality" ("Integrity of Personality") and identifying profiles of digital self-management. **Hypotheses.** The factor structure of the DDLSM will be retained with the addition of the "Integrity of Personality" subscale. **Methods.** The study included 1841 respondents: 649 adolescents (14—17 years, M = 16,3, SD = 0,7, 55% female) and 1192 young adults (18—39 years, M = 23,4, SD = 6,1, 64,3% female). A new subscale was developed and validated using the Hardiness Test, Basic Beliefs Scale, and Subjective Happiness Scale. Data were analyzed using confirmatory factor, correlation, and cluster analyses. **Results.** A four-factor structure was confirmed: "Integrity of Personality" "Management of Digital Devices," "Experience of Digital Daily Life," and "Digital Sociality." Integrality correlated positively with happiness, hardiness, and basic beliefs. Cluster analysis revealed four profiles: "Strategists," "Integrators," "Maladaptives," and "Minimalists" — differing in well-being and adaptability. **Conclusions.** The DDLSM-2 is a valid tool for assessing key aspects of the technologically extended self, including integrity. The indicators of its impairment help to identify zones of actual and proximal development related to mastering digital tools as new psychological instruments. This mastery determines the success of managing one's digital everyday life and the potential for transitioning to a new, coherent integrity.

Keywords: integrity, well-being, technologically extended personality, extended mind, digital socialization, scale

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Расширенная версия Шкалы самоуправления цифровой повседневностью (СУЦП-2): целостность как потенциал адаптации и благополучия

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Резюме

Контекст и актуальность. Цифровизация повседневности создает новый социотехнологический контекст для развития личности, требуя осмысления ее целостности в условиях цифрового опосредования. Исследование выполнено в русле развития культурно-исторического подхода и нацелено на поиск инструментов для изучения целостности технологически достроенной личности. Полученные данные внесут вклад в понимание оптимальных стратегий развития личности в цифровую эпоху. **Цель.** Разработка и апробация новой версии Шкалы самоуправления цифровой повседневностью (СУЦП-2), дополненной субшкалой «Целостность технологически достроенной личности» («Целостность личности»), а также выделение профилей самоуправления цифровой повседневностью. **Гипотеза.** Факторная структура опросника СУЦП сохранится при добавлении субшкалы «Целостность личности». **Методы и материалы.** В исследовании приняли участие 1841 респондент, среди которых 649 подростков 14—17 лет (M = 16,3, SD = 0,7, 55% — женского пола), 1192 представителей молодежи 18—39 лет (M = 23,4, SD = 6,1, 64,3% — женского пола). На основе теоретической модели была разработана новая субшкала. Для проверки ее валидности использовались методики: Тест жизнестойкости, Шкала базисных убеждений и Шкала субъективного счастья. Обработка данных проводилась с помощью конфирматорного факторного, корреляционного и кластерного анализа. **Результаты.** Подтверждена четырехфакторная структура методики СУЦП-2, включающая субшкалы «Целостность личности», «Управление цифровыми устройствами», «Переживание цифровой повседневности», «Цифровая социальность». Показана положительная связь целостности со счастьем, жизнестойкостью и базисными убеждениями. Кластерный анализ позволил выделить четыре профиля самоуправления цифровой повседневностью, значимо различающихся по уровню благополучия и потенциала адаптации личности: «стратеги», «интеграторы», «дезадаптанты» и «минималисты». **Выводы.** СУЦП-2 является надежным и валидным инструментом для диагностики ключевых аспектов технологически достроенной личности, в том числе ее целостности, индикаторы нарушения которой позволяют обозначить зоны актуального и ближайшего развития, связанного с овладением цифровыми инструментами как новыми психологическими орудиями, что определяет успешность управления цифровой повседневностью и возможности перехода к новой целостности.

Ключевые слова: целостность, благополучие, технологически достроенная личность, расширенное сознание, цифровая социализация, методика

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Introduction

Digital transformations and the emergence of increasingly “smart,” personalized digital tools, such as smartphones, the Internet of Things, and artificial intelligence technologies, constituting a technosystem as a key component of the modern human development ecosystem, define the formation of a 21st-century anthropological type, the technologically extended personality (Soldatova, Voiskunsky, 2021). Within the framework of a socio-cognitive concept of digital socialization, grounded in L.S. Vygotsky’s cultural-historical ap-

proach, digital environments and devices are regarded as cultural tools mediating mental functions, social interaction, new forms of activity, and the cultural practices of the individual. The technosystem, as part of the external environment, expands the capacities of both children and adults, integrating into their cognitive, behavioral, and social systems, modifying and extending them. Human development within such an ecosystem represents a natural stage of social evolution and calls for a conceptual focus on the integrity of the technologically extended personality (Soldatova, Ilyukhina, 2025), as well as the development of specialized instruments for its study.

The universal principle of integrity is reflected in various psychological frameworks (Kostromina, Grishina, 2024). It is embodied in L.S. Vygotsky's key ideas on the unity of higher mental functions, sensory and motor processes, the integration of affect and intellect, the sign as a "determining whole," and the meaningful whole of "object-tool-sign" activity (Vygotsky, 1984). Integrity is also considered a methodological lens for analyzing individuality as an anthropological principle (B.G. Ananyev, A.G. Asmolov, S.L. Rubinstein, K.A. Abulkhanova, A.V. Brushlinsky, V.S. Merlin, V.D. Nebylitsyn, et al.). The concept of integrity has been addressed in various international psychological schools (G. Allport, A. Maslow, C. Jung, C. Rogers, E. Erikson). In practice-oriented approaches, integrity is viewed as a hypothetical end point of human and personal development, which individuals strive toward but can never fully attain. A changing world presents constant challenges to integrity, and the ontological fragmentation, complexity and multidimensionality of life at the intersection of the real and digital necessitate the construction of a new form of integrity, more complex and inclusive of the digital dimension (Soldatova, Ilyukhina, 2025).

The need to consider integrity as a fundamental principle of human self-regulation in the process of adaptation to rapid change becomes increasingly evident. Previously, we developed the Digital Daily Life Self-Management Scale (DDLSM), which includes indicators such as experience of digital daily life, engagement in digital sociality, and digital device management (Soldatova et al., 2024a). Given the conceptual independence of each of these indicators, the addition of a new parameter, integrity, will allow a more comprehensive analysis of the technologically extended personality and the examination of potential personality profiles according to different combinations of these parameters. We will focus on the key criteria of integrity in the context of continuous extension of the self through technological tools during digital socialization.

Within the cultural-historical psychology paradigm, the human body is regarded as the first object of mastery and transformation in ontogeny, becoming a universal tool and sign (Tkhostov, 2002). Building on L.S. Vygotsky's ideas, the body can be conceptualized as a key meaningful boundary that provides the process of self-mastery with integrity and a specific structure (Smirnov, 2016). Drawing on psychodynamic approaches, neuropsychology, and attachment theory, the integration of the bodily and psychological self is understood as the basis for experiencing one's psychophysical wholeness, continuity, and uniqueness (Krueger, 2013). Digital technologies influence the user's physical condition, and excessive use is associated with physical discomfort, manifesting in disrupted sleep, irregular eating patterns, reduced physical activity, and other negative health outcomes (Kelley, Gruber, 2013; Kokka, 2021; Paakkari et al., 2021). In this context, bodily integrity can be measured by attention to one's physical needs regardless of offline or online activity, whereas its disruption may be reflected in continuing digital activity despite experiencing physical discomfort.

Identity as an integrative personal construct is considered a key phenomenon for understanding the integrity of the technologically extended personality (Soldatova et al., 2024b). E. Erikson defines identity as the continuity and sameness of a person to themselves. Identity is dynamic, changing and developing throughout life, while simultaneously maintaining a certain temporal continuity that supports personal integrity (Erikson, 1996). The process of integrating and constructing a coherent, non-contradictory identity is viewed as one of the main trajectories of personal development, recognized by most researchers (Grishina, 2024). Empirical studies indicate a tendency for virtual and real identities to converge in mixed-reality contexts, leading to the emergence of hybrid identities (Kopteva et al., 2024; Soldatova et al., 2022; Zimmermann et al., 2023). Integrity of identity can be reflected in the effort to maintain an online self-image congruent with one's actual state in real life, whereas its disruption may manifest as experiencing oneself as a different person in digital environments.

Digital devices act as new extensions that expand the boundaries of the self and, consequently, its integrity. In his description of the development of the proprium as a path to achieving integrity, G. Allport identifies a stage of self-boundary expansion, beginning around age four, when a child becomes aware of what is "mine" not only in relation to their body but also to elements of the surrounding world (mother, toys, cat, etc.) (Allport, 2002). In the extended mind framework, E. Clark and D. Chalmers demonstrate that cognitive processes can extend beyond the human brain to include external objects, such as smartphones. They propose several criteria for incor-

porating an object into the integrated perception of an extended mind: availability, functional support, reliability, and trust (Clark, Chalmers, 1998). Studies building on this perspective examine phenomena reflecting special experiences of closeness to digital objects as significant parts of the self, including emotional attachment expressed through attributing character and emotions to a device and caring for it (Park, Kaye, 2019), the need to customize a device to personal preferences, and anxiety experienced in its absence (Ross, Kushlev, 2025). Thus, the integrity of the technologically extended personality may be determined by the drive to personalize one's device and incorporate it within the boundaries of the self, whereas the opposite pole is characterized by a lack of attachment, reflecting the perception of the device as alien or external.

Autonomy is recognized as one of the key characteristics of personality, supporting greater integration and effective self-regulation. In Russian psychology, autonomy is considered in the context of the development of personal independence (L.S. Vygotsky, D.B. Elkonin, S.L. Rubinstein, A.A. Bodalev). As a basic human need, autonomy occupies a central place in self-determination theory, manifesting as a sense of self-directedness, freedom of action, and the ability to achieve personal goals (Deci, Ryan, 2015). The specific nature of digital environments can create a perception of expanded opportunities for exercising autonomy, surpassing the limitations of the physical world. This may lead to an imbalance in one's self-experience across real and virtual contexts. In this framework, an indicator of the integrity of the technologically extended personality may be the equal perception of the significance of achievements in both real and virtual life as a result of exercising autonomy. A disruption of integrity may be reflected in experiencing greater independence in the virtual world compared to the real world.

From the perspective of the cultural-historical approach, personality integrity is understood as the result of the mediation of the psyche by cultural tools, which ensure coherence of behavior and the internalization of social norms. Digital platforms, as a new type of psychological tool, can disrupt this unity. A striking phenomenon illustrating this disjunction is the online disinhibition effect (Suler, 2004). This effect reflects changes in the developmental social situation, where online interaction becomes a fragmented activity due to the specific characteristics of the digital environment, including anonymity, physical distance, the absence of familiar social cues, and lack of immediate emotional feedback. Significant differences in behavior between the virtual and real worlds may be considered a risk to the integrity of the technologically extended personality. Integrity can also be reflected in taking into account the expectations of significant others when enacting behavior in both real and virtual contexts.

The value-meaning domain is considered one of the key dimensions for understanding personality. D.A. Leontiev, for instance, identifies the meaning-making sphere as the principal constitutive substructure of personality. Personality can be understood as a "coherent system of meaning-based regulation of life activity," encompassing the entire system of relationships with the world, including the temporal perspective as a whole (Leontiev, 2003). In the context of digitalization, this criterion of personality integrity is defined by the individual's ability to ascribe meaning to their online activities based on a unity of motives, values, and life orientations within a mixed-reality environment. The opposite pole may manifest as the inability to adhere to one's values and principles in the online space.

Self-knowledge in psychology is regarded as a crucial instrument for achieving personal integrity. Within the subject-centered approach to personality psychology (S.L. Rubinstein, K.A. Abulkhanova-Slavskaya, A.V. Brushlinsky), one of the main criteria for defining a subject is the capacity for reflection and well-developed self-knowledge skills. Digital transformations create both new opportunities and new risks for self-knowledge. On one hand, practices such as self-tracking and lifelogging, recording all events on digital media, provide unprecedented opportunities for self-exploration (Lupton, 2016), allowing individuals to quantify themselves and their life experiences and access this data at any time. On the other hand, researchers highlight the "dark side" of self-tracking, namely its potential negative effects on psychological well-being and health, which remain poorly understood (Feng et al., 2021). These effects may manifest as an externalization of self-knowledge, where the focus shifts from internal self-perceptions and the development of personal capacities to external quantitative indicators (likes, steps, ratings), potentially representing a step toward the loss of personal agency and subjectivity.

Thus, the issue of integrity takes on a new perspective when the personality becomes technologically extended and supplemented by digital tools, presenting new challenges in finding strategies for integration to maintain well-being within a different cultural-historical context (Soldatova, Ilyukhina, 2025). Given the conceptual independence of each of the indicators, extending the Digital Daily Life Self-Management Scale through the addition of a new parameter, integrity, allows for a more comprehensive analysis of the technologically extended personality and the examination of potential personal-

ity profiles in terms of adaptation and well-being in a mixed-reality environment.

Objective. The objective of the study was to develop and validate an extended version of the Digital Daily Life Self-Management Scale (DDLSM-2), supplemented with a subscale measuring the integrity of the technologically extended personality ("Integrity of Personality"), and to identify personality profiles of the technologically extended individual based on all subscales.

In line with this objective, the following hypotheses were formulated:

1. The addition of the "Integrity of Personality" subscale will preserve the structure of the DDLSM, including the subscales Digital Device Management, Experience of Digital Daily Life, and Digital Sociality.

2. The "Integrity of Personality" subscale will be positively associated with measures of happiness, hardiness, and basic beliefs.

3. Combinations of scores across the four subscales will allow identification of several profiles of the technologically extended personality, differing in their potential for adaptation and well-being in a mixed-reality environment.

Materials and methods

Participants. The study sample included 1841 respondents, comprising 649 adolescents aged 14–17 (M = 16,3, SD = 0,7, 55% female) and 1192 young adults aged 18–39 (M = 23,4, SD = 6,1, 64,3% female). Participants resided in the cities of Moscow (32,2%), Saint Petersburg (14,9%), Tyumen (14,7%), Rostov-on-Don (19,2%) and Makhachkala (19,1%). The sample included school students (17,3%), college students (24,7%), university students (34%) and employed respondents (24%).

Development of the "Integrity of Personality" Subscale. The development of the subscale was guided by the criteria of integrity for technologically extended personalities identified in the theoretical section. Following expert review of multiple item formulations for each criterion, two items (one direct and one reverse-scored) were selected per criterion. These addressed bodily self ("I pay attention to my body and physical needs regardless of whether I am online or offline," "I often continue digital activities even when I feel physical discomfort"), identity ("I change my avatars on social networks and messengers to match my current appearance," "Online, I feel like a different person, unlike my real-life self"), expansion of self-boundaries ("Before using a new device, I fully customize it for myself," "I am not attached to my smartphone and can easily replace it"), autonomy in mixed reality ("My achievements in real and virtual life are equally important to me," "I feel more independent in the virtual world than in the real one"), consistency of social norms ("In my actions, both online and offline, I consider the expectations of people important to me," "Online, I behave in ways I would not behave around acquaintances in real life"), value-sense orientations ("What I do on the Internet is meaningful; for me, it is also part of real life," "Online, unlike in the real world, I do not always manage to follow my life values and principles"), and self-knowledge ("Through the Internet, various apps, and digital devices, I better understand my true self," "Sometimes I rely more on likes, step counts, navigation apps, or information from the Internet than on my own sensations and experiences in the physical world"). Respondents rated each item on a 5-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree").

These items were incorporated into the DDLSM (Soldatova et al., 2024a), which comprised three subscales: Digital Device Management (conscious use and control of digital devices to ensure safety and efficiency), Experience of Digital Daily Life (reliance on digital devices in everyday life and emotional attachment to them), and Digital Sociality (engagement in digital social environments, including the importance of virtual self-presentation, feedback, and belonging to digital communities). The updated version of the instrument is designated DDLSM-2.

Measures. To assess the convergent validity of the "Integrity of Personality" subscale, the following instruments were used: the Maddi Hardiness Test (Osin, 2013), the Basic Beliefs Scale (Padun, Kotelnikova, 2007), and the Subjective Happiness Scale (Osin, Leontiev, 2020).

Data Collection. Data were collected through an online survey conducted from autumn 2024 to winter 2025 within a research network of universities, schools and colleges.

Data Processing. Data were processed using IBM SPSS Statistics 22.0 and Jamovi 2.4.8, employing CFA, Pearson correlation coefficients, ANOVA and cluster analysis.

Results

Factor Structure of the DDLSM-2 Scale. To evaluate the adequacy of the theoretical structure of the DDLSM-2, which comprises four subscales ("Digital Device Management," "Experience of Digital Daily

Life," "Digital Sociality," and "Integrity of Personality"), a CFA was conducted. The selected model included a seven-item "Personal Integrity" subscale (Cronbach's $\alpha = 0,82$, $M = 3,6$, $SD = 0,9$), with each item representing one criterion of integrity and formulated as a reverse-scored statement (Tables 1, 2, Figure 1, Appendix A). Versions of the subscale that mixed direct and reverse-scored items, or consisted solely of direct items, did not demonstrate satisfactory internal consistency.

Following the post-hoc examination of potential ways to improve the fit of the scale structure to the observed data, several model modifications were introduced. Specifically, residual correlations were added between Items 13 and 21 ($\chi^2 = 154,8$, residual factor loadings = 0,28, $p < 0,01$) and Items 25 and 27 ($\chi^2 = 250,9$, residual factor loadings = 0,37, $p < 0,01$) within the "Digital Device Management" subscale, as well as between Items 2 and 6 ($\chi^2 = 96,7$, residual factor loadings = 0,23, $p < 0,01$) and Items 14 and 22 ($\chi^2 = 102,5$, residual factor loadings = 0,24, $p < 0,01$) within the "Experience of Digital Daily Life" subscale. All of these item pairs originate from the initial DDLSM subscales (Table 2, Appendix A).

Sociodemographic indicators of the "Integrity of Personality". Significant differences were found across age groups ($F(2, 1838) = 11,2$, $\eta^2 = 0,012$, $p < 0,001$) and between gender groups ($F(1, 1833) = 4,0$, $\eta^2 = 0,004$, $p < 0,05$). Scores on the subscale increased with age and were higher among females (Figure 2).

Validity of the "Integrity of Personality" subscale. The subscale shows significant associations with overall happiness, hardiness, as well as with core beliefs about the benevolence of the world, a positive self-image, belief in one's own luck and a sense of personal control over one's life (Table 4).

Personality profiles. Using hierarchical cluster analysis (complete-linkage method), four groups were identified that showed significant differences across all DDLSM-2 subscales: "Integrity of Personality" ($F(3, 1837) = 282,7$, $\eta^2 = 0,32$, $p < 0,001$), "Digital Device Management" ($F(3, 1837) = 1767,9$, $\eta^2 = 0,74$, $p < 0,001$), "Experience of Digital Daily Life" ($F(3, 1837) = 1156,7$, $\eta^2 = 0,65$, $p < 0,001$), and "Digital Sociality" ($F(3, 1837) = 729,3$, $\eta^2 = 0,54$, $p < 0,001$) (Figure 3).

One-third of respondents (31%) were classified into the first group, the "Strategists"; more than a third (40,4%) into the second, the "Integrators"; 14,3% into the third, the "Maladapters"; and 14,4% into the fourth group, the "Minimalists," comprising roughly every seventh participant (Figure 3).

Differences among the groups were also found on the Happiness Scale ($F(3, 1835) = 24,4$, $\eta^2 = 0,04$, $p < 0,01$), with the highest scores observed in the first group, the "Strategists" ($M = 19,2$), and the second group, the "In-

Table 1

Summary items of the subscale «Integrity of Personality»

№ п/п	Item	M	SD	Cronbach's alpha if item deleted	Correlation with the subscale
4	I often continue my digital activities even when I feel physical discomfort (like hunger, back pain, or drowsiness)	3,46	1,25	0,81	0,66**
8	I feel like a different person online than I am in real life	3,79	1,22	0,68	0,78**
12	I feel more self-assured in the virtual world than I do in the real one	3,68	1,27	0,67	0,77**
16	I'm not particularly attached to my smartphone and could easily replace it	3,02	1,30	0,84	0,46**
20	I behave differently online than I would around people I know in real life	3,72	1,24	0,78	0,77**
23	It's harder for me to stick to my personal values online compared to offline	3,73	1,19	0,78	0,76**
24	Sometimes I prioritize online feedback (likes, step counts, internet information, GPS) over my own physical sensations and real-world experience	3,51	1,31	0,80	0,69**

Note: «**» — correlation is significant at the 0,01 level.

Table 2

Quality indicators of the structure of the DDLSM-2

Sample	Df	CFI	TLI	SRMR	RMSEA	RMSEA 90% confidence interval
The entire sample (DDLSM-2)	318	0,909	0,900	0,071	0,070	0,068—0,073
14—17 years old (DDLSM-2)	321	0,919	0,911	0,064	0,069	0,065—0,073
118—39 years old (DDLSM-2)	318	0,089	0,887	0,074	0,073	0,070—0,076
The entire sample (DDLSM-2) (post-hoc)	314	0,925	0,916	0,071	0,064	0,062—0,067

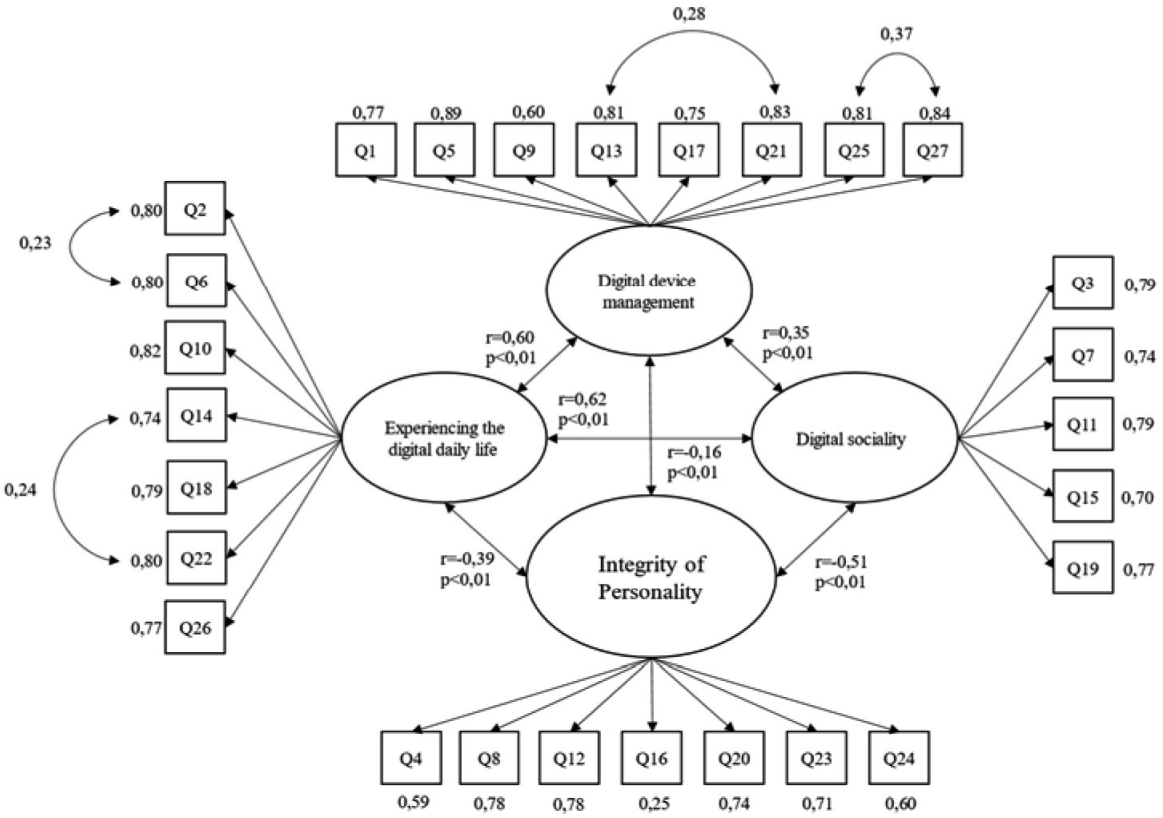

Fig. 1. Factor structure of the DDLSM-2

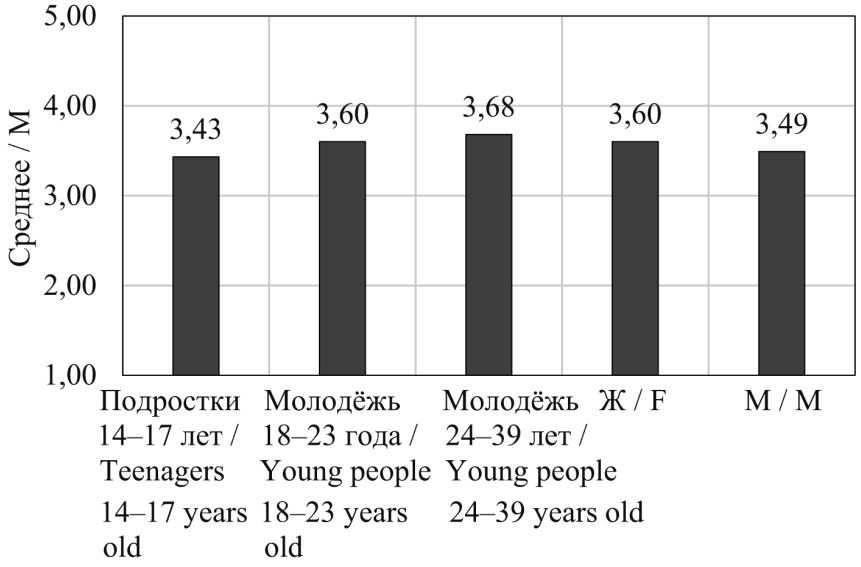

Fig. 2. Sociodemographic differences of the subscale «Integrity of Personality»

tegrators" (M = 18,0). Scores were lower in the third group, the "Maladapters" (M = 17,0), and the fourth group, the "Minimalists" (M = 16,6).

A partially similar pattern emerged for the Hardiness Scale ($F(3, 1835) = 32,3$, $\eta^2 = 0,05$, $p < 0,01$): the highest scores were found in the "Strategists" (M = 21,4) and "Integrators" (M = 18,3), with a decrease among the "Maladapters" (M = 17,9), but comparatively high scores in the "Minimalists" (M = 20,7).

Discussion of the results

Psychometric properties of the DDLSM-2. The obtained results demonstrate internal consistency, good structural quality, and factorial validity of the DDLSM-2, which includes four subscales: Digital Device Management, Experience of Digital Daily Life, Digital Sociality, and the newly introduced Integrity of Personality subscale. The relationships of the Integrity of

Table 4

Correlations of the indicators with the subscale «Integrity of Personality»

Scales and subscales		Pearson correlation
Happiness		0,17**
Hardiness	Commitment	0,28**
	Control	0,21**
	Challenge	0,23**
	Hardiness	0,27**
World assumptions scale	Benevolence of World	0,16**
	Justice	0,07
	Self-Worth	0,19**
	Luckiness	0,16*
	Control	0,18*

Note: «**» — correlation is significant at the 0,01 level.

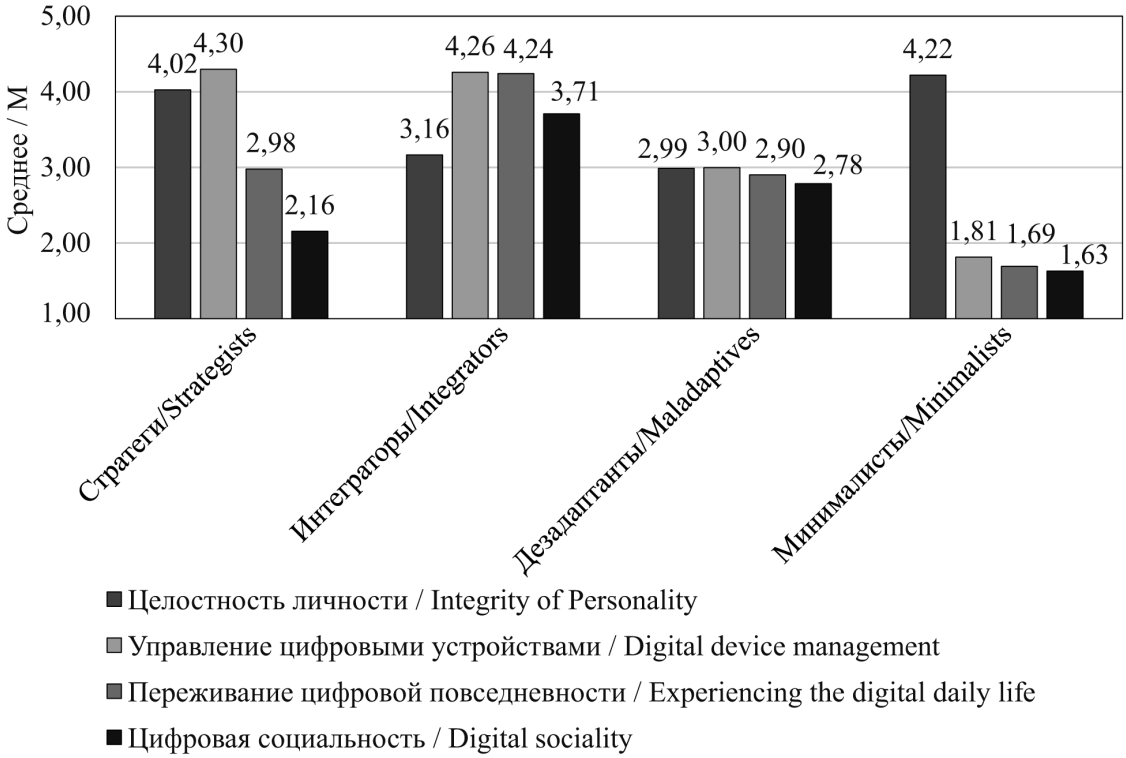

Fig. 3. Profiles by DDLSM-2 subscales

Personality subscale with overall happiness, hardiness, positive self-concept, and belief in control over one's life demonstrate its convergent validity. These findings are consistent with the widely recognized view of the importance of integrity for personal stability, development, and well-being (Kostromina, Grishina, 2024).

The negative association of the Integrity of Personality subscale with the other DDLSM-2 subscales indicates that at this stage of personal evolution, integrity is challenged in the context of digitalization across various spheres of life. In particular, high engagement in digital social life, the significance of digital extensions in everyday routines, and strong emotional attachment to them may complicate integrative processes. This aligns with existing research on the negative effects of social media and digital dependencies on personal well-being (Karakose et al., 2023; Sala et al., 2024). The seemingly paradoxical, although weak, negative correlation with the Digital Device Management subscale may be explained by the significant effort required for conscious regulation and control of digital devices. This effort likely depletes personal resources, which must be allocated both to managing digital extensions for effective functioning in mixed-reality environments and to maintaining personality integrity.

Integrity of the technologically extended personality. The new subscale includes only reverse-coded items reflecting risks to the integrity of the extended personal-

ity and its deficits, based on a set of symptoms of digital maladaptation. This finding is a significant substantive result, indicating that in the contemporary digital context, integrity is manifested problematically, through the identification of its violations. This aligns with the activity-based approach, in which development often occurs through awareness and resolution of contradictions and difficulties, highlighting zones of actual and near-term personal growth in interaction with technologies.

At the same time, the subscale items fully correspond to the original theoretical model, which includes seven criteria of integrity, confirming the complex and multilevel nature of this phenomenon. The results complement existing understandings of integrity by taking into account new digital realities and mixed-reality environments, emphasizing the importance of bodily self-integrity (Smirnov, 2016; Krueger, 2013), continuity and coherence of identity (Grishina, 2024), expansion of the boundaries of the self (Clark, Chalmers, 1998), value-semantic orientations (Leontiev, 2003), alignment with social norms of behavior (Suler, 2004), autonomy (Deci, Ryan, 2015), and self-knowledge (Feng et al., 2021).

In the integrity of the technologically extended personality, a key capacity is the ability to master digital tools while maintaining a balance between the real and the virtual, prioritizing the former, and using digital technologies functionally and instrumentally without losing connection to physical and social reality. Such a person demonstrates the ability to self-regulate their personal boundaries between online and offline contexts, avoiding "dissolution" in digital space, and maintaining continuity and integrity of the self in technologically mediated daily life, thereby transforming the challenges of digitalization into zones of personal development.

Profiles of the technologically enhanced personality. Cluster analysis identified four groups of respondents that differed in their scores across the subscales of the DDLSM-2 as well as in levels of happiness and hardiness: integrators, strategists, maladaptives, and minimalists. The first two profiles were the most well-adjusted in the context of cyber-physical everyday life and were also the most common in the sample, representing over seventy percent of participants. The first group, strategists, combines high integrity of the technologically extended personality with advanced strategic skills for managing digital devices, a critical attitude toward the digital environment, and relatively low engagement in digital sociality. This combination of traits provides the highest levels of happiness and hardiness within this profile. The second and largest group, integrators, also shows good well-being: moderate levels of integrity are paired with strong skills in managing digital devices, high significance of digital everyday life, and active engagement in the online social world. This combination supports social integration, effectiveness, and subjective well-being in a mixed-reality context. In contrast, the maladaptive group is characterized by lower scores across all DDLSM-2 subscales as well as reduced happiness and hardiness, making it relatively disadvantaged both digitally and psychologically. The fourth group, minimalists, demonstrates high levels of integrity and hardiness, yet low engagement in digital everyday life limits their opportunities for achievement and positive functioning in modern cyber-physical conditions, which may reduce their potential for experiencing happiness in the contemporary world. In this case, lower happiness should not be interpreted as a personal failure but rather as a potential cost of maintaining autonomy in a digital society. The highest levels of well-being and hardiness are achieved when a critical approach to the digital environment is combined with moderate or high engagement, while excessive restriction of digital participation or insufficient integrity is associated with risks of reduced adaptation and lower happiness. These findings contribute to understanding optimal strategies for the development of a technologically enhanced personality. This shows that within complex systems such as the personality in mixed reality, integrity is not a simple sum of its parts, and qualitatively different configurations of variables can exist across different types. The identified profiles do not represent ideal types but rather different adaptive strategies that individuals adopt in response to the challenges of mixed reality. Each profile reflects a unique balance between the benefits and costs of digitalization. To verify these types and understand the motivations and life strategies of respondents within each cluster, additional qualitative research is required.

