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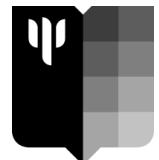
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DEVELOPMENTAL PSYCHOLOGY
ПСИХОЛОГИЯ РАЗВИТИЯ

Development of Formal-logical and Dialectical Thinking in Children of 5–8 Years Old

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This article presents the longitudinal study results dedicated to evaluation of formal-logical and dialectical thinking development in senior preschool children (5–6 and then 6–7 years old) as well as in elementary school children (7–8 years old). The formal–logical thinking study included 58 children. We used Piaget tests: “Probability”, “Scales” and “Cylinder”. The dialectical thinking study included 92 children. We evaluated three techniques: “Drawing an unusual tree”, “What can be both at the same time?” and “Cycles”. Data of 52 children who participated in the study at the age of 5–6 years old and 7–8 years old were used for the correlation analysis. The research results showed that the preschool age is sensitive for the development of formal operations as well as dialectical thought activities. A positive correlation was identified between the ability of 5–6 and 7–8 years old children to coordinate two differently directed movements to create a holistic image and overcome contradictions. It was also found that during the transition to learning at school, indicators for solving a creative problem (which involved the independent construction of opposite objects) decreased.

Keywords: formal-logical thinking, dialectical thinking, logical operations, contradictions, serialization, preschool age, junior school age.

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Развитие формально-логического и диалектического мышления у детей 5—8 лет

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В статье представлены данные лонгитюдного исследования, направленного на оценку развития формально-логического и диалектического мышления у детей старшего дошкольного (5—6, затем 6—7 лет) и младшего (7—8 лет) школьного возраста. В исследовании формально-логического мышления приняли участие 58 детей. Были использованы пробы Ж. Пиаже: «Вероятность», «Весы» и «Цилиндр». В исследовании диалектического мышления приняли участие 92 ребенка. Для диагностики были применены три методики: «Рисунок необычного дерева», «Что может быть одновременно?» и «Циклы». Для корреляционного анализа были использованы данные 52 детей, которые были продиагностированы в 5—6 и 7—8 лет. Полученные результаты показывают, что дошкольный возраст сенситивен для развития формальных операций и диалектических мыслительных действий. Была установлена положительная связь между способностью детей 5—6 и 7—8 лет координировать два разнонаправленных движения для создания единого образа и преодолением противоречий. При переходе к обучению в школе снижаются показатели по решению творческой задачи, которая предполагает самостоятельное конструирование противоположных объектов.

Ключевые слова: формально-логическое мышление, диалектическое мышление, логические операции, противоречия, сериация, дошкольный возраст, младший школьный возраст.

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Introduction

Child cognitive psychology development in the 20th century set up a foundation for the research of the two independent forms of thinking: formal-logical and dialectical thinking. Based on the analysis of international [10; 14; 17; 20] and Russian [2; 6; 7; 8; 9; 11; 18; 19] studies, the main distinguishing features of these forms of thinking were formulated. As “a distinctive feature of formal logic the manipulation of mental forms abstracted from the con-

tent was used, and dialectical logic began to be understood as the logic of unfolding the contradiction of the developing content” [2, p. 5]. Dialectical thinking was interpreted as a non-independent process supporting the formal structures formation [14]. In this article, we will consider the differences from the J. Piaget’s point of view in terms of assimilation and accommodation paradigm in order to maintain the perspective of cognitive development integrity.

The formal logical thinking development is a long process that consists of various subsequent stages. Each

stage is the result of qualitative changes in a child's cognitive development and is characterized by a new level of achievement of dynamic balance of intellectual processes. The logical operations formation in the paradigm of assimilation ("the canvas of actions that can be actively reproduced") and accommodation ("the influence of the environment, which has the opposite effect, that changes the assimilative cycle") is described as an achievement of a balance between these processes. J. Piaget emphasized that "the operational thinking balance does not at all represent a certain state of rest, but is a system of balanced exchanges and transformations, infinitely compensating each other" [10, p. 19]. The thinking development process is accompanied by changes in the forms of equilibrium. Thus, the perceptual structures equilibrium is characterized by a "displacement of equilibrium", when each change of one of the existing relations meaning entails the transformation of the whole, up to the formation of a new equilibrium, that is different from the one that characterized the previous state. The equilibrium of operational structures is both dynamic and permanent at the same time. The transformations inherent in such systems do not change this balance, because they are always accurately compensated by the reverse – real or potential – operations (reversibility).

According to J. Piaget, dialectic is directly linked to the equilibrium formation: "in any cognitive development, there is an alternation of dialectical and discursive phases" [14, p. 188]. "Dialectic constitutes the genetic aspect of any equilibrium" [14, p. 10], i.e. leads to the structures' formation. In the discursive phase, stable structures generate new interdependencies, and once again dialectic arises, since a new commonality is formed, requiring new balancing processes.

Dialectic leads to interactions and connections formation, which, according to J. Piaget, are organized in a spiral model [14]. As the main conflict that triggers the interaction processes J. Piaget described the tension between "possible" and "necessary": "the acquisition of knowledge R (reals) entails several new possibilities P (possible). Between some of these necessary relations N (necessaries) such relations are established which then cover the original object R, but in the augmented form R2. From R2 new possibilities P2 immediately follow, and then new needs will lead to R3, etc." [14, p. 193]. Thus, based on Piaget's theory, dialectic is an auxiliary process in the new cognitive stage formation.

J. Piaget denies the existence of contradictions between the two objects. In his opinion, "once the qualities of the elements are abstracted in order to consider them as units equivalent to each other, the inclusions can only be supported by the arrangement, which generates new, much more complex commonality, which is a sequence within" [14, p. 187]. "A child is not able to think in terms of relationships until he/she has learned to conduct seriations. Seriation is the primary reality, any asymmetric

relationship of which is only a temporarily abstracted element" [10, p. 17]. Therefore, when discussing the equilibrium of structures within the operational model, J. Piaget excludes contradictions by using the seriation.

Arguing with J. Piaget, K. Riegel highlighted the problem of understanding the contradictions by children and offered descriptions of dialectical manifestations at each cognitive development stage. In particular, at the preoperational stage, in his opinion, a child perceives two concepts simultaneously and is able to sort objects by color into red and green, i.e., into those that show the presence of an attribute, for example, red, and those that demonstrate its absence (non-red). K. Riegel also pointed out: "Piaget systematically searches for contradictions in the child's judgments and thereby undermines his own dialectical interpretations, and also underestimates the child's dialectic" [17, p. 11], since contradictions are sorted out formally. According to Riegel, this leads to "alienation" of thinking, and in order to reach maturity, the "alienated" child will have to return to the dialectical basis of thinking [17, p. 11]. The development of K. Riegel's ideas about returning to the dialectical foundations of thinking served as the basis for interpreting dialectical operations as post-formal [20]. M. Basseches identified 24 dialectical schemes that an adult uses to solve subjectively complex problems [20, p. 7]. However, considering dialectical thinking as post-formal leads to the fact that the possibility of studying this form of thinking in childhood is excluded.

O. Shiyan et al. [12] hypothesized that in childhood formal structures are associated with dialectical thinking, if "formal intelligence is understood in the J. Piaget tradition as the formation of reversibility" [12, p. 21]. The authors used tests that assessed ideas of preservation (of sets, length, mass) and understanding of the "part-whole" relationship. The research demonstrated that there is a significant relationship between children's success in solving the preservation task and their ability to overcome contradictions.

In Russian psychology, the concept of structural-dialectical psychology has been developed. This research direction was formed in the context of cultural-historical theory. It was supported by the works of A. Zaporozhets, in which data were obtained on the preschoolers' sensitivity to contradictions [6]. Dialectical thinking is defined by N. Veraksa as an independent branch of cognitive development and it represents a system of mental actions aimed at operating with the relations of opposites while solving dialectical problems [1].

The basis of the dialectical thinking model are the relationships of the opposites, that allow to build a dynamic structure of mental actions. The dialectical action of *transformation* is the mental transformation of an object A into its opposite – an object B (for example, morning-evening). Dialectical action *mediation* combines the opposites A and B into a single object AB (orange color,

as well as yellow and red at the same time). Dialectical action *seriation* is a mental reproduction of an object's gradual transformation from the initial state A to its opposite state B via the intermediate state AB (for example, morning-afternoon-evening-night-morning). Understanding the structure of this action is associated with the construction of a cyclic representation that reflects the process of changing the object from the initial state to the opposite, and then back, from the opposite to the initial one [1]. Dialectical thinking is substantively related to the solution of three problem types: 1) making a creative product [9]; 2) understanding developmental processes [5]; 3) overcoming contradictions [9].

The study conducted on preschool children [4], showed that the dialectical thinking development process is heterochronous. The prerequisites for the dialectical thinking development originate already in the early preschool years [3]. By the age of 4, a child understands the processes of transformation, although such a task as "Drawing an unusual tree" remains difficult for him/her, and the number of dialectical drawings increases by the time of entering a preparatory group. At senior preschool age a child successfully copes with seriations, he/she develops an understanding such processes as transformation and conversion. During preschool age, a child improves the ability to overcome contradictions by applying the mental action of mediation. In a previously conducted study [4] a positive correlation between the "Probability" test results and the "Cycles" test results performed by children of 5-6 years old was discovered. We assumed that such a result may reflect the cyclic structure of dialectical thinking in senior preschool age children.

Research Methods

In this research, there were two tasks: 1) to analyze the formal-logical and dialectical thinking development in children from 5 to 8 years old 2) to explore the interrelations of these thinking forms.

We formulated the following hypotheses. Hypothesis 1: a correlation between the development of the ability to coordinate two processes and evaluate the probability of a result as well as the developmental processes understanding previously discovered in senior preschool children also takes place in elementary school age children. Hypothesis 2: spatial multiplicative relations understanding is connected with the mediation development. Hypothesis 3: elementary school age children show a decrease in the success of dialectical problems solving with an increase in the success of formal logical operations implementation compared with children of 5–6 years old.

A longitudinal study of the formal logical thinking development involved 58 children (31 girls and 27 boys),

who completed 3 tests: "Probability", "Balance" and "Mechanical curve" in the senior kindergarten group and then in 2 years in the 1st year of elementary school. The study of dialectical thinking development included 92 children (44 boys and 48 girls), who performed the test tasks 3 times – in the senior kindergarten group, in the preparatory kindergarten group, and in the 1st year of elementary school. These children completed 3 tests: "Drawing an unusual tree", "Cycles", "What can be at the same time?". To analyze the correlation between the two thinking forms, the data of 52 children were used. All children at the time of the research attended educational institutions in Moscow. The study was conducted from 2019 to 2021.

The "Balance" [4; 15] evaluated operations that allow to coordinate and quantify such variables as weight and distance. A child was presented with a visual task using balance scales with 12 holes equidistant from the fulcrum on each side and with 16 metal weights weighing 32 grams each. (Fig. 1). Throughout the test, the arms of the scales were fixed in a horizontal position. Each time the weights were placed, the tester asked a child the question: "What will happen to the scales when I unlock the shutter? Will they stay in the same position or lean to this side or to that one? In which direction? How did you understand this?". There were 5 tasks in total (2 introductory and 3 actual ones).

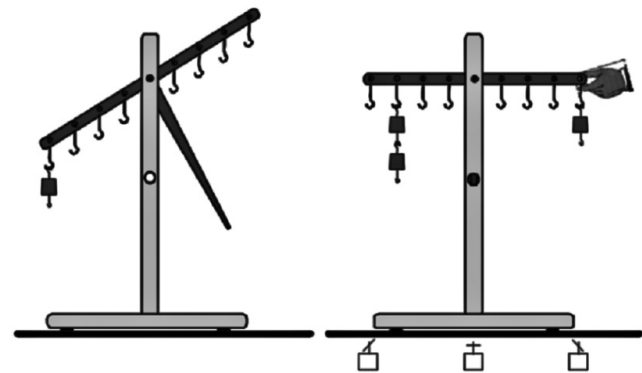


Fig. 1. Device for carrying out the "Balance" test

The "Probability" [4; 15] evaluated operations that allow estimating the probability of achieving a certain result based on different ratios of white and black dibs. The instruction was as follows: "Imagine that we have put the dibs in the bags and shook them. Now imagine that we take 1 dib from here (pointing to the left pile of dibs) and 1 dib from here (pointing to the right pile of dibs). Which side will have a higher chance of getting a white chip? How did you understand this?" There were 5 tasks in total (2 introductory and 3 actual ones).