The DDLSM-2 can be used in psychological counseling to assess adaptation challenges in mixed-reality environments and to develop individualized support strategies; in education and organizational settings to monitor digital aspects of student and employee well-being; and in academic research as a basis for further study of personality transformations in the context of digitalization and integration with technological extensions.

Conclusion

1. A new version of the Digital Daily Life Self-Management Scale (DDLSM-2) was developed and tested, including a subscale Integrity of Personality. The scale demonstrated a reliable four-factor structure and confirmed its validity.

2. The integrity of the technologically extended personality, theoretically defined through seven crite-

ria (bodily self, identity, expansion of self-boundaries, autonomy, consistency of social norms, unity of value-meaning orientations, and self-knowledge), empirically manifests primarily through indicators of its disruption. This finding suggests that in the context of digitalization, integrity is experienced by the individual not as a given, but as a task requiring conscious resolution. Indicators of disrupted integrity help identify areas of current and near-term personal development related to mastery of digital tools as new psychological instruments, which in turn determines the effectiveness of digital daily life management and the potential for achieving a new form of integrity.

3. A positive relationship was established between the integrity of the technologically extended personality and subjective well-being (happiness), resilience, and core beliefs, confirming its role as a key resource for adaptation and preadaptation in mixed-reality environments.

4. Four profiles of the technologically extended personality were identified, differing in adaptive potential and well-being: "strategists," "integrators," "maladapters," and "minimalists." The most well-adjusted profiles are the strategists and integrators, combining high or moderate integrity with well-developed digital management skills. Identifying different adaptive strategies allows for a shift from studying simple linear relationships to analyzing complex, systemic configurations of personality within the new human development ecosystem.

5. The results indicate that for psychological well-being and resilience in mixed-reality conditions, the critical factor is not minimizing digital engagement, but developing the capacity to manage digital extensions and integrate digital experiences into a coherent personal system while maintaining autonomy and connection to reality.

Limitations. A limitation of the study is the need for further verification of the scale on representative samples from various age groups and types of residence. Additionally, as the research was conducted on a Russian sample, the findings may be specific to that cultural and historical context.

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Appendix

Appendix A. Form and key for the scale. https://doi.org/10.17759/pse.2025300___

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Contribution of the authors

Galina U. Soldatova — ideas; development of the scale; control over the research; writing of the manuscript.

Svetlana V. Chigarkova — planning of the research; development of the scale; data collection; visualization of research results; annotation and writing of the manuscript.

Svetlana N. Ilyukhina — development of the scale; data collection and analysis; application of statistical, mathematical methods for data analysis; visualization of research results; writing and design of the manuscript.

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

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Солдатова Г.У. — идея исследования; разработка Шкалы; контроль за проведением исследования; написание рукописи.

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

Conflict of interest

The authors declare no conflict of interest.

Конфликт интересов

Авторы заявляют об отсутствии конфликта интересов.

Ethics statement

The study was reviewed and approved by the Bioethics Committee of Lomonosov Moscow State University (report no 164-д-з, 2025/09/26).

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The psychological well-being of adolescents growing up within and outside the family

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Abstract

Context and relevance. The problem of orphanhood is one of the pressing social issues, and the development of scientifically based recommendations for reducing risk factors for the development of children living outside the family, creating an optimal socio-psychological environment for maintaining well-being are extremely relevant. **Objective.** This study aims to understand the specifics of the well-being of modern adolescents growing up both within and outside their families. **Hypothesis.** Adolescents from orphanages and from families have different potential sources for psychological well-being, related to their varying current and past social development situations. **Methods and materials.** The study involved 405 adolescents living in orphanages (M = 14,5, SD = 1,16, 42% girls, 58% boys) and in families (M = 14,7, SD = 1,21, 44% girls, 56% boys). Potential sources of psychological well-being were assessed using a battery of questionnaires, including Multidimensional Students' Life Satisfaction Scale, Dispositional Vitality Scale, Comprehensive Diagnostic Methodology for Subjective Well-Being, Nonverbal Scale of Attitudes Towards Life and School, and the Life Orientation Test (LOT-R). Additionally, a qualitative content analysis of the Unfinished Sentences Test was conducted. **Results.** The hypothesis about different potential sources of well-being of adolescents growing up in and outside the family, associated with the characteristics of their current and past social situation of development (L.S. Vygotsky), was confirmed. Specific potential sources of the well-being of adolescents from orphanages were found, related to optimistic ideas about the future, their profession, future family and life, which can be independently controlled. We have also found several common bases for joy and psychological well-being of adolescents in the two groups — joy from communicating with friends, achieving success in what you do and orientation towards professional self-realization. **Conclusions.** The results obtained indicate the importance of considering the social situation of adolescent development and their experiences when investigating their psychological well-being. The data can be used in consulting work with adolescents from orphanages and in the training of caregivers.

Keywords: adolescents growing up outside the family; psychological well-being; social situation of development; coping strategies

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Психологическое благополучие подростков, растущих в семье и вне семьи

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Резюме

Контекст и актуальность. Проблема заботы о сиротах — одна из актуальных социальных проблем, и разработка научно обоснованных рекомендаций по снижению факторов риска развития детей, проживающих вне семьи, созданию оптимальной для поддержания благополучия социально-психологической среды крайне актуальна. **Цель**. Настоящее исследование ставит задачей понять специфику психологического благополучия современных подростков, растущих в семьях и вне семей. **Гипотеза**. У подростков из детских домов и семей разные потенциальные основания психологического благополучия, связанные с разной текущей и прошлой социальной ситуацией развития. **Методы и материалы**. В исследовании приняли участие 405 подростков, проживающих в детских домах (M = 14,5, SD = 1,16, 42% — девочки, 58% — мальчики) и семьях (M = 14,7, SD = 1,21, 44% — девочки, 56% — мальчики). Потенциальные источники психологического благополучия оценивались с помощью батареи опросников (Многомерная шкала удовлетворенностью жизнью, Шкала диспозиционной витальности, Комплексная методика диагностики субъективного благополучия, Невербальная шкала отношения к жизни и к школе, Опросник диспозиционного оптимизма (ТДО-П)), а также был проведен дополнительный качественный контент-анализ методики незаконченных предложений. **Результаты.** Гипотеза о разных источниках благополучия подростков, растущих в семье и вне семьи, связанных с особенностями их текущей (и прошлой) социальной ситуации развития, была подтверждена. Были обнаружены специфические основания благополучия подростков из детских домов, связанные с оптимистическими представлениями о будущем, своей профессии, будущей семье и жизни, которую можно будет самостоятельно контролировать. Также удалось установить ряд общих оснований для радости и благополучия подростков двух групп — радость от общения с друзьями, достижения успеха в том, что ты делаешь, и ориентация на профессиональную самореализацию. **Выводы**. Полученные результаты свидетельствуют о важности учета социальной ситуации развития подростков и их переживаний при исследовании их психологического благополучия. Данные могут использоваться в консультативной работе с подростками из детских домов, при подготовке воспитателей.

Ключевые слова: подростки, растущие вне семьи; психологическое благополучие; социальная ситуация развития; копинг-стратегии

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Introduction

The issue of orphanhood, its consequences, and its prevention is one of the key social problems in contemporary Russia. The development of evidence-based recommendations for creating an optimal psychological environment for children growing up outside the family is extremely important. In recent years, significant state efforts have been made towards the deinstitutionalization of orphans (e.g., various types of substitute families, family-style orphanages, inclusive schooling, professional training for caregivers) (Semya, Tarasova, Volchanskaya, 2024), which has led to a substantial improvement in their living conditions and an overall reduction in the number of orphans and adolescents left without parental care. Currently, there are approximately 29 thousand orphans and adolescents left without parental care residing in institutional care settings in Russia.

The psychological problems associated with the personality development and well-being of adolescents left without parental care stem from their specific social situation of development and its experience, and require thorough study and analysis. Within the cultural-historical approach, developed by Lev Vygotsky, the social situation of development is the central psychological mechanism that reveals the main patterns of

a child's personality development and determines their activity as the main cause of this development. Furthermore, «...the environment determines the child's development through their experience of the environment, <...> the forces of the environment acquire a guiding significance through the child's experience» (Vygotsky, 2001, p. 213).

The problem of psychological well-being has been intensively researched over the past few decades due to positive psychology, which has demonstrated that well-being is not merely the absence of ill-being, but possesses its own intrinsic value, consequences, and distinct sources (Seligman, 2013). According to the well-known PERMA model there are five main sources of eudaimonic well-being: P — Positive Emotions; E — Engagement (flow); R — Positive Relationships; M — Meaning; A — Accomplishment (achievements, sense of competence). Thus, two sources of well-being are external — relationships and accomplishments, while the other three are sources are internal, psychological. In this paper we will focus on the role of external factors in the well-being of adolescents left without parental care taking into account this model.

Adolescence is a critical period for a child's personality development, sensitive to marked fluctuations in well-being (Gordeeva, Sychev, 2023). Comparisons of psychological well-being between Russian adolescents from families and those from orphanages (including both orphans and adolescents left without parental care) show that adolescents from orphanages display lower levels of life satisfaction and sense of meaning in life than adolescents from families (Sulimina, 2014; Golovey, Danilova, Danilova, 2017; Danilova, Danilova, 2020). They also more frequently exhibit symptoms of anxiety and depressive disorders (Avakian, Volikova, 2014; Zolotareva, Khegay, 2024), experience more stress, and have more suicidal thoughts (Sigal et al., 2003). Adolescents from orphanages demonstrate lower general self-esteem and lower specific self-evaluations of personality traits compared to adolescents from families (Prikhozhan, Tolstykh, 2005; Golovey, Danilova, Danilova, 2015; Kholmogorova, Volikova, Safonova, 2015; Zhiltsova, Soldatov, 2015; Sulimina, 2014). It was also shown that adolescents from orphanages are less satisfied with their studies but more satisfied with leisure and extracurricular activities than adolescents from families (Danilova, Rykman, 2018).

At the same time, there is data indicating an absence of differences in several indicators of ill-being, such as school and interpersonal anxiety, between adolescents from orphanages and adolescents from families, as well as a more positive attitude towards school and teachers among adolescents from orphanages (Avakian, Volikova, 2014). There is initial evidence, albeit from very small samples, suggesting no difference in overall life satisfaction between adolescents from orphanages and adolescents from families (Danilova, Rykman, 2018). Yet another study of orphanage graduates and adults without institutionalization experience showed no differences in levels of anxiety, depression, locus of control, delinquent behavior, satisfaction with interpersonal relationships, or physical and psychological health (Chumakova et al., 2020). It corresponds to the results of another study which notes that Canadian adults being institutionalized as children and those raised in families were equally satisfied with their social life and did not differ in the frequency of chronic diseases (Sigal et al., 2003).

The family is a crucial source of a child's well-being. The results of recent study based on representation Russian sample of 15 years old adolescents showed that warm and supportive relationships with parents are important predictors of happiness, life satisfaction, and positive emotions (Gordeeva, Sychev, 2023). Adolescents from orphanages are at risk of reduced psychological well-being because they find it difficult to establish appropriate, reliable, and trusting relationships with close individuals, and caregivers often fail to provide the necessary level of empathy, support, and acceptance (Golovey, Danilova, Danilova, 2017; Danilova, Danilova, 2020). Research data indicate that the biological families of orphaned adolescents are characterized by greater dysfunction than those of adolescents from families, and the experience of being raised in a dysfunctional family or in an institution is associated with lower psychological well-being in adolescents (Kholmogorova, Volikova, Safonova, 2015; Oslon et al., 2022). Adolescents enter institutional care from families due to various adverse reasons, including abuse, parental substance abuse, parental imprisonment, or parental illness/death (Suzuki, Tomoda, 2015).

Most adolescents with institutionalization experience exhibit insecure attachment styles (Avakian, 2015; Subasi, Yildiz, 2022). Due to the formation of problematic attachment patterns, adolescents from orphanages show specificities in interpersonal relationships with adults and peers, reduced trust in others and in themselves, less developed communication skills (Prikhozhan, Tolstykh, 2005; Golovey, Danilova, Danilova, 2017; Danilova, Danilova, 2020), a fear of social evaluation (Kholmogorova, Volikova, Safonova, 2015; Avakian, Volikova, 2014). Adults raised in care are less likely to marry and tend to lead more isolated lives (Sigal et al., 2003). On the other hand, a recent study showed that the substitute family for adolescents from orphanages does not always lead to higher well-being among its graduates compared to graduates of orphanages (Oslon et al., 2023). These recent data underscore the importance of studying the factors of well-being in children and adolescents growing up in orphanages.

Kholmogorova and colleagues have shown in their study that adolescents from orphanages, compared to ad-

olescents from families, have a lower striving for acceptance, lower satisfaction with social support, and higher fear of rejection. This leads to their excessive demands, reduced capacity for mutual, symmetrical supportive relationships, and diminished expression of gratitude and reciprocal help. At the same time, adolescents did not differ in their satisfaction with instrumental support (availability of help in solving everyday problems) and emotional support or availability of supportive relationships (Kholmogorova, Volikova, Safonova, 2015).

As the literature review indicates, previous research has focused mainly on indicators of ill-being in adolescents from orphanages: their anxiety, depression, negative affect, suicidal thoughts and behavior, and anger. The focus of our study is on well-being and optimism. The aim of the present research is to investigate psychological well-being, optimism, and perception of the future in adolescents from orphanages and adolescents from families using integrated data from validated well-being scales and questionnaires and semi-projective techniques.

The main hypothesis of the study is that there are different potential sources of well-being in adolescents from orphanages and adolescents from families, associated with their different current and past social situations of development which leads to the higher likelihood of family adolescents to form warm, secure relationships with adults. Specifically, we suggest that relationships with friends, constructive ideas about the future, one's profession, family, and a future life that can be independently controlled may serve as resources for the psychological well-being of adolescents from orphanages.

Materials and methods

Sample

The study compared two samples of adolescents aged 13-17 without health impairments: 1) 182 adolescents from orphanages (M = 14,5, SD = 1,16, N_{girls} = 77, N_{boys} =105) residing in orphanages in the city of Kemerovo, Siberia, and 2) 223 adolescents from families (M = 14,7, SD = 1,21, N_{girls} = 99, N_{boys} =124) residing with their families in Moscow and the Kursk region.

Procedure

The study was administered to adolescents from orphanages using online forms in the computer classrooms of their orphanages. A psychologist was present in the room, and adolescents entered the computer classrooms one by one. The study was administered to adolescents from families using printed forms; participants completed the questionnaires in groups in their classrooms in the presence of a psychologist and a teacher.

Statistical data analysis was performed using the software packages Jamovi 2.6.44 [rus] and Microsoft Excel 2007.

Measures

The following instruments were used to assess adolescents' psychological well-being:

The Multidimensional Students' Life Satisfaction Scale (Sychev, Gordeeva et al., 2018), which assesses life satisfaction across five subscales: "Friends," "School," "Teachers," and "Myself." The "Family" subscale was not used to avoid causing frustration among adolescents from orphanages growing up outside a family.

- The Dispositional Vitality Scale (Alexandrova, 2014), designed to assess the subjective experience of possessing physical and mental energy available for goal-directed activity.
- The Emotional Well-Being scale from MULTICAM (Little, Wanner, 1997; adapted by T.O. Gordeeva), intended to assess well-being over the last two weeks. It contains four subscales: Joy (e.g., "I felt energetic and cheerful"), Positive Relationships (e.g., "I felt that others liked being with me"), Anxiety (e.g., "I felt worried"), and Anger (e.g., "I felt like smashing something"). All four subscales have been used in our previous research (Gordeeva, Sychev, Sukhanovskaya, 2020) and have demonstrated high reliability (Cronbach's $\alpha \geq ,80$).
- The Nonverbal Scale of Attitudes Towards Life and School (Andrews, Withey, 1976), which features seven symbolic faces ranging from sad to happy.
- To assess optimism as a correlate and source of well-being, the Life Orientation Test (LOT-P) (Gordeeva, Sychev, Osin, 2021) was used, measuring generalized positive expectations about the future.
- Furthermore, to assess psychological well-being, perceptions of life and the future, as well as coping strategies, a semi-projective technique Incomplete Sentences Test was used. Five sentence stems were administered: "My life...", "In the future, I...", "When I have a problem...", "I like it when...", and "My favorite subjects are...". The data were processed using qualitative content analysis (Savinskaya, 2023).

Results

Table 1 presents the means and standard deviations for all variables studied. Since the data distribution deviated from normality (p-values ranging from < 0,001 to 0,045), non-parametric statistical methods were applied. The gender distribution did not differ among adolescents from orphanages and adolescents from families (χ^2 = 0,178, p = 0,673). A comparison of the two adolescents subsamples from regular families from two Russian regions (Moscow and the Kursk region) revealed only

isolated and statistically small differences; therefore, they were combined into a single sample (Adolescents from families) for all subsequent analyses.

To test the main hypothesis regarding differences in the potential sources of psychological well-being, optimism, and satisfaction with relationships between adolescents from orphanages and adolescents from families, the non-parametric Mann-Whitney U test for two independent samples was used. As shown in Table 1, there were no significant differences for most variables. However, adolescents from orphanages reported higher levels of vitality and school satisfaction (both $p < 0,001$) and lower levels of ill-being, such as anxiety and anger, compared to adolescents from families.

A Mann-Whitney U test of gender differences within each sample revealed that in both groups, girls scored higher on anxiety ($p < 0,01$) and anger ($p < 0,05$) than boys. This is consistent with recent data obtained from Russian samples (Gordeeva, Sychev, Sheldon, 2024).

To refine the main hypothesis and expand the results of the quantitative analysis, a qualitative content analysis of five incomplete sentences was conducted: "My life...", "In the future, I...", "When I have a problem...", "I like it when...", and "My favorite subjects are...". An expert assessment method was employed, with two experts (the authors of this publication) independently coding the responses. A Z-test (Glass, Stanley, 1976) was used to assess the reliability of differences in category proportions. A rank-biserial correlation, which can serve as an effect size measure for the Mann-Whitney U test, was used to assess the relationship between quantitative variables and the identified qualitative categories. Categories with fewer than 10 responses were excluded from the correlation analysis.

Using the Mann-Whitney U test, it was found that responses from adolescents from orphanages to the incomplete sentences were less detailed and elaborate than those from adolescents from families ($p < 0,001$). Furthermore, adolescents from orphanages had significantly more omitted responses in the incomplete sentences, particularly for the sentences "In the future, I..." and "I like it when...".

The data from the incomplete sentences partially confirm the results from the questionnaires. Specifically, adolescents from families and adolescents from orphanages overall evaluated their lives equally positively ($N_{orphanages}$ = 89 (60%); $N_{families}$ = 105 (55%); $p = 0.31$) (e.g., "My life is good/wonderful"). Positive answers from adolescents in both groups were positively correlated with most well-being variables and negatively correlated with anxiety and anger (r ranging from —0,30 to 0,50, $p < 0,05$). However, these correlations were more pronounced for adolescents from families, while for adolescents from orphanages they were often non-significant (see Table 2).

Adolescents from families gave significantly more neutral answers when describing their lives (e.g., "My life... is normal/ ordinary") compared to adolescents from orphanages ($N_{orphanages}$ = 10 (7%), $N_{families}$ = 45 (23%), $p < 0,001$). Only among adolescents from families these

Table 1

Descriptive statistics and differences on scales of psychological well-being between adolescents from orphanages and families

Scales	Adolescents from families		Adolescents from orphanages		PDifferences (U Manna—Whitney)	*p*	Effect size
	M	***SD***	***M***	***SD***			
Optimism	16,5	4,98	15,9	4,63	18379	0,102	0,09
Vitality	32,7	8,54	35,8	7,82	15977	<0,001	—0,21
Joy	11,4	3,09	11,6	2,86	19921	0,75	—0,02
Anxiety	8,65	3,70	7,41	2,78	16668	0,002	0,18
ГAnger	10,2	4,39	8,97	3,69	16921	0,004	0,17
Positive attitudes	12,7	3,12	12,5	2,85	19141	0,32	0,06
Attitude towards life	5,42	1,45	5,58	1,44	18804	0,19	—0,07
Attitude towards school	4,24	1,62	4,55	1,66	18255	0,08	—0,10
School satisfaction	17,2	5,22	19,3	5,83	15873	<0,001	—0,22
Teachers satisfaction	19,1	5,99	19,1	6,14	20211	0,94	—0,00
Self-satisfaction	21,2	5,83	21,1	4,81	20092	0,86	0,01
Satisfaction with friends	24,3	5,05	23,5	5,65	18908	0,24	0,07

Note: «M» — average value; «SD» — standard deviation; «*p*» — significance.

answers were associated with lower well-being, i.e. reduced vitality, joy, optimism, and increased anxiety ($p < 0,01$).

Adolescents of both groups mentioned the role of friends in their lives with equal frequency. For instance, they liked spending time with friends ($N_{orphanages}$ = 11 (7%), $N_{families}$ = 13 (7%), p = 0,80), and when facing difficulties, they could turn to them for help ($N_{orphanages}$ = 10 (6%), $N_{families}$ = 11 (5%), p = 0,80). However, among adolescents from families, mentioning friends showed a positive correlation only with satisfaction with friends, whereas among adolescents from orphanages, it also correlated with other well-being indicators (Table 2).

The aspiration to become financially secure was a common life goal that did not differ between the two groups. In the incomplete sentence "In the future, I...", adolescents from orphanages and adolescents from families did not differ in the frequency of this category ($N_{orphanages}$ = 7 (5%), $N_{families}$ = 17 (9%), p = 0,80) (e.g., "Rich," "Will earn a lot"). Adolescents from both groups wrote with approximately equal frequency about the pleasure derived from achieving success in activities ($N_{orphanages}$ = 20 (14%), $N_{families}$ = 41 (21%), p = 0,07) (e.g., I like it when... everything works out; I see good results from my work). However, this category was associated with well-being variables predominantly among adolescents from orphanages.

Well-being and interpersonal relationships

When writing about their future in incomplete sentences, adolescents from orphanages more frequently mentioned family. In the incomplete sentence "My life..." ($N_{orphanages}$ = 11 (7%); $N_{families}$ = 5 (3%); p = 0.037) and "I like it when..." ($N_{orphanages}$ = 40 (27%), $N_{families}$ = 32 (16%), p = 0,02), they gave more responses indicating that their lives are filled by the presence of social relationships, expressing a need for them. In the incomplete sentence "In the future, I...", adolescents from orphanages more often expressed a desire to have a family and children in the future compared to adolescents from families ($N_{orphanages}$ = 14 (9%), $N_{families}$ = 6 (3%), p = 0,03) (e.g., In the future, I... will be a wife and mother; ... want a large and close-knit family / a good mom / a good dad ...). In contrast, adolescents from families, when describing their current lives, significantly more often mentioned warm relationships ($N_{orphanages}$ = 17 (11%); $N_{families}$ = 38 (20%); p = 0,04). Here are just few quotes from what adolescents from orphanages wrote: "I like it when... I am respected / listened to / loved / given attention / understood / my opinion is considered, people listen to me."

Notably, adolescents from orphanages exhibited a strong need for praise in the incomplete sentences ($N_{orphanages}$ = 25 (16%), $N_{families}$ = 5 (3%), $p < 0,001$) (e.g., I like it when ... I am praised). Adolescents from orphanages also more frequently expressed a desire for autonomy, to be free from external rules and constraints associated with the regimented nature of group living. This is manifested in the characteristic phrase "My life — my rules," which was not found among adolescents from families ($N_{orphanages}$ = 10 (7%), $N_{families}$ = 0). Thus, we can conclude that the current interpersonal relationships with adults among adolescents from orphanages are characterized by a dependence on praise and inequality.

Coping strategies. The specificity of relationships and dependence on others among adolescents from orphanages is also evident in their coping strategies from the incomplete sentences. Specifically, adolescents from orphanages more frequently choose the strategy of searching social support ($N_{orphanages}$ = 60 (37%), $N_{families}$ = 31 (15%), $p < 0,001$) (e.g., "I do it together with my caregiver," "I consult with close ones"), while adolescents from families more often preferred to cope with difficulties independently (Active coping, $N_{orphanages}$ = 64 (40%), $N_{families}$ = 131 (65%), $p < 0,001$) (e.g., "I try to solve it myself," "I solve it"). Furthermore, active coping category showed more correlations with well-being variables among adolescents from families, whereas among adolescents from orphanages, searching social support was

Table 2

The relationship between categories of incomplete sentences and quantitative variables in two groups of adolescents — from orphanages and from families

Categories	N		1	2	3	4	5	6	7	8	9	10	11	12
Pos.Aswers	105	ПС / AF	0,5***	0,5***	0,4***	–0,3***	–0,3***	0,4***	0,4***	0,24**	0,4***	0,34***	0,5***	0,4***
	89	ДД / АО	0,22*	0,2*	0,1	–0,01	–0,2*	0,12	0,2*	0,2*	0,14	0,2*	0,2*	0,3**
Achievements	41	ПС/ AF	0,3**	0,1	0,1	–0,18	–0,06	0,15	0,3**	0,16	0,22*	0,1	0,14	0,16
	20	ДД / АО	0,22	0,25	0,26	–0,3	–0,4**	0,3*	0,3*	0,3*	0,4**	0,3*	0,3*	0,23
Friends	13	ПС / AF	0,23	0,3	0,05	–0,07	–0,2	0,2	0,3	0,18	0,12	0,2	0,14	0,4*
	11	ДД / АО	0,4*	0,12	0,34	–0,34	–0,3	0,5**	0,24	0,16	0,13	0,14	0,24	0,4*

Note: «1» — optimism; «2» — vitality; «3» — joy; «4» — anxiety; «5» — anger; «6» — positive attitude; «7» — attitude to life; «8» — attitude to school; «9» — satisfaction with school; «10» — satisfaction with teachers; «11» — satisfaction with oneself; «12» — satisfaction with friends; « PosAswers» — positive answers; «AF» — Adolescents from families; «АО» — Adolescents from orphanages. «*» — correlation is significant at the 0,05 level; «**» — correlation is significant at the 0,01 level; «***» — correlation is significant at the 0,001 level.

Table 3

The relationship between categories of incomplete sentences and quantitative variables in two groups of adolescents — from orphanages and from families

Categories	N		1	2	3	4	5	6	7	8	9	10	11	12
Active coping	133	ПС /AF	0,2*	0,2*	0,03	–0,13	0,08	0,08	0,2*	0,1	0,2*	0,2*	0,2*	0,1
	64	ДД /АО	0,08	0,06	0,07	–0,1	–0,08	0,17	0,03	0,09	0,16	0,07	0,06	0,16
Focusing on emotions	12	ПС / AF	–0,5**	–0.,4*	–0,4*	0,4*	0,5**	–0,4**	–0,6***	–0,4**	–0,5**	–0,6***	–0,6***	–0,5**
	22	ДД / АО	–0,2	–0,2	–0,15	0,3*	0,2	–0,12	0,04	–0,06	–0,09	–0,12	–0,06	–0,2
Search for social support	31	ПС / AF	0,3**	0,03	0,3*	0,06	–0,3*	0,24*	0,23*	0,1	0,2	0,2	0,1	0,04
	60	ДД / АО	0,3**	0,2*	0,15	–0,2	–0,3**	0,22*	0,22*	0,2*	0,14	0,23*	0,2*	0,24**

Note: see table 1.

more correlated with well-being variables (see Table 3). Interestingly, unlike adolescents from families, among adolescents from orphanages, the strategy of focusing on emotions was not associated with ill-being or relationship satisfaction.

Specifics of the foundations of psychological well-being in achievement and l eisure

When describing their favorite subjects, adolescents from orphanages significantly less frequently choose core subjects—mathematics, Russian language, natural sciences and STEM ($p < 0,01$), as well as social sciences and humanities ($p < 0,001$), showing a preference for non-core subjects instead ($N_{orphanages}$ = 72 (42%), $N_{families}$ = 32 (16%), $p < 0,001$), such as physical education, technology, and art.

Like most adolescents from families, adolescents from orphanages were oriented towards obtaining a profession in the future ($N_{orphanages}$ = 86 (56%), $N_{families}$ = 84 (47%), $p = 0,08$). However, significant differences were found in the content of the chosen professions. Adolescents from orphanages more often choose more practical professions ($N_{orphanages}$ = 45 (29%), $N_{families}$ = 20 (11%), $p < 0,001$), such as cook, welder, hairdresser. In contrast, adolescents from families more often choose more complex professions requiring higher education ($N_{orphanages}$ = 28 (18%), $N_{families}$ = 50 (28%), $p = 0,04$), such as doctor, lawyer, teacher. Also, in the incomplete sentence "In the future, I...", adolescents from families significantly more often reported a desire to become successful ($N_{orphanages}$ = 10 (7%), $N_{families}$ = 24 (13%), $p = 0,04$). For adolescents from orphanages, the choice of core academic subjects and professions was positively related to well-being variables, whereas the choice of non-core lessons and practically oriented professions showed no such associations (Table 4). For instance, optimism, self-satisfaction, and low anxiety were associated with a preference for more complex professions requiring university education.

When describing what brings them joy (in the incomplete sentence "I like it when..."), adolescents from families, unlike adolescents from orphanages, reported a wider range of activities and hobbies, including studies, tutors, but mainly — games (usually computer games), music (listening and playing instruments), as well as sports, dancing, drawing, and other hobbies ($N_{orphanages}$ = 4 (3%), $N_{families}$ = 24 (12%)).

Additionally, adolescents from families often wrote about the desire to rest, relax and do nothing ($N_{orphanages}$ = 3 (2%), $N_{families}$ = 21 (11%)), whereas this category was extremely rare among adolescents from orphanages (since fewer than 5 responses were identified in these categories for adolescents from orphanages, the significance level of these differences was not assessed (Glass, Stanley, 1976).

Thus, in the analysis of the incomplete sentences, it is evident that several key categories have different psychological meanings for adolescents from orphanages and adolescents from families.

Table 4

The relationship between categories of incomplete sentences and quantitative variables in two groups of adolescents — from orphanages and from families

Categories	N		1	2	3	4	5	6	7	8	9	10	11	12
Profession (any)	84	ПС / AF	–0,07	–0,02	0,01	0,02	0,01	–0,03	0,06	0,03	–0,02	0,04	–0,05	–0,05
	86	ДД / АО	0,15	0,08	0,14	–0,08	–0,09	0,2*	0,07	0,2*	0,2*	0,2*	0,16	0,3***
Professions (university)	50	ПС / AF	–0,13	–0,06	–0,09	0,003	–0,06	–0,04	0,08	–0,02	0,02	–0,01	–0,07	–0,08
	28	ДД / АО	0,25*	0,22	0,13	–0,24*	–0,10	0,17	0,11	0,13	0,18	0,23	0,3*	0,4**
Practical professions	20	ПС / AF	0,20	0,31*	0,32*	–0,06	0,07	0,05	0,16	0,16	0,007	0,19	0,24	0,09
	45	ДД / АО	0,06	–0,02	0,07	0,06	–0,03	0,11	–0,03	0,07	0,07	0,07	0,05	0,18

Note: see table 1.

Discussion

The present study aimed to investigate psychological well-being and identify its potential sources in adolescents growing up within and outside the family. The analysis of self-report measures showed that the two groups of adolescents did not differ in their levels of optimism, joy, satisfaction with life and oneself, as well as indicators of positive relationships and satisfaction with relationships with friends and teachers. Moreover, adolescents from orphanages reported higher levels of vitality and school satisfaction and lower levels of anxiety and anger than adolescents from families. These findings contradict a number of earlier studies that found lower levels of psychological well-being in adolescents from orphanages (Prikhozhan, Tolstykh, 2005; Golovey, Danilova, Danilova, 2015; Kholmogorova, Volikova, Safonova, 2015; Zhiltsova, Soldatov, 2015; Sulimina, 2014; Golovey, Danilova, Danilova, 2017), but they are consistent with more recent studies (Danilova, Rykman, 2018; Chumakova et al., 2020), which may indicate positive dynamics due to implemented measures. The greater school satisfaction among adolescents from orphanages compared to adolescents from families is also consistent with the findings of Avakian and Volikova (2014), which showed that adolescents from orphanages are more satisfied with school, skip classes less often, and have a better attitude towards teachers as significant adults. Nevertheless, we also suggest that the self-report questionnaire of orphaned adolescents data may be affected by social desirability bias.

In this regard, we examined different potential sources of psychological well-being in adolescents from orphanages and adolescents from families based on questionnaire data, supplemented by an analysis of the incomplete sentences test data. The results indicate indeed several similarities between adolescents from orphanages and adolescents from families. They evaluate their lives equally positively, dream that "everything will be good," derive joy from achieving success in different activities, both groups aspire to obtain a profession and achieve financial security in the future. However, certain characteristic differences were also found, which correspond to differences in the socialization conditions of the two groups. The following three common potential sources of psychological well-being for both groups can be identified: joy from communicating with friends (spending time together), current successes in activities, and an orientation towards professional self-realization. The first is interpersonal in nature, related to relationships with others, while the latter two are achievement-oriented, related to achieving success and a sense of competence. In other potential sources, specificities are observed, evidently linked to their social situation of development, both before entering the orphanage and during their stay there.