The "Mechanical curve" [16; 4] assessed the ability to coordinate two differently directed processes. A special installation consisting of a cylinder that could be rotated with a handle and a cleat fixed on top of it was placed

on the table in front of a child. A sheet of paper with a starting point was fixed on the cylinder. A pencil could be moved along the cylinder (Fig. 2).

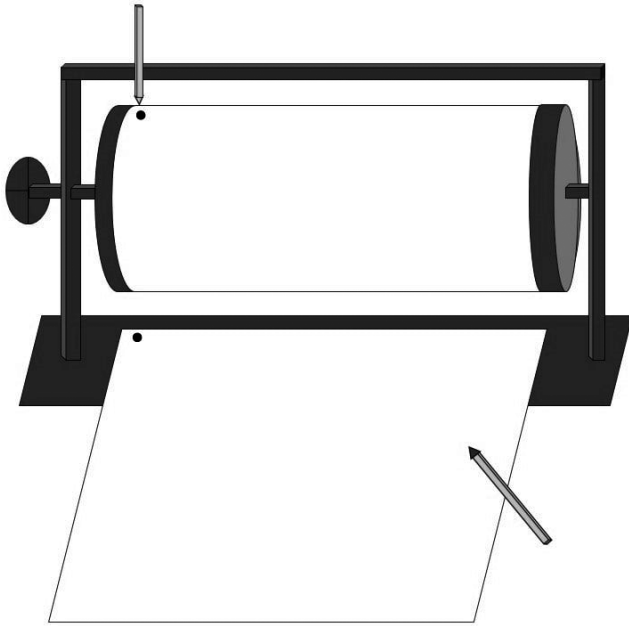


Fig. 2. Device for carrying out the “Mechanical curve” test, frontal view from the side of a child

The tester explained the significance of the starting point and demonstrated the principles of installation elements operation. For each task, a child was presented with a sheet of paper with a starting point. The instruction was as follows: “Draw what the trace will be if ...”. In the introductory tasks, the tester showed a child the movements of the pencil and cylinder, and in the actual test tasks, the tester only voiced the conditions of the task. There were 5 tasks in total (2 introductory and 3 actual ones).

Therefore, the Piaget test contains a coordination of two parameters: amount and color of chips; number of weights and the distance at which they are hanging; vertical movements of a cylinder and horizontal — of a pencil. In all of the three Piaget tests, each child’s answer was evaluated on standardized 4-point scale [15; 16]: 0 points — a child did not understand the task; 1 point — a child took into account only one parameter in his/her answer; 2 points — a child mentioned both parameters in the answer, but relied on only one of them in the forecast; 3 points — a child tried to correlate two parameters. As a result, we have rated types of trees: normative, symbolic and dialectical (0–2 points) and transformations (0-7 points) in accordance with a standard rating procedure [3]. 4 kinds of trees have been allocated among “normative” drawings according to the degree of transformation: 0 — no transformation; 1 — partial transformation affects one part of a tree; 2 — complex transformation — various plant fruits grow on a tree which aren’t typical for it

(mushroom tree); 3 — an attempt of a complete transformation, but a tree still remains (cactus). In “symbolic” drawings modifications are caused by magic and an idea of fulfillment of children’s wishes; 4 — the drawing contains an idea of magic and unusualness, elements of animation and a reflection of theme of desires are present; 5 — complex transformation, which reflects a variety of objects and creation of a new image using a combination with other objects; 6 — an attempt of a full transformation which demonstrates structural changes, but there’s also some symbolism (a fountain tree). 7 points are added for “dialectic” trees which reflect structural transformation (reversed trees which grow upside down).

The “Drawing an unusual tree” [4] made it possible to evaluate the success of a child solving a creative task to generate a new graphic image. To complete the drawing, the children used an A-4 sheet and a pencil. A child was given the following instruction: “Please draw an unusual tree.” After completing the drawing, a child told in detail what was unusual about the depicted tree. As a result, we evaluated the type of transformation from 0 to 2 points, as well as the type of transformation in the sublevel from 0 to 7 points.

The “Cycles” [4] assessed a child’s ability to solve problems that reflect developmental processes. A child was given three tasks with five cards. In total, three plots were used such as: “Dissolving lumps of sugar in tea”, “Preparing boiling water in a teapot”, “The beginning of a thunderstorm”. The instruction was as follows: “Lay out the cards so that you get a story”. For each task child received from 0 to 5 points, with a maximum of 15 points in total for 3 tasks.

The “What can be both at the same time?” [4] evaluated the ability to overcome contradictions. The test included five questions containing an inconsistent pair of features. The children were asked to answer the question: “What can be at the same time: both black and white; both light and heavy; both big and small; both living and non-living; both the same and different?” For each task child received from 0 to 4 points, with a maximum of 20 points in total for all 5 tasks.

Results

The obtained data analysis was carried out in 3 stages. At the first stage, descriptive statistics were formed on the children’s performance in tests aimed at assessing formal logical and dialectical thinking. Then, using Wilcoxon signed-rank test, the significance of grades’ differences in the senior kindergarten group, preparatory kindergarten group and in the 1st year of elementary school was assessed for the parameters under consideration. At the third stage, a correlation analysis of the interrelations between the indicators of the two thinking forms

was carried out. The IBM SPSS statistics program v. 26 was used for data analysis.

Formal logical thinking

Table 1 presents the statistics for each type of J. Piaget tests. For all tests, the average values increase from the senior group to the 1st year of elementary school, while the variation of data decreases.

Using Wilcoxon signed-rank test, the significance of grades' differences in the senior kindergarten group and in the 1st year of elementary school was assessed for the parameters under consideration (Table 2).

According to all the considered parameters (except for the "Balance, median"), the scores in the 1st year of elementary school are significantly higher than in the senior kindergarten group. The older children get, the better they cope with multiplicative tasks of coordinating two parameters and estimating probabilities. In general, this corresponds to the formal operations development in childhood and, in its turn, points to a sensitive period – 5 to 7 years old for the development of abilities that underlie the Piaget tests' successful completion.

Dialectical thinking

In the senior kindergarten group, while performing the "Drawing an unusual tree" test, 47 children (51.1%) drew a normal tree, 36 (39.1%) – a symbolic one and 9 (9.8%) – a dialectical one. In the preparatory kindergarten group (one year after the first drawing), 22 (23.9%) children drew a normal tree, 53 (57.6%) – a symbolic

one, and 17 (18.5%) – a dialectical one. In the first year of elementary school (two years after the first drawing), 20 children (21.7%) drew a normal tree, 63 (68.5%) – a symbolic tree, and 9 (9.8%) – a dialectical one. The number of "normal" trees sharply decreased from the senior group to the preparatory one (from 36 to 22) and remained approximately at the same level (from 22 to 20) in the first year of elementary school. The number of "dialectical" trees increased from the senior to the preparatory group (from 9 to 17) and fell again in the first year of elementary school (from 17 to 9). Thus, analyzing the ratio of the images of tree types, we see that with age, children better cope with creative task (reducing the number of normal trees). At the same time by the end of preschool age, children more actively use the dialectical mental action of transformation, i.e., draw inverted trees, trees on which grow other trees, etc., i.e., while preserving the idea of a tree, they transform the structure. Moreover, a decrease in the frequency of these actions during the transition to schooling can be noted. Such a decrease in solving creative problems is typical for elementary school age. To assess the statistical significance of this shift, Wilcoxon signed-rank test was used, in which we also evaluated sublevels that could be considered as a rank scale. Table 2 shows the main psychometric characteristics of children's sublevels, as a result of the "Drawing an unusual tree" test completion at different ages.

The previously obtained standards of performance by older preschool children [3] indicate that average

Table 1
 Statistics on the Piaget tests performance in the senior kindergarten group and in the 1st year of elementary school (N=58)

Indicator	M (SD)	Med	M (SD)	Med	M (SD)	Med
	Max score		Median		Total score	
Probability						
Senior kindergarten group	1.03 (0.56)	1	0.90 (0.48)	1	2.81 (1.42)	3
First year of elementary school	1.32 (0.57)	1	1.12 (0.426)	1	3.41 (1.06)	3
Difference						
W	-2.446		-2.457		-2.748	
p	0.014		0.014		0.006	
Balance						
Senior kindergarten group	1.17 (0.65)	1.00	1.10 (0.51)	1.00	5.34 (2.32)	5.00
First year of elementary school	2.36 (0.91)	3.00	1.29 (0.56)	1.00	7.97 (2.42)	8.00
Difference						
W	-5.107		-1.826		-4.549	
p	<0.001		0.068		<0.001	
Mechanical curve						
Senior kindergarten group	1.78 (0.87)	2.00	1.66 (0.84)	2.00	4.95 (2.42)	6.00
First year of elementary school	2.09 (0.70)	2.00	1.90 (0.64)	2.00	5.69 (1.78)	6.00
Difference						
W	-2.253		-2.150		-2.236	
p	0.024		0.032		0.025	

Table 2

Statistics on the performance in tests aimed at assessing dialectical thinking in the senior and preparatory kindergarten groups and the 1st year of elementary school (N=92)

Group	Mean	Median	SD	Min	Max
Drawing an unusual tree, sublevels					
Senior group	2.78	4.00	2.454	0	7
Preparatory group	4.12	4.00	2.220	0	7
First year of elementary school	3.98	4.00	1.816	0	7
Cycles					
Senior group	5.30	5.00	3.441	0	13
Preparatory group	9.65	9.00	2.658	3	15
First year of elementary school	11.45	12.00	3.072	0	14
“What can be both at the same time?”					
Senior group	3.66	2.00	3.433	0	14
Preparatory group	7.20	7.00	4.277	0	17
First year of elementary school	9.82	10.00	4.098	0	18

ratings of completion of the “Cycles” methodology are within the range from 3 to 9 points, and for the “What can happen at the same time?” methodology a high level of performance is measured from 7 points. A figure of the sublevel in the range of 4-6 points indicates a depiction of “symbolic” trees with various degrees of transformation, 7 points mean that children have drawn “dialectic” trees which is an indicator of implementation of a dialectic mental action of transformation.

It has been determined using Friedman test for multiple related samples that there’re significant distinctions in evaluation of children from different groups on “Unusual tree, sublevels” (Chi-square=14.445; $p=0.001$), “Cycles, overall score” (Chi-square=98.646; $p<0.001$) and “What can happen at the same time” (overall score) (Chi-square=73.576; $p<0.001$). Then, using a pairwise comparison via Wilcoxon signed-rank test, it has been determined which exact ages have differences.

An analysis of the children’s results in the “Drawing an unusual tree” test performance using Wilcoxon signed-rank test showed that:

1) the sublevel of test implementation in the senior group was significantly lower than in the preparatory group ($W=-3.981$; $p<0.001$) and in the first year of elementary school ($W=-3.966$; $p<0.001$);

2) the sublevels of test implementation in the preparatory group and in the first year of elementary school did not differ significantly ($W=-0.114$; $p=0.909$). It can be concluded that at the end of preschool childhood there is a significant increase in children’s results in this test, which is somewhat leveled at the beginning of schooling.

A comparative analysis of the children’s results in the “Cycles” test, carried out using the t-test for linked samples, it was found that:

1) the children’s scores in the senior group were significantly lower than in the preparatory group ($W=-6.983$; $p<0.001$) and in the first year of elementary school ($t=-7.056$; $p<0.001$);

2) the children’s scores in the preparatory group were significantly lower than in the first year of elementary school ($W=-7.655$; $p<0.001$). Children began to solve the problems of developmental processes better using the dialectical seriation.

Analysis of the children’s results in the “What can be both at the same time?” test showed that:

1) the children’s scores in the senior group were significantly lower than in the preparatory group ($W=-5.712$; $p<0.001$) and in the first year of elementary school ($W=-7.478$; $p<0.001$);

2) the children’s scores in the preparatory group were significantly lower than in the first year of elementary school ($W=-4.461$; $p<0.001$). Children began to overcome contradictions more successfully, using the action of mediation. The obtained results allow us to conclude that senior preschool and elementary school age are sensitive for the dialectical action of mediation development.