The obtained data show that the level of well-being in adolescents from orphanages is very weakly related to a characteristic source of well-being—more positive and secure relationships with close people in the present, and adolescents from orphanages are clearly less satisfied with these relationships. This corresponds with the results of previous studies comparing the level of emotional distance, on the one hand, and the feeling of acceptance and love from caregivers for adolescents from orphanages and from parents for adolescents from families, on the other (Golovey, Danilova, Danilova, 2017). However, their actively present dreams about a future family serve as a source of such well-being. Adolescents from orphanages more frequently noted a need for social relationships than adolescents from families, and currently, they felt a lack of warm and accepting relationships with others and the presence of dependent relationships. Adolescents from orphanages also more often reported a need for praise, which may characterize psychologically immature relationships with others, based on frequent external evaluation and submission. These results are consistent with previous research data showing that one of the main distinctions of adolescents from orphanages are a high fear of rejection, social anxiety, dissatisfaction with integration into social interactions (Kholmogorova, Volikova, Safonova, 2015; Avakian, Volikova, 2014).

We also discovered a vivid manifestation of specificity in the experiences and satisfaction of basic psychological needs among adolescents from orphanages, particularly in autonomy. Only among adolescents from orphanages was the phrase "My life — my rules" present, indicating a frustration of the need for autonomy; it was not found among adolescents from families. This appears to reflect the experience of living by predetermined rules set by adults, not by the adolescent themselves, which corresponds with the perception of the caregiver figure for adolescents from orphanages as more direct and authoritarian than that of parents for adolescents from families (Golovey, Danilova, Danilova, 2017). This may lead to a more pronounced external locus of control in adolescents from orphanages found in previous studies (Prikhozhan, Tolstykh, 2005; Zhiltsova, Soldatov, 2015; Sulimina, 2014).

Different foundations of well-being in adolescents, depending on socialization conditions and specifics of relationships, are also evident in different coping strategies found in two groups. For orphans, well-being is associated with seeking social support, while for adolescents from families, it is linked with active coping. This result differs from the previous data (Prikhozhan, 2015), which showed that adolescents from orphanages less frequently use the strategy of searching social support and do not differ from adolescents from families in their preference for active coping with difficulties. This discrep-

ancy might be related to the time elapsed between the two studies or differences in diagnostic measures.

Well-being is largely associated with how adolescents see their future (Prikhozhan, Tolstykh, 2005). Overall, an achievement orientation is associated with well-being in all adolescents, regardless of socialization conditions. However, family-raised adolescents express a stronger desire to become successful in the future compared to adolescents left without parental care. When describing the future, adolescents from orphanages more often choose practical professions requiring college training, while adolescents from families choose professions requiring university education. Also, adolescents from orphanages less frequently choose non-core subjects as their favorites. Both results are consistent with earlier research (Prikhozhan, Tolstykh, 2005; Golovey, Danilova, Danilova, 2015; Zhiltsova, Soldatov, 2015; Danilova, Rykman, 2018) and reflect the social situation of development for adolescents from orphanages. Notably, for adolescents from orphanages, unlike adolescents from families, the choice of more complex professions is associated with well-being.

We also discovered specificity in how the two groups spend their leisure time, reflecting a limited number of hobbies, various extracurricular activities, and leisure pursuits among adolescents from orphanages compared to adolescents from families. This result corresponds with previous data indicating that adolescents from orphanages report less richness of significant events in the past, present, and future compared to their family-raised peers (Zhiltsova, Soldatov, 2015).

It should be taken into account that the reasons for psychological problems in adolescents from orphanages may include early family trauma, on the one hand (Oslon et al., 2022), and insufficient support from adults for the child's psychological needs, coupled with life regulations leading to frustration of autonomy, on the other (Golovey, Danilova, Danilova, 2017). Conversely, specific challenges for adolescents from families may include being overloaded with studies, anxieties related to university admission and fulfilling complex life plans, meeting expectations, and parental pressure.

The direction for future research on the psychological well-being of adolescents, depending on their experiences and social situation of development, lies in identifying the conditions for fostering a sense of control over one's life, supporting autonomy, competence, and secure attachment, while controlling for the duration of stay in an orphanage.

Conclusion

The results from the self-report measures did not distinguish adolescents from orphanages and adolescents from families on most indicators of psychological well-being, which most likely indicates a contribution of social desirability. On the other hand, the results of the qualitative analysis of the incomplete sentences test revealed significant differences in perceptions of life, the future, and different foundations of psychological well-being among adolescents, depending on the specifics of their social situation of development. This situation is primarily associated with a lack of supportive communication with adults and limited opportunities for socio-emotional and intellectual life for adolescents in care.

The conducted analysis allowed us to identify both general developmental characteristics and potential sources of well-being relevant to this age group (communication with friends, success in activities, professional self-realization, and financial well-being), as well as specific ones related to their particular social situation of development. The specificity of psychological well-being in adolescents from orphanages is largely associated with the frustration of needs for competence, autonomy, and relatedness, leading them to search support not in the current present but in the future. It was shown that well-being is higher among those who anticipate professional self-realization in the future, hope for the possibility of building close family relationships, and envision their own life organized "by their own rules."

The specificity of well-being in adolescents from families is linked to current warm relationships with close people, the realization of their abilities within their studies, an orientation towards achieving competence and status in the future, as well as various hobbies, entertainment, and rest (a hedonic orientation). At the same time, they exhibit slightly greater personal maturity, expressed in a readiness to independently solve emerging problems and cope with them actively.

To study the psychological well-being of adolescents from orphanages, it is advisable to use both quantitative (self-report questionnaires) and qualitative methods, primarily the incomplete sentences test, due to its greater informativeness and lower susceptibility to social desirability despite the time-consuming and labor-intensive nature of this analysis.

Thus, we discovered potential sources for the psychological well-being of adolescents growing up outside the family, their strengths and weaknesses. They could be considered when developing modern programs for successful integration of adolescents from orphanages into society, as well as in the training of orphanage caregivers.

Limitations. The limitations of the study include the inaccessibility for researchers of information about the time adolescents spend in orphanages and their life histories, including the current presence of family members and relatives. Another limitation is the potential social desirability bias of responses of adolescents from orphanages.

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

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Avatar-mediated identity and life meaning orientations among internet users

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Abstract

Context and relevance. In digital reality, the attachment of young Internet users to their avatar — the digital self-image — is linked to the search for life's meaning and the problematic pathway of identity development. However, little is known about the sign mediation mechanism associated with these phenomena. The theoretical basis of the research was cultural-historical theory, within which an attempt was made to interpret an avatar as a sign. **Objective.** To study the mediating role of the avatar in the development of virtual identity and life-meaning orientations. **Hypothesis.** The avatar identification characteristics mediate the connections between virtual identity, identification with the avatar, and life-meaning orientations. **Methods and materials.** The study involved 457 young Internet users of online platforms (M = 20,6, SD = 2,6, 67% female). The study measured the indicators of virtual identity (VISI), Purpose-in-Life Test, (PIL), avatar identification (IOS), and avatar identification characteristics (the "Who am I?" test with modified instructions). **Results.** The results showed that the social, physical, and reflective characteristics attributed to the avatar are mediators of the effects of the search for and acceptance of virtual identity on life-meaning orientations (Goals, Result, Locus of control) and avatar identification. This means that avatar-mediated identity enhances clarity in life goals and satisfaction with self-realization, while reducing the flexibility of meaningful control over behavior among Internet users. **Conclusions.** It has been shown that the semiosis of the avatar, mediating the preadaptive pathway of development of identity and life-meaning orientations, depends on the experience and gender of the Internet user. The materials can be used in the development of new methods of applying avatar technologies to foster the psychosocial well-being of young Internet users.

Keywords: sign mediation, meaning, life meaning orientations, identity, virtual identity, avatar, avatar identification

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Аватар-опосредствованная идентичность и смысложизненные ориентации интернет-пользователей

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Резюме

Контекст и актуальность. В цифровой реальности привязанность молодых интернет-пользователей к своему аватару связана с поиском смыслов жизни и проблемным путем развития идентичности, но мало известно об ассоциированном с этими явлениями механизмом знакового опосредствования. Теоретической основой исследования послужила культурно-историческая теория, в контексте которой предпринята попытка осмыслить аватар как знак. **Цель**. Изучить опосредствующую роль аватара в развитии виртуальной идентичности и смысложизненных ориентаций. **Гипотеза**. Показатели сигнификативных и коннотативных значений идентификационных характеристик аватара опосредствуют связи между виртуальной идентичностью, идентификацией с аватаром, смысложизненными ориентациями. **Методы и материалы**. В исследовании приняли участие 457 молодых интернет-пользователей онлайн-платформ (M = 20,6, SD = 2,6, 67% женщин). В исследовании измерялись показатели виртуальной идентичности («Статус ВИ»), смысложизненных ориентаций (СЖО), идентификации с аватаром (IOS), идентификационные характеристики аватара (тест «Кто Я?» с измененной инструкцией). **Результаты.** Результаты показали, что коннотативные и сигнификативные значения социальных, физических, рефлексивных характеристик, приписываемых аватару, являются медиаторами эффектов влияния поиска и принятия виртуальной идентичности на смысложизненные ориентации (цели, результат, локус контроля) и идентификацию с аватаром так, что аватар-опосредствованная идентичность способствует повышению ясности жизненных целей и удовлетворенности самореализацией, но снижает осмысленный контроль над поведением интернет-пользователей. **Выводы**. Показано, что семиозис аватара, опосредствуя преадаптивный путь развития идентичности и смысложизненных ориентаций, зависит от опыта и пола интернет-пользователя. Материалы могут быть использованы в разработке новых методов применения аватар-технологий для содействия психосоциальному благополучию молодых интернет-пользователей.

Ключевые слова: знаковое опосредствование, значение, смысложизненные ориентации, идентичность, виртуальная идентичность, аватар, идентификация с аватаром

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Introduction

According to the principle of mediation, adopted in cultural-historical psychology (Zavershneva E., van der Veer R. (Ed.), 2018), the existential-personal development is mediated by sign systems and practices. Advances in digital technologies have stimulated the development of the metaverse — a computer-generated immersive digital environment that simulates the physical world and in which social interaction between people occurs (Giang Barrera, Shah, 2023) — and have led to the "decarnation" of the physical environment, associated with the complication of the mechanisms of sign-symbolic mediation in the development of the human user: digital technologies as "secondary" signs (Rubtsova, 2019) "re-mediate" previously formed mental and personal structures (Tikhomirov, 1993), lead to the digital expansion of the personality and transformation of identity (Soldatova, Chigarkova, Ilyukhina, 2024), blurring the boundaries between personality and technology.

Although most research on the phenomenon of human presence in the metaverse is conducted from a technological perspective (Crespo-Pereira, S nchez-Amboage, Membiela-Poll n, 2023), the most traceable theme in psychological research on *identity* in the

metaverse concerns the phenomena related to the mediating role of the *avatar* — a digital visualized image controlled by a human user or software and capable of interaction (Mancini et al., 2024). Researchers note that a new type of technologically mediated attitude of the human user to their self-image embodied in the virtual environment is being formed — *identification with the avatar* (Brown et al., 2024), attachment to the avatar (Stavropoulos et al., 2023), and merging with the avatar (M sseler, von Salm-Hoogstraeten, B ffel, 2022).

The influence of the avatar on the cognitive, affective, and behavioral aspects of human development in the virtual environment has become evident (Peng, Cowan, Lo Ribeiro, 2025). However, contemporary empirical research demonstrates contradictory data regarding the role of avatar identification in the psychosocial well-being of young people. Researchers note that identification with the avatar negatively correlates with indicators of psychosocial well-being (Mancini et al., 2024), clarity of life meanings (Klementyeva, 2024), and self-perception (Yang et al., 2024), but positively correlates with identity crisis (M ller, Bonnaire, 2021) and the search for meaning in life (Fraser, Slattery, Yakovenko, 2023). Other authors assert a positive correlation between avatar-mediated technologies and mental health indicators (Barabanschikov, Selivanov, 2023). Modern psychologists often find explanations for these contradictory effects within the framework of R.W. Belk's "extended self" and E.T. Higgins' "self-discrepancy" theories, suggesting an extension of the "actual self," "ideal self," and the avatar (Snodgrass et al., 2025). The emergent "self-avatar" system is characterized by measures of identification with the avatar, objectivation, idealization, and user self-actualization through the avatar, and is also considered a factor of compensatory behavior in the virtual environment.

However, within this system, the interrelation between the avatar and *virtual identity*, which integrates the experience of uniqueness and belonging to a virtual community, is defined ambiguously. Some researchers interpret the avatar as virtual identity (Nagy, Koles, 2021); others differentiate between virtual identity and the avatar, identifying different types of user-avatar relationships such as self-identification, symbiosis, subject-object, and subject-subject relations (Banks, Bowman, 2021), emphasizing the relative independence of the avatar from the user's preferences and personality traits (Lemenager et al., 2020; Mancini et al., 2024; Zimmermann, Wehler, Kaspar, 2023). In other words, avatars, through which users express themselves, form identity, establish social partnerships in the virtual environment, and are not equivalent to virtual identity.

The debate about the avatar's role in users' psychosocial development highlights problematic issues concerning the attributive characteristics of avatars. Previous research has focused on the *technical* characteristics of avatars — the realism of their form and behavior as correlates of users' "real" identity (Stavropoulos et al., 2023; Snodgrass et al., 2025; Wang et al., 2024; Zimmermann, Wehler, Kaspar, 2023), emphasizing a higher level of self-presentation in interactions with realistic and "intelligent" avatars compared to unrealistic ones (Miao et al., 2022). Contemporary researchers emphasize the preferential use by online users of anthropomorphic, realistic avatars for their self-presentation — "metahumans" in the virtual world (Pawar, Mishra, 2025).

Undoubtedly, this approach has its advantages. However, such an interpretation is incomplete, as it hinders the psychological analysis of avatar identification. We believe that such an analysis is possible within the context of the *"mediation" principle*, where the avatar can be interpreted as a sign, a psychological tool for the formation of virtual identity and the promotion of human psychosocial well-being in the virtual environment.

The works of Russian researchers (Klementyeva, 2024; Rubtsova, 2019; Soldatova, Chigarkova, Ilyukhina, 2024) have outlined a pathway for applying the ideas of cultural-historical psychology to explain the sign-symbolic mediation of identity development processes in the digital environment; however, research on the sign function of the avatar is lacking.

With the present study, we contribute to the existing research concerning the role of the avatar in user identity development and propose to apply a cultural-historical approach for the psychological interpretation of avatar identification.

Carrying on the traditions of cultural-historical psychology, we believe the avatar can be interpreted by extrapolating the attributive characteristics of signs, as generalized in the works of Russian psychologists (Veraksa, 2024; Zavershneva E., van der Veer R. (Ed.), 2018): sociality, mediation, arbitrariness, systemic nature, intentionality, conventionality, and meaningfulness. From this perspective, the *avatar* is presented as a *significant (sign) function of the human user's self-consciousness*, reflecting and forming their virtual identity in the digital environment in a generalized and structured manner for the purpose of generating, storing, processing, and transmitting personally significant information. In other words, as a sign, the avatar functionally *replaces and models* human *identity* in the virtual environment, at the same time serving as a means for its *formation* and self-awareness. Within the sign structure of the avatar, one

can distinguish the material aspect of the avatar and the ideal aspect, which influences identity — the meaning. Identification with the avatar can be viewed as a result of virtual collaboration with avatars of other users (and/or avatars managed by artificial intelligence), during which the avatar becomes "signified" and attached with subjective meaning. The emergent network of meanings and significations of the avatar, we believe, guides the user's identification process in the virtual environment. The transition from the interpsychic to the intrapsychic plane of avatar use is governed by interiorization mechanisms and concerns the *formation of a new type of identity — virtual identity*.

Indirect confirmation of our hypothesis can be found in studies that have substantiated the mediating role of the avatar in mental and behavioral functions: 1) both proximity to the user's self-perception (Yang et al., 2024) and correspondence with the "ideal Other" (Snodgrass et al., 2025; Wang et al., 2024) have been found in avatars; 2) the "Proteus effect" data demonstrate users' tendencies to transfer behaviors that corresponded to avatar characteristics into their natural environment (Coesel, Biancardi, Buisine, 2024).

The study of avatar identification is possible within the framework of examining the process of imbuing the avatar with meaning and significance, in the dialectic of comprehending the meanings and signifying the significations. The primary function of a sign is semiosis, the formation of meanings. The most important place in cultural-historical psychology is given to the study of meanings fixed in language, which generalize and comprehend the "transformed" form of existence of cultural objects and social relations world. An analysis of the significant and connotative meanings of the avatar, with which the user imbues it, will allow for a psychological analysis of the formation of avatar-mediated identity within a system of connections with existential-personal properties. And although an attempt at semantic analysis of avatar identification has been made in modern psychology (Banks, Bowman, 2021; Brown et al., 2024), the interpretation of the obtained results does not involve the meanings of the avatar, and identification with the avatar is conducted within the psychodynamic context of "self-discrepancy."

Thus, numerous attempts to understand the mechanism of user identification with an avatar, and through it, the ways identity and life meaningfulness are formed in the virtual environment, contribute to the rapid accumulation of empirical material that is characterized by multifacetedness and generalization challenges, which makes the problem of the limited research contexts of avatar-mediated identity relevant. A contradiction is evident between the accumulated scientific psychological knowledge about avatar identification and the lack of a conceptual understanding of the sign mediation mechanisms associated with this phenomenon.

Based on the foregoing, the ***purpose of this research*** is to study the sign function of the avatar within the system of connections between virtual identity, avatar identification, and life meaning orientations among internet users.

The research hypothesis is that the significant and connotative meanings of the identification characteristics of the avatar mediate the connections between indicators of virtual identity, avatar identification, and life meaning orientations.

The general hypothesis is further elaborated in the following specific hypotheses:

1) there is an interrelationship between the meanings of the avatar, virtual identity, avatar identification, and life meaning orientations;

2) indicators of the significant and connotative meanings of the avatar mediate the influence of virtual identity on life meaning orientations and avatar identification.

Materials and methods

Sample. 457 internet users aged 18-25 studying at universities in Moscow (n = 257) and Tula (n = 200) participated in the research. The median age was 20 years. Of these: 67,5% (n = 308) were female and 32,5% (n = 149) were male. The sample was randomized.

Procedure. The inventories were submitted remotely and anonymously. Written informed consent was obtained from respondents for their participation in this study. A mixed-methods research plan was employed, combining quantitative and qualitative approaches.

Research tools. The following methods were applied: assessment of virtual identity (Klementyeva, 2024), life meaning orientations (Osin, Kosheleva, 2020), avatar identification (Yang et al., 2024), and avatar identification characteristics (the "Who Am I?" test (Rumyantseva, 2006) with a modified instruction: "You need to give as many answers as possible to one question related to your avatar: What kind of avatar?").

Quantitative data processing was carried out using comparative (t-test and Fisher's *- angular transformation criterion), correlational (Pearson's r-test), and regression (Hayes' process) analysis.

Qualitative data processing (avatar identification characteristics) was conducted using content analysis. 30 K-variables were identified and grouped into 8 categories of significant meanings (significates, *Lat. signi-*

ficata) of identification characteristics: social, communicative, material, physical, activity-based, prospective, reflective, problematic (Rumyantseva, 2006).

Additionally, respondents' answers were classified into two groups based on avatar realism (Miao et al., 2022): 1) unrealistic — 2D images, anime, and static images (45% of participants); 2) realistic — 3D images, visually dynamic images, and anthropomorphic images (55% of participants).

Results

A comparative analysis of the frequency of occurrence of avatar identification characteristics in groups ranked by gender revealed that men more often single out the social characteristic of the avatar ($\varphi^* = 2{,}14$, $p = 0{,}016$), while women emphasize the physical characteristic of the avatar ($\varphi^* = 1{,}71$, $p = 0{,}045$). Furthermore, comparatively lower indicators of physical and reflective avatar characteristics were found among internet users experiencing a moratorium on virtual identity ($\varphi^* \le 2{,}32$, $p \le 0.01$). Pairwise comparisons revealed a preferential use of reflective ($\varphi^* \le 2{,}49$, $p \le 0{,}005$) and physical ($\varphi^* \le 1{,}98$, $p \le 0{,}02$) avatar characteristics compared to other characteristics.

It was also revealed that participants more frequently attribute reflective characteristics to realistic avatars ($\varphi^* = 1{,}91$, $p = 0{,}03$), and physical characteristics to unrealistic ones ($\varphi^* = 1{,}8$, $p = 0{,}04$). The study participants who indicated the use of realistic avatars demonstrated higher levels of avatar identification ($t = 2{,}4$, $p = 0{,}01$) compared to those participants who used unrealistic avatars.

The results of the correlation analysis are given in Table 1. Table 1 only presents the indicators of significant values (significates) of avatar identification characteristics that have relevant correlations.

Based on the correlation analysis data, the predominant use of the physical characteristic of the avatar (avatar's appearance) distinguishes internet users who meaningfully adapt their identity to the virtual environment, identify with their avatar, and also demonstrate clarity of life goals, general meaningfulness of real life, and satisfaction with self-realization. Conversely, the emphasis on the social characteristic of the avatar (avatar's position, role, status, and affiliation with social groups) is characteristic of internet users who are oriented towards a meaningless adaptation to the virtual environment, accompanied by a low meaningfulness of real life, confusion of life goals, and a loss of control over life. Internet users who attribute existential-personal properties to their avatar (reflective identification characteristic of the avatar) tend to identify with their avatar in the virtual environment, while those who imbue their avatar with a communicative characteristic are satisfied with self-realization in the real world. The problematic characteristic of the avatar is inherent in Internet users who avoid interaction in the virtual environment using an avatar, experience difficulties with virtual identification, and are dissatisfied with self-realization. Internet users who use negative connotations of the avatar experience difficulties with life meaning orientations.

Furthermore, a correlation was found between the extent of avatar usage experience and the physical ($r = 0{,}12$, $p = 0{,}01$) and reflective ($r = 0{,}15$, $p = 0{,}003$) characteristics of the avatar, as well as with avatar identification ($r = 0{,}20$, $p < 0{,}001$), and the search for and commitment to virtual identity ($r \le 0{,}14$, $p \le 0{,}004$).

Table 1

Correlation of indicators of virtual identity, life-meaning orientations, avatar identification and avatar identification characteristics (N = 457)

Parameters	Avatar identification characteristics						
	Significants					Connotations	
	С	*К*	*Ф*	*Р*	*П*	+	-
Meaningfulness of commitment of virtual identity	–0,16*	0,03	0,15*	0,05	–0,13*	–0,01	–0,03
In-depth exploration of virtual identity	–0,12*	–0,01	–0,03	–0,01	0,03	–0,01	0,02
Avatar identification	0,06	0,07	0,14*	0,12*	–0,21*	0,14*	0,05
Purpose	–0,18*	0,08	0,13*	0,01	–0,05	0,07	–0,18*
Process	–0,06	0,04	0,06	0,02	–0,02	0,09	–0,20*
Result	–0,05	0,14*	0,13*	0,01	–0,14*	0,08	–0,20*
Locus of control	–0,15*	0,05	0,09	–0,01	–0,06	0,03	–0,08
Overall index of meaningfulness of life	–0,16*	0,08	0,14*	0,01	–0,07	0,09	–0,22*

Note: «*» — correlation is significant at the 0,01 level (two-sided). Avatar identification characteristics: «С» — social, «К» — communicative, «Ф» — physical, «Р» — reflective, «П» — problematic; «+» — positive connotative meanings; «—» — negative connotative meanings.

Table 2 presents the relevant results of the mediation analysis, where the parameters of life meaning orientations and avatar identification are the dependent variables, indicators of virtual identity are predictors, and the connotative and significant values (significates) of avatar identification characteristics are mediators, mediating the effects of the connection between dependent and independent variables.

The results demonstrate a statistically significant indirect effect of influence of indicators of the search for and commitment to virtual identity on life meaning orientations and avatar identification through the indicators of significant and connotative meanings of avatar identification characteristics (social, physical, communicative, and reflective), which validate the proposed hypothesis. Furthermore, there is a statistically significant direct influence of virtual identity on life meaning orientations and avatar identification. In other words, avatar-mediated virtual identity contributes more to the variability of life meaning orientation indicators (purpose in life, outcome of life, and locus of control) compared to *non*-avatar-mediated virtual identity, increasing clarity of life goals and life satisfaction, but decreasing the sense of control over life in the real world.

Discussion of results

This study expands the scope of previous research on avatar identification by offering a new perspective on the connection between internet users and their avatars, a topic explored in foreign psychology, within the framework of L.S. Vygotsky's cultural-historical psychology. We continue the tradition of Russian psychology in studying the mechanism of sign mediation in virtual environments (Rubtsova, 2019; Soldatova, Chigarkova, Ilyukhina, 2024), interpreting the avatar as a sign and analyzing its meanings (significant and connotative).

The study confirmed the hypothesis that the significant and connotative meanings of avatar identification characteristics mediate the interrelation of virtual identity, avatar identification, and life meaning orientations — one of the key indicators of human psychological well-being. This aligns, in general, with the conclusions of previous works (Barabanschikov, Selivanov, 2023; Soldatova, Chigarkova, Ilyukhina, 2024; Banks, Bowman, 2021; M sseler, von Salm-Hoogstraeten, B ffel, 2022). It was found that the meaningful commitment to avatar-mediated identity by internet users contributes to increased clarity of life goals and satisfaction with self-realization. This primarily occurs through attributing

Table 2

Analysis of the effects of avatar-mediated virtual identity on the life-meaning orientations and avatar identification (N = 457)

Dependent variables	Mediators	Quality indicators of the mediation model		
		Total effect	Direct effect	Indirect effect
Predictor – Meaningfulness of commitment of virtual identity				
Purpose ($F = 7{,}2^{***}$; $R^2 = 0{,}11$)	Social significates	b = 0,16 (t = 5,6***)	b = 0,14 (t = 5,0***)	b = 0,02 (t = –2,42*)
	Negative connotations			b = 0,01 (t = –3,47**)
Result ($F = 4{,}9^{***}$; $R^2 = 0{,}09$)	Communicative significates	b = 0,10 (t = 4,43***)	b = 0,08 (t = 4,02***)	b = 0,02 (t = 2,41**)
	Negative connotations			b = 0,01 (t = –4,00***)
Locus of control ($F = 4{,}7^{***}$; $R^2 = 0{,}06$)	Social significates	b = 0,06 (t = 2,89**)	b = 0,04 (t = 2,38*)	b = 0,02 (t = –2,01*)
Avatar identification ($F = 6{,}3^{***}$; $R^2 = 0{,}10$)	Social significates	b = 0,28 (t = 2,92***)	b = 0,26 (t = 4,72***)	b = 0,01 (t=2,01*)
	Reflective significates			b = 0,01 (t = 1,98*)
Predictor – In-depth exploration of virtual identity				
Locus of control ($F = 2{,}8^{**}$; $R^2 = 0{,}05$)	Social significates	b = –0,06 (t = –1,98*)	b = –0,04 (t = –2,12*)	b = 0,01 (t = –2,98**)
	Physical significates			b = 0,01 (t = 2,08*)
Identification with an avatar ($F = 4{,}1^{***}$; $R^2 = 0{,}05$)	Physical significates	b = 0,16 (t = 3,00**)	b = 0,18 (t = 3,11**)	b = 0,01 (t = 2,00*)
	Reflective significates			b = 0,01 (t = 2,12*)

Note: «*» — $p < 0{,}05$; «**» — $p < 0{,}01$; «**» — $p < 0{,}001$.

significant meanings of social, physical, and reflective identification characteristics to their avatars. Negative connotations reduce the effect of the positive influence of avatar-mediated identity on the meaningfulness of life in the future and the past. Apparently, the semantic space of avatar meanings formed in this manner, within the dialectic of "external-internal" relationships, facilitates the transition from *sociocultural* manipulation of the avatar as a mediator (or tool) in interactions between users (e.g., for role-playing or representation in social networks) to an *existential-personal* use of the avatar within the new "self-avatar" psychological system, where the avatar embodies the user's identity. Of interest in this context is the revealed reduction in the conscious sense of control over life and behavior among young internet users with avatar-mediated virtual identity, which is likely caused by the "decarnation" of the physical environment, increased uncertainty of the virtual environment and dependence on technical avatar settings (degree of avatar realism), and reduced freedom of choice due to the limited conditions of the virtual environment.

The positive effect of influence, as we believe, is due to the mechanism of sign mediation within the artificial system of *"identity — avatar (sign) — meaning of life,"* which creates new sociocultural connections between functions where identity dominates. However, the limited technical characteristics of the avatar pose a barrier to further psychological mediation by the avatar-as-sign, hinder the flexibility of conscious control over behavior and, more broadly, life in general, forcing the user to adapt the "identity — *avatar (sign)* — meaning of life" system to the avatar's capabilities and limitations. In this case, it is the avatar, not the identity, that assumes the dominant function. The difficulties in self-regulation arising in this artificial system, in our opinion, are one of the reasons for the correlation between psychosocial ill-being and problematic avatar identification observed in modern research (Brown et al., 2024; Mancini et al., 2024; M ller, Bonnaire, 2021; Yang et al., 2024).

The study revealed that the frequency of social, physical, and reflective identification characteristics attributed to one's avatar reflects the dependence of the avatar's significant function on gender, usage experience, and virtual identity status. The obtained data clarify the conclusions of contemporary researchers regarding the higher engagement of men in avatar-mediated experiences (Lemenager et al., 2020; Wang et al., 2024; Zimmermann, Wehler, Kaspar, 2023): novice male users who experience difficulties describing their avatar's appearance and attributing existential-personal characteristics to it more often undergo an identity crisis than women.

Conclusion

The study results allow us to conclude a connection between avatar-mediated virtual identity and life meaning orientations. The signification of physical, reflective (existential-personal), and social identification characteristics of the avatar is associated with a preadaptive pathway of virtual identity formation, accompanying the increased satisfaction with self-realization and clarity of life goals. However, avatar semiosis not only expands the opportunities for successful self-realization and efficient goal-setting in the virtual environment but also poses to individuals an existential-personal challenge of self-regulation and self-determination within the artificially created "self-avatar" system. Overcoming this challenge faces barriers related to the avatar's significant and technical characteristics. Our findings regarding the role of the avatar's significant function are relevant for future psychological research on identity within the metaverse, where human interaction is mediated by avatars, and the processes of existential-personal human development are dependent on digital technologies. The research materials can be used in the development of new methods for applying avatar-mediated technologies to foster the psychosocial well-being of young users.

Limitations. The limitations are related to the sampling and the research plan. Firstly, no conclusions can be drawn about the changes in the relationship between avatar-mediated identity and life-meaning orientations over time. Secondly, the limitation arising from the sampling based on socio-demographic and territorial characteristics does not allow for broad generalizations of the results.

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Victoriya I. Ivanova — annotation, writing and design of the manuscript; application of statistical, mathematical and other methods for data analysis; conducting the study; data collection and analysis.

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The authors declare no conflict of interest.

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Научная статья | Original paper

Overcoming the sign naturalization in learning programming and working in information systems

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Abstract

Context and relevance. The constructionist approach proposed by S. Papert is currently dominant in teaching students programming, including implemented in educational environments such as Scratch and LEGO Mindstorms. This corresponds to the evolution of digital human-machine systems, which, along with their popularity and focus on untrained users, implement trial and error as a leading method and are not aimed at student development. **Objective.** The goal is to consider the phenomenon of sign naturalization in learning programming. **Hypothesis.** An approach to overcoming the phenomenon of sign naturalization involves solving practical problems while modeling the original relations of the mastered computational system based on a specific programming language. **Methods and materials.** This theoretical study is based on the principles of cognitive and activity-based approach, thinking and the ideas of developmental education by V.V. Davydov, V.V. Rubtsov, and Y.V. Gromyko. The article examines the history of the issue and modern scientific ideas about overcoming sign naturalization when working within information systems, including the organization of modeling activities based on game- and educational-based situations using modern cyber-physical systems and environments. **Results.** The subject of modeling is the relationship of a notional machine to a programmable, regulated system of automated material processes in various practical contexts. **Conclusions.** The approach considered in the study being researched and implemented in the educational process makes it possible to build an alternative environment for the development of students' thinking when working in digital environments and learning programming.

Keywords: sign naturalization, constructionism, modeling, cognitive and activity-based approach, thinking, operations in digital system, programming, developmental education, reflection, human-machine systems

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Преодоление знаковой натурализации при обучении школьников программированию и работе в информационных системах

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Резюме

Контекст и актуальность. Предложенный С. Пейпертом конструкционистский подход в настоящее время является доминирующим при обучении школьников программированию, в том числе реализован в таких образовательных средах, как Scratch и LEGO Mindstorms. Это соответствует эволюции цифровых человеко-машинных систем, которые вместе с популярностью и ориентацией на неподготовленных пользователей реализуют в качестве ведущего метод проб и ошибок и не направлены на развитие учащихся. **Цель**. Рассмотреть явление знаковой натурализации при обучении работе в информационных системах и возможность его преодоления. **Гипотеза**. Подходом к преодолению знаковой натурализации учащимися может стать моделирование исходного отношения осваиваемой системы программируемых вычислений на основе конкретного языка программирования. **Методы и материалы**. Данная теоретическая статья опирается на принципы мыследеятельностной педагогики и идеи развивающего образования В.В. Давыдова, В.В. Рубцова, Ю.В. Громыко. В статье рассматриваются история вопроса и современные научные представления о преодолении знаковой натурализации при работе в информационных системах, в том числе посредством организации деятельности моделирования на материале игровых и учебных ситуаций с использованием современных киберфизических систем и сред. **Результаты.** Предметом моделирования становится отношение идеального компьютера (notional machine) к программируемой, регулируемой системе автоматизированных материальных процессов в разных практических контекстах. **Выводы**. Рассмотренный в статье подход при последующем исследовании, реализации и внедрении в образовательный процесс дает возможность выстроить альтернативную среду развития мышления учащихся при работе в цифровых средах и обучении программированию.