The correlation pleiad (Spearman’s coefficient) of the children’s performance scores in all three tests over the course of three years ($r>0.2$; $p<0.05$) is shown in Figure 3.

The children’s results in the “What can be both at the same time?” test were associated in pairs across all age groups. The scores of the senior and preparatory preschoolers according to the “Cycles” test also turned out to be interconnected.

The results of the “Drawing an unusual tree” test were not related to the results of other tests. Within the test itself, the scores obtained by children in the preparatory group and the first year of elementary school turned out to be related. The children’s results in all 3 age groups showed positive correlation of the ability to find a single object that has two given opposite properties. The obtained data demonstrated that dialectical mediation represents a stable line of dialectical thinking development throughout the preschool age and beginning of elementary school age. At the same time, the suc-

cess of solving problems to overcome contradictions was associated with the ability of preschoolers to understand developmental processes.

The correlation pleiad of the children's performance scores in tests for dialectical and formal-logical operations in the senior kindergarten group and in the 1st year of elementary school is shown in Figure 4.

As a result of the correlation analysis, it was revealed that:

1) the total score in the "What can be at the same time?" test in the senior kindergarten group was associated with the total score in the "Mechanical curve" test in the senior kindergarten group ($r=0.30$; $p<0.05$);

2) the total score in the "What can be at the same time?" test in the 1st year of elementary school was associated with the total score in the "Mechanical curve" test in the senior kindergarten group ($r=0.30$; $p<0.05$) and 1st year of elementary school ($r=0.46$; $p<0.05$).

3) a positive correlation was found between the ability to simultaneously coordinate two processes and overcome contradictions. At the same time, the better a child was able to perform a formal action in the senior kindergarten group, the better he/she was able to overcome contradictions in the senior kindergarten group and later in the 1st year of elementary school. The correlation of these two actions was also preserved in the 1st year of elementary school.

Discussion

In a previously conducted study [4], data was obtained on a positive correlation between the ability of children of 5–6 years old to coordinate two processes and evaluate a result's probability with an understanding of developmental processes. In hypothesis 1 it was assumed that this correlation would also appear in subsequent measurements. However, no such association was found in our study. At the same time, hypothesis 2 was confirmed and a correlation was found between a child's ability to solve the overcoming the contradiction problem ("What can be both at the same time?") and understanding of multiplicative spatial relations (see Figure 4). The existence of such a correlation can be explained by the fact that in the "Mechanical curve", the solution success, i.e., a correct idea of the intended drawing was possible only if a child took into account that the pencil moved both vertically and horizontally at the same time. This meant that the movement of the pencil was the mediation of two opposite movements. Therefore, both in the "Mechanical curve" as well as in the "What can be at the same time?", the solution was based on the use of similar dialectical mental operations, namely, the operation of mediation. So, the diagnostic results showed that hypothesis 1 was not confirmed, while hypothesis 2 was (that the understanding of multiplica-

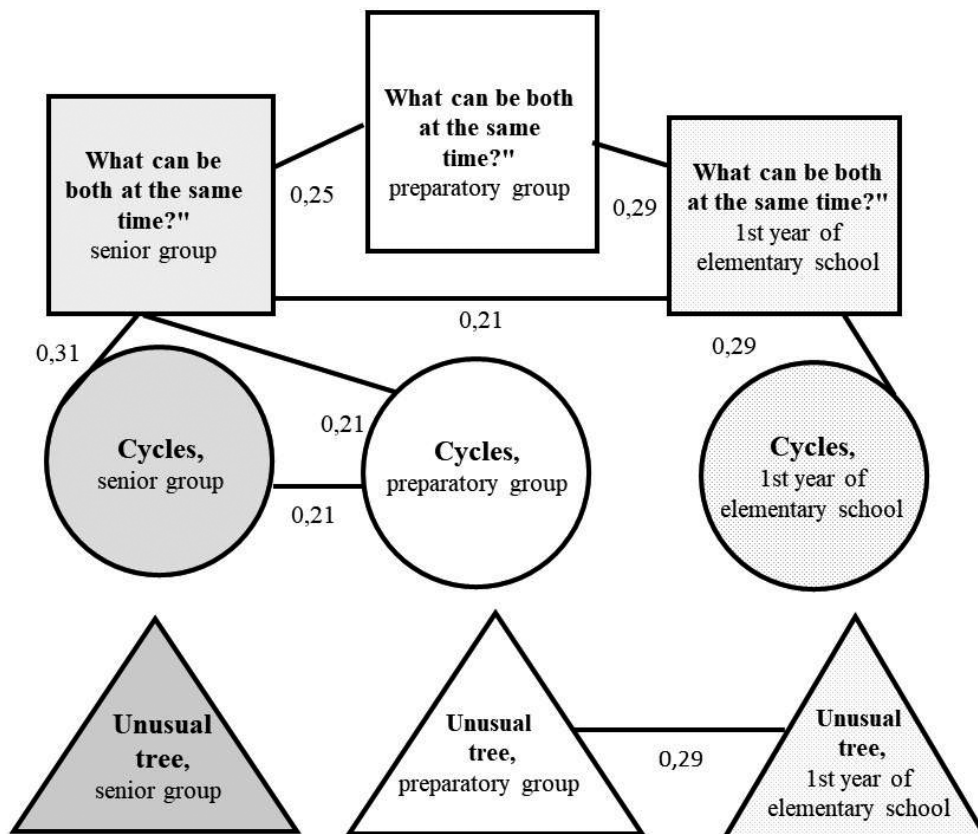


Fig. 3. The correlation pleiad of the children's performance scores of all three tests over the course of three years

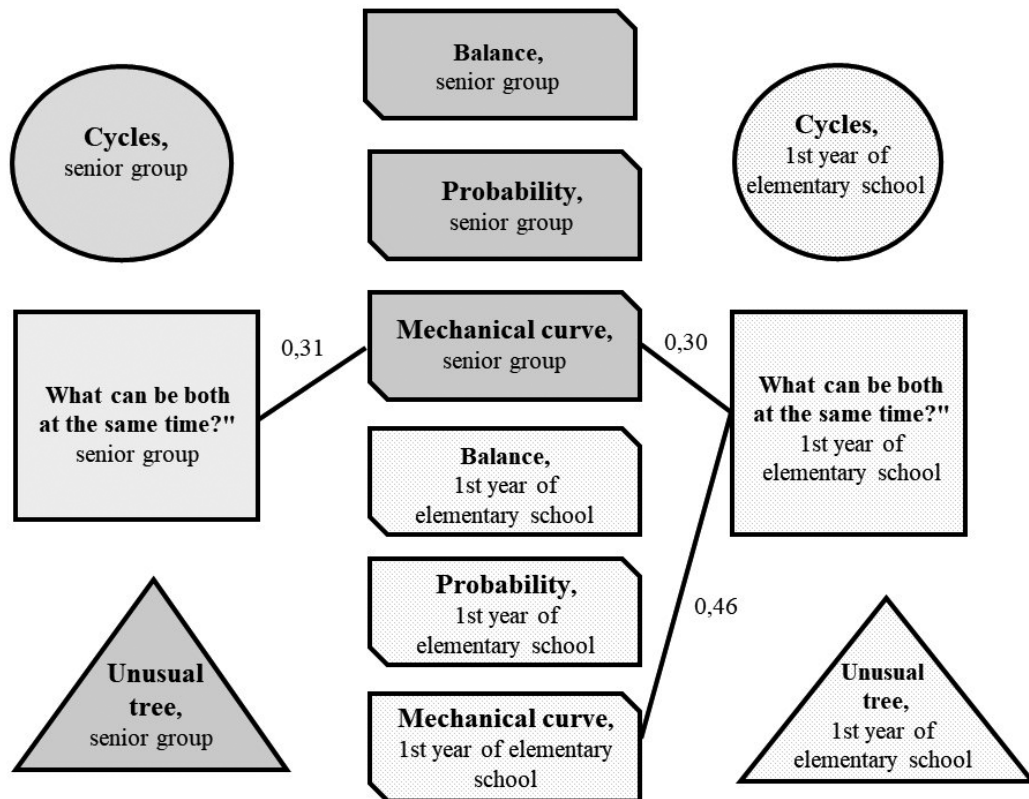


Fig. 4. The correlative pleiad of scores in dialectical thinking and Piaget tests in the senior kindergarten group and in the 1st year of elementary school ($r>0.2$; $p<0.05$) ($N=52$)

tive spatial relations is associated with the mediation development). Moreover, we clarified that the action of mediation, aimed at overcoming the contradiction, was most closely related to the coordination of two differently directed actions in a single object (see Figure 4). In other words, the dialectical thinking was connected with the formal-logical operations of multiplication. Once again it is crucial to emphasize that essentially, we consider multiplicative actions not only as a result of the formal thinking development, but also as a consequence of the dialectical thinking development. The dialectical thinking development in preschool age we associate with the play activity development, which has a rather complex dialectical structure. We assume that the discovered correlations are largely based on the preschoolers' dialectical thinking transition to a new higher level in the developmental process. Probably, by the beginning of the concrete operational stage (i.e., closer to the age of 7 years), children begin to actively use the dialectical operation of mediation, which allows them to solve multiplicative problems. The data on the positive relationship between the mediation action successful implementation and the tests for formal operations results were presented in the publication by O. Shiyan et al. [12].

At the same time, we also hypothesized about the possibility of a dialectical thinking indicators' regression at the end of preschool age. In a previously conducted research led by N. Veraksa the data was received on a

decrease in the dialectical thinking indicators in children of elementary school [1]. These data were partially confirmed: we did not find correlations between the performance results in the "What can be both at the same time?" and performance results in the "Drawing an unusual tree". However, the ability to overcome contradictions increased within 3 years, and the indicators of the ability to create a new image based on dialectical transformations, after growth in the preparatory group, again decreased among first graders to the indicators of children of 5–6 years old. In the majority of the drawings done by children of 7–8 years old, symbolic images predominate, i.e., "unusual tree" reflects more often an emotional component of modification of an image of a tree rather than structural transformations. Based on L. Vygotsky cultural-historical theory, we can assume that dialectical thinking is undergoing a qualitative change. Likely, during the transition to schooling a new social situation of development appears. In this situation, dialectical thinking development is going on in the context of the objects' symbolic reflection dominance in the system of concepts.

Conclusion

1. The conducted experimental study showed that the senior preschool age is sensitive for dialectical think-

ing development. In the first year of elementary school, the children who took part in our longitudinal study were more successful in coping with tasks to overcome contradictions and understand developmental processes than in preschool age. Moreover, in children of elementary-school age, there was a decrease in the use of the dialectical mental action of transformation when performing creative drawing tasks.

These results partially confirm the assumption that elementary-school age children would show a decrease in the successful dialectical problems solving with an increase in the successful formal logical operations performance. Probably, this change is connected with the leading activity change from the playing one to the educational one. In this case, the possibility of a child's action in an imaginary situation is reduced, while this imaginary situation made it possible to remove the contradiction between the desired and possible.

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In the future on the samples of this longitudinal study, we plan to study the interrelations between the two thinking forms at the age of 8–9 years old in order to analyze the cognitive development dynamics at elementary-school age and compare the two thinking forms' indicators in children at the ages of 5–6 years old, 7–8 years old and 8–9 years old.

2. With age children are able to cope more successfully with the solution of formal logical problems aimed at coordination of two conditions. The correlation analysis results show that at the age of 5 and 7 years old, the successful overcoming of contradictions by children is positively associated with the multiplicative spatial relations understanding: when the movements of two differently directed objects create a single image. It confirms the assumption that the multiplicative spatial relations understanding is associated with the dialectical mediation development.

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Children's Play in the Context of Digital Transformation: Cultural and Historical Perspective (Part 2)

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The article focuses on the problem of classification of digital play. Key approaches to classifying types of traditional play activity in foreign and in Russian psychology are studied. The authors argue that for the majority of foreign researchers the criteria for indicating a type of play is represented either by the level of its cognitive complexity (J. Piaget, K.H. Rubin, K. Stagnitti, S. Smilansky, N. Takata) or by the character of social interactions, in which the child is involved in the process of play (M.B. Parten, J. Mildred). Classifications of play, suggested by Russian scholars – E.E. Kravtsova, S.L. Novoselova, N.Ya. Mikhailenko and N.A. Korotkova, E.O. Smirnova – are discussed. The authors stress the need of differentiating between the concepts of “digital play” and “digital game”. They also discuss the possibility of applying classifications of video games and those of traditional play for the analysis of digital play. The article also focuses on the classification of digital play elaborated by J. Marsh on the basis of the taxonomy of play types by B. Hughes. Authors argue that for indicating types of digital play it might be more efficient to apply classifications of traditional play under condition of their adaptation.