Ключевые слова: знаковая натурализация, конструкционизм, моделирование, мыследеятельностный подход, мышление, операции в цифровой системе, программирование, развивающее образование, рефлексия, человеко-машинные системы

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Introduction

Programming has been taught in schools for more than half a century. The emphasis has shifted over time, but the focus has always been on introducing students to the world of digital systems and teaching them how to use digital technologies. Soviet academician A.P. Ershov, one of the founders of computer science education in USSR, wrote about programming as a "universal second literacy" in the early 1980s — even then, computers and programming were seen as a way to enhance children's cognitive development (Ershov, 1983). The world-famous researcher and advocate of teaching children programming, Seymour Papert, has formulated the following educational principle (Papert, 1980): the way we teach not only programming but also other subjects must change. Instead of providing students with ready-made knowledge, they should be encouraged to build their own understanding through independent exploration. A programmable computer can be an invaluable tool in this process.

Papert's pedagogical innovation, *constructionism*, was a response to the traditional approach to teaching programming, which he called "instructionism". This approach involves learning through teacher-led instructions. Instead, Papert proposed creating situations in which children could independently construct new knowledge. To study the processes of child development, Papert and his colleagues from the Massachusetts Institute of Technology created the LOGO programming language. This language allows children to draw figures on a computer screen by programming the movement of a virtual turtle.

In the 1980s and 1990s, researchers both abroad and in Russia showed that Papert's approach to teaching programming and computer science had limitations (Pea et al., 1985), as well as in the broader context of child development (Davydov, Rubtsov, 1990). However, this does not diminish the revolution that his approach has made in educational psychology. It provides a unique example of creating conditions for a child's independent learning activities. The way Papert suggested working and learning on a computer is more like a game or a *bricolage*, rather than a systematic learning of a tool (Turkle, Papert, 1990).

Despite the skepticism of many researchers and educators, this technique has been continued in school LEGO robotics (Resnik et al., 1988) and programming in visual environments. The most popular of these is Scratch[1], which has become ubiquitous. Often, elementary school students' first steps in programming begin with Scratch or LEGO Mindstorms robots. From 2022, in Russia, analogues of these products flooded schools (Ovsyannikov et al., 2023). Constructionism pedagogy also finds continuation in "fabs" — digital production environments — through the creation of material embodiments of digital models (LaParde, Lassiter, 2023).

The popularity of constructionism is not a coincidence and is based on the evolution of computers and the way users interact with them. Along with the rise of the mass culture of consumer society and the increasing popularity of digital devices, there has been a decrease in the demand for specialized knowledge and computer science background among users. This is not without influence from Papert's ideas, as independent user exploration through an accessible interface and trial-and-error actions have become the primary mode of interaction. The motto *"Don't Make the User Think"* has been widely adopted by digital system interface designers for over 30 years (Krug, 2000).

An analysis of the development of operating systems reveals that users of modern computers and smartphones have been offered a limited range of specific actions or *procedures*, allowing them to perform only those actions prescribed by the system developer (Kouryachy, 2004). These *procedural* human-computer systems rely on independent testing based on a graphical interface and reinforcement of correct user behavior when manipulating virtual objects. This reduces the need for prior knowledge and self-learning is based on a constructionism approach.

From a psychological perspective, this type of system provides the user with a limited range of operations using fixed sign systems designed to address specific practical tasks. At the same time, the reconstruction of the underlying principles of sign systems and the proposed operations remain outside the user's scope, and the user often loses sight of the need to conceptualize and model the subject matter of the objects they are working with (Davydov, Rubtsov, 1990).

The idea that schools should train literate consumers has been discussed many times in pedagogical communities and widely. Modern digital technologies can only help such schools, as the need to teach children specifically how to use these programs is decreasing every year. Children are in a digital environment from birth and, as "natives", they naturally master new interfaces and sort through available operations (Palfrey, Gasser, 2011). At the same time, it becomes increasingly difficult for them to avoid the patterns and limitations of thinking that modern procedural systems hide (Fedoseev, 2013). The consequences of this are epistemological relativism, where *feedback* takes the place of *error* (Turkle, Parept, 1990), and the spread of phenomena like "technomagic" among users — forms of ignorance where digital systems are no longer seen as knowable control devices.

In contrast to the consumer-oriented approach, prominent educators, including Papert, Ershov, and V.V. Davydov, argued that schools should focus on developing children's thinking. This perspective is reflected in thought-activity pedagogy and the vision for the future of education (Gromyko, Rubtsov, Margolis, 2020). Building on Davydov's ideas, Russian educators and psychologists have developed requirements for computer-assisted learning technologies that prioritize the principle of computer modeling of activity (Davydov, Rubtsov, 1990) and the development of the culture of thinking (Zhegalin, 2007).

Is it possible to maintain the student's subjectivity in education, characteristic of constructionist pedagogy, while also overcoming the limitations of modern digital systems? How can we move beyond the dichotomy between the formal-logical instructionist approach to teaching programming and the limitations of constructionism based on empirical thinking? For example, by working with ideal models? Can we shift from rote memorization to modeling-based learning using programming and digital systems, similar to V.V. Davydov's work on the formation of the concept of number or A.A. Ustilovskaya's work with geometric objects (Ustilovskaya, 2008)?

This article explores the theoretical foundations of this issue and proposes a potential approach to address-

[1] https://scratch.mit.edu

ing the limitations of constructionism in the digital learning of schoolchildren.

Seymour Papert's pedagogical approach

In the 1980s, the primary method of working on a computer involved programming using text-based languages, which assumed the performing specific operations through the command line. This form of programming required a strong mathematical background, including an understanding of basic algebra (variables and operations), functional analysis (functions and recursion), and formal logic for theorem proving (logical conditions and sequential program execution), among other concepts. Due to these requirements, the number of students who successfully mastered computer science was limited. Seymour Papert, in his humanitarian effort to promote *computer literacy for the masses*, introduced the concept of *constructionism*[2] in his book "Mindstorms" (Papert, 1980). Developing the ideas of Jean Piaget's constructivism, Seymour Papert emphasized the importance of students' simple interactions with virtual objects and their creation of new objects. This allowed students to explore the virtual environment and develop more complex operations. Through this process, students constructed the subject of their work and gained knowledge about it.

This was made possible thanks to Papert's key pedagogical technique, which was implemented in the LOGO visual programming environment — visual construction. This technique ensures a direct representation of the commands in the programming language to the results of their execution (see Fig. 1), in the form of a trajectory drawn by the turtle on the screen following the commands in the program.

The user could execute commands and see the changes on the screen at the same time. This approach allowed the child to create his own learning process. Over time, he could add more complex operations to elementary ones and form various concepts of structural programming. He could also learn the basics of *imperative programming*, algorithmic and constructive thinking.

The LOGO language offered by Papert provided new opportunities for teachers. They could give children the possibility to create their own virtual world and designate specific actions for the turtle in the program using *words*. Although the object was represented on the computer screen in a material way, this approach helped children reach *ideal meanings* about programming. The 'TRIANGLE' command, created by the child and consisting of simpler operations for drawing segments, reproduced a triangle on the computer screen according to clear and strict mathematical rules. In this way, symbolic representations in the program code and on the screen began to represent the key characteristics of ideal objects (see Fig. 2). Building on this *elementary step* of independently constructing and naming objects, Papert proposed building more complex ideal objects through induction.

The constructionist approach implemented in LOGO was developed through further experimental pedagogical practices. M. Beynon proposed expanding work with graphic objects to include more complex operations for constructing dynamic objects, in order to create an ideal representation of *processes* (Beynon, 2017). As part of creating tangible objects in digital production spaces called "fabs", researchers from the Massachusetts Institute of Technology suggested introducing primary ideas about *ontologies* to schoolchildren (LaParde, Lassiter, 2023).

Nevertheless, the widespread use of LOGO in schools has not only aroused enthusiasm among teachers, but also sparked criticism. This criticism has pointed out, among other things, the limitations of the constructionism approach to teaching programming and the development of programming abilities (Pea et al., 1985). The main areas of concern include the lack of influence of LOGO on the development of basic programmer skills such as planning and problem-solving, as well as difficulties transferring programming knowledge and skills to other learning contexts, including professional settings.

However, one of the most significant aspects is the crucial role of the teacher in conducting these classes. S. Papert emphasized the importance of training teachers who can guide children as they embark on the journey of constructing new knowledge. Such aspects of the

Fig. 1. The main relation of the constructionist approach by S. Papert

[2] It is important not to confuse S. Papert's constructionism with J. Piaget's constructivism.

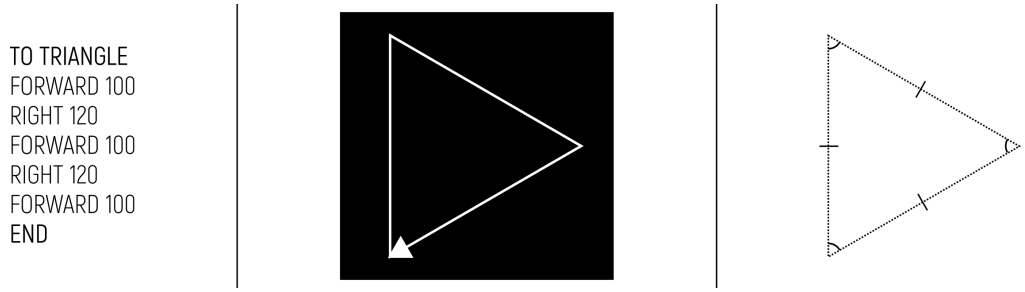

Fig 2. The construction of a triangle and the ideal characteristics of the geometrical object

teacher's work as comparing the ideal content with the context of the visual environment and working with an ideal representation of a computer system are highlighted. Designing one's own actions based on elementary operations when working with a specific subject area and practical task involves students entering the modeling process, which puts high demands on both the digital system and the teacher (Rubtsov, Margolis, Pazhitnov, 1987).

Today, Paper's ideas have been implemented not only in elementary schools, but also in secondary schools, where students use the Scratch visual programming environment to create cartoons, simple video games, as well as the LEGO Mindstorms plastic robots, which they program to perform simple actions, such as riding a line (Resnick et al., 1988). The Scratch environment implements the same basic principle as the LOGO programming language, but with a more modern graphical interface (see Fig. 3). Instead of *writing code*, students *compose programs* by selecting and combining existing blocks. This makes the programming process easier and more intuitive for students. From a psychological perspective, this change was fundamental. Instead of thinking about and introducing new concepts based on existing ones (as in the example of drawing a triangle, which involved three movements and turns), students started to visually combine symbols that represent individual operations on objects into a specific sign system of words, icons, and numerical parameters.

This interface is designed in the tradition of modern digital systems, where users work with graphical objects and select and move them using the mouse. For children who are accustomed to graphical and tactile interfaces on computer and smartphone screens from a young age, this method of creating programs may be more appealing.

However, the issue of *sign naturalization*, which arises from operating with objects without considering the underlying structure of actions and essential ideal characteristics of these objects, requires more detailed examination (Ustilovskaya, 2008). This is prompted, among other factors, by the visually rich interfaces that we encounter in modern information systems. Let's take a closer look at this phenomenon of sign naturalization when working with these systems.

Sign naturalization in modern information systems

The phenomenon of sign naturalization is studied in educational psychology as a way to distinguish between

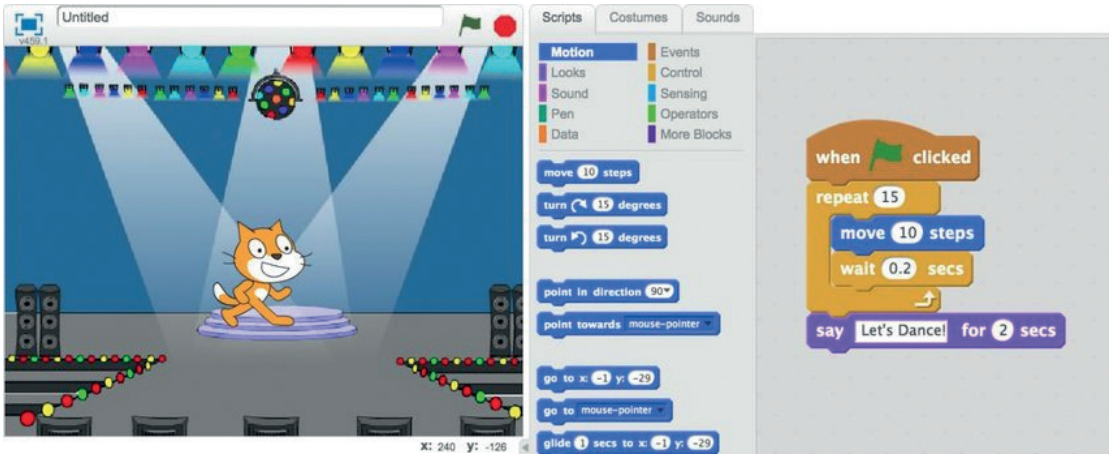

Fig. 3. The user interface of Scratch: we see similar connection between the program and its result in a rich visual environment

the development of specific skills in solving practical problems and the student's ability to restore the initial relationships and ideal characteristics underlying these skills (Davydov, 1996; Medvedev, 2010). When working in a given system of skills, naturalization (or embodiment) occurs if there is no need to reconstruct the structure, laws, and ideal representations associated with those skills. In other words, when working in sign systems, students may operate on signs without having to restore their original meaning.

In a pedagogical context, naturalization itself may be the first step in overcoming *verbalization*, as shown by the example of students studying geometry (Ustilovskaya, 2008). Students must first perform substantive actions with drawings in order to move beyond simple pronunciation. However, in order to develop generalized methods of action, teachers must specifically organize the process of overcoming naturalization in order to achieve the ideal relationships that characterize geometric objects.

At the moment, when it comes to working with information systems, the problem of verbalization is not as significant[3], because even novice users can perform simple operations in the system, which lead to visible changes. However, due to the richness of the interface and the variety of plots (for example, in Scratch or LEGO), children may fall into the trap of sign naturalization: objects on the screen *appear to be real objects* — they begin to be perceived as they look, without considering the ideal content behind them.

Sign naturalization is a common phenomenon in modern information systems. Since the advent of the LOGO, there has been a revolution in user interaction with systems. Most end-user systems, whether they are personal computers or smartphones, can be described as *procedural* (Kouryachy, 2008). This concerns the very principle of how users operate them (see Fig. 4). If for a professional programmer, computer programming is a set of tools based on which they design the environment necessary to solve specific problems, then users in a procedural system can only solve tasks that are covered by a list of possible operations in the system. These operations are embedded in the interface and can be combined to perform certain actions. The composition of such systems is not transparent to users, so their behavior is predictable only when they perform standard actions.

An interesting effect of using these systems is that a given set of procedures often not only determines how to solve a problem, but also significantly influences the user's initial task statement — the external task becomes adapted to the capabilities of the system. For example, when using a popular text editor, the user edits a document at the level of its *external representation*, as if it were created on paper. However, the user often overlooks many unique features of digital documents, such as the separation of information, the various forms of presentation, and the use of automated tools like numbering bibliographies and working with dictionaries.

A striking feature of modern information systems with graphical interface is the use of special icons that resemble real-world objects. These icons allow users to perform operations without relying on their knowledge of the system's inner workings. For example, a desktop appears on the screen with "folders" and "documents" that can be stored, sent to the cloud, or moved to "trash". These actions are familiar to users who have experience with real-world files and folders.

Sign naturalization allows you to perform available operations independently and form simple actions from them. You can see the immediate result of your steps and transform objects. This is useful for simple operations that lead to clear results, as well as for learning the available operations in a system. This corresponds to the idea of constructionism. It is not surprising that designers of

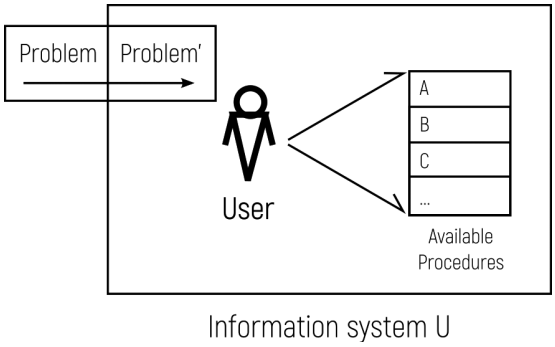

Fig. 4. The characteristics of user experience in a procedural information system

[3] Due to the increasing popularity of dialog-based interfaces based on artificial intelligence tools, and their partial replacement of graphical interfaces, the issue of verbalization in information systems may become more relevant.

commercial products have used this technique to create interfaces that are easy to understand and use. They create a sign naturalization for users, allowing them to quickly master and use the product. This speeds up user actions and leads to automatism (Krug, 2000).

From a psychological perspective, some important limitations of procedural systems based on sign naturalization mechanisms can be noted. This includes the user's disclaimer of responsibility for their actions — anything can go wrong: faulty hardware, buggy programs, or incompetent programmers. The widespread adoption of procedural systems is linked to commercialization and the transformation of users into *consumers* — the consumer receives a finished product and doesn't have to deal with issues caused, among other things, by their own mistakes.

Another limitation is related to the potential for developing the user's thinking. When working with ready-made procedures, templates, and wizards, users may fail to understand the limitations of the system and the modeling or design activities that are characteristic of instrumental use by programmers. M. Wertheimer has also noted how the habit of consistently acting step by step according to a learned pattern hinders the development of thinking (Wertheimer, 1987). It is also possible to detect limitations in users' ability to detect ideal representations and retain these representations when using interfaces typical of modern procedural systems (Fedoseev, 2013).

Sign naturalization is a serious limitation in teaching programming. Due to the immutability and procedural nature of these systems, as well as the inability to reconfigure or change the activity model, users and novice programmers are limited in their ability to select the ideal computer (or *notional machine*) for their needs. For example, the turtle in Seymour Papert's LOGO language and the Scratch language cannot be modified by users, and these systems are not designed to allow users to "look under the hood" and understand the internal workings of the system. Researchers have identified the allocation of a notional machine as a key pedagogical goal when learning programming methods (Munasinghe et al., 2023; Papert, 1980; Sorva, 2013). However, this goal is often not achievable due to the limitations of current procedural systems.

V.V. Davydov, V.V. Rubtsov and other researchers (Davydov, Rubtsov, 1990) analyzed the approach of S. Papert and found that in his pedagogical system, the main content that students master is reduced to performing operations specified by the organization of a computer system. This corresponds to operative control in Davydov's developmental education. Other learning activities, such as highlighting the initial relationships of the system, modeling, and transforming models, are less represented in Papert's system. Furthermore, following the approach of J. Piaget, Papert equates the operational form of action and the content of the action, which have a definite meaning for students. According to Davydov and Rubtsov (Davidov, Rubtsov, 1990), if we take into account the interchangeability of educational actions and operations, it becomes very difficult to define the composition of operations unambiguously.

The S. Papert's game-pedagogical approach is criticized by some researchers and developers of educational video games, for example, J. Bogost (Bogost, 2010). The student, working according to the S. Papert system, takes for granted the presented image of objects and a set of operations in a specific computer system. In this learning system, the student is not put in a situation of building a sign relationship and creating models of the essential characteristics of the computing system used in a given programming language. It is this type of model that may be the most fundamental and important, since it allows students to answer questions about why they use programmable computing systems and how they interfere with the regulation of automated physical processes. That is, computer-based programmable computing systems could become a means of organizing student activities.

Thus, when working with information systems and teaching programming, it is necessary to use tools and pedagogical practices to overcome the sign naturalization and create situations that promote students' thinking development. Let us take a closer look at a possible approach to solving this problem based on the works of V.V. Davydov, V.V. Rubtsov, and Yu.V. Gromyko (Gromyko, Prosekin, 2024; Gromyko et al., 2020).

Overcoming the sign naturalization

In the works of Russian scholars V.V. Davydov, V.V. Rubtsov, and Yu.V. Gromyko, the process of overcoming limitations of constructionism and sign naturalization is linked to the students' actions of modeling. Computer modeling of activity can create conditions for identifying and highlighting essential characteristics of objects (Davydov, Rubtsov, 1990). By using specific actions and tools, overcoming sign naturalization forms a fundamental step toward shaping children's thinking (Ustilovskaya, 2008). This requires going beyond the limits of excessive illustrativity and persuasion in order to reveal mental structures embedded within language (Gromyko, 2023).

V.V. Davydov developed an educational system that also encourages students to acquire knowledge "in a

ready-made form", as S. Papert argued. However, unlike Papert's constructionism, Davydov's approach is based on the use of specific activities that allow students to understand the origins of knowledge, such as the concept of number and phoneme. To master these concepts, students must engage in hands-on activities that help them understand their origins. Davydov developed a methodological system for the formation of a primary school student's educational activity. This system consists of independent learning activities that the student performs: specific subject actions to identify the initial relationship of the system being studied, actions to model this relationship, actions to transform the model in order to study this relationship, solving specific problems based on the development of a general solution method, and actions to control and evaluate the development of this general method for solving learning problems. Through these educational activities, young students learn the content of a concept.

Overcoming sign naturalization is possible by identifying the essential characteristics of an object and *constructing proper sign systems* that define its ideal representation within the framework of a human-machine activity system. This process has been studied by Russian psychologists in the context of forming a generalized mode of action among schoolchildren through students' independent model construction as a result of cyclic movement from objective actions to ideal representations by introducing new symbols and words (Davydov, Andronov, 1997). L.V. Bertsfai's (Davydov, 1996) and A.M. Medvedev's (Medvedev, 2010) experiments consider the process of transition from mastering individual operations to mastering generalized abilities through the formation of students' own sign representations. By applying this approach to working with an information system, students can recreate the ideal scenario of activity in which a programmed system is used. This allows them to discover the limitations of existing models or propose their own solutions.

From the point of view of thought-activity pedagogy, theory and practice of developmental education, the student should be given the task of modeling the initial relationship of the mastered system of programmable computing. In this case, the aim of such modeling is the relationship of a *notional machine* to a programmable, regulated system of automated material processes in various practical contexts. It is this form of modeling that will allow the student to transform *computational thinking* (Grover, Pea, 2013) into a means of working with an activity system that includes a computer. Such modeling makes it possible to turn signs into the means of expression. For instance, the focus of work in a programming game should not be so much on constructing programs from pre-built blocks or elements of a programming language. Rather, it should be on understanding the principles that the developer has laid down in such a framework, discovering the modeling relationships in a given programming language, and exploring its limitations. Additionally, it is important to go beyond these principles when tackling more complex practical problems. This includes creating new and more advanced models.

This approach can also benefit from the use of specialized tools, such as simulation modeling environments (Zhegalin, 2007) and agent-based modeling systems within the framework of *the digital-cognitive approach* (Gromyko, 2023). Additionally, artificial intelligence systems and cyber-physical systems have great potential for modeling education, as they are associated with addressing uncertainties at the intersection of deterministic digital systems and stochastic physical realities. Working with cyber-physical systems that involve both digital and physical processes offers a more comprehensive understanding of modeling. These systems form the foundation for a new meta-disciplinary field known as activity-based cyberphysics, which is currently being developed in Russia through the National Cyber-physical Platform (Fedoseev, 2023), based on a network of technology communities (Andryushkov, 2023). Working in these systems involves students directly participating in the creation of a model of the desired system, and only then moving on to creating a program (process management or digital simulation) based on that model.

Speaking about the exceptional significance of the principles proposed within the framework of constructionism for shaping the educational subjectivity of schoolchildren and their autonomous learning activities in situations organized by teachers, it is worth noting the great potential of play-based learning forms (Fedoseev et al., 2025; Bogost, 2010), especially when involving participants in complex activities such as research activity (Fedoseev, Vdovenko, 2014). Integrating game tools that simulate and organize reflective communication and student engagement can be a significant step towards implementing the pedagogical approaches outlined in this article.

Conclusion

The article discusses the issue of sign naturalization in teaching programming and work with information systems in general. This issue has become particularly relevant due to the widespread transition from tradi-

tional teaching methods to constructionism, proposed by S. Papert, and implemented in modern software and educational environments such as Scratch, as well as in widely used information systems.

The approach discussed in the article, which aims to overcome the sign naturalization and is associated with the restoration of the original modeling relationship in the system, makes it possible to create an alternative environment for student thinking development when working in digital environments and learning programming. When implemented in the educational process, this approach can help to put into practice ideas from *the school of the future*, which are based on the development of student ways of thinking, communication, and action through immersion in design, research, and other leading forms of cultural activity.

In order to identify the psychological mechanisms for overcoming the sign naturalization of modern digital systems and environments, and to create conditions for implementing appropriate pedagogical practices in junior and secondary schools, further psychological and pedagogical research is needed. This includes experimental confirmations of certain approaches outlined in this article.

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Peculiarities of personal development of students in inclusive educational environment

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Abstract

Context and relevance. The educational environment of a modern school is characterized by a variety of special educational needs of students. A condition for obtaining quality education in a situation of diversity is psychological assistance to all students who need it, aimed at developing their personality. An important indicator of the personal development of a primary school student is his or her self-assessment, which can indirectly indicate the adequacy of the conditions created in the educational organization for the development of the child as a subject of activity and interpersonal relationships. **Objective.** The aim is to identify the features of self-assessment as an important indicator of the personal development of primary school students with special educational needs and normatively developing peers within the context of joint education in an inclusive educational environment. **Hypothesis.** The personal development of different categories of primary school students is characterized by the features of self-esteem and the level of aspirations, which should be taken into account when providing psychological assistance in an inclusive educational organization. **Methods and materials.** The study involved 1713 fourth-grade students (aged 10 to 11 years) from 55 inclusive schools in 6 regions of the Russian Federation. The Dembo-Rubinstein method (modified by A.M. Prikhozhan) was used to study self-assessment and the level of aspirations; the following statistical methods were applied: the Shapiro-Wilk test was used to assess the normality of distributions, and the Kruskal-Wallis nonparametric ANOVA with a post hoc assessment was applied to compare the distributions of self-assessment indicators. **Results.** Significant differences in self-assessment indicators were revealed between different categories of students (students with normal development, students with disabilities, students with a non-native Russian language, gifted students) of primary school age in an inclusive educational environment. In general, in the sample of inclusive schools, a favorable variant of personal development prevails among primary school students (74%). Every fourth junior schoolchild is at risk of developing an unfavorable variant of personal development, which requires psychological assistance. The greatest risk of an unfavorable variant of development is observed in students with disabilities (34%), demonstrating low self-assessment. **Conclusions.** As shown in the study, self-assessment as an indicator of age-related personality development of a junior schoolchild varies among students with different special educational needs. This necessitates the development of various models for providing psychological assistance to different categories of children with special educational needs in an inclusive educational environment.

Keywords: primary school age, special educational needs, self-esteem, level of aspirations, inclusive educational environment, personal development

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Особенности личностного развития обучающихся в инклюзивной образовательной среде

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Резюме

Контекст и актуальность. Образовательная среда современной школы характеризуется разнообразием особых образовательных потребностей обучающихся. Условием получения качественного образования в ситуации разнообразия является психологическая помощь всем нуждающимся в ней обучающимся, направленная на развитие их личности. Важным показателем личностного развития младшего школьника является его самооценка, которая может косвенно свидетельствовать об адекватности созданных в образовательной организации условий для развития ребенка как субъекта деятельности и межличностных отношений. **Цель**. Выявить особенности самооценки как важного показателя личностного развития младших школьников с особыми образовательными потребностями и нормативно развивающихся сверстников в условиях совместного обучения в инклюзивной образовательной среде. **Гипотеза**. Личностное развитие разных категорий обучающихся младшего школьного возраста характеризуется особенностями самооценки и уровнем притязаний, которые следует учитывать при оказании психологической помощи в инклюзивной образовательной организации. **Методы и материалы**. В исследовании приняли участие 1713 обучающихся 4-х классов (от 10 до 11 лет) из 55 инклюзивных школ 6 регионов Российской Федерации. Для исследования самооценки и уровня притязаний была использована методика Дембо—Рубинштейн (модификация А.М. Прихожан); применены статистические методы: для оценки нормальности распределений — тест Шапиро—Уилка, для сравнения распределения показателей самооценки — непараметрический дисперсионный анализ, по Краскелу—Уоллису с апостериорной оценкой. **Результаты.** Выявлены значимые различия в показателях самооценки между различными категориями обучающихся (ученики с нормативным развитием, обучающиеся с ОВЗ, с неродным русским языком, одаренные обучающиеся) младшего школьного возраста в инклюзивной образовательной среде. В целом в выборке инклюзивных школ у младших школьников преобладает благоприятный вариант личностного развития (74%). Каждый четвертый младший школьник находится в зоне риска по формированию неблагоприятного варианта личностного развития, нуждается в психологической помощи. Наибольший риск неблагоприятного варианта развития наблюдается у обучающихся с ограниченными возможностями здоровья (34%), демонстрирующих низкую самооценку. **Выводы**. Как показано в работе, самооценка в качестве показателя возрастного развития личности младшего школьника различается у обучающихся с различными особыми образовательными потребностями, что требует разработки различных моделей оказания психологической помощи разным категориям детей с особыми образовательными потребностями в инклюзивной образовательной среде.

Ключевые слова: младший школьный возраст, особые образовательные потребности, самооценка, уровень притязаний, инклюзивная образовательная среда, личностное развитие

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Introduction

The contemporary educational environment is marked by growing diversity in students' learning needs and developmental profiles. These differences arise from disabilities, linguistic backgrounds, giftedness, and adverse life circumstances Under such conditions, children's personal development acquires distinctive features that must be considered when designing psychological support programs (Decree of the Ministry of Education of Russia No. R-193, 2020). When students encounter difficulties in learning or social participation, successful inclusion requires systematic psychological and pedagogical support—one of the core functions of school-based psychological services (Levchenko et al., 2016; Babkina, 2023; Samsonova et al., 2023). These principles are codified in Federal Law No. 273-FZ (2012) and the professional standard for educational psychologists (Order No. 514n, 2015). Services for providing psychological assistance must, therefore, account for both educational needs and the age-related characteristics of students.

Primary school age is a period of significant personal transformation. According to Vygotsky (2009), self-esteem at this age becomes a generalized, stable, and differentiated attitude toward oneself (Vygotsky, 2009, p. 203). Self-esteem serves as a crucial indicator of a child's development as an agent of activity and a key component of personal self-regulation. It mediates the child's self-attitude and integrates their experiences. Learning activity—the leading activity of primary school age—plays a decisive role in shaping children's evaluative relations (Gutsu et al., 2023). Evaluative processes grow increasingly sophisticated and rely on formal academic outcomes, peer comparison, and parental feedback (Borozdina, 2011; Fomina et al., 2022).

An inclusive educational environment aims to ensure support, acceptance, and meaningful participation for all students. Under these conditions, positive changes in self-esteem and aspirations may be expected, making these indicators sensitive indirect markers of environmental adequacy.

Based on this rationale, *the aim* of this article is to identify the specific features of self-esteem and aspiration as key indicators of the age-related personal development of primary school children with diverse educational needs (DEN) and their typically developing peers in inclusive settings.

Hypothesis: In inclusive settings, the personal development of different categories of primary school-age students is characterized by distinct features of self-esteem and aspiration, which must be considered when designing psychological assistance.

Materials and methods

Methodological framework: The study is grounded in the sociocultural theory of L.S. Vygotsky, which posits that psychological development is shaped by social interaction, cultural tools, and communication. This framework aligns with contemporary research emphasizing the socio-historical foundations of development, continuity between typical and atypical pathways, and the central role of agency. We also draw on studies of inclusive educational environments and their influence on personal development (Bystrova, 2022; Konokotin, 2022; Williams et al., 2024).

Participants: The study involved 55 inclusive schools, selected through regional initiatives to pilot an inclusive school model developed by the Ministry of Education of Russia (participating regions included Kaliningrad Oblast, Stavropol Krai, Lipetsk Oblast, Krasnoyarsk Krai, Khanty-Mansi Autonomous Okrug, and the Donetsk People's Republic). A total of 1713 fourth-grade students, aged between 10 and 11 years at the time of assessment, participated in the study. The sample included students both with DEN and with typical development (see Table 1). The category of students with disabilities was not further differentiated in this study. As demonstrated in our prior work from 2022, based on an analysis of 3054 randomly selected schools from 82 regions of Russia, among students with SEN, those with intellectual disabilities and developmental delays significantly predominated, constituting 21,23% and 60,23%, respectively (Alekhina et al., 2024). There is no reason to believe that the sample in the present study deviates substantially from this established trend. Schools assigned students to DEN categories other than disabilities independently, based on their own criteria. Proportions of students with DEN were calculated from frequency data provided by the schools for each DEN category.

The research was conducted at the beginning of the fourth grade, when the approximate age of primary school children is about 10 years (between 10 and 11). This age marks the formation of self-esteem as a key developmental acquisition of the primary school period (Borozdina, 2011).

For the subsequent analysis, student groups with DEN that were significantly represented in the overall research sample were selected: typically developing students (79,98%), students with disabilities (7,71%),

Table 1

Number of students of different categories with special educational needs in schools which participated in the study (N = 1713)

Categories of students with special educational needs	Fourth grade	
	N	%
Total students	1713	100
Normotypical students	1370	79,98
Students with disabilities	132	7,71
Students with deviant behavior	38	2,22
Students from orphans	2	0,12
Students in difficult life situations	13	0,76
Students from ethnic minorities	4	0,23
Students from foster families	9	0,52
ifted students	69	4,03
tudents whose mother tongue is different from the main language of instruction (with a non-native Russian)	76	4,44

gifted students (4,03%), and students with a non-native Russian language (4,44%).

Measures: To investigate the personal development of primary school-age children in inclusive settings, the Dembo-Rubinstein method for assessing self-esteem and aspiration (modified by A.M. Prikhozhan) was employed. According to A.M. Prikhozhan (2007), cases unfavourable for personal development and learning include: all instances of low self-esteem (Type 1); cases where a student exhibits average, poorly differentiated self-esteem combined with an average level of aspiration and characterized by a weak discrepancy between aspiration and self-esteem (Type 2); and cases of very high, poorly differentiated self-esteem combined with extremely high, poorly differentiated aspirations and a weak discrepancy between the two (Type 3).

Statistical analysis: The Shapiro-Wilk test was used to assess normality of distributions; Levene's test was used to test for equality of variances; and the non-parametric one-way analysis of variance (Kruskal-Wallis test) with a post-hoc Dwass-Steel-Critchlow-Fligner test was used to compare samples across student DEN categories. All analyses were conducted using the SPSS v. 23.0 statistical software package.

The normality test for self-esteem indicators (Shapiro-Wilk) showed a statistically significant deviation of all indicator distributions from normal ($p < 0,001$). Testing for equality of variances (Levene's test) also revealed statistically significant differences in variances between DEN categories for level of aspiration ($p < 0,01$), degree of discrepancy between aspiration and self-esteem ($p < 0,05$), and degree of differentiation of aspirations ($p < 0,001$).

The sample size of fourth-grade students allowed for the establishment of sample-specific norms for the level of self-esteem, level of aspiration, and degree of discrepancy between aspiration and self-esteem, using the 25th and 75th percentile values of the distribution after converting raw scores to Z-scores. For the other two variables, norms from the methodology established in the prior work of A.M. Prikhozhan were adopted. Norms were defined with a split into 3 ranges, unlike Prikhozhan (2007), where medium and high levels were considered normal, and the entire normal range for children aged 10—11 spanned 61—85 points. In our study, normal self-esteem values fall within the range of 65—85 points. In Prikhozhan's work, normal values for the level of aspiration are in the range of 68—97, whereas in the present study the medium range extends from 84 to 96. According to our data, the degree of discrepancy between aspiration and self-esteem has normal values in the range of 8—23. Normal values for the degree of differentiation of self-esteem and for the degree of differentiation of aspirations, based on Prikhozhan's data, are within the ranges of 6—20 and 5—19, respectively.

Results

According to the established norms, self-esteem indicators were classified into low, medium, and high levels (see Table 2).

As evident from Table 2, the distribution of self-esteem values across these ranges among students with a non-native Russian language is similar to that of typically developing students. In contrast, gifted students predominantly demonstrate a high level of self-esteem, while students with disabilities more frequently exhibit low self-esteem. This distribution suggests that students

with disabilities may be at heightened risk of adverse developmental outcomes due to low self-esteem.

It is important to note that no statistically significant differences in levels of aspiration were found among students of different categories (see Table 4).

In the distributions of values for the degree of discrepancy between self-esteem and aspiration, shown in Table 3, the medium level predominated across all student categories except for gifted students, who more frequently exhibited a weak level of discrepancy, likely due to an initially higher baseline level of self-esteem. Students with disabilities more often showed a high degree of discrepancy, students with a non-native Russian language showed a weak one, while among typically developing students, strong and weak discrepancies between self-esteem and aspiration occurred approximately equally.

Table 4 presents descriptive statistics for various self-esteem indicators for the total sample and by SEN categories of fourth-grade students.

The Kruskal-Wallis analysis showed statistically significant differences between groups for all self-esteem indicators except for the level of aspiration, with a significance level of at least $p < 0,05$ (see Table 4).

The values of self-esteem indicators (Table 4) and pairwise comparison of student categories (Table 5) indicate that students with disabilities have lower self-esteem ($p = 0,002$), while gifted students have higher self-esteem ($p < 0,001$), compared to their typically developing peers. The self-esteem value for students with a non-native Russian language and those with typical development is approximately the same. Thus, students with disabilities are potentially more vulnerable to the risk of an adverse developmental pattern associated with low self-esteem.

This is further supported by Table 2, which shows the highest proportion of students with low self-esteem among students with disabilities (34%), and the lowest among gifted students (12%). For students with a non-native Russian language and typically developing students, this proportion is practically identical (26% and 25%, respectively). Across the total sample, the proportion of students with low self-esteem is 26%. These results sufficiently confirm our hypothesis regarding the differences in self-esteem indicators as markers of risk for adverse development among different categories of students with DEN.

Among the types of adverse developmental patterns (Prikhozhan, 2007), Type 1, characterized by low self-esteem, strongly predominates: typically developing students — 336, students with disabilities — 45, students with a non-native Russian language — 19, gifted students — 7. This totals 407 students (96,9%) out of

Table 2

Distribution of students of different categories by self-assessment level

Categories of students		Самооценка / Self-assessment				
		Missed	Low	Intermediate level	High	Total
Normotypical	N	47	336	694	293	1370
	%	3,4	24,5	50,7	21,4	100,0
With Disabilities	N		45	72	15	132
	%		34,1	54,5	11,4	100,0
With a non-native Russian	N		19	35	22	76
	%		25,0	46,1	28,9	100,0
Gifted	N		7	33	29	69
	%		10,1	47,8	42,0	100,0

Table 3

Distribution of students of different categories by level of discrepancy between aspirations and self-assessment

Categories of students		Level of discrepancy				
		Missed	Weak	Moderate	Strong	Total
Normotypical	**N**	79	334	659	298	1370
	%	5,8	24,4	48,1	21,8	100,0
With Disabilities	**N**	2	22	66	42	132
	%	1,5	16,7	50,0	31,8	100,0
With a non-native Russian	N		23	43	10	76
	%		30,3	56,6	13,2	100,0
Gifted	N		31	28	10	69
	%		44,9	40,6	14,5	100,0

Table 4

Descriptive statistics on self-assessment indicators and level of aspirations for the main categories of students

Categories of students	N*	SA (N* = 1671)	LA (N* = 1638)	LD SA and LAN* = 1637)	LDA (N* = 1606)	LDSA N* = 1670)
Normotypical	1370	73,54 ± 14,1	88,30 ± 11,4	15,81 ± 11,2	24,91 ± 24,4	38,62 ± 21,1
With Disabilities	132	68,24 ± 15,9	86,52 ± 12,4	20,20 ± 14,9	27,18 ± 26,0	43,56 ± 23,6
With a non-native Russian	76	74,91 ± 14,6	87,03 ± 12,2	14,25 ± 11,2	19,72 ± 18,5	38,28 ± 19,0
Gifted	69	79,86 ± 13,0	91,05 ± 7,47	11,93 ± 11,9	15,08 ± 14,2	34,14 ± 17,6
χ^2_{emp}	-	30,12	5,17	24,57	8,69	12,41
p-value**	-	**<0,001**	0,160	**<0,001**	**0,006**	**0,034**
Всего / Total	**1713**	**73,2 ± 14,5 (Me = 74,3)**	**88,1 ± 11,5 (Me = 92,0)**	16,2 ± 11,8 (Me = 14,7)	24,4 ± 23,9 (Me = 18,0)	39,2 ± 21,2 (Me = 39,0)

Note: «*» — number of valid measurements by variables; the columns in the table present the means and standard deviations: SA — self-assessment, LA — level of aspirations, LD SA and LA — level of discrepancy between self- assessment and level of aspirations, LDA — level of differentiation of aspirations, LDSA — level of differentiation of self-assessment, Me — median; «**» — based on the results of comparison using the nonparametric one-way Kruskal—Wallis analysis of variance.

Table 5

Pairwise comparison of self-assessment values of students without SEN and different categories of SEN using the Dwass-Steele-Critchlow-Fligner post-hoc test

Variable	Categories of students	Categories of students	W	p
Self-assessment (SA)	Normotypical	With disabilities	–5,01	0,002
	Normotypical	Gifted	5,50	<0,001
	With disabilities	With a non-native Russian	3,84	0,033
	With disabilities	Gifted	7,57	<0,001
Level of discrepancy of SA and LA	Normotypical	With disabilities	4,56	0,007
	Normotypical	Gifted	–4,72	0,005
	With disabilities	With a non-native Russian	–4,34	0,012
	With disabilities	Gifted	–6,25	< 0,001
Level of differentiation of aspirations	Normotypical	Gifted	–4,39	0,010
	With disabilities	Gifted	–4,28	0,013
Level of differentiation of self-assessment	With disabilities	Gifted	–3,86	0,032

Note: Only statistically significant comparisons are shown.

420 students identified with an adverse developmental pattern across these categories. Only one typically developing student was classified under the second type of adverse pattern. The third type included 10 individuals from typically developing students, 1 from students with a non-native Russian language, and 1 from gifted students (totalling 13 students with the 2nd and 3rd types of adverse developmental pattern).

Discussion

The study revealed significant differences in self-esteem indicators with the except of aspirations between the studied categories of primary school-age students in inclusive settings. Thus, the proposed hypothesis was confirmed. Across the total sample of fourth-grade students, the proportion of those with low self-esteem as an indicator of risk for adverse development stands at 26%.

The highest proportion of students at risk for adverse developmental pattern was found among students with disabilities (34%). Since all studied categories included schoolchildren at risk for adverse development, it can be assumed that such risks are present among students with all types of students with disabilities. The distribution of students with disabilities who are at risk for adverse development by specific type of disabilities was not examined in this study and could be a subject for future specialized inquiry.

The self-esteem indicators of students with different educational needs may depend on both the characteris-

tics of the students themselves and external factors, such as the attitudes of teachers, parents, and peers.

B.I. Pinsky noted that the level of self-esteem can depend both on the type and severity of an impairment and on "the assessment by the surrounding world" (Pinsky, 1985, p. 111). According to G.N. Penin and N.M. Nazarova (2021), individuals with disabilities of all categories may experience "insecurity and unjustified dependence on others, low sociability, egocentrism, pessimism, and low or inflated self-esteem."

Lack of adequate support from the teacher and a low level of acceptance by peers are often causes for the development of feelings of inferiority and low self-esteem in a child with disabilities. Coupled with a high level of aspiration due to intellectual characteristics, this can lead to adverse personal development. Several researchers note that overprotection can lead to a phenomenon in children with disabilities similar to "learned helplessness" (Zaretsky, Gordon, 2011). This phenomenon inhibits the development of not only self-esteem but of self-awareness as a whole, as it prevents the child from becoming the agent of their own activity. The sense of belonging to the school and class is considered a significant factor influencing the self-esteem, self-respect, and subjective well-being of students from various vulnerable groups, and is an important indicator of the success of their inclusion (Zaman et al., 2025). Placement in inclusive or separate classes has been shown to affect the academic self-concept of 5th—6th grade students with disabilities, and the presence of students with disabilities in a general education classroom affects the same indicator in students without disabilities (Pirker et al., 2025).

All these factors must be considered when organizing psychological assistance for students with disabilities.

As the primary factors for successful school adaptation and the formation of adequate self-esteem in children with a non-native language of instruction, scholars most often cite acceptance by adults and the presence of peer support. Research indicates that children with a non-native language of instruction require psychological assistance in adapting to a peer group (Alivernini et al., 2019). Among the risks of adverse personal development that hinder the integration of such students, a document from the Ministry of Education of Russia lists: "insufficient proficiency in the Russian language, hindering successful mastery of the educational program and socialization... emotional difficulties caused by experiencing migration stress; absence or lack of age-appropriate social skills... orientation towards the norms and rules of the culture of the country and region of origin, differing from those accepted in the region of study in Russia" (Letter of the Ministry of Education of Russia No. HH/202-07, 2021). Supporting self-esteem, developing self-regulation, and encouraging a sense of self-efficacy among students from low-income families in South Africa has been shown to help bridge the gap between aspirations and achievement levels (Masinga, 2025).

According to A.A. Semenova (2016), among gifted students there were learners with conflicting self-attitude and inadequate self-esteem, which could be both low and high. Her study revealed that inflated self-esteem served as a defense mechanism. Gifted children are more sensitive to assessments of their reputation, indicating a low level of emotional stability despite high achievement. They often underestimate or overestimate their potential, may find it difficult to establish contact with peers, and to defend their opinions (Parts, 2007). According to E.N. Volkova et al. (2022), gifted schoolchildren often need psychological assistance in developing resilience, agency, a sense of self-efficacy, and positive self-attitude. As M. Elias and colleagues argue (Elias et al., 2024), for building an inclusive and accepting society, it is more appropriate in working with gifted students to direct pedagogical efforts to all students, not singling them out based on giftedness through testing, and to encourage cooperation and socio-emotional interaction among them.

At the same time, as our study and a number of others have shown (Prikhozhan, 2007; Borozdina, 2011), typically developing students can also be at risk for adverse developmental patterns. The causes of risks for personal development can be varied. When organizing psychological assistance for vulnerable students, this risks need to be identified.

Thus, research by both Russian and international scholars confirms our hypothesis that the self-esteem of primary school children, as a key indicator of their personal development, exhibits distinct features across different categories of students with diverse educational needs, necessitating specific consideration when providing psychological assistance in inclusive settings.

Conclusion

The study demonstrated that within the total sample of school students, a favorable pattern of personal development predominates among fourth-grade students (74%). However, children with low self-esteem, as an

indicator of risk for adverse development, were identified across all studied categories of primary school children. Among students with disabilities, low self-esteem is more pronounced than high self-esteem, while the opposite is true for gifted students. Meanwhile, the mean self-esteem values of typically developing students and those with a non-native Russian language are approximately equal, whereas those of gifted students are higher than those of typically developing peers.

Thus, based on the identified risks of adverse development in children with low self-esteem, our research underscores the importance of paying attention to the psychological state of at-risk students across all studied categories in order to provide them with timely psychological assistance when necessary.

A prospect for further research is the development of psychological assistance services that account for the personal development risks of students with diverse educational needs in inclusive settings.

Limitations. As an indicator of personal development, only self-assessment indicators of students with special educational needs were studied. The assignment of students with special educational needs to the categories of students was carried out independently by the school.

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Elena V. Samsonova — planning the study, discussing the results, writing and formatting the manuscript; formulating the objectives and conclusions of the article.

Alexey Yu. Shemanov — formulating the study hypothesis; describing and discussing the results, using statistical methods for data analysis; annotating, visualizing the study results, writing and formatting the manuscript; formulating conclusions; formatting the list of references.

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Научная статья | Original paper

The safety of childhood as a fundamental issue of developing preschool education

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Abstract

Context and relevance. At the beginning of the 21st century, preschool childhood is increasingly exposed to global civilizational influences, threatening its transformation into the initial stage of organized education and upbringing of a child with a predetermined set of competencies that allow them to take a worthy place in the technological chain of training a human machine completely immersed in its functions (educational, industrial, family, etc.). The presented provisions actualize the problem of childhood safety, which has growing theoretical and practical significance. **Objective.** To update the understanding of safety and the value of preschool childhood as a cultural phenomenon and a fundamental issue in developing preschool education, especially in light of the exacerbation of global problems faced by humanity at the beginning of the third millennium. **Hypothesis.** Reflection on the genesis of scientific knowledge about the amplification of child development, introduced into circulation by the theory of activity of A.V. Zaporozhets and the position of L.S. Vygotsky on the zones of child development, will allow us to develop theoretical foundations for the development of ideas about modern preschool childhood as a cultural phenomenon and its safety. **Methods and materials.** Achievement of the goal and verification of the realism of the working hypothesis were accomplished through a combination of theoretical research methods: analysis, synthesis, induction, and deduction. **Results.** The conducted research allows us to state that the avalanche-like growth of scientific and technological achievements, leading to an increase in the density of events in preschool childhood, actualizes the problem of safety of the child's physical and mental development. **Conclusions.** Scientific reflection on the research problem allowed us to formulate a number of theoretical provisions that make it possible to resist the transformation of preschool education into a sphere of satisfying the requests of collective adults for the intensification of a child's development (often achieved through the conversion of means and methods of school education and upbringing), by creating an educational environment in preschool educational organizations and in the family that is safe for the child's physical and mental development. The practical significance of the study lies in the possibility of using the materials of the article in the development of conceptual provisions of preschool education.

Keywords: childhood as a phenomenon of culture, amplification of development, zones of child's development, safety of preschool childhood

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Безопасность детства как фундаментальная проблема развивающего дошкольного образования

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Резюме

Контекст и актуальность. В начале XXI века дошкольное детство все больше подвергается глобальным цивилизационным воздействиям, угрожающим ее трансформации до начальной ступени организованного обучения и воспитания ребенка с заранее заданным набором компетенций, позволяющих занять достойное место в технологической цепочке создания человекомашины, целиком погруженной в свои функции (образовательные, производственные, семейные и т. п). Представленные положения актуализируют проблему безопасности детства, обладающую растущей теоретической и практической значимостью. **Цель статьи.** Актуализация проблемы безопасности и ценности дошкольного детства как феномена культуры и фундаментальной проблемы развивающего дошкольного образования в период обострения глобальных проблем человечества в начале третьего тысячелетия. **Гипотеза.** Рефлексия генезиса научных знании об амплификации развития ребенка, введенного в обиход в теории деятельности А.В. Запорожцем, и положения Л.С. Выготского о зонах развития ребенка, позволит выработать теоретические основания разработки представлений о современном дошкольном детстве как феномене культуры и его безопасности. **Методы и материалы.** Достижение цели и проверка реалистичности гипотезы достигались совокупностью теоретических методов исследования: анализа, синтеза, индукции, дедукции. **Результаты.** Проведенное исследование позволяет констатировать что лавинообразное нарастание достижений научно-технического прогресса, приводящее к увеличению плотности событийности дошкольного детства, актуализирует проблему безопасности физического и психического развития ребенка. **Выводы.** Научная рефлексия проблемы исследования актуализировала ряд теоретических положений, позволяющих противостоять превращению дошкольного образования в сферу удовлетворения запросов коллективного взрослого на интенсификацию развития ребенка посредством конверсии средств и методов школьного обучения и воспитания за счет создания безопасной для физического и психического развития образовательной среды в дошкольных образовательных организациях и семье. Практическая значимость исследования состоит в возможности применения материалов статьи при разработке концептуальных положений дошкольного образования.

Ключевые слова: детство как феномен культуры, амплификация развития, зоны развития ребенка, безопасность дошкольного детства

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Introduction

Today, there's not a single authoritative psychological or pedagogical school of thought that doesn't recognize the uniqueness and intrinsic value of preschool childhood as an autonomous stage of human development, associated with the formation of a child's consciousness through the first tentative attempts to establish cause-and-effect relationships in the subject-based cognition of the surrounding reality, the understanding of one's actions, emotions, and thoughts, the first generalizations about oneself and the world around oneself, and the playful modelling of reality. This emphasis is placed on the highly eventful nature of childhood, which is associated with the creative reproduction of phylogenesis in the first seven years of a child's life (Zinchenko, 2018, p. 20).

Against this backdrop, educators and parents, captivated by fashionable social trends concerning children's unique abilities and concerned for their future, explicitly transform their lives into an endless pursuit of rapidly passing time, intensifying child development through various forms of imitation of historically established human activities. In these activities, living movement, feeling, words, and thoughts are not born in the child but are hastily and mechanically assimilated. Wishing the

best for their children, adults replace the process of active appropriation of objective forms (images) of culture with a mechanical (stimulus-reactive) transfer of its values from one mind to another (Zinchenko, 2018, p. 22). The maximum that a child can achieve with such care from an adult is "...an artificial or, what is the same, a 'disabled' intellect..." (Zinchenko, 2018, p. 159) that dismembers and crushes the world in his consciousness into small fragments, wherein he memorizes the technique of movement rather than constructing a living movement in the conditions of correlating his physicality with a given cultural model, memorizes a socially approved way of expressing feelings rather than experiencing them in various situations of communication with another person, and replenishes his memory with new words without understanding their meaning.

Results of scientific reflection. In their extreme forms, preschool educational institutions resemble factories for the pedagogical design of future first-graders, with a set of required qualities and personality traits that determine their readiness for school. However, this ignores the fact that the density of events in preschool childhood significantly exceeds that of the cultural and historical development of humanity, thanks to the child's ability to experience wonder, to stop the passage of time, to live simultaneously in the past, present, and future, in real and imagined reality, in which the habitual, retrospective mode of recollection is combined with prospective modeling aimed at the future, allowing children to experience, within the relatively short period of preschool childhood, the centuries-long journey of the development of Homo sapiens.

In this cultural tradition, childlike genius is manifested, allowing one to transform fiction into reality and reality into fiction, the past into the future, and the future into the past, and to take a polycentric position in play activities. Excessive and intrusive adult concern for the child's future distorts their present with an increased intensity of development and, as a consequence, blurs the line between stimulus-response learning and development, reduces the uniqueness of early childhood to the rapid acquisition of cultural products, and leaves children defenseless against the challenges of the rapidly accelerating twenty-first century, where interaction and communication—as participation, empathy, mutual penetration of worlds, and engagement with cultural values—becomes an unaffordable luxury. As a result, the process of facilitating the formation of an organic unity of past, present, and future, of the real and the imagined in the child's consciousness, is replaced by living in the rush of the rapidly slipping present. The process of the child actively apprehending cultural values is substituted with training in socially approved forms of behavior and activity. The pedagogy of cooperation between adult and child degenerates into the use of educational means, forms, and methods inappropriate to the child's age and abilities (Rodin et al., 2022, p. 29), thereby causing irreparable harm to the child.

Against this background, the generalized image of a preschool-aged child as a microcosm, created by A.V. Zaporozhets and his students, becomes relevant. In this microcosm, the entire real world and all great cultural-historical epochs are contained in an embryonic state and are revealed as children's consciousness expands; consciousness itself then becomes a universal form of mental reflection of the past, present, and probable future. Developing ideas about personality as the highest form of sociality and the drama of a possible human being, A.V. Zaporozhets proposed creating conditions for the fullest realization of children's potential abilities to independently form knowledge about themselves and the surrounding world through active engagement with cultural values at each stage of preschool childhood, subtly connecting these with L.S. Vygotsky's concepts of a child's zones of actual and proximal development. This theory is called the amplification of development.

The need to introduce this concept into the vocabulary of child psychology and preschool pedagogy was linked to the development of the age-related aspect of A.N. Leontiev's activity-based paradigm, in particular, the fullest realization of the potential of the entire ensemble of children's activities in early and preschool age.

In the development of A.V. Zaporozhets's ideas on the amplification of development at the beginning of the twenty-first century, several important points can be identified.

The first proposition is the relevance of contemporary realities associated with the emergence of new forms of activity (digital technologies, virtual communications, hybrid educational environments), which necessitates the adoption of the following axioms:

1) the expansion of the ontogenetic boundaries of the concept of developmental amplification to all periods of human life;

2) the multi-meaningful nature of developmental amplification through pedagogical means, methods, forms of teaching and education, and pedagogically unformed models of historically established and emerging types of human lifestyles across eras and cultures (Kudryavtsev, 2022).

The second point is determined by the challenges of uncertainty, complexity, and diversity of the modern world, which requires considering the amplification of development within the evolutionary logic of construction, as well as other unattainable spaces of human development in a situation of uncertainty in a changing world, and its relativistic perception, which allows the child to break through the barriers of traditional thinking in the process of understanding the rapidly changing world and themselves in it through established joyful and carnival forms of action and play for the sake of play (Asmolov, 2015), conditional reality and clowning in the understanding of M.M. Bakhtin, which gives the child the opportunity to confuse, parody, exaggerate life, to speak in a parodied manner, "... not to be literal, not to

be oneself, the right to depict life as a comedy and people as actors, the right to remove masks from others..." (Bakhtin, 1975).

The third point reflects the development of L.S. Vygotsky's ideas about the zones of a child's development as a complex, structured phenomenon, carried out by V.K. Zaretsky (Vygotsky, 1984, p. 243) and according to which:

1) any aspect (vector) of a child's cognitive and personal development can be considered through the concept of the zone of proximal development (ZPD);

2) the expansion of the ZPD in the course of a child's development occurs in cooperation with adults and peers and, therefore, depends on the quality of their joint, shared activity;

3) the multi-vector nature of the zones of actual and proximal development, the magnitude of which is determined by the regularities of psychogenesis and psychological-pedagogical influences.

4) the presence of at least three zones of child development: the zone of actual development, the zone of immediate development, and the zone of currently inaccessible development. The latter is characterized as a zone in which the child cannot consciously, "with intelligence," or without imitating, interact with adults (according to Vygotsky, 1984; Zaretsky, 2007, 2016, 2024; Zinchenko, 2000, 2016; Rubtsov, 2016; Elkonin, 2016). This occurs when the possibility of the child performing collective activities and communication is determined by adults as a potential ability (italics added by us), reflecting the potency of initiating mental processes that then become the child's internal possession (Leontyev, 2001; Vygotsky, 2005, p. 11).

The intersection of L.S. Vygotsky's ideas on the multi-vector and hierarchical nature of developmental zones with A.V. Zaporozhets's propositions on the amplification, intensification, and simplification of development highlights bifurcation points in the development of the child as a highly complex, structured psychological system.

These propositions on the zones of child development are closely linked not only to L.S. Vygotsky's ideas on self-development according to one's own internal laws, as opposed to the child's transformation into a socially determined reality, but also to concerns about protecting the child's health, physical, and mental development — that is, the need to protect the child's psyche from the perspective of their personal age. Each era has its own universal structure of experiences, its own drama. Ignoring this is detrimental to the child's personality. In his outlines of his theory of age, L.S. Vygotsky insisted on practical actions to "protect the child's development" (Yaroshevsky, 2020, p. 271). It can be said without any exaggeration that absolutely all practical measures for the protection of a child's development, his upbringing and education, as they relate to the characteristics of a given age, necessarily require developmental diagnostics. The application of developmental diagnostics to solving countless and infinitely diverse practical problems is determined in each specific case by the scientific development of developmental diagnostics itself and the demands placed on it in solving each specific practical problem" (Vygotsky, 1984a, p. 268). According to M.G. Yaroshevsky, this same light illuminates his concept of experience, which became his final word in the search for an integrated framework imbued with the drama of the organization and history of the individual (Yaroshevsky, 2020, p. 271).

The problem of amplifying development in joint shared subject activity becomes relevant in the era of post-industrial society, where soulless materialism, under the slogans of humanism, has taken the place of the enlightened philosopher, declaring technical progress as a condition for human well-being and an inexhaustible source of unexpected and incomprehensible phenomena. Robotics, IT technologies, and artificial intelligence act as additional factors and, at the same time, as a problem for expanding the adequate actions, tools, and forms of a child's cultural development activities.

The need to process a large amount of information in the form of bright, constantly changing visual images, without time to comprehend them, leads to a rupture in the child's thought connections. Their consciousness, overloaded with the flow of information, becomes incapable of dissecting and understanding the multidimensionality of existence. The child's life unfolds under the illusion of absolute knowledge and participation, a sense of involvement in the flow of life, which in reality is only an imitation, preventing the formation of a clear picture of the world in their mind, measured by well-defined cultural markers of good and evil, reality and fiction. At the same time, the process of exteriorization does not occur; it is incorporated into the child's consciousness as separate elements. Everything happens here and now, under the weak control of human consciousness, which is consequently replaced by biased images. As a result, following nature, the child gradually integrates into the technical environment, the function of which is to assign preschool educational institutions to artificially isolated territories. Even now, the child is distanced from universal computerization in order to protect their human abilities from technization, which carries the risk of transforming education and upbringing into a process of turning the child into a social object, a human tool — a function consisting of a body capable of performing actions necessary for its existence, and a special organ, consciousness, controlling the body, whose task is to ensure the body's behavior is adequate to the conditions of life.

F.I. Girenok is more radical. He argues that in the modern post-industrial world there is no place for childhood, with its all-encompassing naivety, vividness, and concreteness of living in the present, in which the child's mind is not yet separated from feeling and its inability to articulate thoughts, and which cannot be fully understood without experiencing the drama of the formation

of his consciousness and personality. To the meaningless events of the world, approaching the speed of light, deprived of the possibility of contemplation — in which nothing can be seen, understood, or extracted—he contrasts the integrity of the child's naive, all-encompassing worldview with the piercing lines from A.P. Platonov's story "The Cow." Here are those words: "The students were assigned to write an essay about their lives. Vasya wrote in his notebook: 'We had a cow. When she was alive, my mother, father, and I drank her milk. Then she gave birth to a calf, and he too. There were three of us, and he was the fourth, and there was enough for everyone. The cow also plowed and hauled loads. Then her son was sold. The cow began to suffer but soon died; she was hit by a train. And she, too, was eaten because she was beef. The cow gave us everything: her milk, her son, her meat, her skin, her entrails, and her bones; she was kind. I remember our cow and will never forget her." (Girenok, 2021; Platonov, 1983).

This all-encompassing acceptance of the child as a manifestation of the naive universal human principle is lacking in timely preschool and early education, a world whose creation begins with the infant's acquisition of the experience of separating merged sensations, followed by their division against the backdrop of care for the child and stimulation of their activity in relation to the surrounding environment by an adult. Then comes the development of the ability to think in early childhood using abstractions or symbols in combined activities, thrice mediated by the adult — the mediator of culture, sign, and tool. Next — the emergence and development of extra-sensory thinking and the ability to think in ideal images and operate with 'pure' signs and other symbolic means in preschool age during joint multi-age activities of the child with the collective other (Rodin, 2023).

Actively exploring the surrounding world of objects and itself within it, the child seems to be divided. On the one hand, it organically exists within a sensory-given, humanized environment, a world of things with established human modes of activity. On the other hand, it exists within a system of forms of social expression of this sensory-given world, a socially conscious and spiritually assimilated world, through the comprehension of the meaning of activity in words. A child's physical action cannot be understood as an act of cognitive activity (its motives, goals, degree of awareness) outside of its symbolic expression (Rodin, 2023). Drawing on the words of M.M. Bakhtin, we aim to construct '...his important testimony, explanations, confessions, admissions, and further develop his possible or actual inner speech...' (Bakhtin, 1979, p. 292). By revealing and self-identifying in words, the child's initiative develops into objective action and a meaningful, humanly significant deed. Here we are talking about words that are born in the process of word creation between a child and a collective adult, who is faced with the need to constantly reflect on what is happening with the student and, in accordance with this understanding, facilitate his movement in the active comprehension of universal human culture (Ilyenkov, 2019; Rodin, 2023).

Conclusion

We and our children happen to live in an era of radical civilizational changes that provoke a rethinking of the fundamental ideas of existence and reason for humans, as posed by I. Kant regarding the potential of human reason—not as a fully formed, knowing reason per se, but as a reason that develops throughout life, a reason that not only comprehends the meanings of culture but also generates them. This requires a focused slowing down of thought from multiple perspectives, framing questions that drive the researcher's mind to uncover the phenomenon of childhood in the development of human culture, its vulnerability to the forces of technocratic civilization, and the necessity of preserving its cultural creative essence.

The first perspective is based on L.S. Vygotsky's brilliant idea of the multivector and hierarchical zones of development, along with A.V. Zaporozhets' propositions on amplification, intensification, and simplification of development, which capture the bifurcation points of a child's psychogenesis as a complexly structured psychological system.

The second is that a slow, thoughtful reflection on the genesis of scientific knowledge about the amplification of child development, introduced into circulation by A.V. Zaporozhets's theory of activity and L.S. Vygotsky's position on the zones of child development, allows us to uncover this secret and to develop theoretical concepts of preschool childhood as a cultural phenomenon that sets the vector of knowledge about the development of a child's thought, grounding in his developing consciousness the civilizational changes of the 21st century. In this regard, the task of an adult is not to interfere with this process by intensifying the development of the child's consciousness, but from the first days of his life to accompany the process of cognizing the dynamic, dialectically contradictory relationships "person — person," "person — society," "person — nature," "person — civilization," and "person — culture."

The third perspective suggests that the concept of a child's developmental zones is closely linked not only to L.S. Vygotsky's ideas on self-development according to one's own internal laws, as opposed to the transformation of the child into a socially determined reality, but also to concerns about protecting their physical and mental development. Ignoring these concepts is detrimental to the development of the individual, whose destiny is shaped in childhood. In this context, ensuring childhood safety is a necessary condition for successful upbringing and personal development.

The fourth perspective reveals the phenomenon of childhood, with the all-encompassing trust acquired

by the child practically from the first days of life in interactions with adults and which determines the emergence of distinctively human feelings and experiences, without which it is impossible to imagine the future of humanity. Childhood and culture are semantic synonyms, filling the space between the individual and the surrounding objective environment, in which "... various forms of semiotic-symbolic, objective, verbal, and, in the broad sense, mental activity are formed..." (Zinchenko, 2016, p. 224). A consumerist attitude towards childhood and its spontaneity, against the backdrop of technocratic determinism — in the form of the intensification and simplification of child development — threatens to replace culture with the environment, turning a person into a function.

The fifth perspective emphasizes that the ongoing changes in the world pose a challenge to preschool education in ensuring the safety of early childhood, a cultural phenomenon. It is directly connected to the transformation of human nature. Pedagogical influences on the child must be responsible, based on knowledge of general patterns of the child's growth and development in a constantly changing environment, grounded in an interdisciplinary synthesis of achievements in biology, psychology, and pedagogy, minimizing didactic risks, and ensuring sustainable, enriched mental development of the child as a guarantee of further cultural development and the preservation of rational life on Earth.