Keywords: digital play, classification of play types, taxonomy of play, computer game, video game, play activity.

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Детская игра в условиях цифровой трансформации: культурно-исторический контекст (Часть 2)

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В статье обсуждается проблема типологизации цифровой игры. Рассматриваются основные подходы к классификации «традиционной» игровой деятельности в зарубежной и отечественной науке. Показано, что для большинства иностранных авторов критерием выделения типа игры является либо уровень ее когнитивной сложности (Ж. Пиаже, К.Н. Rubin, К. Stagnitti, S. Smilansky, N. Takata), либо характер социальных взаимодействий, в которые ребенок оказывается вовлеченным в процессе игры

(М.В. Parten, J. Mildred). В отечественной науке приводятся классификации игры, предложенные Е.Е. Кравцовой, С.Л. Новоселовой, Н.Я. Михайленко и Н.А. Коротковой, Е.О. Смирновой. Подчеркивается необходимость различения понятий «цифровая игра» как программный продукт и «цифровая игра» как специфический вид игровой деятельности. Обсуждается возможность применения классификаций компьютерных игр (видеоигр) и «традиционных» игр для анализа цифровой игры. Приводится классификация цифровой игры Дж. Марш, разработанная на основе типологии Б. Хьюза. Обосновывается идея о том, что для выделения типов цифровой игры наиболее перспективными являются классификации «традиционной» игры при условии их соответствующей адаптации.

Ключевые слова: цифровая игра, классификация игр, типологизация, компьютерная игра, видеоигра, игровая деятельность.

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Typologization of digital play: on the problem definition

As already mentioned [9], in the last few years the number of psychological and educational works based on the opposition of traditional and digital play is decreasing. Play activity, mediated by the use of technologies and various kinds of digital content, is regarded as a new form of play, where real and virtual objects coexist and interact in real time mode. In this kind of play digital means (smartphones, tablets etc.) are regarded as the same attributes of play as traditional toys.

An important step in studying digital play as a new socio-cultural phenomenon is connected with understanding its heterogeneity, which is, on the one hand, based on the diversity of the technologies applied, and, on the other hand, — on the variety of ways, how the digital media are introduced into the context of play. It can be assumed that exactly as traditional play activity, digital play evolves and develops depending on the child's age, the level of the development of their digital skills and the character of their interaction with gadgets (frequency of interaction, involvement of adults and age mates in the play process, etc.) Therefore, the challenge emerges of identifying types of digital play and elaborating its taxonomy.

Apparently, the approaches for resolving this task will depend on the conceptual consideration of traditional play activity, its types, and functions. In the framework of this article the authors attempt to briefly consider a few classifications, based on the well-known concepts of play (including Cultural-Historical Theory). The authors also attempt to discuss the perspectives of applying these taxonomies to play, mediated by the use of technologies.

Foreign approaches to classifications of “traditional” play

The challenge of identifying types of play activity has attracted the attention of many foreign psychologists and educators. Most classifications may be grouped around two key approaches to understanding play: the cognitive approach and the social approach. The authors, working in the framework of the first direction, define types of play depending on the level of their *cognitive complexity* (J. Piaget, K.H. Rubin, K. Stagnitti, S. Smilansky, N. Takata). In the framework of the second approach the criteria for identifying types of play is the character of *social interactions*, in which the child is involved in the process of play (M.B. Parten, J. Mildred). In some classifications the regarded types of play are considered as stages, connected with the general line of cognitive and/or social development, while some of them presuppose parallel development and intersection of different types of play. There are also a few classifications based on the criterion of toys, with which the child interacts in the process of play [19].

Cognitive taxonomies are based on the ideas of J. Piaget. According to his concept of stage development, the content of children's play develops from subjective constructions to adequate reflection of reality [29]. Children do not acquire new skills while playing, but rather practice and consolidate skills that were acquired recently. J. Piaget identified three types of children's play [26]:

- practice play (listening, visual, and tactile experimentation with objects, sounds, words,
- expressions),

- symbolic play (symbolic use of objects as they were something else; use of absent objects),
- play with rules (games with a specific code and rules accepted and followed by the players).

Later other scholars extended the taxonomy of J. Piaget and included more types of play, making it possible to trace, how the complexity of play actions increases with the cognitive development of the child. For example, N. Takata, on the basis of the classification by J. Piaget, suggested an age taxonomy of play, identifying the following types [28]:

- sensorimotor play (0–2 years),
- symbolic and simple constructive play (2–4 years),
- dramatic and complex constructive play (4–7 years),
- games with rules (7–12 years),
- recreational and competitive play (12–16 years).

Social classifications underlie the ideas of M.B. Parten, who identified types of play depending on the character of children's interactions in the process of play [25]. M.B. Parten described the following types of play:

- solitary play (the child plays alone and independently even if surrounded by other children),
- parallel play (the child plays independently at the same activity, at the same time, and at the same place),
- associative play (the child is still focused on a separate activity, but there is a considerable amount of sharing, lending, taking turns, and attending to the activities of one's peers),
- cooperative play (children can organize their play and/or activity cooperatively with a common goal and are able to differentiate and assign roles).

M.B. Parten's ideas became basis for The International Classification of Functioning Disability and Health Children and Youth, adopted by The World Health Organization in 2007.

Another group of classifications relates to the type of toys, which are used by children in the process of play. The classifications of this group may not be regarded as strictly scientific, since they often rely on the characteristics of toys, declared by manufacturers, while in reality the functions of toys in the process of play are often identified by the child differently. B.M. Kudrowitz and B. Goodson suggested to classify play depending on the toys, which are needed for different kinds of play, and identified the following types [20]:

- active play (push and pull, ride-on toys; outdoor and gym, sports equipment),
- manipulative play (construction toys, pattern making, dressing, lacing, stringing),
- sand and water play toys),

- make-believe play (dolls, puppets, stuffed toys, place scenes, transportation toys),
- creative play (musical instruments, art and craft materials, audio-visual equipment),
- learning play (games, books, specific skill-development toys).

It is also important to highlight that researchers are not unanimous in the analysis of the existing classifications of play and their belonging either to cognitive or to social direction. E. Mellou [24] and K. Stagnitti [27] e.g. consider both J. Piaget and L.S. Vygotsky as scholars of the cognitive direction. In his turn, F.P. Hughes opposes cognitive theories and the so-called contextual approach to play. According to F.P. Hughes, the contextual approach is based on the idea that the development of the child can only be considered in the framework of the socio-cultural and historical context, in which it takes place [22]. As an example of the contextual approach to play F.P. Hughes points to L.S. Vygotsky's Cultural-Historical Theory.

B. Hughes is the author of one of the most well-known classifications of play activity [21]. According to E.O. Smirnova, in the framework of his taxonomy, types of play are indicated "intuitively rather than theoretically" [12, p. 6]. Typology of play by B. Hughes was at first elaborated as a practical instrument for the analysis of child's play, meant for specialists working with preschoolers. The author indicated 16 types of play, with some of them lacking analogues in the Russian psychological tradition (see table 1).

Thus, the problem of indicating types of child's play regularly appears in research, attracting attention both of psychologists and educators, who are interested in practical instruments for analysis and assessment of contemporary children's play.

Russian typologies of play

Interpretation of play activity in Russian psychology is rooted in the ideas of L.S. Vygotsky, for whom the key characteristics of children's play was the imaginary situation. The imaginary situation allows the child to make up the play setting, use play substitutes, create play rules and accept a particular role [3]. Developing Vygotsky's ideas about the phenomenon of child's play, D. Elkonin rearranged the key points and emphasized rules rather than imaginary situation, arguing that in the process of role playing the child's actions are transformed and the child's relation to reality changes [15]. In further research A. Zaporozhec drew attention to the importance of the child's initiative in play activity. The author

suggested the term «initiative play» (samodeyatel'naya igra) pointing to the determining role of children's initiative in constructing role play [16].

It is important to highlight that it was “suzhetno-rolievaya igra” (role play or plot-role-playing,) that was in the focus of Russian researchers for a long time. It was treated as the higher, most developed form of play, which needs to be developed in preschool childhood. Probably for this reason the problem of play taxonomy and indication of other types of play did not attract particular attention of Russian scholars.

Interestingly the term “suzhetno-rolievaya igra” does not have absolute synonyms in English language. Usually, the concept of *role play*, *pretend play* and *make-believe play* are used as its synonyms. Sometimes such terms as *fantasy play*, *dramatic play*, *plot-role-playing* and *social-dramatic play* are also applied. All these concepts are not interchangeable and emphasize certain aspects of “suzhetno-rolievaya igra”.

The most well-known typologies of play in Russian psychology were suggested by E.E. Kravtsova, S.L. Novoselova, N.Ya. Mikhailenko and N.A. Korotkova, E.O. Smirnova.

According to E.E. Kravtsova there is a tense connection between the development of imagination and play in preschoolers. The author traces their development the following way: from imagination as prerequisite of play – directed play (rezhissyorskaya igra) – to imagination as the result of play – image role play (obrazno-rolievaya igra) – then to developed imagination in role play (suzhetno-rolievaya igra) and finally back to imagination as prerequisite of play activity – play with rules, late form of directed play (rezhissyorskaya igra) [4]. She, thus, indicates four types of children's play, which match certain age (fig. 1):

Developing the ideas of D. Elkonin, N.Ya. Mikhailenko and N.A. Korotkova regard play as an element of society's culture, including education and labor. The authors distinguish between the following types of play:

1) Play with rules (igry s pravilami) – rules underlie play activity:

- outdoor play (podvizhnye igry);
- board games (nastol'nye igry);
- word games (slovesnye igry).

2) Role (creative) play (syuzhetnye/tvorcheskie igry) – transformation and animation of things underlie play activity:

- role play (rolievye igry) – the child himself turns into someone;
- make-believe play, directed play (rezhisserskie igry) – involve animation and control of objects;
- dramatization play (igry-dramatizatsii) – presupposes roles, based on a literary plot.

N.Ya. Mikhailenko and N.A. Korotkova also emphasize that usually there are elements of plot in play with rules and elements of rules in creative play [7].

Developing the ideas of A.V. Zaporozhec, S.L. Novoselova [8] suggests a taxonomy of play based on the criterion of initiative (fig. 2). The author distinguishes between play that constitutes the preschoolers' leading activity and contributes to preschoolers' development, and play as an educational technology, or play as something that helps the child or introduces the child to certain cultural patterns [16].

We would like to consider particularly the types of play, indicated by E.O. Smirnova. The author argues that at the age of two process play (protsessual'naya igra) or, according to L.S. Vygotsky, quasi-play (kvazi-igra) emerges, which represents the transfer of action from one object to another (from the “real” to the “playful”). The sense and the goal of this play consists in the very process of the activity. Process play cannot be considered play in the strict sense of the word, since there is neither role, nor plot, nor imaginary situation in it. However, it represents an important step for the formation of creative play. Process play gives way to role play (syuzhetno-rolievaya igra), in which central new formations of preschool age develop. Apart from role play (syuzhetno-rolievaya igra) E.O. Smirnova also distinguishes between directed/make-believe play (rezhisserskaya igra), dramatic play (igra-dramatizatsiya), play based on rules – outdoor

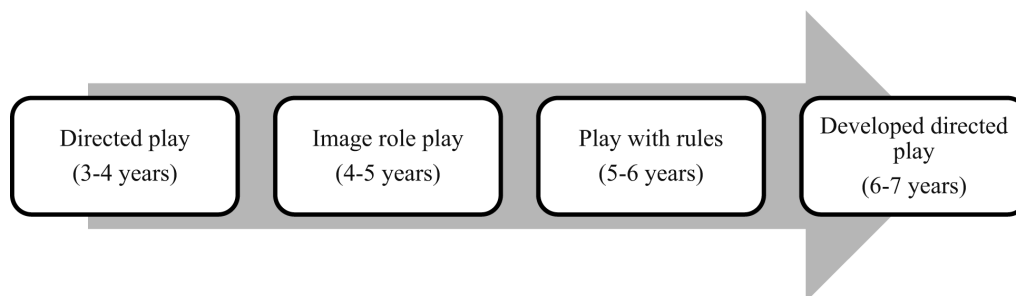


Fig. 1. Stages of play development by E.E. Kravtsova

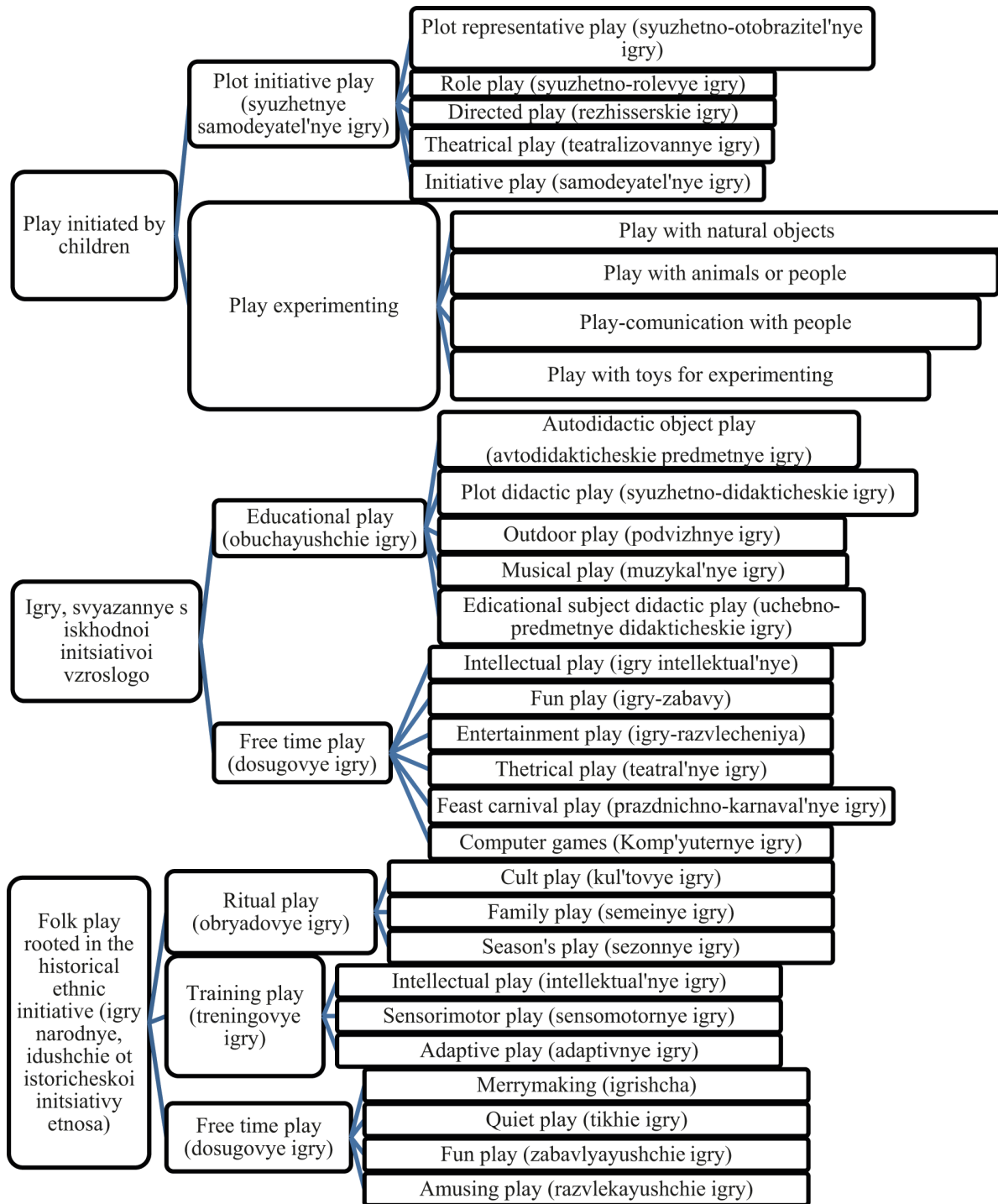


Fig. 2. Taxonomy of play by S.L. Novoselova

play and board play (podvizhnaya i nastol'naya) – and didactic play (didakticheskaya igra). Directed play (make-believe play, rezhisserskaya igra) is similar to role play (syuzhetno-rolevaya igra), however in the process of it the child interacts with people rather than with toys. The child distributes roles among toys, animates them and performs a certain plot. In dramatic play (igra-dramatizatsiya) children perform rules themselves, and usually the plot of the play is taken from fairy tales and cartoons. In play based on rules

(igra po pravilam) the actions of the participants are regulated by rules rather than by roles. In this kind of play there are winners and losers necessarily [10]. Importantly, E.O. Smirnova opposes play as independent activity of children, and play as a learning instrument. Using play methods for education (didactic play) presupposes not just the adult's initiative, but the adult's guidance of play, which, according to E.O. Smirnova, does not contribute to the development of the child's initiative and independence [11].

Generally, the analysis of the most well-known classifications of children's play reflects the differences in conceptual understanding of this phenomenon in foreign and in Russian psychology. Apparently, these differences would be also reflected in the interpretation and taxonomy of the phenomenon of digital play.

Approaches to the classification of digital play

The problem of classifying play, mediated by technologies, inevitably brings us back to the necessity of overcoming terminological confusion and, particularly, distinguishing between the concepts of digital play and digital game, to which N.N. Veresov and N.E. Veraksa draw attention [30]. As we have already mentioned [9], the English term "digital game" refers mostly to software. Its synonyms in Russian language are "komp'yuternaya igra" (computer game) or "videoigra" (videogame)¹. The term "digital play", which is also translated into Russian as "tsifrovaya igra", refers to play activity as a process, which presupposes interaction of players between each other and with digital media. In this sense, the Russian term "tsifrovaya igra" is used for indicating a specific type of play activity.

Quite often the concepts of "digital game" and "digital play" are used as interchangeable. Moreover, there are a few attempts of applying classifications, originally elaborated for digital games, (videogames) to digital play. These classifications are either based on the characteristics of video games as products, or build the connection between video games and psychological and personal characteristics of play.

The most elaborated classifications of video games are based on the criterion of genre. They form big clusters of video games: action, simulator, strategy, role play, adventure, puzzle etc. The criterion for indicating a game genre is based on such characteristics as role, tasks, plot, game setting etc. [5]. The advantages of genre classifications of video games are their universal character and accessibility for players, IT specialists, researchers, and users. Genre classifications also give the possibility of enriching and developing the existing classifications by indicating new types in different genres. At the same time in contemporary games the elements of different genres are often mixed, which makes indication of genres rather challenging [2].

Apart from genre classifications there are also psychological classifications of video games. E.g taxonomy by A.G. Shmelev is based on the qualities/skills of player, the development of which may be achieved by different types of game. The author indicates seven types of video games: logical, gambling, sports, military, persecution-avoiding games, adventure, international, simulators [17].

Topology of video games suggested by I.M. Kyshtymova and S.B. Timofeev is based on the principle of system and the ideas of the psycho-semiotic approach about the mediation of the processes of development [6]. According to the fundamentals of the theory, game represents a multi-level structure. The model of game is represented by seven levels with two of them – the level of game play and the level of setting – are indicated as basic, found in all types of video games, and five – as variable. The indicated levels consist of 34 components, which are assessed in scores according to certain scales. Based on the assessment of these scales, the play can be referred to one of the types. The psychological topology of video games, consistent with this structure model, may become the basis for testing hypotheses about the influence of computer games on the psychological peculiarities of players.

As an example of taxonomy connecting video games with different psychological and personal characteristics of players, we could also refer to the classification of players based on the criterion of motivation, suggested by R. Bartle. The author indicates four main motives of play: orientation on players or world, acting or interacting. According to the combination of these motives 4 types of players are distinguished: achievers, who are proud of their formal status in the game's built-in level hierarchy, and of how short a time they took to reach it; explorers, who are proud of their knowledge of the game's finer points, especially if new players treat them as founts of all knowledge; socializers, who are proud of their friendships, their contacts and their influence; killers, who are proud of their reputation and of their oft-practiced fighting skills [18].

All of the described taxonomies refer to adult players. Taxonomies which refer to child players are extremely rare, though under digital transformation most children get acquainted with video games in early childhood. As we have mentioned [9], one of the few classifications of video games for children was suggested by E.O. Smirno-

¹ Videogra (videogame) usually refers to a game with images "based on the interaction of human and gadget (computer, notebook, TV, tablet, smartphone etc.). Earlier videogames presupposed exclusively games on a special portable device – e.g. game console. Since contemporary videogames are multiplatform, the terms "computer game" and "videogame" are often used as synonyms" [14, c. 25].

va and E.R. Radaeva. Based on the genre taxonomy of video games, they suggested to use the player's role in the game as the main criterion for indicating game types. On the basis of the player's position they indicated three groups of games: above the situation (strategy, etc.), out of the situation (narrative, etc.), and in the situation (simulators, etc.) [13].

From our point of view, application of taxonomies that were originally elaborated for computer games (video games) to digital play is not always efficient, since children very often interact with the software in different ways, that were not designed by the manufacturers. The attempts to reduce the interaction with digital content exclusively to the ways, suggested by concrete software or gadget, fundamentally impoverish the variety of types of play activity, mediated by technologies. Therefore, we agree with J. Marsh, who argues that a different approach is needed for indicating types of digital play.

J. Marsh attempted to adapt classifications of the so-called "traditional play" to the play, mediated by technologies [23]. In the framework of a research project on digital play, J. Marsh with colleagues analyzed a few classifications of play activity and concluded that the most perspective for the description of digital play is the taxonomy of B. Hughes (table 1).

According to the author, *communication play* may refer to digital play with words, songs, rhymes, poems, as well as textual, audio- and video messages.

Creative play may be associated with creation and exploration of new objects in digital environments.

Imaginative play presupposes that children ascribe imaginary qualities to objects in digital contexts.

Deep play is connected with the child facing risky experiences or feeling as though they have to fight for survival in digital play.

Digital play in which children can take on roles of fantastic creatures (e.g. Spiderman, superhero etc.) or use an off-screen character in on-screen activities, can be attributed to *fantasy play*.

Dramatic play can be understood as digital play that dramatizes events, which children have witnessed in society, but in which they have not directly participated (e.g. TV shows). This could take place through play with avatars, or in chat rooms, etc.

Exploratory play involves exploring digital objects, spaces, etc. Children search for new information, or explore possibilities of virtual objects.

Digital *lokomotor play* involves movement (jumping, running, swimming etc.) in a digital context.

Mastery play suggests gaining control over digital environments or virtual worlds.

Digital play in which children explore virtual objects through vision and touch through the screen or mouse can be categorized as *object play*.

Recapitulative play suggests playing in digital contexts in ways that resonate with the activities of our human ancestors.

Digital *role play* presupposes that children can take real-life roles (doctor, driver, teacher etc.) in digital contexts. In this type of play virtual characters might be used or children can participate in play on-line.

Digital *rough and tumble play* takes place when avatars that represent users in a digital environment touch each other playfully, e.g. bumping each other.

Type of digital play in which social rules are developed and used, belongs to the category of *social play*.

Social-dramatic play involves the enactment of real-life scenarios that are based on personal experiences in a digital environment. This could take place through play with avatars, or by imagining that an on-screen virtual character is involved in such play off-screen.

Symbolic play occurs when children use a virtual object to stand for another object.

According to J. Marsh, all but two of Hughes' 16 play types were identified in the research on children's play with apps across the school and homes [23]. The two types of play not observed were recapitulative play and rough and tumble play. Rough and tumble play relates to physical contact, and whilst there are virtual replications of this in online play, such play episodes were not observed in the research by J. Marsh. Recapitulative play is a category of play that is difficult to discern as it often overlaps with other play types. B. Hughes argued that this type of play occurs primarily when children have access to nature, since it presupposes actions, typical of animals or ancient people (play with fire, knives, gathering plants, wearing masks, making tattoos etc.) J. Marsh assumes that recapitulative play did occur in her research when children were using the Minecraft app, as they built dens and created civilizations [23].