The sixth approach requires proposing, as a supertask, the pedagogy, psychology, and philosophy of studying phenomena of amplification and zones of proximal development as a model of human development. The intermediate result of addressing this problem is revealing the child's transition from one type of independent regulation to another, more advanced and adequate one in relation to constantly changing life conditions. The main goal is, based on the biological and psychological laws of human development, to foster the child's attachment to universal values such as kindness, beauty, humanism, reason, love, aspiration for perfection, and full health.

Limitations. The framework of this study is limited to the reflection of the genesis of L.S. Vygotsky's ideas on zones of proximal development and A.V. Zaporozhets' ideas on the amplification of child development. The focus of the analysis is on the theoretical foundations that allow for the discussion of the necessity to ensure the safety of early childhood. This is viewed as a phenomenon of culture and a guarantee for solving fundamental problems of humanity, at the center of which is the change in the nature of man himself and his future.

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Научная статья | Original paper

The process of ascending from the abstract to the concrete in a school course (on the problem of developing scientific concepts in school education)

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Abstract

Context and relevance. The ascent from the abstract to the concrete as a principle for developing theoretical concepts in teaching is an important principle of modern didactics. However, building courses on this basis requires logical-subject and logical-psychological analysis. Therefore, there are few examples and descriptions of teaching based on the principle of ascent. **Objective.** A detailed description of the logic behind the structure and results of teaching 6th and 7th grade students, aimed at clarifying one of the key concepts in biology — the concept of an organism. **Hypothesis.** Teaching using the logic of progression from the abstract to the concrete ensures the development of conceptual thinking and transforms students' everyday perceptions. **Methods and materials.** Logical-subject and logical-psychological analysis of the concept of an organism. Formative experiment. Comparative diagnostic examination of the development of the concept of organism using the 'Sparrow and Birch' method: experimental classes (227 students, 104 girls and 123 boys), control classes (a total of 199 students, including 86 girls and 113 boys). **Results.** An example is given of how to teach a key concept in school biology based on the principle of moving from the abstract to the concrete. A comparison between experimental and control classes using the Mann—Whitney criterion revealed significant differences in both the 6th and 7th grades, as well as in the combined analysis of all data ($p < 0{,}001$). **Conclusions.** Traditional biology teaching does not allow students to make significant progress in mastering theoretical concepts. Teaching key concepts in primary school should be structured according to a logic that moves from the abstract to the concrete. Teaching based on this principle not only forms scientific concepts that become the basis for solving various problems, but also transforms students' everyday ideas.

Keywords: ascent from the abstract to the concrete, cell, contradiction, conceptual thinking, scientific concepts, content of education

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Восхождение от абстрактного к конкретному в предметном курсе основной школы (к проблеме развития научных понятий в школьном обучении)

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Резюме

Контекст и актуальность. Восхождение от абстрактного к конкретному как принцип развития теоретических понятий в обучении представляет собой важный принцип современной дидактики, однако построение курсов обучения на этой основе требует логико-предметного и логико-психологического анализа, поэтому примеров-описаний обучения в логике восхождения немного. **Цель**. Описать логику построения и результаты обучения школьников 6—7 классов, направленного на уяснение одного из ключевых понятий биологии — понятия организма. **Гипотеза**. Обучение в логике восхождения от абстрактного к конкретному обеспечивает развитие понятийного мышления и преобразует житейские представления учеников. **Методы и материалы**. Логико-предметный и логико-психологический анализ понятия организма. Формирующий эксперимент. Сравнительное диагностическое обследование развития понятия организма с помощью методики «Воробей и береза»: экспериментальные классы (227 учеников, 104 девочки и 123 мальчика), контрольные классы (всего 199 учеников, из них 86 девочек и 113 мальчиков), обучавшиеся по традиционной методике. **Результаты.** Описан пример построения обучения ключевому понятию школьной биологии на принципе восхождения от абстрактного к конкретному. Сравнение между экспериментальными и контрольными классами с использованием критерия Манна—Уитни выявило значимые различия как в 6-м, так и в 7-м классах, а также при объединенном анализе всех данных ($p < 0{,}001$). **Выводы**. Традиционное обучение биологии не позволяет достигать существенного прогресса в освоении школьниками теоретического понятия, обучение ключевым понятиям основной школы должно быть выстроено в логике восхождения от абстрактного к конкретному. Основанное на этом принципе обучение не только формирует научные понятия, становящиеся опорой в решении разнообразных задач, но и преобразует житейские представления учеников.

Ключевые слова: восхождение от абстрактного к конкретному, клеточка, противоречие, понятийное мышление, научные понятия, содержание обучения

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Introduction

Within cultural-historical psychology, one of the most persistent and significant lines of inquiry has been the study of how scientific concepts develop through school-based education (Chapaev, 2015; Gennen, 2024; Romashchuk, 2024; Waerm , Broman, 2024; and others). A substantial breakthrough in this area became possible due to the work of the distinguished dialectical philosopher E. V. Ilyenkov (Ilyenkov, 1974; Ilyenkov 2017) and the founders of the theory of learning activity, D. B. Elkonin and V. V. Davydov (Davydov, 1996; Davydov, 1999; Elkonin, 1989). Their analyses revealed a fundamental distinction between the acquisition of empirical generalizations and that of theoretical concepts. Crucially, they showed that it is the appropriation of theoretical concepts that enables the development of reflective thinking and consciousness. As Ilyenkov insisted, "the specificity of 'generalization' in a concept lies not in identifying something abstractly common, but in identifying the universal — the law that makes a thing precisely the thing it is, and not another, in all its definiteness, particularity, and singularity" (Ilyenkov, 2017, p. 213).

Although these ideas were articulated more than fifty years ago, the content of basic school education has changed only marginally. Part of the reason is struc-

tural: a genuine transformation of curriculum content demands a deep logical-subject matter analysis capable of reconstructing the development of a concept from its "initial cell," its initial abstraction, to its fully concrete articulation — that is, following the logic of ascent from the abstract to the concrete.

To date, examples of constructing curriculum content according to this logic remain scarce. Exemplary cases exist for primary school, notably the conceptual lines of number and phoneme (Davydov, 1998, and others). Attempts have also been made to design learning activity—based courses for lower- and upper-secondary students, for university education, and for adult learning (Rubtsov, Elkonin, Zuckerman, Ulanovskaya, 2024; Elkonin, Vorontsov, Chudinova, 2004; Engestr m, 2020). Yet these initiatives tend to focus primarily on methodological dimensions of instruction rather than on the logical reconstruction of subject matter.

The purpose of this article is to demonstrate, through a concrete example, what a system of learning tasks looks like when organized as an ascent from the abstract to the concrete — the educational trajectory students undertake and how their thinking and consciousness develop along the way.

The central hypothesis is that a concept jointly constructed by a class in accordance with the logic of ascent can become not only a tool for thinking within the specific school subject but also a means through which students can become aware of, interrogate, and transform their everyday experience.

Materials and methods

The material for this study was drawn from biology instruction for 11—13-year-old students (the topic "The organism: its structure and functioning"). To develop new instructional content, we conducted a logical-subject matter analysis and a Logical-psychological analysis of the concept of an organism. This was followed by a formative experiment: instruction based on the course *New Biology*, module "Animals," which extended over approximately one school year (60—70 instructional hours).

To test the research hypothesis, we used the diagnostic method "Sparrow and Birch". Using this instrument, we assessed 227 students in Grades 6 and 7 in the experimental classes (104 girls and 123 boys) and 199 students in the control classes (86 girls and 113 boys). The control classes were drawn from the same school and two other schools with comparable location and social composition of the student body. Students in the control classes were taught using the most widely implemented biology curriculum currently used in Russian schools[1].

Students were asked to write five statements ("what I already know") and five questions ("what I want to find out") about two familiar organisms — the sparrow and the birch tree — in order to reveal their understanding of how the organisms are structured and how they function. Each statement was evaluated by three independent experts on a scale of content accuracy and scientific quality (0 to 5 points). Comparisons between the experimental and control classes were carried out using the Mann—Whitney U test.

Results

Results of the logical-subject matter analysis: identifying the subject content of instruction and the conceptual logic

For the developers of a learning course, the first task is to identify and understand what Ilyenkov calls the law that determines a given "thing" — in this case, the logical path by which thought arrives at a definition of the organism as a unity of structures and functions. This work, carried out by the course designers, is referred to as logical-subject matter analysis (Davydov, 1996). Such analysis reveals — and, when required for instructional purposes, reconstructs — the logic of the concept's development, a logic often concealed within the long historical trajectory of scientific thought.

Ilyenkov writes: "Human thinking proves capable of uncovering the objective 'beginning' of a process only through analysing its highest results" (Ilyenkov, 2017, p. 241). Accordingly, the initial work of the developers consisted in analysing contemporary scientific achievements together with the historical development of biological knowledge, in order to understand the structure and functioning of highly developed organisms (for example, humans, higher animals, and plants). Examining the structure and functioning of such organisms made it necessary to identify an "initial cell," whose developmental potential could give rise to the past and presently existing biological diversity.

In our case, the logical-subject matter analysis of the scientific conception of the organism as a unity of structures and functions required identifying and reconstructing this initial cell — the understanding of the body's boundary as a relation between the internal and external environment[2].

The boundary is a structural element that renders a living being discrete, separating its internal content from the surrounding environment. The concept of the

[1] Pasechnik, V.V., Sumatokhin, S.V., Gaponyuk, Z.G., Shvetsov, G.G. (2025). Biology. The Line of Life (Grades 5—9). Moscow: Prosveshchenie.

[2] We did not find, in the history of biology, any such simple abstraction that could serve as a prototype of the initial concept for the school subject.

body's boundary functions as the initial cell because it contains within itself the potential to develop into the full concept of the organism. The boundary is internally contradictory: it simultaneously separates and connects the inner and outer environment. This abstraction can therefore serve as the foundation for a developing instructional model — the future concept of the organism[3]. The contradiction inherent in the boundary is resolved across the diversity of structural solutions that nature has produced in living beings. The logic of the emergence of this diversity can become the basis for a system of learning tasks within the course.

Thus, the content of the course was presented as a systemic body of theoretical knowledge in which the initial abstraction becomes progressively concrete in more specific cases logically derived from it (the ascent from the abstract to the concrete). The initial model form was a diagram capturing the unity of the principal vegetative processes of the organism (Figure 1) (Chudinova, Zaytseva, 2022).

This diagram shows the logical connection among the processes of respiration, nutrition, gas exchange, and excretion, as well as the "location" where these processes occur. Respiration[4] — the acquisition of energy — takes place inside the body, whereas all other processes occur at the boundary between the internal and external environment. Through these processes, substances necessary for respiration enter the body, while unnecessary or harmful substances are removed. Thus, the initial relation between the internal and external environment is represented, at the starting point, as a closed line designated by the term "boundary."

Results of the logical-psychological analysis: identifying deficits in students' initial knowledge and skills, and constructing the sequence of learning tasks

Logical-psychological analysis makes it possible to embed the subject-matter logic that has been identified into a system of learning tasks appropriate for a given age group and level of schooling. As V. V. Davydov observed, "it is often very difficult for the psychologist and the didactician to determine the concrete actions that open up the content of concepts" (Davydov, 2006, p. 42). This difficulty is real: it is necessary not only to assess the children's existing concepts and representations but also to understand their developmental potential — the zone of proximal development of their biological thinking. Students beginning the study of biology hold certain initial ideas about living beings, but they lack many of the concepts in chemistry and physics that are essential for biological understanding.

The outcome of the Logical-psychological analysis was to determine how students could arrive at the first initial abstraction, and in what form and through which actions this abstraction could emerge in instruction. This required constructing a methodology through which students could analyse phenomena observable in simple experiments and transform their everyday representations in such a way that the first learning task could be set.

In our case, it became clear that students could not be brought to the initial abstraction of the boundary without developing their initial ideas about respiration (Chudinova, Zaytseva, 2022), as well as their under-

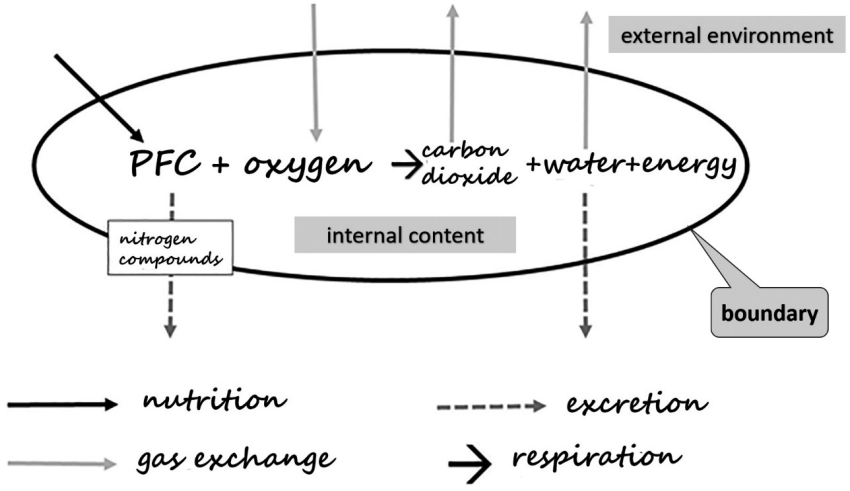

Fig. 1. The diagram illustrating the relationship between the main vegetative processes in the body. In it, for the first time, students encounter the boundary of the body, which separates the internal content where respiration takes place from other processes that occur at the boundary

[3] A few years ago, it was discovered that the concept of the "body boundary" in the sense mentioned above had appeared in contemporary scientific reports (Vasilov, 2020). It is possible that earlier it had not been in demand in scientific research; however, once science began to address the problems of immunity — that is, the problems of the organism's integrity — the introduction of this concept proved to be inevitable.

[4] Here and throughout, the term "respiration" is used in the sense of "cellular respiration"; however, the pupils have yet to discover the very existence of cells.

standing of the composition of the internal and external environment. This implied the need for several months of preliminary work with the students (Chudinova, 2019). The joint investigative work of the class had to focus on changes in air during respiration, and on processes of nutrition, gas exchange, and excretion. Observations and experiments involving the students' own bodies were to serve as the primary material for analysis. When such observations were impossible for physical or ethical reasons, descriptions of observations of animal organisms could be used. Thus, the "reduction" to the initial relation also had to occur through the analysis of developed forms — complexly organized organisms.

The Logical-psychological analysis ultimately clarified which specific steps of concretization would be appropriate in this instructional sequence. Some interesting logical—subject-matter insights had to be set aside because the expected learning outcomes needed to be aligned with the requirements of the educational standard. The sequence of learning tasks was determined by the fact that the results of solving earlier tasks were necessary for solving those that followed.

Description of the formative experiment: movement through content as the ascent from the abstract to the concrete

As noted above, the body's boundary initially appeared to students in a maximally abstract form — as a line in the diagram, labelled by the teacher as "the boundary of a living being's body." Students understood only the most general fact: that this line limits the body and divides space into what is "inside" and what is "outside." In this way, the boundary between the internal and external environment first emerged as a shared, general representation for all students in the class. The term boundary entered the discussion as the class reasoned about where the processes already identified in earlier investigations — nutrition, gas exchange, respiration, and excretion — take place.

The first substantive step in understanding the boundary itself occurred as students discovered its central contradiction and attempted to resolve it. The body's boundary must simultaneously maintain and preserve the internal environment — distinct in both properties and composition from the external environment — and, at the same time, allow certain substances to pass through it. It must, for instance, let in air, water, and organic substances required for cellular respiration. Thus, the boundary must perform two tasks that are opposite in meaning. This contradiction is never made explicit at the moment when students collaboratively construct the initial diagram (Fig. 1).

When asked to draw a "molecular scheme" of the edge of a jellyfish's body in seawater, based on the given diagrams showing the composition of the internal and external environments, students proposed two opposing versions (Fig. 2).

To ensure that students experienced this contradiction in a vivid and grounded way, the teacher intentionally amplified it. The class discussed which drawing corresponded more closely to reality. Because a *molecular* picture was required, no "non-molecular" lines were allowed — after all, both the jellyfish and seawater consist solely of molecules. This immediately ruled out version "B."

To evaluate version "A," the teacher invited several students to the board to reproduce version "A" using colored circular magnets. Unlike the static circles in the drawing, the magnets could be moved, and many students immediately thought to demonstrate diffusion[5].

"The jellyfish is dissolving!!!" the students exclaimed as they saw what happened. It turned out that the second version was also unsuccessful. The teacher further sharpened the contradiction, and the students began to

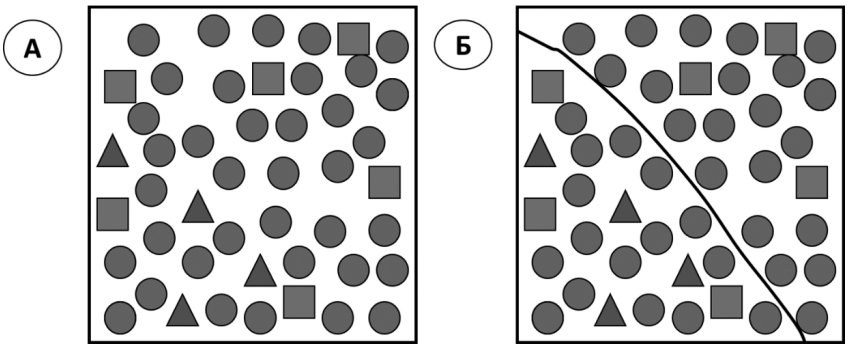

Fig. 2. On the left is a diagram showing a 'molecular picture' of the internal and external environments of a jellyfish, between which there is essentially no boundary (option "A"). In the second diagram, the boundary between the internal and external environments is marked by a line (option "B"). Squares represent mineral salt[6] molecules, circles represent water molecules, and triangles represent organic molecules

[5] The fact that all molecules are in constant chaotic thermal motion has already been mastered by the pupils in a series of tasks at the previous stage.

[6] At this initial stage of science education, the pupils hold such a not entirely accurate understanding; they will learn about substances with ionic bonds and about electrolytic dissociation later on.

feel the real problem of the boundary — they no longer understood what it was or how it worked. Some even wondered whether it existed at all. As they became aware of the contradiction, students articulated it verbally, in ways such as: "But this is paradoxical! The boundary lets some molecules through but not others!" or "Maybe some parts of the boundary let things through, and some parts don't...". They recorded the contradiction in writing, after which they were assigned a series of tasks meant to help them approach a solution. These included experiments with boundaries made of polyethylene, cellophane, and gauze; a home experiment with a representative of the living world — a carrot; and a virtual experiment in the practical module *Types of Boundaries*[7].

Through analysis of these tasks, the initial abstraction of the body's boundary developed and became more concrete in the concept of a selectively permeable boundary. Later, when students studied a "simple" living organism — the amoeba — they encountered the cell membrane as the concrete embodiment of such a "most elementary" boundary (as termed in the text)[8].

The next step in the development of the concept involved overcoming the fixation on the boundary's structural integrity and immobility. This began with examining amoeba movement, and then with analysing its nutrition. In formulating hypotheses about how an amoeba feeds, students discovered that the size of the amoeba's food creates a problem for the passage of necessary substances through the boundary of its body. The unicellular organisms eaten by the amoeba are too large to pass through the membrane into the internal environment. This prompted an examination of the stages of feeding (e.g., preliminary fragmentation of food) and shifted the notion of the body's boundary — it was now understood as sufficiently mobile and active, capable of changing shape to capture food.

As the students continued studying unicellular organisms, the question arose: what prevents them from being large — for example, the size of a human? They conducted an investigation of the ratio between the surface area of the body's boundary and the volume of that body. They identified one of the factors preventing unicellular organisms from surpassing a certain size threshold: as body volume increases (with shape held constant), the surface area available per unit of volume decreases. To overcome this size threshold, students "invented" a multicellular organism. The fundamental contradiction of the boundary reappeared, but on a new level. Students realized that the cells inside a multicellular body would require oxygen and organic substances from the external environment, and would also need to dispose of unnecessary or harmful substances. However, the boundary of the organism was no longer the membrane of a single cell, but layers of cells in contact with the external environment.

How, then, should the needs of the internal cells be met? Working on this new task led students to invent constructions involving cell specialization. Typically, at least one student group proposed a design with mobile cells — "carrier cells" — moving between the boundary and the internal cells. At this point, new potential pathways of conceptual movement emerged: towards the study of transport systems and the study of tissue types in living organisms.

The teacher then introduced a new phenomenon for investigation: a jellyfish washed ashore during a storm dies. Many students had seen this themselves. But why does it happen? Various explanations were discussed. The version "the jellyfish dissolves" was dismissed upon closer examination. Students concluded that the jellyfish dries out. But this contradicted the fact that other multicellular organisms — humans, for example — can remain in air without drying.

The thought occurred to many: "Maybe some parts of the boundary let things through, and some do not..." Returning to the model "Body size / surface area" allowed students to understand that the exchange-active part of the body's boundary must be much more extensive than its protective part. The teacher suggested modelling this using strings of different thicknesses.

By tying together two strings — one long and thin, the other short and thick — students obtained a movable model of the body's boundary consisting of two parts: an exchange-active part and a protective part[9].

The task was to strengthen the protection of the internal environment without losing the ability to carry out exchange with the external environment (Fig. 3). All possible solutions involved "folding" the exchange-active part of the boundary and hiding it — fully or partially — under the protective part. The resulting variants later turned out to correspond to different types of gas exchange in multicellular animals. Over several lessons, students studied concrete material on these types of gas exchange, including in humans, by reading scientific texts.

Next, the structural variants they had constructed were tested for their suitability for carrying out the function of nutrition. It became clear that, for various reasons, these designs were not particularly effective for the new task. Analysing their shortcomings led to the discovery of the through (complete) digestive system. All structural "inventions" supported the emergence of a new way of seeing— a new approach to considering the structure of multicellular animals, to "reading" diagrams of their structure by distinguish-

[7] https://urok.1c.ru/library/biology/virtualnaya_laboratoriya_po_biologii_dykhanie_i_obmen_veshchestv_4_11_klass/tipy_granits/

[8] It is clear that at this point the pupils' notions of fat-like substances and proteins were highly abstract, but the development of these concepts follows other disciplinary trajectories and depends on how and when this material will be studied in chemistry lessons.

[9] The idea of modelling with threads emerged during a discussion of the course with S. Yu. Kurganov.

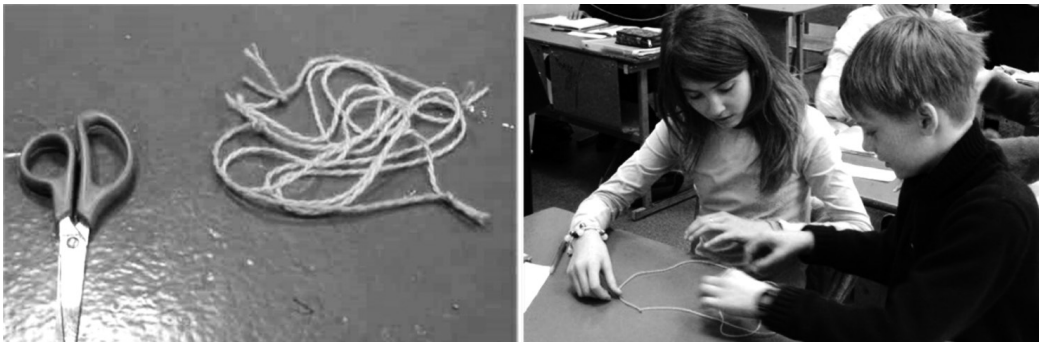

Fig. 3. Students are modelling the boundary of a multicellular living organism, which consists of two parts: the 'exchange' part and the 'protective' part

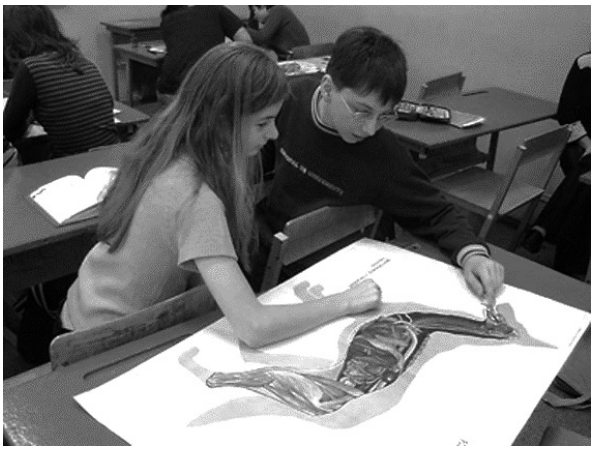

Fig. 4. Working in pairs, students analyse an image of a dog's internal organs, trying to figure out on their own where (at which boundaries) gas exchange, absorption of organic substances, and excretion occur. Understanding the general principles of the structure of multicellular animals allows them to do this

ing between internal and external environments and between exchange-active and protective parts of the body's boundary.

The concept of the boundary became increasingly concrete through analysis of the diverse structures of multicellular animals. Students could now see that as the boundary transforms, so too do the structures and forms of living beings, altering the spatial relationship between the internal and external. An "external environment" begins to appear *inside the body* — for example, air in the lungs or the contents of the digestive tract.

The more concretely students understood the boundary, and the more deeply they explored the possible details of its structure, the broader and more comprehensible the diversity of possible organismal structures and functions became to them. The concept gradually turned into a set of "lenses" through which they began to view the material presented for study: descriptive texts about living beings, schematic drawings of their structure, and video fragments of their lives (Fig. 4).

As students continued into Grade 7 with the study of the human excretory system, they discovered the phenomenon of active transport — that is, the exchange-related "work" of the boundary carried out with an expenditure of energy.

By the end of Grade 6, having completed their study of the major vegetative functions of animals and the structural features supporting these functions, the students had, in effect, constructed the concept of the organism. Only at this point did the teacher introduce the term *organism*. Prior to this, the term had not been used; and if a student mentioned it, the teacher asked: "Do you know what an organism is? Not exactly? Then let's not use this word yet."

Showing the students' jointly constructed diagram, which represented the connections among major vegetative functions in animals, the teacher would say: "This is what we call an organism. Try to formulate what it is." Students read their definitions aloud, and by selecting the most precise formulations, they composed a shared class definition, typically something along the lines of: "An organism is a set of interconnected structures (organs) that perform different functions."

After this, the class moved on to the study of plants. The teacher displayed an image of a spruce — a tree familiar to all as a New Year symbol — and said: "You can look at a spruce with different eyes. A gardener will be pleased by how lush, green, and fast-growing it is. An artist will see how it fits into the landscape, how it is lit... Try to look at the spruce as an organism. Write down

what you can claim about it and what questions you would like answered." This marked the beginning of the next major stage in the concretization of the concept of the boundary and of other concepts whose development had begun in the previous stage.

Results of the diagnostic assessment of concept development in traditional instruction and in the *New Biology* course

We can speak of genuine scientific understanding only when the concepts students have mastered exist not merely as verbal formulations reproduced when prompted, but when these concepts transform the way students view the objects around them — including those that were never explicitly discussed in class.

The study involved Moscow schoolchildren who had studied for one or two years in the traditional program (199 students in total) and students who had studied for one or two years in the *New Biology* course (227 students in total). Sixth- and seventh-grade students wrote what they knew and what they wanted to know about the structure and functioning of the birch and the sparrow — two organisms familiar to everyone since childhood. Each statement was evaluated by three independent experts according to agreed-upon criteria, on a scale from 0 to 5 points, depending on its level of substance and proximity to scientific understanding. The substance and scientific quality of the questions and statements produced by students taught through the developmental approach described above were substantially higher (Fig. 5). Comparison between the experimental and control classes using the Mann—Whitney U test revealed significant differences in both Grade 6 and Grade 7, as well as in the combined analysis of all data ($p < ,001$).

Evidence of reliance on scientific understanding of the organism appeared in the way students applied general principles to familiar but school-unexamined organisms — the bird and the tree. For example: "Respiration in the sparrow occurs in every cell," "The sparrow contains inorganic substances," "The birch is a multicellular organism." Indeed, it is precisely these "conceptual lenses" that sharpen students' vision of the object and allow them to detect something new or puzzling in it: "What type of boundary does the sparrow have?", "Are contractile vacuoles possible in the birch?", "Where does the birch obtain water and mineral salts?", "Is the sparrow's transport system closed or open?"

The overwhelming majority of questions and statements formulated by students taught in the traditional way were everyday in character. They remained tied to personal impressions, direct observations, and familiar representations, and often had no relation at all to what an organism is. For example: "My mother loves birches," "Why is birch bark white?", "Birch pollen causes allergies," "A sparrow has two legs and two wings."

Thus, the differences between the groups are qualitative in nature: students in the developmental-instruction setting show a clear increase in the number of substantive statements as their learning progresses, whereas traditional instruction does not lead to any substantial progress.

Discussion

The importance of transforming the content of traditional education and designing instructional courses

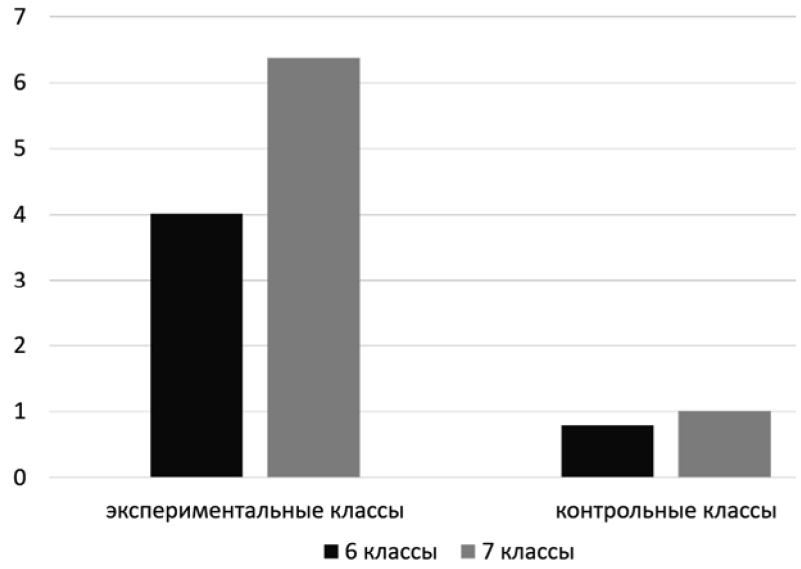

Fig. 5. The diagram shows the average number of statements rated by experts (≥ 3 points out of 5) in the experimental and control classes (1 and 2 years of learning biology). It is clear that in the experimental group, by the end of the 6th grade, students on average write down about four meaningful statements, while for seventh-graders this number increases to six or more (out of 10 possible). In the control group, the indicators remain extremely low: less than one statement in the 6th grade and about one in the 7th grade

on the basis of the principle of ascent from the abstract to the concrete is emphasized in contemporary research (Chapaev, 2022; Engestr m, 2020; Gennen, 2024). Yet the core difficulty lies in moving from an understanding of this general philosophical principle to a concrete methodology of instruction — a transition that necessarily relies on both logical—subject-matter and Logical-psychological analysis (Davydov, 1998). The instructional trajectory described above provides an example of such a transition.

Unfolding the conceptual logic through a system of learning tasks reveals the transformation of the initial abstraction of the body's boundary into the concept of the organism — one of the central concepts in the school biology curriculum. This example clearly demonstrates the evolution of models and the role of the class's collective cognitive movement in their construction. The path of abstraction, the forms of modelling, and the logic of concretization are determined by the very object of thought, as other researchers also note (Waerm , Broman, 2024). Along this path, constructive critique of prior representations and concepts — their *sublation* — is essential (Romashchuk, 2023). Emphasizing the role of such constructive critique, A.N. Romashchuk writes: "This type of critique sets a particular form of transition from one theory to another, from one concept to another. But the question remains as to whether this form is relevant not only for transitions within science itself, but also for transitions between everyday and scientific theories in the learning process."

In the present case we see that the students' initial, shared abstract representation of the body's boundary is first transformed into a more elaborated understanding of different types of boundaries through experiments and virtual practical work. It is then subjected to constructive critique through model-based analysis — for example, the "invention" of a multicellular body with a boundary formed by layers of cells is the result of students' constructive critique of unicellular structure and of overcoming the size limitations inherent in unicellular organisms. In this way, the developing system of scientific knowledge formed in the students' minds preserves earlier representations, continuing to need them as its foundation. The partial incongruence of a concept with reality, the unsettling inexhaustibility of the object that resists full comprehension — the *non-conceptual* dimension described by L. Radford (Radford, 2020) — may become especially tangible in the process of concretization and because of it. This is manifested in the substantive questions that arise about familiar, childhood objects.

G.G. Mikulina and O.V. Savelyeva demonstrated that the capacity for concretization is a decisive distinguishing criterion of theoretical thinking and, consequently, of fully formed knowledge (Mikulina, Savelyeva, 1997). The study conducted with the diagnostic method *Sparrow and Birch* revealed substantial differences in the mastery of the concept *organism* between the experimental and control groups. These differences concern, above all, students' ability to use the conceptual tools they have mastered as instruments for interpreting concrete examples drawn from their prior experience — that is, to move in their understanding of organismal structure and functioning from general principles to particular cases. This allows us to speak of the development of biological thinking and of fully formed biological knowledge in these students.

Conclusion

A school subject under development should not be a direct projection of scientific knowledge into the space of instruction. If a course for schoolchildren is created as a simplified version of university-level material, most students will acquire the knowledge only formally, without understanding. Introducing the term *organism* by listing examples of living beings to which it applies — for instance: "A rose, a herring, a crocodile, and a mouse are living organisms" — produces an empirical generalization, a common representation, but not a concept. For a student, the word *organism* will mean something like: "something that exists separately and is alive, like me or my cat." It is no coincidence that this term is often used by teachers and students as a full synonym for *living being*.

Developing instructional content according to the logic of ascent from the abstract to the concrete requires not only examining the history of science but, at times, constructing for educational purposes a special model—schematic representation of an "initial cell," an initial relation that contains the potential for development into a key concept of the subject. This process is clearly visible in the example of how the representation of the body's boundary develops into the concept of the organism.

Key disciplinary concepts formed through the ascent from the abstract to the concrete, as demonstrated in this example, become genuine supports for thinking. They serve as tools for solving a wide range of tasks and gradually transform a learner's everyday experience. A person gains grounds for meaningful questions and substantive assertions about the objects they encounter in daily life.

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Formation of research vision in schoolchildren using digital mediation tools according to cultural-historical psychology. Part 2

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Abstract

Context and relevance. In the second part of the article, the authors summarize the results of a study, empirically based on the "Schoolchildren as Scientific Volunteers" project. The subject matter in both parts is the problem of developing research vision in schoolchildren involved in research activities. The authors demonstrate that in course of the project pupils were immersed into a new type of activity for them — experimental searching, fundamentally different from their typical experience at mainstream school. **Objective.** To determine the role of digital tools in shaping a research vision among schoolchildren. **Hypothesis.** Engaging schoolchildren, who participate in the "Schoolchildren — Scientific Volunteers" project (hereinafter referred to as SSV), in research activities and integrating digital tools into these activities will contribute to the formation of the desired research vision and a new functional organ in them. **Method and materials.** The authors compare two types of signs: classical (word, speech, symbol) and digital as a virtual symbolic form. Cultural-historical psychology attributes the role of a mediating element as a psychological tool to the classical sign, which has such qualities (in its capacity of a psychological tool) as inward orientation, social and activity-oriented nature, involvement in the act of interaction between an adult and a child, and sign nature. In contrast, the digital exhibits other characteristics: changed vector orientation (digital is not directed at a child), transformed form, lack of integration into the act of interaction between an adult and a child, and replacement of humans by the digital. According to the basic ideas of cultural-historical psychology, the role of the sign (speech) as a psychological tool is that by mastering it with the help of a significant adult, a person is able to control one's natural processes and behavior. However, it is exactly what the digital takes away from children, immersing them in virtual reality and offering a ready-made behavioral script. The authors propose a fundamentally different scenario where the digital does not deprive humans of their "social power" (L.S. Vygotsky), but rather serves as a tool or instrument enhancing the of a schoolchildren's experience of experimental searching, their try-and-search activity. In this context, the article presents an example of such a new psychological tool as a digital map, creating which a schoolchild formed a new vision of natural materials, thereby establishing one's research position. **Results.** The study reveals that such a change in scenario is possible through restructuring the mode of activity and incorporating reflection on the part of a schoolchild. The authors illustrate that in this respect, constructing collaborative experimental-searching activity between an adult and a schoolchild is totally independent of the digital. The digital becomes only a new type of psychological tools, while a schoolchild, builds up a mediating action with the help of an adult, which implies a reflective standpoint of the pupil. It is shown that in the SSV project schoolchildren faced particular difficulties reflexively describing their activity associated with gathering and systematizing material under adult supervision. Reflexive activity of schoolchildren was not included as an integral part of the project, and the pupils did not act as active participants. This is the main lesson drawn from the project. **Conclusions**. Digital cannot be a mediator on its own. It can perform a mediating function when organizing collaborative actions between an adult mentor and a pupil; acting as a smart interface assistant for a person to speed up work and make it more efficient but not replacing humans.

Keywords: cultural-historical psychology, mediation, digital mediating tools, datasets, digital map, research vision, the "Schoolchildren — scientific volunteers" project

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Формирование исследовательского видения у школьников с использованием цифровых средств-посредников с точки зрения культурно-исторической психологии
Часть 2

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Резюме

Контекст и актуальность. Во второй части статьи авторы обобщают результаты исследования, эмпирическим материалом для которого послужил проект «Школьники — научные волонтеры». Предметом обеих частей является проблема формирования исследовательского видения у школьников, включенных в исследовательскую деятельность. Авторы показывают, что в проекте школьники были погружены в новый для них тип деятельности, пробно-поисковый, принципиально отличный от того опыта, с которым они сталкиваются в массовой школе. **Цель.** Выяснить вопрос о роли цифровых средств в формировании исследовательского видения у школьников. **Гипотеза.** Включение школьников, участников проекта «Школьники — научные волонтеры» (далее — ШНВ), в исследовательскую деятельность и встраивание в нее цифровых средств будет способствовать формированию у них желаемого *исследовательского видения*, нового функционального органа. **Методы и материалы**. Авторы проводят сравнение двух типов знаков — классического знака (слово, речь, символ) и цифры, как виртуальной знаковой формы. Первый тип знака, которому в культурно-исторической психологии приписывается роль опосредующего звена как психологического орудия, обладает такими качествами (в качестве психологического орудия), как направленность вовнутрь, социальная, деятельностная природа, включенность в акт взаимодействия взрослого и ребенка, знаковая природа. В отличие от классического психологического орудия для цифры характерны иные качества: смена вектора направленности (цифра не направлена на ребенка), превращенная форма, не встроенность в акт взаимодействия взрослого и ребенка, замещение цифрой человека. Согласно базовым идеям КИП, роль знака (речи) как психологического орудия заключается в том, чтобы, овладевая им, человек с помощью значимого взрослого овладевал своими естественными, натуральными процессами, своим поведением. Но именно это «отнимает» у ребенка цифра, погружая его в виртуальную реальность и навязывая ему готовый сценарий поведения. Авторы предложили принципиально иной сценарий, в котором цифра не забирает «социальную силу» (Л.С. Выготский) у человека, а, наоборот, рассматривается как орудие, инструмент, интенсифицирующий пробно-испытательный опыт школьника, его пробно-поисковую деятельность. В этой связи в статье предложен пример такого нового психологического орудия, как цифровая карта, составляя которую школьник формировал у себя новое видение натурального материала, тем самым у него выстраивалась исследовательская позиция. **Результаты.** Показано, что такая смена сценария возможна при перестраивании способа деятельности, при включении рефлексии со стороны школьника. Авторы показывают, что в этой связи выстраивание пробно-поисковой совместной деятельности взрослого и школьника никак от самой по себе цифры не зависит. Цифра становится лишь новым типом психологического орудия, а сам школьник с помощью взрослого выстраивает посредническое действие, что предполагает рефлексивную позицию самого школьника. Показано, что именно в этом проекте ШНВ школьники столкнулись с трудностью рефлексивно описать свою активность в проекте, связанную со сбором и систематизацией материала под руководством взрослых. В проект не была включена рефлексивная деятельность школьников как его необходимая часть, а сами школьники не выступали в роли активных субъектов. Это было главным уроком проекта. **Выводы.** Цифра сама по себе не может быть посредником. Она может выполнять опосредующую функцию при организации совместного действия

взрослого наставника и школьника, выступая в интерфейсе с человеком в качестве умного помощника, позволяя делать работу быстрее и эффективнее, но не замещая человека.

Ключевые слова: культурно-историческая психология, опосредствование, цифровые средства-посредники, датасеты, цифровая карта, исследовательское видение, проект «Школьники — научные волонтеры»

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Introduction

In the first part of this article, we proposed a reference mediation model where, in line with the cultural-historical approach, we described the experience of schoolchildren's development and the establishment of new, activity-related formations, i.e., higher abilities, including the ability to engage in research activities that involve digital devices (Pavlovsky et al., 2024).

The main characteristics of a child's developmental step are, according to the language of the mediation model, that he or she masters, with the help of an adult mediator, a new way of acting, thereby transforming an external stimulus into an internal activity formation. An external means-stimulus, a psychological tool, turns into an internalized method of action, meaningful and reflected on, which allows it to be appropriated and become part of an individual's personal organic structure, a new "functional organ." As noted by Elkonin (Elkonin, 2010, p. 233), a stimulus that used to be external for a person, becomes an internal resource, and the sign *transforms* into a means for constructing actions.

We put forward a hypothesis that involving students — participants of the "Schoolchildren — Scientific Volunteers" project (hereafter referred to as SSV) in research activities and integrating digital tools into these activities would contribute to developing their desired *investigative vision*, forming a new functional organ.

To verify it, upon completing the project, semi-structured interviews were conducted with different groups of participants from various regions (six groups); 70 schoolchildren took part in a questionnaire survey. Additionally, expert interviews were held with adult mentors and researchers (6 in total). The interviews comprised some benchmark questions aimed at encouraging reflection. We sought to address pupils' reflective experiences regarding their participation in the project. Overall, more than 100 project participants took part in surveys in various formats.

Sign and digital

To understand the specifics of the new mediating link represented by digital tools in the mediation model, it's essential to recall the fundamental features of signs understood as psychological tools under the cultural-historical approach (hereinafter referred to as CHA). What are the characteristics of sign-symbol mediation? What distinguishes classical sign-symbol psychological tools? (See also Vygotsky (1982, 1984), Pavlenko (2020), Polyakov (2022), Khoziev (2005), Elkonin (2010, 2016), Smirnov (2023a).

1. *Self-directedness.* L.S. Vygotsky strongly emphasized that a psychological tool primarily focuses on an individual (a child) who masters it and, through this mastery, gains control over oneself.[1]

[1] As highlighted by L.S. Vygotsky, an essential difference between psychological and technical tools lies in the impact focused on the psyche and behavior. A psychological tool changes nothing in an object; instead, it serves as a means of self-influence — on the mind and behavior — not as a means to affect an object directly" (Vygotsky, 1982, p. 106). It should be mentioned that the aspect concerning children's acquisition of self-control remains underappreciated in CHA. Many scholars describe the differences between signs and tools, classify psychological tools, or discuss the mediational function of signs. We believe, however, that the crucial point for Vygotsky begins there and then, where and when a child uses sign-speech to start mastering his/her innate psychic processes and natural behaviors under the guidance of adults (see also Pavlenko, 2020; Polyakov, 2022; Khoziev, 2005).

2. *Social and activity-based nature*. Psychological tools are initially developed in a social environment external to an individual.[2] First, mental function is manifested externally, in social interactions outside an individual, evolving as a "functional organ" of activity. Basically, there are no localized separate "higher mental functions", inherently present within individuals. All such functions develop through engagement in activities and become integral parts or new formations in an activity-based, functional body of a human personality (an organ of walking, writing, counting, reading, etc.)

3. *Engagement in an act of child — adult interaction*. Developing his teacher's ideas, D.B. Elkonin adopted the figure of a significant "social adult" (that was mentioned but not model-integrated by L.S. Vygotsky, who did not complete the model). A psychological tool does not exist on its own. It does not possess the properties of agency or subjectivity. It is always presented and transferred to a child through the hands, voice, and body of a significant adult. The adult demonstrates to a child how to perform actions using this psychological tool. It is the adult who integrates the psychological tool into an act of communication with the child, carrying out joint mediating action together with the child. In this regard, B.D. Elkonin followed D.B. Elkonin's lead, focusing more on the joint construction of intermediary activity by both adults and children rather than the mediating role of the sign-tool (Elkonin, 1994; Elkonin, 2016).

4. *The sign nature of the psychological tool*. Through the mediation by an adult-intermediary, a child regulates his/her behavior specifically through a "sign operation" — by means of speech, mumbling, gestures, verbal expression, constantly keeping the adult in the focus of attention to show how he / she is eating porridge, building a house with blocks, or drawing scribbles on paper. This sign action is already directed at oneself, towards one's own behavior. The child reinforces one's object-related action with a sign action intertwined with the object-related one. Parallel to the reality of tool activities, a sign reality emerges. It is within this sign reality that speech arises, making humans. As emphasized by L.S. Vygotsky, it is precisely this phenomenon that makes humans free, independent of the natural visual field. The more developed is child's speech, the freer and more purposeful his/her object-directed actions become (Vygotsky, 1984, pp. 85 — 86)[3].

Thus, the main features highlighted by L.S. Vygotsky when describing signs as psychological tools include their *orientation toward an individual (a child),* enabling him or her *to master their own behavior through these tools*. Furthermore, as repeatedly stressed by L.S. Vygotsky, once embedded in the structure of mental activity, the sign alters, restructures, and transforms this very structure. These are the key points[4].

Now, however, our task is to examine the "digital" as a special sign-tool mediating human behavior (particularly, behavior of schoolchildren). What distinguishes the digital (gadgets, devices, or instruments) as a new type of sign-tools from familiar sign forms? Can we identify the constructive role of the digital as a new psychological tool of mediation in an act of development? What is the specifics of the mediating role of the digital[5]?

For example, O.V. Rubtsova argues that by L.S. Vygotsky, the concepts of 'sign' and 'tool' were distinctly separated: the tool acted externally relative to the child, while the sign as a psychological tool was oriented inwardly, towards the self. According to Rubtsova, however, the digital combines both sign and tool features. Take a mobile phone, for example. Sometimes, it serves as a tool (for sending electronic messages); on other occasions, it acts as a sign (mediating cognitive processes, e.g., social media interactions). Moreover, transitions between functioning as a sign and as a tool are fast, seamless, and habitual for users (Rubtsova, 2019, p. 122).

First of all, note that the digital is indeed a sign, albeit special. It a sign of a sign, *virtual sign form*. It designates another, virtual reality, virtual objects rather than conventional social things, actions, people, or relationships. The nature of the digital is virtual. It is this inherent virtual nature that entails profound implications

[2] As stated by L.S. Vygotsky: psychological tools are artificial constructs; they are essentially social in nature, not organic or individually adaptive. (Vygotsky, 1982, p. 103).

[3] See also: "...mediation is a way of cultivating the Arbitrariness of human activity, i.e., genuine human autonomy and initiative, fostering free action" (Elkonin, 2016, p. 111).

[4] Effectively, L.S. Vygotsky equated the process of education with the concept of mastery: "Education is artificial acquisition of natural developmental processes. Education not only influences certain developmental processes but fundamentally reconstructs all behavioral functions" (Vygotsky, 1982, p. 107).

[5] This view is shared by many researchers working in the tradition of Cultural-Historical Psychology (CHP). For instance, G. R ckriem argues that Lev Vygotsky's concept emerged back in the era of Gutenberg printing press, predating the digital age. Yet it's the digital that fundamentally transforms the entire process of mediation. On this basis, R ckriem suggests that the mediation model is not entirely historical since it applies primarily to pre-digital realities and thus cannot adequately explain contemporary digital realities (R ckriem, 2010, p. 32). R ckriem's conclusions seem self-contradictory. While acknowledging that digital technologies serve as a novel leading tool of mediation in the digital epoch, he simultaneously believes that the basic structure of the activity theory, rooted in the pre-digital, book-centric culture, has become obsolete. Consequently, he calls for substantial revision of the fundamental tenets of the activity theory in light of such new fields of knowledge as multimedia history and theory, etc.

regarding its role as a mediator of human actions, particularly those of children, whose higher-order abilities are underdeveloped.

Let's highlight, purely conceptually, the distinctive features specifying the mediating role of the digital based on the classical understanding of the role of psychological tools outlined above.

1. *Changing an orientation vector*. Numerous studies on the impact of the digital (gadgets and internet usage) on children and adolescents — groups that lack sufficient skills and experience in self-regulation and control over their behavior — demonstrate that the digital, being active and directed towards a child, is not taken by a child as a psychological tool aimed inwardly. Instead, it guides a child outwardly, towards the digital environment. Therefore, rather than becoming a sign-tool facilitating the acquisition of the modes of action, the digital deprives children of the power required for a mode of action and offer ready-made solutions. Children do not need to develop self-control; they simply adopt pre-programmed patterns of behavior embedded in a gadget (see detailed analysis in Smirnov, 2023a).

2. *Virtual, transformed nature*. The digital, and virtual reality in general, constitute a transformed form of the reality. It certainly exists as a reality, but a transformed reality. It is fully real, indeed; yet, it is a transformed reality substituting the other, primordial, activity-based reality. Just as the money form of value substitutes the actual value of goods, as Karl Marx demonstrated (Smirnov, 2023b).

In other words, digital reality lacks its own "social power," as L.S. Vygotsky put it. It does not act as a form of authentic social relations but rather substitutes them with virtual forms that seem real and genuine to someone immersed in the virtual sphere. Consequently, it creates an illusion of a comprehensive reality.

3. *Digital as the habitat*. Traditional tools within the CHP framework, for example, spoons used by babies learning to eat cereals or any other items (pens, forks, hammers, mechanisms) were invented by adults — people with experience, relative to whom a new human being is a child, not a self-standing, grown-up individual. The digital, on the contrary, enters children's lives on par with the adults and it happens prematurely, often starting in the first months of life alongside toys and household items[6]. Thus, for children, the digital represents an omnipresent habitat rather than merely a sign-tool. Unlike tools, however, habitat cannot be mastered; one enters it and adapts to its rules. The digital surrounds children independently of adults, simply due to the fact of its presence.

Therefore, in this context, we cannot isolate the communicative act wherein an adult provides a pattern of tool action along with the implicit mode of action. Frequently, the digital envelopes the habitats of both an adult and a child, so there is no clear carrier of the pattern of action.

4. *Substituting humans with virtual signs*. Ultimately, these characteristics of the digital as a sign leads to the displacement not only of an adult, the other individual but of any other social reality. The substitution process commenced prior to the advent of the digital. Sign mediation, natural for the cultural evolution of humans and described within the CHP tradition, obtains its historical continuation. Similarly, further transformations of transformed forms will continue as illustrated by the replacement of paper money with virtual equivalents. The process of transformation takes place not in the minds of particular individuals but in their actual life, just the forms of life are getting increasingly more virtual.

In view of the above features of the psychological tool, it is essential to consider the digital not as the environment and power which strips children (and humans in general) of their actor's position, but rather as a sign capable of transforming hybrid digital environment into a *meaningful field for constructing new, collective, mediated actions,* when the digital becomes an assistant in creating 'try-and-explore scenarios' for diverse developmental situations (Elkonin, 2023a; Elkonin, 2023b)[7].

Therefore, the issue does not lie in the digital per se. Everything depends on the original set-up of educative research: is it geared towards employing the digital as a means of development, or does it merely consider using it as a tool?

Given the risks associated with delegating tasks to digital assistants, especially generative models, reflective tasks, the level of goal-orientation and mindful use of such aids are mandatory. Otherwise, digital devices will dominate the activities and script the behavior of both learners and even researchers. Alternatively, humans could assume an active role, leveraging digital tools effectively to enhance human capabilities.

B.D. Elkonin noted this difference in one of his interviews:

[6] According to various research findings, most children gain their initial exposure to the digital in the first three months of life. By the age of two, approximately 90% of children have regular access to gadgets including smartphones and tablets (Cognitive Development..., 2017).

[7] See: "Intelligent ways of digitalization open up opportunities for try-search-and-explore modes of orientation. I believe that thinking becomes exposed here" (Elkonin, 2023b). See also our work on the structure of search situations with use of the digital (Smirnov, 2023a).

"First example. A mother pushes her five- to six-month-old baby in a stroller. To allow herself to talk on the phone without distraction, she turns on a screen for the child, engrossing him completely so he doesn't bother her with his needs. What's happening here first and foremost... it's not the child controlling the device, but the device controlling the child... It's not the seven-month-old infant managing images with his eyes, eye movements, comprehension, or perception; rather, the pictures dictate the movement of the child's gaze...

Another example... An experiment was conducted at Moscow State University of Psychology and Education when a fairy tale cartoon was demonstrated on a tablet and the participants could interactively manipulate the imagery. Three groups of children were identified: the first group simply scrolled through; the second group did something with the image, such as changing leaf colors to make them brighter, and so on. And the third group actively influenced the climax, i.e., the intrigue, the central event of the storyline, modifying the situation altogether...These children played with the storyline, working with the focal point of the plot. For this particular group, the "digital" became a means to amplify their comprehension and experience of the fairy tale (Elkonin, 2023a, p. 225).

Digital in the SSV project

How was the digital used in the SSV Project?

First, gadgets were employed as the tools with built-in functionalities to photograph plants and mushrooms and identify species.

Second, some schoolchildren compiled digital cards to record data about natural objects. Initially, a child observed the plant directly, then entered systematic botanical information onto the card.

Although this task might look pretty straightforward, it triggers the rules of mediation, similar to the scenario described earlier by B.D. Elkonin in the case of a fairy tale for kids. It is one thing to use pre-designed tools for taking photos of plants; compiling card-catalogues about plants is different, it entails the creation of a new tool by pupils themselves. Gradually filling in datasets related to plants, fungi, and birds a schoolchild develops a more panoramic, extensive vision of biodiversity, shaped, in particular, through the student's own involvement. Thus, we see the diverse role of the schoolchild — not only a collector of materials who knows the area but also an active constructor of a collection, a digital classification system.

Now let's proceed to the crux of the matter. Clearly, the above discussed features of the digital as virtual sign forms, in the absence of effective human guidance, risk dominating the behavior of non-self-standing children. In this case, the challenge is to restore not just the mediating function to the new sign-tool, the digital, but also its capacity to facilitate mastery so that pupils gain control over their behavior and construct their object-oriented actions with the help of an adult, thereby creating a new meaningful field of an exploratory object action. To achieve, this, however, it is necessary to reintroduce an adult into the act of virtual communication.

As such an exploratory action, we proposed the task of compiling digital cards that play the role of an intermediary — a digital diary. Pupils filled out digital cards, structured according to predefined data annotations (datasets). A separate digital card was compiled for each natural object (an individual mushroom, plant, bird). The completed cards were uploaded to a database. Data storage enabled immediate use of the digital cards filled in by the schoolchildren for machine learning as labeled datasets. All project work was duplicated by entering information into the Kappa framework. The project stages and tasks are summarized in the Table 1 below.

Almost all tasks in the right column were performed by schoolchildren together with mentors, except for Item 10, where scientists involved in the project verified the accuracy of the data entered into the digital cards. Consequently, schoolchildren received feedback on their observation diaries, which led to the refinement of the dataset. Subsequently, the students completed a digital card for each natural object (a digital record). An example of a "mushroom" object card is shown in Figure 1 below.

Practically every step-by-step operation of the project followed the logic of expanding the cognitive horizon: site, orientation on the spot — site referencing — identifying and defining an object — snapping and describing an object — mapping an object — inputting and annotating an object in a digital card compiling the collection of objects in the form of photographs and videos — uploading cards to a database on the platform — accessing the digital collection through the platform — compiling taxonomy and classifying objects — world outlook.

Through this process, schoolchildren developed a new view over nature — not only through their own eyes but equipped with observation data and digital tools.

By filling in the digital cards, schoolchildren acquired a new type of psychological tool that facilitated their research efforts and nurtured elements of investigatory insight. Their perceptual horizons expanded, contributing to the formation of a coherent worldview. The summary is presented in Figure 2.

Table

Project stages and types of work for schoolchildren

Project stages	Types of work for schoolchildren
Selection of at least 4 sites for observations: — ability to justify the choice by the objectives of the research; — ability to work with coordinates; — ability to record the site's features	1. Creating a place with a point on the map. Orientation on the terrain. 2. Entering a description of the place. Linking to the territory. Designating yourself on the terrain[8]
Выезд на площадку / Departure to the place	3. Receiving GPS coordinates from a smartphone. 4. Entering weather data on the date of the visit to the site
Keeping a field diary of observations: — photo — text description	5. Identification, detection of various natural objects in the location (mushroom/plant/bird/other). 6. Recording natural objects using gadgets, identifying them using applications. 7. Creating a record of observation (mushroom/plant/bird/other). 8. Attaching a photo, sound, video. 9. Description of the observation according to the protocol
Expert verification	10. Validation of records in the database.
Project protection	11. Formation of a sample
Maintaining the database up to date	12. Constant access to validated records / Storage of records

Note: «*» — This work, though simple, is crucial. Some of the students (senior students!) found themselves in the forest outside the city for the first time. They were simply afraid of it. Some parents were forced to take them home due to stress, tears, and rejection.[9]

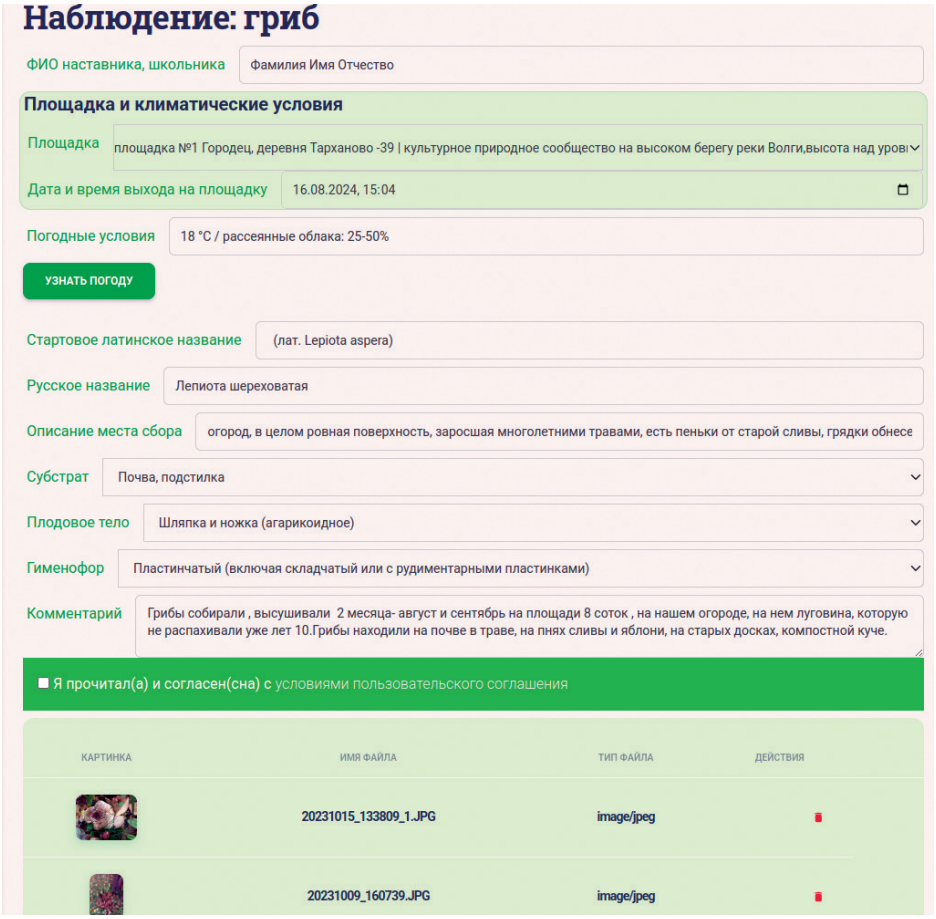

Fig 1. Digital Card (Mushroom)

[8] The task is simple but crucial. Some high-school students found themselves in a forest outside the city limits for the first time and were simply scared. Parents had to bring several kids home because of stress, tears, and refusal to continue participating.

[9] https://syncwoia.com/event/datavolunteers/stages

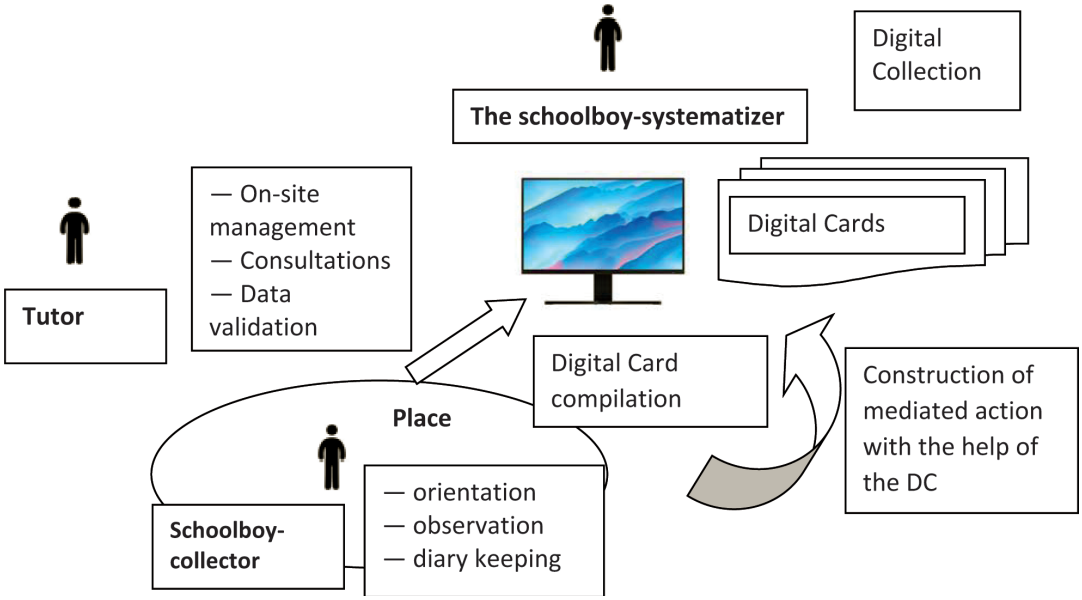

Fig. 2. Mediation via digital card

Discussion

What preliminary conclusions can we draw based on an analysis of the collected materials in line with the specified perspective regarding sign and digital mediation?

1. In the course of reflexive interviews, we found that despite being engaged in basic research practices, schoolchildren struggled to evaluate and articulate their experiences. Most lacked personal reflective assessments of acquiring new modes of action, research action, in the process of studying, in that case, natural materials as part of the SSV project. Schoolchildren faced verbal deficits, struggling to find appropriate words and language to describe even their own feelings, emotions, and impressions, their first elementary experiences of participating in research practices of the project. No one had ever talked to them about it and asked them such kind of questions.

Reflection on their experiences was essentially absent in the SSV project. When we gave pupils reflexive questions regarding their own research experiences, they encountered noticeable difficulties related to self-awareness — what had exactly happened to them? It was hard for them to answer these straightforward questions in their own language; they were unable to say anything to confirm or deny that they had mastered a new mode of action. Assessing their experiences, the schoolchildren relied heavily on adult vocabulary, did not speak for themselves and struggled to find words.

2. Describing their project experiences, schoolchildren predominantly expressed personal feelings and emotional responses, such as: “it was interesting”, “we don’t do it at school”, “it is useful”, “can be used”, “later I will, perhaps, go to the university”, “it broadens horizons”, “learned a lot of new things”, and so on. In this sense, their reflection was predominantly motivational-and-meaningful, surpassing object-and-tool-driven considerations. Few participants were able to demonstrate the latter. For the majority, relationship with adults took precedence, introducing them to a novel form of social interaction. Nevertheless, for some schoolchildren, the operational aspect held greater significance — mastering new procedures, performing lab experiments, studying natural objects, gathering samples[10].

In the first part of the article, we postulated that schoolchildren placed in exploratory contexts related to mastering a new object activity should acquire new competencies, perspectives, and a researcher’s mindset — or a "new functional organ", the idea of which we outlined in the first part of the article. Essentially, it implies an ability to discern latent natural processes, the very "third eye."

It turns out, however, that the issue isn't about the digital that is largely irrelevant! The digital doesn't create the new functional organ nor it serves as its mandatory component. Merely incorporating the digital in some form

[10] D.B. Elkonin demonstrated that motivation and meaning precede mastering means and tools. First the meaning, then the tool: "Each period characterized by acquiring operational-and-technical aspects of activity in the world of objects is preceded by a period of internalizing the motivation-and-need component of human activity... The same principle applies to mastering a separate object-related action. Before grasping the operational-and-technical side of an action, a child must first comprehend the significance of such mastering within the system of relationship with an adult" (Elkonin, 1994, p. 100).

into object activities doesn't guarantee that an individual would develop a new organ. The latter arises from carefully constructed, organized, reflectively framed object-related activity that implies active human engagement — be it a school pupil, a future researcher, or a child immersed in storytelling with the freedom to alter the plot.

The digital (gadgets, tablets, digital maps) may be part of the existing tools or not. You may use as many digital tools as you like, including the most advanced ones, but if the relevant object-related activity of an adult-mediator and a child is not well-planned and built up, if these activities neglect the child's active role as an actor empowered to shape the course of action, no digital platforms or technologies will shape the necessary competencies in children.

Ultimately, our observations and findings corroborate a long-established notion in Cultural-Historical Psychology (CHP). Human abilities develop through try-and-search object-related activities undertaken jointly by adults and children. Simply integrating the digital, using the digital as a sign-tool does not designate and assume the automatic formation of a new organ, a new ability. Such developments rely on specially structured object-related activity involving both adults and children rather than on the digital.

Conclusion

Currently, numerous scholars, including proponents of the concept of Cultural-Historical Psychology (CHP), show an ardent longing to incorporate the digital into the mediation model.

Initially, we also believed that embedding digital devices into schoolchildren's substantive activities would foster the development of a new functional organ, a new capacity enabling them to observe natural objects and see something they did not notice previously. And the digital would facilitate it.

Contrary to the expectations, it turned out that the matter is not in gadgets or digital tools.

Effectively, the CHP concept validated its core principles: human abilities develop with building up a new object-related activity where an adult-mediator plays a pivotal role, while a child assumes an active role as an actor mastering a new mode of action.

The difficulty encountered by schoolchildren in the SSV project due to their inability to reflectively describe their project activity related to material collection and systematization under adult supervision, while using gadgets — highlights the absence of reflective practices as a necessary element of this experience and the fact that the pupils were not engaged in the project as active actors.

These findings imply that the digital alone cannot be an intermediary. It can perform the mediating function in the course of joint actions of an adult mentor and a schoolchild, acting as intelligent assistants interfacing with humans to expedite and optimize the work — but never replacing the human.