Adaptation of the taxonomy of play by B. Hughes to digital play by J. Marsh is presented in more detail in Table 1.

J. Marsh argues that the taxonomy by B. Hughes does not allow to embrace all types of digital play. The author identifies one more type of digital play – *transgressive play*, which she defines as "play in which children contest, resist and/or transgress expected norms, rules and perceived restrictions in both digital and non-digital contexts" [23, p. 9]. As an example of this type of digital play, Marsh refers to an episode where a child uses an app. This app suggests lining the alphabet blocks. In her research the child didn't follow the rules of this play, he

Adaptation of the taxonomy of play by B. Hughes to digital play by J. Marsh [12; 21; 23]

№	Type of play by B. Hughes	Analogue in Russian psychology (by E.O. Smirnova)	Description of the type of play by B. Hughes	Adaptation to digital play by J. Marsh
1	Communication play	Emotional-practical interaction of children	Play that enables children to explore, develop ideas and make things. Includes various language resources: making up rhymes, songs, new words etc.	Play that enables children to explore, develop ideas and make things in a digital context. Includes various language resources: making up rhymes, songs, new words etc. May include text messages and other ways of digital communication.
2	Creative play	Productive play activity	Play, in which children explore the surrounding world, learn about qualities of materials, textures, colors etc., discover new objects.	Play in which children explore and create new objects in digital environments.
3	Deep play	No analogue	Play in which children encounter risky experiences or feel as though they have to fight for survival.	Play in digital contexts in which children encounter risky experiences, or feel as though they have to fight for survival in digital contexts.
4	Fantasy play	Similar to role play	Play in which children can take on roles that would not occur in real life (e.g. Spiderman, superhero etc.)	Play in which children can take on roles that would not occur in real life (e.g. Spiderman, superhero etc.) This could be through the use of an avatar, but may also include taking on a character off-screen whilst they engage in on-screen activities in the fantasy scenario.
5	Imaginative play	Similar to role play	Play in which children pretend that things are otherwise (ascribe different qualities – e.g. a dog swims under water like fish etc.).	Play in digital contexts, in which children pretend that things are otherwise (ascribe different qualities – e.g. a dog swims under water like fish etc.).
6	Dramatic play	Play-dramatization	Play that dramatizes events, which children have witnessed in society, but in which have not directly participated (e.g. TV shows).	Play that dramatizes events, which children have witnessed in society, but in which have not directly participated (e.g. TV shows). This could take place through play with avatars, or in chat rooms, etc.
7	Exploratory play	Similar to experimenting	Play in which children explore objects, spaces, etc. through the senses in order to find out information, or explore possibilities.	Play in a digital context in which children explore objects, spaces, etc. through the senses in order to find out information, or explore possibilities.
8	Lokomotor play	Brings together elements of physical and outdoor play	Play which involves active movement (chase, hide-and-see, etc.), there are rules that might be introduced.	Virtual locomotor play involves movement in a digital context, e.g. a child may play hide-and-see with others in a virtual world.
9	Mastery play	No analogue	Play in which children attempt to gain control of environments (forest, mountains, rivers, fields), overcoming various obstacles (e.g. building dens).	Play in digital contexts in which children attempt to gain control of environments, e.g. over a virtual world.
10	Object play	Manipulating	Play in which children explore objects through touch and vision.	Play in which children explore virtual objects through vision and touch through the screen or mouse. They may play with the virtual objects.
11	Recapitulative play	No analogue	Play in which children might explore history, rituals and myths, and play in ways that resonate with the activities of our human ancestors (lighting fires, building shelters etc.)	Play in a digital context in which children might explore history, rituals and myths, and play in ways that resonate with the activities of our human ancestors (playing with fire or knives, gathering plants, wearing masks, making tattoos etc.)

№	Type of play by B. Hughes	Analogue in Russian psychology (by E.O. Smirnova)	Description of the type of play by B. Hughes	Adaptation to digital play by J. Marsh
12	Role play	Very similar to role play (“rolevaya igra”)	Play in which children might take on a role (doctor, driver, teacher etc.)	Play in a digital context in which children might take on a role. In this type of play virtual characters might be used or children can participate in play online.
13	Rough and tumble play	No analogue	Interaction when children are in physical contact, but there is no violence or aggression.	Virtual rough and tumble play occurs when avatars that represent users in a digital environment touch each other playfully, e.g. bumping each other.
14	Social play	Almost the same as social communication with age mates	Play during which rules for social interaction are constructed and employed (children learn how to manage, compete, help, assist etc.)	Play in a digital context during which rules for social interaction are constructed and employed.
15	Social-dramatic play	A kind of role play	The enactment of real-life scenarios that are based on personal experiences, e.g. playing house, going shopping etc.	The enactment of real-life scenarios in a digital environment that are based on personal experiences, e.g. playing house, going shopping etc. This could take place through play with avatars, or by imagining that an on-screen virtual character is involved in such play off-screen.
16	Symbolic play	Is used in role play	Occurs when children use an object to stand for another object (e.g. a stick becomes a horse).	Occurs when children use a virtual object to stand for another object (e.g. an avatar’s shoe becomes a wand).

raised the block up to the top of the screen and made it disappear, then released the block to bounce back on the screen and said, ‘Peek-a-boo!’. Transgressive play may thus be identified in cases, when in the process of play children try to use functions that were not originally established by the software developers.

Thus, the research by J. Marsh et al. demonstrates that “traditional” play classifications — particularly, B. Hughes’ framework — may be applied to digital play with certain revisions. From our view, application of “traditional” play taxonomies provides more opportunities in comparison with the application of video games’ classifications. At the same time, it is important to highlight that these frameworks require adaptation and revision if applied to digital play.

Some concluding remarks

Identifying types of digital play is one of the challenges for contemporary psychological and educational science. Facing this challenge is connected, on the one hand, with the further elaboration of the concept of digital play as a specific type of play activity, and, on the other hand, it presupposes reconsideration

of the existing approaches to the classification of play and their adaptation to play interaction in mixed reality.

Now it seems that classification of digital play in the framework of the Cultural-Historical scientific school is not yet regarded as a particular research task. In our opinion, the perspectives of identifying types of digital play based on the ideas of L.S. Vygotsky and his followers relate to the analysis of the peculiarities of the imaginary situation, which emerges when the child is interacting with virtual objects in the play process. We can also assume that, as any kind of play activity, digital play possesses structure and dynamics, which depend on the child’s age, the level of their digital competences and general play skills. Without studying digital play, one can neither speak about the peculiarities of the social situation of development in contemporary children, nor analyze the peculiarities of the development of their higher mental functions.

Identification of types of digital play, based on the ideas of the Cultural Historical Concept, would have principal significance for constructing developing child-adult communities and organization of children’s interactions with different types of digital content in different periods of childhood.

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Real-Self and Virtual-Self: Identity Matrices of Adolescents and Adults

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Understanding the trajectories of identity formation in response to the interplay between traditional and digital socialization, especially among the younger generation, is interesting for predicting the areas of opportunity and risks of a changing society. The aim of the study is to carry out a comparative analysis of the specific aspects of online and offline identities and their structure in adolescents and parents. The study sample comprised 396 adolescents aged 14 to 17 and 411 parents of adolescents of this age. The ‘Who Am I’ method was used to assess real and virtual identities. The results show that the online and offline identity matrices of adolescents and parents differ from each other in a number of parameters. For adolescents, the categories of the “Social Self” and “Personal Self” appear online as equal, while offline the importance of the social Self increases. For parents, the social Self definitely dominates in the two worlds. For adolescents and parents, digital identity is the leading subcategory in the online social Self. Parents are characterized by a less rich Self-image in the virtual space compared to both adolescents and their own image of the real Self. The virtual Self and the real Self do not oppose each other but actively interact on the principle of mutual complementation. Meanwhile, for adolescents and parents they differ significantly in content and are constructed in different ways. Compared to parents, adolescents develop a more holistic Self-image online and offline, which allows them to master adaptive strategies of mixed convergent reality better, and in retrospect the strategies prove to be pre-adaptive and determine a higher readiness of new generations to change.

Keywords: digital socialization, real-self, virtual-self, social self, personal self, digital identity, real identity, extended personality, adolescents, parents.

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Я-реальное и Я-виртуальное: идентификационные матрицы подростков и взрослых

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Понимание векторов формирования идентичности в условиях взаимодействия традиционной и цифровой социализации, особенно у подрастающего поколения, представляет интерес для прогнозирования зон возможностей и рисков изменяющегося общества. Цель работы — сравнительный анализ особенностей идентичности и ее структуры у подростков и родителей в онлайн и офлайн. Выборку исследования составили 396 подростков от 14 до 17 лет и 411 родителей подростков этого возраста. Для оценки реальной и виртуальной идентичности использовалась методика «Кто я?». Полученные результаты показывают, что идентификационные онлайн- и офлайн-матрицы подростков и родителей различаются между собой по ряду параметров. У подростков категории «Социальное Я» и «Личностное Я» выступают в онлайн как равновеликие, а в офлайн растет значимость социального Я. У родителей в двух мирах безусловно доминирует социальное Я. В качестве ведущей подкатегории в социальном Я онлайн у подростков и родителей выступает цифровая идентичность. Для родителей характерен менее насыщенный образ Я в виртуальном пространстве по сравнению и с подростками, и с собственным образом реального Я. Я-виртуальное и Я-реальное не противостоят друг другу, а активно взаимодействуют по принципу взаимного дополнения; при этом у подростков и родителей они содержательно значительно различаются и конструируются разными способами. По сравнению с родителями подростки формируют более целостный образ Я онлайн и офлайн, что позволяет им в большей степени осваивать адаптивные стратегии смешанной конвергентной реальности, которые в ретроспективе оказываются преадаптивными и определяют более высокую готовность новых поколений к изменениям.

Ключевые слова: цифровая социализация, Я-реальное, Я-виртуальное, социальное Я, личностное Я, цифровая идентичность, реальная идентичность, расширенная личность, подростки, родители.

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Introduction

The challenges of the constantly changing modern world, including those determined by the increasing role of digital technologies, raise the question about the specifics of identity formation, primarily among adolescents, for whom this process is most important due to both age characteristics and high online activity. Identity performs a number of functions related to orientation in the world and its structuring, value

navigation and existential fullness, and gives integrity, continuity and certainty to an individual, providing regulation of behavior through differentiation with various social communities and solidarity with significant groups. Analyzing the directions of identity formation among different generations in response to the interplay between traditional and digital socialization will allow to take a more holistic look at the areas of opportunities and risks for a changing society from this prospective.

Erik Erikson wrote about the complex multilevel identity structure, paying special attention to the process of its formation during the psychosocial development of personality and emphasizing the social level of its reflection through the solidarity of a person with group ideals, self-categorization of oneself in the world and the construction of self-identical and consistent self [13]. Serge Moscovici introduced the concept of the identity matrix as a categorical grid, in which many identities co-exist and are constructed in the process of group and individual interaction on the basis of connections and distinctions [7]. Henri Tajfel and John Turner considered social identity as a portion of the self-concept, which is formed as a result of the processes of categorization and social comparison that determine group affiliation and place an individual into the 'us versus them' frame [17]. Social identity theory makes a distinction between a social identity (the result of identification through group membership) and a personal identity (identification through unique personality traits and features), which are integrated as a personal position in the social system. Identity is arranged in a hierarchy from the most important to the least significant categories, and within a time perspective from the past to the future [16].

Research on identity in the digital environment focuses primarily on expanding opportunities to experiment with self-construction in the virtual social space, on finding new boundaries and personal self-categorizations, on creating new images of oneself that differ from the real self [5]. In the first works related to this subject, virtual identity was considered as one of the forms of realization of the 'ideal self' in the situation of identity crisis and dissatisfaction, leading to 'blurring' and distortion of self-awareness [18; 19]. In regard to the place of digital identity in an individual's self-awareness, researchers often tended to analyze digital identity as an aspect of real identity, as one of its projections into the virtual world [4]. More recent works focused not only on the blurriness and multiplicity of digital identity but also on its possibilities to be a stable form of building and self-presentation of a personality in the real world [1; 9].