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Bair N. Tuchinov — development of the marking methodology, compilation of datasets.

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

Вклад авторов

Павловский Е.Н. — разработка методики разметки; составление датасетов.

Сидорова Т.А. — проведение экспертных интервью.

Смирнов С.А. — разработка концепции исследования; аннотирование; проведение экспертных интервью; сбор и анализ данных.

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The authors declare no conflict of interest.

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DISCUSSIONS AND DISCOURSES
ДИСКУССИИ И ДИСКУРСЫ

Научная статья | Original paper

Response to Commentary "Cultural-Historical Neuropsychology and ADHD" by Prof. Tatiana V. Akhutina

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Abstract

The present short review contains the authors response to Commentary "Cultural-Historical Neuropsychology and ADHD" by Prof. Tatiana V. Akhutina (Akhutina, 2025) for the article "Diagnosis from the Perspective of Cultural-Historical Neuropsychology" (Koutsoklenis, Solovieva, Quintanar, 2025). The Commentary by Prof. Tatiana V. Akhutina was published in the same issue of the Journal. The present response is relevant for understanding of the authors' theoretical position on the topic of ADHD and cultural historical approach.

Keywords: Attention-Deficit/Hyperactivity Disorder, ADHD, diagnosis, cultural-historical theory, cultural-historical neuropsychology

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Ответ на комментарий «Культурно-историческая нейропсихология и СДВГ» профессора Т.В. Ахутиной

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Резюме

Данный краткий обзор содержит ответ авторов на комментарий "О культурно-исторической нейропсихологии и диагнозе СДВГ" профессора Т. В. Ахутиной (Ахутина, 2025) к статье "Диагностика СДВГ с позиций культурно-исторической нейропсихологии" (Кутоскленис, Соловьева, Кинтнар, 2025). Ком-

ментарий профессора Т. В. Ахутиной был опубликован в том же номере журнала. Настоящий ответ важен для понимания теоретической позиции авторов по теме СДВГ и культурно-исторического подхода.

Ключевые слова: синдром дефицита внимания и гиперактивности, СДВГ, теория культурно-исторической психологии, культурно-историческая нейропсихология

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We would like to begin by expressing our sincere gratitude to the *Journal of Cultural-Historical Psychology* for the opportunity to publish our article, *"ADHD Diagnosis from the Perspective of Cultural-Historical Neuropsychology"* (Koutsoklenis, Solovieva, Quintanar, 2025). We are particularly appreciative of the journal's openness to addressing Attention Deficit Hyperactivity Disorder (ADHD), a topic not commonly featured within its pages. We view this inclusion as an important step toward integrating clinical neuropsychology into the broader framework of cultural-historical psychology, as originally envisioned by Luria and his followers.

We are equally pleased to note the publication, in the same issue, of a commentary by our esteemed colleague and friend, Professor Tatiana V. Akhutina, titled *"Cultural-Historical Neuropsychology and ADHD: Commentary on the Article 'ADHD Diagnosis from the Perspective of Cultural-Historical Neuropsychology"* (Akhutina, 2025). It is likely that Prof. Akhutina was among the reviewers of our article — a possibility we regard as both an honor and a valuable opportunity for academic dialogue.

In this response, we would like to address several important points raised in her commentary. We are encouraged by Prof. Akhutina's affirmation of our shared theoretical and methodological foundations, grounded in the work of Vygotsky and Luria. We believe it is essential for scholars from diverse national and academic contexts to engage in meaningful cross-cultural dialogue regarding the clinical application of these theories — particularly in complex areas such as the diagnosis of attentional difficulties. At the same time, we recognize that theoretical principles may be interpreted and applied differently in academic, clinical, and research settings, as evidenced by practices in our respective countries of Greece and Mexico.

In our article, we argued that the concept of Attention Deficit Hyperactivity Disorder (ADHD) does not constitute a valid or useful diagnostic category within the framework of cultural-historical neuropsychology. Rather than identifying a coherent syndrome, the term functions as an umbrella label that aggregates heterogeneous symptoms and diverse neuropsychological syndromes into a single, overly generalized classification. In light of this, we were somewhat surprised to see that Prof. Akhutina appears to support this categorization.

Empirical research (Solovieva et al., 2016a; Solovieva et al., 2016b) demonstrates that children diagnosed with ADHD frequently present with varied neuropsychological profiles, each grounded in distinct functional mechanisms — or what Luria (Luria 1973; Luria 2002) referred to as neuropsychological factors. These mechanisms involve specific deficits in cortical and subcortical regulation and are substantiated by both neuropsychological assessments and neurophysiological findings. From this standpoint, a singular diagnostic category such as ADHD conceals the functional diversity of these cases rather than clarifying it.

We are particularly concerned that psychiatric classifications endorsed by institutional authorities — such as the American Psychiatric Association — and reinforced by the pharmaceutical industry may undermine the specificity and explanatory power of diagnoses rooted in cultural-historical neuropsychology. The consolidation of multiple, distinct functional syndromes under a single diagnostic term fails to reflect the complexity of neuropsychological dysfunctions, ultimately weakening the diagnostic and therapeutic processes central to cultural-historical methodology.

Prof. Akhutina suggests that rejecting the concept of ADHD might hinder future research. On the contrary, we argue that moving beyond this generalized category opens the door to more productive inquiries into the biological and social origins of attentional difficulties. A proper clinical investigation must encompass multiple levels of analysis — including psychological, neuropsychological, neurophysiological, and social dimensions. While we do not propose that every child be subjected to neurophysiological or electrophysiological testing, such procedures can enhance the precision of neuropsychological assessments. Collaboration between neuropsychologists and electrophysiologists is a promising avenue for more effective, multidisciplinary evaluation of developmental disorders.

We are in full agreement with Prof. Akhutina's assertion that neuropsychologists must be highly qualified. However, we do not consider this a weakness of our critique. Neuropsychology, as a rigorous scientific discipline, requires training that goes beyond symptom identification based on behavioral checklists that are ambiguous, redundant, and arbitrary, such as those found in DSM (Honkasilta, Koutsoklenis, 2022). A truly diagnostic approach must move beyond surface-level descriptions to uncover the functional syndromes responsible for a child's difficulties. In this regard, our critique aligns with Luria's warning (Luria, 1973) that clinical assessment should not be limited to listing observable symptoms of isolated 'functions' (e.g., attention, memory, language).

Another point of disagreement concerns the role of the 'social situation of development' in diagnostic practice.

Prof. Akhutina claims that this concept is unrelated to ADHD diagnosis. We firmly disagree. As we argued in our article, a child's social situation of development — structured by the attitudes and expectations of adults — has a profound effect on their psychological growth. While we acknowledge that diagnostic labels such as ADHD may, in some cases, offer individuals a framework for understanding their experiences and accessing resources (thus serving an empowering or humanizing function), such labels also carry the risk of distancing individuals from perceived 'normalcy' and imposing lasting stigma (Honkasilta, Koutsoklenis, 2022). We reiterate that our rejection of the ADHD concept does not imply a rejection of neuropsychological diagnosis or research. On the contrary, we advocate for diagnoses grounded in functional neuropsychological syndromes, as outlined by Luria (Luria, 1973). External symptoms — such as inattention — may result from different functional deficits (e.g., of general brain activation or of programming and regulation), which must be distinguished through detailed analysis. We argue that the purpose of diagnosis is to reveal the core neuropsychological factor responsible for a pattern of symptoms, rather than to merely catalog those symptoms. From this standpoint, the ADHD concept lacks internal consistency and neuropsychological validity. It is disconnected from materialist-dialectical thinking, which underpins cultural-historical psychology. Luria (Luria, 2003) described voluntary actions as the product of coordinated activity across cortical and subcortical brain zones. This principle underlies our diagnostic methodology, which emphasizes functional complexes over static identification of so-called 'attention functions'.

In our view, the diagnostic entity of ADHD, represents a theoretical stagnation within contemporary neuropsychology and a significant departure from the foundational principles of cultural-historical psychology. Despite this, we sincerely appreciate Prof. Akhutina's thoughtful engagement with our article and fully agree that attention-related difficulties remain a vital area of inquiry within the cultural-historical framework. Continued dialogue and critical examination are essential for advancing both theory and practice in this domain.

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Научная статья | Original paper

Commentary on the response of A. Koutsoklenis, Yu. Solovieva, and L. Quintanar Rojas

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Abstract

This commentary continues the discussion with A. Koutsoklenis, Yu. Solovieva, and L. Quintanar Rojas on the understanding of ADHD mechanisms. It questions the authors' assertion that abandoning the term ADHD will reduce the stigma of children with this syndrome.

Keywords: cultural-historical neuropsychology, attention-deficit/hyperactivity disorder (ADHD), stigmatisation

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Комментарий к ответу А. Куцокленисса, Ю. Соловьевой, Л. Кинтанара Рохаса

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Резюме

Комментарий продолжает дискуссию с А. Куцокленисом, Ю. Соловьевой, Л. Кинтанаром Рохасом о понимании механизма СДВГ. В нем подвергается сомнению точка зрения названных авторов о том, что отказ от термина СДВГ приведет к уменьшению стигматизации детей с этим синдромом.

Ключевые слова: культурно-историческая нейропсихология, синдром дефицита внимания и гиперактивности (СДВГ), стигматизация

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I welcome the authors' response to my commentary, as it once again demonstrates the commonality of our theoretical positions — our commitment to the principles of cultural-historical psychology and Luria's syndrome analysis, as I noted in my review.

Regarding our dispute, in their response, the authors of the article ignore my main criticism regarding the in-

consistency of their presentation of the current understanding of ADHD mechanisms. First, they write that "according to the DSM, which reflects the prevailing view, ADHD is a 'complex, multifactorial neurodevelopmental disorder.'" I cannot disagree with this definition (in fact, by revealing their understanding of the syndrome, the authors make the same point both in the article and in their response to my comment). However, later in the article, they express doubts about the validity of ADHD as a diagnosis and cite the lack of "biomarkers" for the syndrome, according to Stefan Schleim (Schleim, 2022), as the primary reason. I'm criticizing the "biomarker" theory specifically, but the authors of the response turn a blind eye to it. The assertion in the response that "a truly diagnostic approach must move beyond surface-level descriptions to uncover the functional syndromes responsible for a child's difficulties " should be addressed to the author of the "biomarker" idea, and not to me, I agree with that.

The authors write that "the ADHD concept lacks internal consistency and neuropsychological validity. It is disconnected from materialist-dialectical thinking, which underpins cultural-historical psychology". Is this referring to the concept that the syndrome is a "complex, multifactorial neurodevelopmental disorder"? Do the authors disagree with that?

The response states that "Prof. Akhutina claims that this concept (concept of the 'social situation of development' — *T.A.*) is unrelated to ADHD diagnosis". I don't understand how my words, "The neuropsychologist's recommendations will depend on what support is actually available in the child's social situation," can lead to such a conclusion. I also don't understand how abandoning the term ADHD will reduce the stigma surrounding children with developmental disabilities.

In my opinion, the scientific concept of ADHD shouldn't be confused with the myths about it that are widespread in the pseudo-scientific literature. Let's combat the popular medicalization of ADHD, which oversimplifies the problem, and seek optimal ways to help children.

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ПАМЯТНЫЕ ДАТЫ
MEMORABLE DATES

А.В. Запорожец с монгольской девочкой

Солнце детской психологии: 130-летие А.В. Запорожца

12 сентября 2025 года исполнилось 120 лет со дня рождения великого детского психолога Александра Владимировича Запорожца (1905—1981), классика культурно-исторической психологии, ученика Л.С. Выготского. В кругу Выготского его называли Совестью школы, сотрудники созданного им в системе Академии педагогических наук Института дошкольного воспитания — Солнышком.

Институт был уникальным центром разнодисциплинарных исследований дошкольного детства, куда устремлялись со всего мира психологи и педагоги, а в гостях бывали всемирно известные ученые: от Джеймса и Элеонор Гибсон до Джерома Брунера и Ури Бронфенбреннера. В стенах Института сложилась школа А.В. Запорожца, представленная именами классиков культурно-исторической психологии второго и третьего поколений — Н.Н. Поддьякова, Л.А. Венгера (материал к его 100-летию публикуется в этом номере журнала), Е.Е. Кравцовой. К их числу следует отнести и ученицу Запорожца М.И. Лисину, которой он передал свою лабораторию в Психологическом институте на Моховой, уходя в новый Институт. Практически все сотрудники НИИ дошкольного воспитания — психологи, педагоги, философы, художники, инженеры — считали себя питомцами «солнечной» школы Запорожца. Ярчайшим лицом школы Запорожца был выдающийся психолог и мыслитель В.П. Зинченко, учредитель и первый главный редактор журнала «Культурно-историческая психология».

Пушкина называли «Солнцем русской поэзии» (с авторством выражения нет ясности, на него претендуют А.А. Краевский, что наиболее вероятно, и В.Ф. Одоевский). Запорожец был Солнцем детской психологии с его светом, теплом и притяжением. Солнцем... и мыслящим сердцем. Как «работает» такое «сердце» у ребенка, он и стремился понять вслед за Выготским, занявшись изучением вместе с сотрудниками сложнейшей проблемы нерасторжимого, но диалектически противоречивого единства аффекта и интеллекта, обобщенного переживания, «умных» эмоций. И имел все основания сказать: «Ребенок познает мир не только умом, но и сердцем» — умным сердцем, которое живет в постоянном режиме взаимопревращения идеи в страсть (Спиноза).

Сделанное А.В. Запорожцем (далеко не все) можно тезисно выразить следующим образом (за многими из этих тезисов стоят посылы Л.С. Выготского).

Первое. Л.С. Выготский писал, что «до трех лет ребенок учится по собственной программе». В рамках школы Выготского А.В. Запорожцу удалось свести положения культурно-исторической детерминации развития и его самодетерминации, которые до сих пор и разводятся, и «запараллеливаются». Саморазвитие ребенка в материале и средствами культуры и определяет эффекты его развития, которые, по выражению Запорожца, ложатся в «золотой фонд зрелой человеческой личности». Развитие через освоение культуры и саморазвитие через ее преобразование (пусть субъективно значимое) — это не два процесса, а один. И после трех лет ребенок с опорой на взрослую программу продолжает создавать собственные программы обучения — об этом — в работах Н.Н. Поддьякова.

Второе. А.В. Запорожец первым возвел в научный принцип идею самоценности детства (идущую еще от Руссо) и показал, что именно она определяет образовательную ценность достижений дошкольного детства, тем самым превратив аксиологию в методологию.

24-летний А.В. Запорожец в экспедиции на Алтае (1929)

Третье. Еще в харьковский период (1930-е гг.) А.В. Запорожец стал первопроходцем исследования психологии действия (наряду с А.Н. Леонтьевым, П.И. Зинченко, С.Л. Рубинштейном и отчасти Н.А. Бернштейном). Если быть точнее, Запорожец на материале анализа перцептивных действий фактически открыл этот феномен как единицу психики (С.Л. Рубинштейн). Восприятие задолго до когнитивистов, по сути, рассматривалось как конструирование образа действительности, а ее отражение выступало результатом конструирования. Через почти три десятилетия в своем капитальном исследовании «Развитие произвольных движений» (1960), подлинный общепсихологический смысл которого до сих пор по-настоящему не раскрыт, он нащупал в детской моторике свободу, осмысленность, выразительность действия (тут его подход вновь смыкается с подходом Бернштейна). А.В. Запорожцем вместе с его учениками В.П. Зинченко, Л.А. Венгером был продолжен анализ действенной природы восприятия. Результаты лежат в фундаменте общепсихологической теории деятельности, которая выросла из психологии действия прямого ученика Л.С. Выготского.

Четвертое. А.В. Запорожец впервые прочертил линию, позволяющую восстановить генез развития личности в дошкольном детстве: действие в форме содействия — сопереживание, сочувствие (1940-е годы) — предчувствие, предвосхищение (1970-е годы, исследование, проведенное совместно с Я.З. Неверович). Эта линия вышла на пересечение двух, столь актуальных в наши дни, сюжетов Выготского — единства аффекта и интеллекта и единства общения-обобщения.

Пятое. При всей значимости игры — ведущей деятельности дошкольника — А.В. Запорожец настаивал на изучении ансамбля «специфически детских видов деятельности» (от игры до различных видов художественного творчества) и его образовательной поддержки в целом. Эту поддержку он называл *амплификацией* (обогащением, расширением) перспективы детского развития. Идея амплификации легла не только в основу первой программы развивающего дошкольного образования, разработанной в Институте дошкольного воспитания, но и всех последующих инновационных подвижек в этой сфере со второй половины 1980-х годов по настоящее время.

А.В. Запорожец остается не простой действующей, а ключевой фигурой в детской психологии и в практике дошкольного образования 21-го века.

Редколлегия журнала «Культурно-историческая психология»

Уроки «очного определения человека» Михаила Бахтина

17 ноября исполнилось 130 лет со дня рождения литературоведа и мыслителя Михаила Михайловича Бахтина, всемирно известного ученого, референтного для психологов. Примечательно и то, что он родился в один день с Л.С. Выготским, но на год раньше. Совпадение не только символическое: на созвучие их идей указывают с 1980-х годов, тема «Бахтин и Выготский» стала сквозной в России и за рубежом. Подробнее об этом — в статье В.Т. Кудрявцева «Выготский и Бахтин. И дольше века длится день», опубликованной на портале PsyJournals.ru (https://psyjournals.ru/news/2977).

Диалогика М.М. Бахтина не тождественна культурно-исторической психологии Л.С. Выготского, — они не просто дополняют, а взаимообосновывают друг друга. У Выготского высшая психическая функция появляется на сцене развития дважды — вначале в разделенной между двумя людьми форме, а затем в индивидуальной, претерпевая ряд изменений. У Бахтина в диалоге рождается со-знание. Но здесь появление нового участника, например читателя беседы героев романов Достоевского, приводит к тому, что и роман перестает быть тем, как он был написан, поскольку из него читатель вычерпывает это со-знание.

Неслучайно Достоевский писал в одном из своих писем, что никогда не пытался придать своей мысли окончательную формулировку, оставляя место не просто интерпретации произведения, но и внутреннему голосу читателя. И даже его внутренней речи, которая говорит не столько на «языке мышления», сколько на «квазиязыке воображения» (исследование И.Д. Рыжовой, выполненное в МГППУ под руководством В.Т. Кудрявцева). Вспомним тезис Лакана: «Бессознательное — это речь Другого». Для Выготского речь другого — скорее, «сверхсознательное», голос культуры. Условно говоря, «ВПФ» одного героя в Бахтинском диалоге с «ВПФ» другого героя, который конструирует «ВПФ» автора. В диалог вливается читатель и производит его переосмысление. Получается, что последнее слово в литературе принадлежит психологии. Плох тот писатель, который все договаривает за читателя. Именно поэтому Достоевский считается великим писателем-психологом. Именно поэтому М.М. Бахтин нашел свой отклик не только у представителей культурно-исторической психологии.

«Душа — есть дар, это дар моего духа другому человеку. Когда я думаю о другом человеке, я думаю о его душе (его образе), что касается меня самого, то сам я живу в духе» (Бахтин М.М. (2017). *Автор и герой в эстетическом событии. Избранное. Том I. С. 97.* М.; СПб.). Бахтин выступал против «заочного определения человека» в любой науке о нем. Такие определения более всего опасны в психологии, которыми она, увы, изобилует (личностные черты, когнитивные стили, стратегии совладания и т. д., если рассматривать их вне оптики опросников и тестов).

Ф.Т. Михайлов говорил о том, что главный предмет поиска для ребенка, для человека — не вещь, а другой человек. А вещь — постольку, поскольку она в его руках, как погремушка, перешедшая из рук матери в ручки младенца — лишь «остановленное» мамино движение. Так и «недостроенное» литературное произведение — повод «включить» индивидуальное читательское сознание, на уровне которого решается судьба романа и его героев, становящихся «очными» собеседниками читателя вместе с авторами. «Над вымыслом слезами обольюсь» (Пушкин).

Литературовед М.М. Бахтин учит психологию мыслить «очно».

Редколлегия журнала «Культурно-историческая психология»

Блюма Вульфовна Зейгарник в юности (Минск)

«Феномен Зейгарник»: прерванное действие — воспоминание о будущем

9 ноября 2025 года широко отмечалось 125 лет со дня рождения психолога Блюмы Вульфовны Зейгарник, ученицы Курта Левина и последовательницы Л.С. Выготского. Во всех источниках годом ее рождения указывается 1900-й, хотя родилась она в 1901-м, о чем свидетельствует в своих воспиминананиях ее внук Андрей Владимирович Зейгарник. К этим разночтениям (возможно, связанным с записью в паспорте) сама Блюма Вульфовна относилась спокойно: какая разница — год раньше, год позже.

И вообще, она относится к тем ученым, о которых вспоминают не только по юбилеям: «феномен Зейгарник» у всех на устах — от студента до профессора, он постоянно напоминает о себе всем ходом нашей изменчивой жизни. И именно эта изменчивость в значительной степени актуализирует его в обыденности, биографиях, истории. Конечно, «феномен Зейгарник», как ученого и личности, намного больше открытого ею в молодости факта эффективности запоминания прерванного действия. Но это один из тех фактов, который имеет фундаментальное общепсихологическое (да и общегуманитарное) значение.

Б.В.Зейгарник и П.Я.Гальперин. 1980-е годы

В прерванном действии возникают смысл, мысль, мечта, творческий порыв, сознание и многое другое, что с этим связано. Для психологии оно не один из источников фрустрации, а условие порождения человеческой

психики в специфических формах. Как блестяще показал Петр Яковлевич Гальперин, необходимость в психике у всего живого создает ситуация противодействия — разрыва, преграды и т. д. Ее преодоление предваряет строительство образного плана-ориентировки, в котором оно поначалу совершается. Но только у человека этот образ наполняется мечтой, новыми смыслами и размышлениями о действительности и своих возможностях. Потому «фрустрация» не вытесняется, а лучше всего запоминается. И в памяти о ней содержатся ростки продуктивного действия.

Животное видит в противодействии только риск, а человек — еще и шанс. Крыса в опытах бихевиористов никогда не бросалась на участок клетки под током, избегала его, как и ее сородичи, наблюдавшие за ней. Человек принимает на себя «высокое напряжение» жизни, если находит малейший шанс (и даже «без шансов») совершить что-то сверхзначимое. А сверхзначимое становится общезначимым, воодушевляет, вдохновляет, провоцирует других, вселяет в них смысловую интригу. Точка риска перерастает в точку роста, вокруг которой группируются человеческие устремления и усилия.

«Фрустрация» вгоняет животное в агрессию, в нервный срыв, в итоге — в апатию — как собаку в знаменитых опытах И.П. Павлова, на глазах которой круг превращался в эллипс. Человек в подобных случаях может испытывать целый диапазон переживаний: от отчаяния, вплоть до безысходности, до наивысшего душевного пика. Животное запоминает прерванное действие, чтобы не повторялось, человек — чтобы, порой с нетерпением, продолжить.

Прерванное действие — воспоминание о возможном. О будущем. В этом парадоксальность «феномена Зейгарник». Впрочем, все это тема особого разговора и, главное, — новых исследований.

Б.В. Зейгарник с сотрудниками созданной ею в составе Института психиатрии Академии медицинских наук СССР — соратницей и подругой С.Я. Рубинштейн и молодой исследовательницей Т.И. Тепеницыной

Вклад Б.В. Зейгарник в патопсихологию требует особого анализа (который уже проделан многими авторами), но можно сказать, что он имеет общепсихологическое значение. На материале исследования мышления больных шизофренией Блюме Вульфовне удалось лучше, чем кому бы то ни было, продемонстрировать силу и глубину идеи Л.С. Выготского о том, что мысль — не последняя инстанция, что за ней стоит мотивация, «аффективная и волевая тенденция». Именно нарушения в этой сфере приводят к патологии мышления.

В какой-то мере все мы — ученики Б.В. Зейгарник, независимо от принадлежности к той или иной области психологии. Ее школа бесценна для нас и всех, кто идет за нами.

Редколлегия журнала «Культурно-историческая психология»

От психологии свободы к персонологии
К юбилею В.А. Петровского

14 августа 2025 года отметил свое 75-летие Вадим Артурович Петровский, член-корреспондент РАО, доктор психологических наук, профессор, научный руководитель Центра фундаментальной и консультативной персонологии Национального исследовательского университета «Высшая школа экономики». К этому следует добавить, что, наряду с этим (и многим другим), он является членом редколлегия и постоянным автором журнала «Культурно-историческая психология».

Еще в 1981 году на самой первой конференции, посвященной научному творчеству Л.С. Выготского, в Москве, он провозгласил: в отличие от традиционных подходов социальной детерминации психики, в исследованиях Выготского (например, при проведении методики «двойной стимуляции») обращение к культурному средству никогда не являлось навязанным и фатальным. Оно определялось особой активностью человека, имеющей неадапативный характер. Использование культурного средства, особенно в поисковой ситуации (а предмет поиска — собственные возможности человека, о них говорил Выготский), не только внеситуативно, но и надситуативно. Никакого социального гомеостаза не существует, а, скажем, конформизм — это искажение самого социального способа жизни, в основе которого — свободное объединение людей внутри деятельности как творчества. Можно вспомнить учителя В.А. Петровского — А.Н. Леонтьева, споривше го с Ж. Пиаже с его «конструктивным» адаптационизмом: бессмысленно «уравновешиваться» с понятием как продуктом созидания человеческой мысли. Принцип «свободной причинности» В.А. Петровского — в унисон культурно-исторической психологии.

Однажды один юноша, почти ребенок, задался удивительным, совсем не детским вопросом. Он смотрел на горную вершину и размышлял: *в чем моя свобода (воля, по определению, свободная)?* В том, чтобы, преодолев страх (при отсутствии элементарных альпинистских навыков), сделать попытку и взобраться? Или все-таки обуздать в себе стремление подняться к манящей высоте. Вопрос состоял не в том, что сильнее — страх или стремление покорить вершину. А в том, в чем же тогда свобода. Иной раз «героизма» для того, чтобы остаться внизу, нужно не меньше, чем для того, чтобы карабкаться по горным откосам. Такова природа человека.

Юношу, незнакомого с психологией, который, по сути, поставил «центральную проблему психологии» (Л.С. Выготский, в «Записных книжках»), звали Вадим Петровский.

Концепция отраженной субъектности и идеальной представленности людей друг в друге, которую выдвинул В.А. Петровский, также отсылает к идеям Выготского о социальной ситуации развития, раскрывая новые грани ее личностного взаимопереживания и сопереживания детьми и взрослыми.

Все это еще ждет своих исследователей и может быть исследовано с позиций персонологии, которую, в том числе, с опорой на ряд идей культурно-исторической психологии разрабатывает в последние десятилетия В.А. Петровский.

Коллеги по редколлегии от всей души поздравляют Вадима Артуровича с юбилеем, ждут от него новых статей и книг, каждая из которых становится событием в научной жизни! Уверены, что к нам присоединятся многие.

Редколлегия журнала «Культурно-историческая психология»

Человек грядущего
К 70-летию Т.Ю. Базарова

7 мая 2025 года исполнилось 70 лет Тахиру Юсуповичу Базарову, доктору психологических наук, профессору МГУ имени М.В. Ломоносова, Заслуженному профессору МГУ, одному из лидеров современной социальной и организационной психологии, создателю уникальных практик поддержки человеческих отношений в мире 21-го века. С этого года Т.Ю. Базаров пополнил состав редколлегии журнала «Культурно-исторической психология. Приглашение Т.Ю. Базарова стать членом редколлегии не было случайным.

Идя по стопам своего учителя Г.М. Андреевой, Т.Ю. Базаров по-особому развивает позиции культурно-исторического подхода в сфере социально-психологического знания (это демонстрирует и его статья с соавторами, опубликованная в этом номере журнала). Мыслить психологию *в терминах будущего* — естественно. «Психологический» человек — всегда «гость из будущего». Потому что всегда есть намерение, цель, план, образ, мотив, всего из чего предстоит вырасти человеку, которого пока нет, и оно парадоксальным образом детерминирует то, что уже есть, то, что сложилось. Об этом писали многие: от Н.А. Бернштейна до Ж. Нюттена. Но, как справедливо отметила О.А. Седакова, Л.С. Выготский еще в «Психологии искусства» поставил в центр *возможного человека,* который может состояться, а может и не состояться. И в образе личности внутри общности, и в образе самой общности личностей, которые пока не нашли ничего общего в виде объединяющего смысла — как не всякий ребенок способен найти смысл в бессмысленных слогах при классификации фигурок (методика Выготского—Сахарова).

Т.Ю. Базаров занимается особого типа возможным в человеке, которое он называет *грядущим человеком,* тем, что становится возможным в ненаступившем будущем, будь то завтра или далекая историческая перспектива, не поддающаяся измерению, потому что измерительная «рулетка» только внутри человека. «Внутренний план» «производится» (П.Я. Гальперин), рождается вместе с идеями, наполняющими его смыслом, а не просто переносящимися извне внутрь. В ручонках младенца, которые тянутся к маме, чтобы поймать и замкнуть в маминых объятиях доступное бытие, сохранив доверие к недоступному. Маму не приближают, мама не приближается. Мама *грядет* со всем этим незнакомым, но заведомо чудесным миром, который она прихватит, зачерпнет в объятия. И Т.Ю. Базаров вводит понятие *зоны грядущего развития* — ЗГР (по аналогии с ЗБР), которая соотносима не с тем, что вчера еще не получалось без помощи другого человека, а сегодня выполняется самостоятельно, а с тем, что Выготский называл «судьбой», которая была его исследовательской мечтой. Судьбой с ее диалектическими превратностями, драматизмом, непредсказуемостью, неопределенностью — не «по случаю», а в главном, необходимом.

С Грядущим можно разойтись. Хотя, возможно, именно сейчас оно проходит сквозь нас. Грядущее — это не будущее, не хронологическое «завтра», а «другое измерение», которым, по Т.Ю. Базарову, призвана заниматься психология и работать с ним на практике. Примеры такой работы — в социально- и организационно-психологических развивающих сессиях, которые успешно ведет Т.Ю. Базаров. По его словам, дружба с неопределенностью — это дружба с самим собой — «возможным человеком», готовность к встрече с ней и с ним, а не реакция на ныне модные «вызовы будущего» (это тот же неизжитый бихевиоризм).

Это и есть грань той свободы, которую Л.С. Выготский считал «центральной проблемой психологии». И перспектива культурно-исторической психологии 21-го века — там, где не только общая, по Выготскому, но и социальная психология срастаются с генетической на базе культурно-исторической методологии. К этой смычке с разных сторон пришли навстречу друг другу Т.Ю. Базаров и В.В. Рубцов (один — со стороны социальной, другой — со стороны генетической психологии; здесь следует еще назвать имена В.С. Мухиной и Я.Л. Коломинского).

Поздравляя Тахира Юсуповича с юбилеем, пожелаем ему продуктивного и вдохновляющего движения в той перспективе, которую он наметил сам.

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НЕКРОЛОГИ
OBITUARIES

Памяти Владимира Самуиловича Собкина

25 ноября 2025 года ушел из жизни Владимир Самуилович Собкин — академик РАО, доктор психологических наук, профессор МГУ, автор и давний друг нашего журнала. Ему было 77 лет — возраст активной зрелости, полный планов и замыслов. Для многих его уход стал ударом молнии: еще недавно с ним обсуждали проекты, ждали его на конференциях, получали «с пылу, с жару» новые книги.

Владимир Самуилович вошел в науку в конце 1980-х, в составе ВНИК «Школа» Эдуарда Днепрова, с амбициозной задачей — написать историю детства на основе социологии современных детско-взрослых сообществ. Так родилась линия исследований, соединяющая социологию детства и образования, школу и семью, повседневность и субкультуру. В 1990-е годы он создал в системе РАО Центр (затем Институт) социологии образования, вокруг которого сложилась уникальная исследовательская школа, отразившаяся в многотомной серии «Труды по социологии образования».

Будучи психологом по образованию и мировоззрению, Владимир Самуилович вдохнул в социологию образования идею развития в духе культурно-исторического подхода Л.С. Выготского. По сути, он заложил основание культурно-исторической, или генетической, социологии детства и образования, показал, что социологическое исследование невозможно вне понимания «социальной ситуации развития» ребенка.

Особую страсть Владимира Самуиловича составляли психология искусства, тексты и театр Выготского. Под его руководством был подготовлен и издан том «Психология искусства» Л.С. Выготского с фундаментальным корпусом комментариев к его театральным рецензиям. Театр сопровождал его всю жизнь — от студенческих капустников до серьезных исследований.

Александр Асмолов вспоминал, как еще студентом Собкин анализировал историю театра через эффект «прерванного действия» Б.В. Зейгарник: античная драма, театр Мольера, Брехт, Любимов... Спектакль кончается, а зритель остается внутри действия, продолжает жить спектаклем. Владимир Собкин был именно таким человеком — человеком прерванного действия, живущим искусством и продолжающим внутренний диалог тогда, когда занавес уже опущен.

Неотъемлемой частью его жизни была любовь и творческий союз с Еленой Олеговной Смирновой — «доброй феей» детской психологии. После ее ухода он прожил еще пять лет, но так и не смирился с потерей. Память о Елене Олеговне поддерживала его, задавала тон его словам о детстве, развитии, игре, о педагогах и детях.

Два редкостно талантливых и любящих человека, чья общая жизнь стала одним большим сгустком смысла, — теперь оба остаются с нами в текстах, идеях, ученических судьбах, в театральной интонации их научной прозы. Прервано действие, прерван полет. Но любовь, благодарность и влияние Владимира Самуиловича Собкина — не прерываются.

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