A number of works devoted to theoretical and empirical research in the context of the cultural and historical paradigm of digital sociality and mixed reality as key characteristics of digital socialization [10; 11] suggest another trajectory of identity transformation amid digitalization of everyday life. The growing importance of various digital socio-cultural practices and online spaces where these practices are implemented contributes to the building of an integral hybrid identity. This identity combines, in a complex way, characteristics that are conditionally related to the virtual and real worlds and, in the modern context, represent the attributes of convergent reality.

Although there are many studies on the identity of adolescents and young people, empirical works devoted

to studying the relation between the real and the virtual in their identity are just beginning to appear [8], and works focusing on intergenerational comparisons, to the best of our knowledge, have not yet appeared. Thus, the **aim** of this study is to carry out a comparative analysis of the specific aspects of online and offline identities and their structure in adolescents and parents. The following hypotheses were put forward:

1. Compared with the virtual world, in the real world self-descriptions related to the social self dominate in the structure of identity of both parents and adolescents.

2. Teenagers are more characterized by self-descriptions through an individual's personality traits, and parents — through a social affiliation.

3. In the real and virtual worlds, a portion of self-descriptions of both adolescents and parents coincide, which can be considered as one of the indicators of the mixed reality identity.

4. Parents are characterized by the transfer of social statuses from the real to the virtual world.

5. Teenagers are characterized by the transfer of self-descriptions from the real to the virtual world, and vice versa.

Research Methodology and Procedure

The study sample consisted of 396 adolescents aged 14 to 17 (182 boys and 192 girls, 45.9% and 48.5%, respectively; 22 respondents did not indicate their gender — 5.6%) and 411 parents aged 28 to 57 ($M=41$, 70 men and 334 women, 17% and 81.3%, respectively; 7 respondents did not indicate their gender — 1.7%). The sample included respondents from Volgograd (15.6%), Petropavlovsk-Kamchatsky (15.7%), Novosibirsk (13.4%), Moscow and the Moscow Region (24.5%), Makhachkala (15.2%) and Yekaterinburg (15.6%).

The 'Who am I' method was used to assess real and virtual identities [6]. The respondents were offered the following instructions: "Please think and give 5 answers to each of the two questions: 'Who am I in the Internet?' and 'Who am I in real life?'".

The obtained data was processed using qualitative content analysis in consultation with eight experts at several stages (initial encoding, approval of categories with two experts, verification by five experts of the legitimate character of the categorization of self-descriptions, frequency analysis).

The data were processed in IBM SPSS Statistics 20.0, using Pearson's chi-squared test.

Results

The social self in real and virtual identities of teenagers and parents. Based on the content analysis, all

the self-descriptions were divided into two categories: social self and personal self. Within the general social self-category, a number of subcategories were identified: pan-human identity ('human', 'ordinary person'), professional identity ('employee', 'worker'), academic identity ('pupil'), family identity ('son', 'mother'), belongingness to groups of people with shared interests ('music lover', 'role player'), gender and age identity ('girl', 'teenager'), religious identity ('Muslim'), civil and regional identity ('citizen'), ethnic identity ('Russian'), economic identity ('consumer'). Separately, in addition to the categories presented, digital identity was distinguished, which included descriptions of oneself as an online user, consumer, content creator and moderator.

In the real and virtual worlds, pan-human and 'friendly' identities are important for teenagers. Compared to their parents, the importance of academic and family identities is significantly reduced for them online. For parents, both real and virtual identities are dominated by family affiliation. Belongingness to a group of friends

and professional identity that is equally represented both online and offline are also important for them. Gender, age, religious, civil, regional, ethnic, economic identities and belongingness to groups of people with shared interests are the least common in both groups in the real and online worlds (Figure 1).

When self-assessing in the virtual world, almost every third teenager and parent uses self-descriptions related to digital identity. When analyzing within this category, parents more often describe themselves as users (49%) ('user') and content consumers (40%) ('subscriber', 'viewer', 'searching for something new'). As opposed to parents, teenagers, in addition to users (35%) and content consumers (27%), also identify themselves with gamers (17% – teenagers, 4.1% – parents) ('player', 'gamer', 'Dota player') and content creators and moderators (21% – teenagers, 7.6% – parents) ('blogger', 'YouTuber', 'meme creator'). Self-descriptions related to digital characteristics also appear in real identity: 1 adult ('user') and 9 teenagers ('user', 'Dota player') had these self-descriptions.

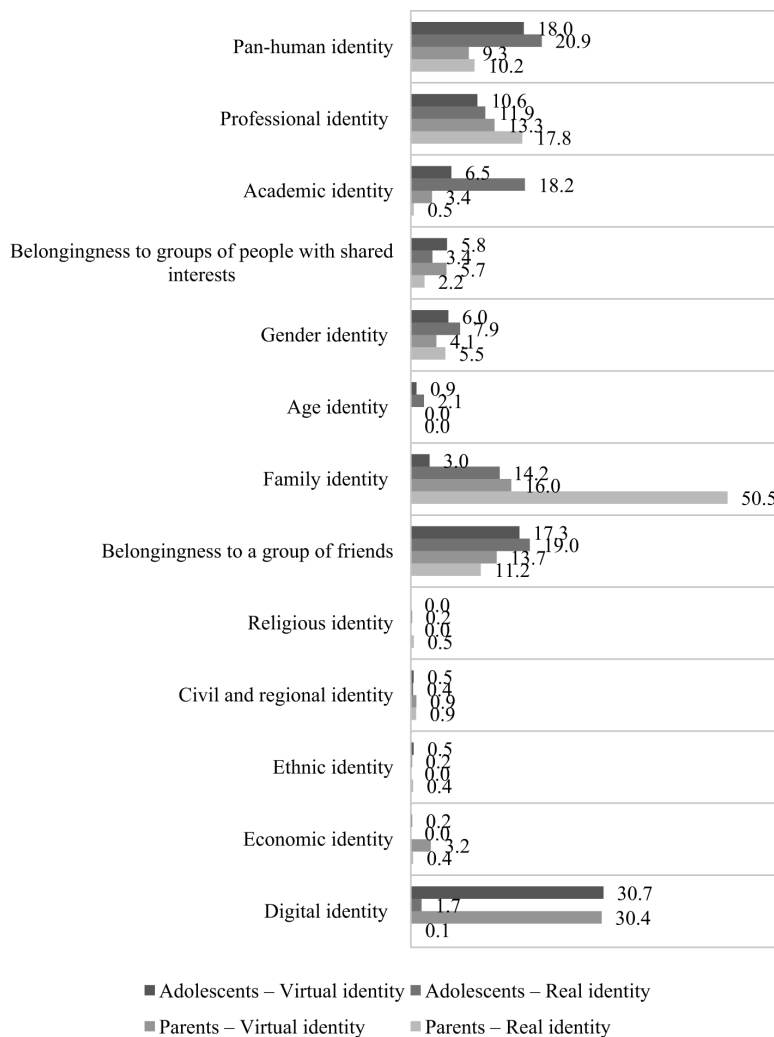


Fig. 1. Categorization of the social self among adolescents and parents in the real and virtual worlds (per cent of the total number of categories within the social self)

The personal self in the real and virtual identities of teenagers and parents. In the personal self-category, several subcategories of self-descriptions were identified: various role-based characteristics, personality traits and behavioral patterns ('responsible', 'kind', 'leader') that, to some extent, are conditionally divided, and also self-assessment of appearance ('beautiful', 'athletic'), problematic identity ('inadequate', 'social outcast', 'mouse'), situational states ('busy', 'tired') and digital self-descriptions that included descriptions of themselves through memes and pop culture heroes ('orc', 'rofler', 'Naruto'), specifics of online anonymity ('anonymous', 'invisible'), ignoring attitude towards the Internet ('rare guest', 'you won't find me there'). Role-based characteristics included self-descriptions through communicative ('collocutor', 'sociable') and prosocial ('assistant', 'adviser', 'responsive') roles, the status of popularity and one's own importance ('popular', 'cool'), intellectual and creative characteristics ('creative personality', 'intellectual', 'analyst'), personal uniqueness ('personality', 'good person') and metaphorical descriptions ('workhorse', 'Oblomov', 'tiger').

For every second teenager and parent, identification through role-based characteristics comes to the fore in both the real and virtual worlds (Figure 2). Personality traits and behavioral patterns come second: every third adult and teenager describe themselves through them in the real world, and every fifth — in the virtual world. Every seventh teenager and parent use digital self-descriptions in the virtual world. For parents, it is more often associated with anonymity and ignoring attitude towards

the Internet, and for teenagers — with identification with memes and digital pop culture heroes. At the same time, unlike parents, some teenagers use digital characteristics for real identities. Identification through negative self-descriptions (problematic identity) or appearance can equally rarely be found online and offline among adolescents. Nevertheless, parents have practically no negative self-descriptions in real life, but, in the virtual world they are more common for parents than for teenagers.

It is worth highlighting the most common subcategory in self-descriptions of the personal self — role-based characteristics. Among the role-based characteristics in virtual identity, the most common is the communicative role: out of all the self-descriptions that are included in the role-based characteristics, slightly less than half of adolescents (42%) and a third of adults (37%) fall into this subcategory. However, in real identity, self-descriptions of communicative roles are less common: every third adolescent (35%) and only every seventh parent (14.5%) give these self-descriptions. As a matter of virtual identity, every seventh-eighth description of role-based characteristics of adolescents is associated with personal uniqueness (13.3%), metaphorical self-descriptions (12.9%), intellectual and creative characteristics (12.9%), the status of popularity and one's own importance (12.9%). While the frequency of using the last two categories by adolescents in the real identity practically does not change (11.4% and 11.8%, respectively), self-descriptions associated with personal uniqueness are almost two times more common (22.3%) as well as prosocial role-based characteristics (11.4% against 6.4% in the virtual world).

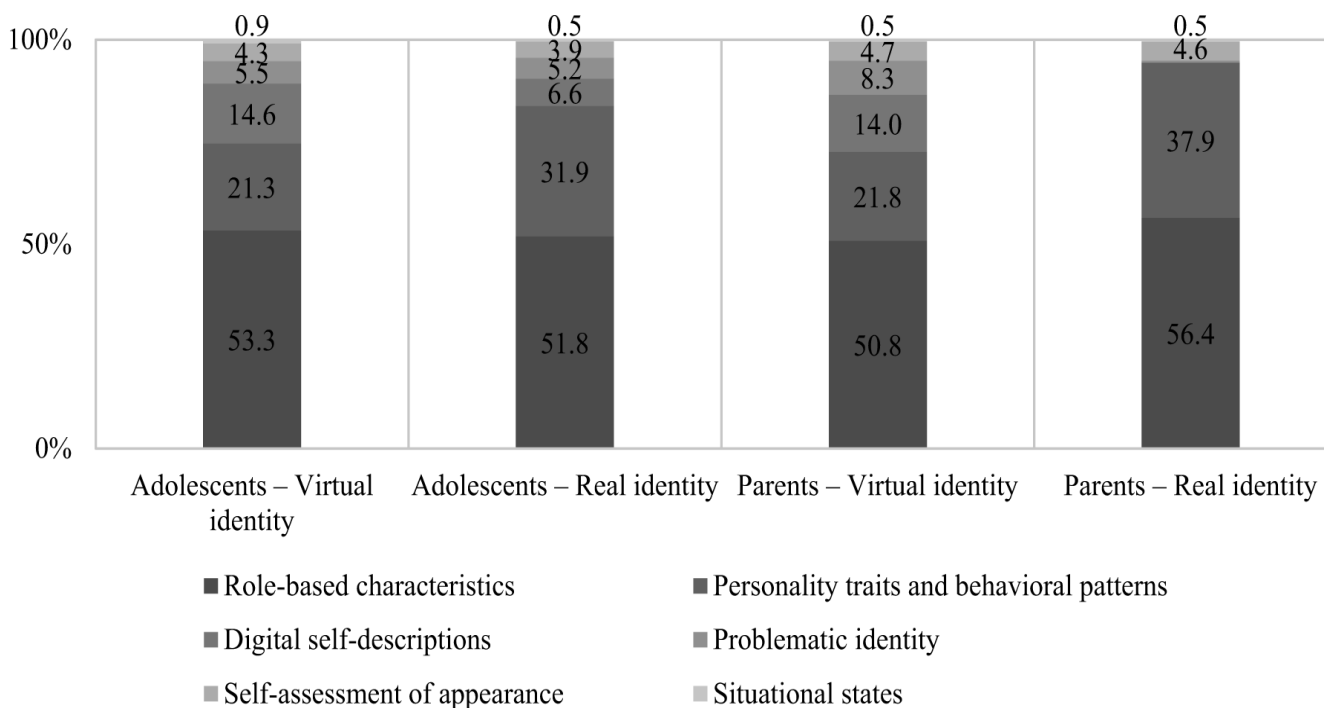


Fig. 2. Categorization of the personal self among adolescents and parents in the real and virtual worlds (per cent of the total number of categories within the personal self)

For parents, role-based characteristics related to intellectual and creative potential (18.4%), prosocial behavior (14.3%), personal uniqueness (13.3%) are important in the virtual space, whereas the categories of metaphorical self-descriptions (8.2%) and popularity (9.2%) are less common. In real identity, the number of self-descriptions through personal uniqueness (31.8%), which occupies a prominent place in role-based characteristics, and prosocial behavioral patterns increases (21.8%).

Real and virtual identities: relation between key categories and 'digital' characteristics. In virtual identity, adolescents equally use self-descriptions related to the categories of the social self and personal self (Figure 3). In real identity, self-descriptions through social statuses and affiliation are somewhat more common. For most parents, self-description through the social self in both the real and virtual worlds is more important. Unlike parents, teenagers more often use digital characteristics in self-descriptions of the personal self-category both in the virtual and real world, whereas parents do not use them at all in the real world. The analysis of the category of the social self in virtual reality shows that parents, on the contrary, use digital characteristics more

often than teenagers, but, first of all, describing themselves as users and content consumers.

Additional parameters for assessing the identity of adolescents and parents: emotional valence, the coincidence of real and virtual identities, the number of self-descriptions. All the self-descriptions of parents and teenagers were evaluated by experts and divided into three groups based on the presence of a certain emotional orientation in them: positive (e.g., 'good friend', 'good mother', 'valued worker'), neutral (e.g., 'daughter', 'employee') and negative (e.g., 'stupid person', 'idiot'). Teenagers and parents differ in how positively they see themselves in the virtual ($\chi^2=44.96$, Cramer's $V=0.30$, $p<0.01$) and real worlds ($\chi^2=29.06$, Cramer's $V=0.23$, $p<0.01$). The vast majority of parents and two-thirds of teenagers characterize themselves in both cases without emotional coloring (neutral). In both worlds teenagers are more likely to describe themselves more positively than parents. Every third teenager in the virtual space and every fourth in the real world assess themselves positively, and this difference is significant ($\chi^2=54.12$, Cramer's $V=0.47$, $p<0.01$). For parents, real self appeared to be more positive ($\chi^2=101.97$, Cramer's $V=0.63$, $p<0.01$) (Fig. 4).

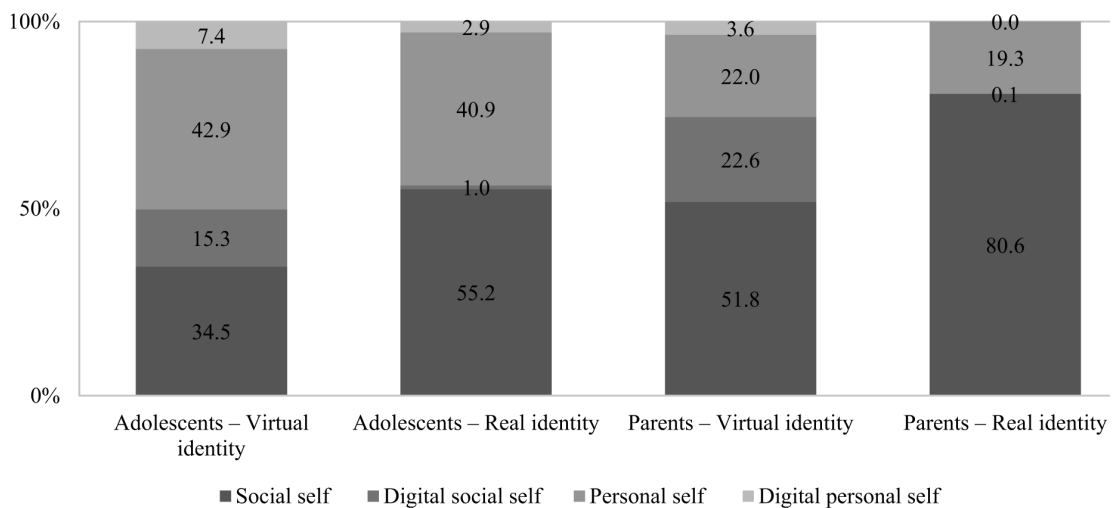


Fig. 3. The relation between self-descriptions of the social self and personal self-categories and digital characteristics included in them in the real and virtual identities of adolescents and parents, (per cent of the total number of self-descriptions)

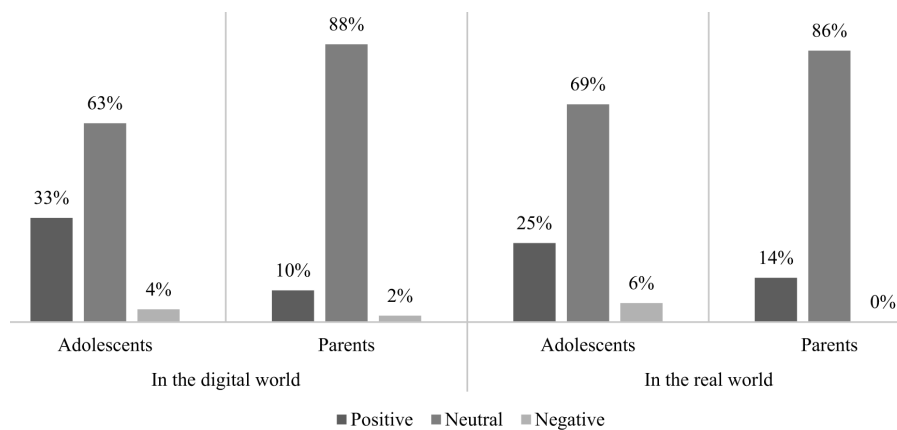


Fig. 4. Emotional valence of self-descriptions of teenagers and parents' real and virtual identities

The number of coincidences of self-descriptions in the real and virtual worlds of the same respondent was evaluated on a 6-point scale, where 0 points meant no self-descriptions coincided, and 5 points — all the self-descriptions of virtual self and real self coincided. Both children and adults have virtual and real identities converge: a third of teenagers (33%) and parents (33%) have 4-5 coincided self-descriptions out of 5 (Figure 5). At the same time, every fifth teenager and every fourth parent gave completely different self-descriptions in the real and virtual worlds. There are no statistically significant differences between adolescents and parents in the selected parameter of the coincidence of real and virtual identities.

The number of self-descriptions of adolescents and adults separately in the real and virtual worlds was also defined (with a maximum of 5 self-descriptions). The average number of self-descriptions in the digital world ($\chi^2=17.67$, Cramer's $V=0.18$, $p<0.01$) differs between adolescents and parents: adolescents give, on average, 3.4 characteristics, and parents — 3. There are no differences in the number of self-descriptions in the real world between adolescents and parents, that is, on average, 3.7 characteristics.

Discussion

The social self in the identity matrices of adolescents and parents. Online and offline identity matrices of teenagers and parents differ in a number of parameters. For adolescents, the categories of the social self and personal self appear online as equal, and offline the importance of the social self is growing. For parents, however, the social self definitely dominates in the two worlds, accounting for more than 80% in the offline identity matrix and a little less in the online one. These differences

in identity structure can be determined by the process of constructing self-concept, which is important for adolescents at this stage of age, and the search for a balance between the growing need for social belonging, which is reflected in the use of self-descriptions through various social groups, and the high-burning need for autonomy, uniqueness and individuality, which is expressed in self-assessments in the form of unique personal and role-based characteristics.

For teenagers, digital identity is indisputably the leading subcategory in the online social self. It should be noted that already in 2010, when teenagers described their 'I am in the Internet', then a relatively new type of the social self — the Internet user — came out on top [12]. Digital identity is followed by pan-human and 'friendly' identities. These three determine the main online activity of teenagers aimed at general self-determination and communication. Family and academic identities are significantly less manifested online compared to their representation in real self. As an important basis for the traditional socialization of adolescents, these identifications — without 'migrating' to digital social space — were more common elements of the image of teenager's real self. Thus, it is possible that for teenagers the digital environment becomes a space of separation from significant figures (parents and teachers), where they prefer 'adult roles'.

Digital identity is also indisputably the leading subcategory for parents online, and this is despite the fact that, in general, they are more characterized by identification through various social statuses and groups. However, all these statuses and affiliations do not withstand competition with digital identification that significantly surpasses even family affiliation, which absolutely dominates for parents offline. Although, the position of family affiliation online has been weakened three times compared to offline, where it is certainly the leading identity

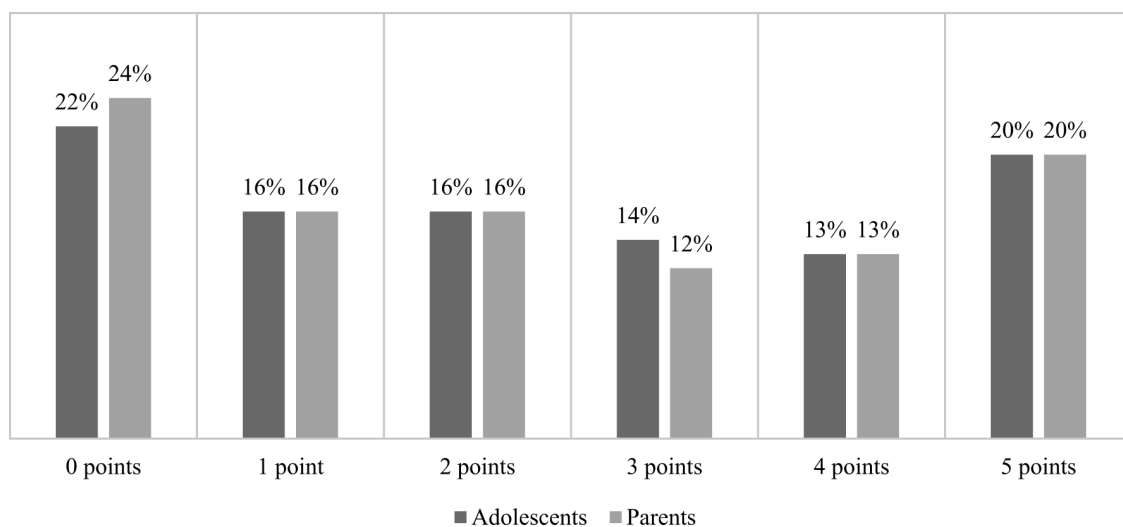


Fig. 5. The coincidence of self-descriptions in the real and virtual identities of adolescents and parents

in the category of the social self, this is perhaps one of the important reasons that allows some parents, for whom the family comes to the fore in all the worlds, to be alert and monitor their children in digital spaces. With adolescents, the 'digital identity' subcategory is more differentiated than with parents.

It should be noted that in virtual identity, the share of digital characteristics in relation to the total number of adolescents' self-descriptions is less than that of parents. This may be explained by the fact that teenagers see the virtual world as a space for realizing their belongingness to various groups within the social self, and not just limit themselves to identifying with users or content consumers. This is consistent with the idea that, while becoming an integral part of the processes of creating meanings and new forms of activity, the Internet as a generative system is associated with the transformation of individuals and allows to produce new diverse forms of identities [2].

The personal self in identity matrices. Online, both teenagers and parents have more self-descriptions related to the category of the personal self. Given the dominance of role-based characteristics in it and relying on other studies on the Internet identity [3; 4], it can be argued that virtual space allows to play a more diverse repertoire of roles, and gives more opportunities to experiment with identity. For both children and adults, role-based characteristics and personality traits are the leading subcategories of the personal level of identity.

The specificity of digital sociality is reflected in the construction of the self-image by teenagers in the virtual space through personal characteristics associated with communication (belongingness to a group of friends, communicative roles). It can be assumed that, primarily for teenagers, the virtual environment provides more opportunities to meet communication needs, the needs of belongingness to a peer reference group, and of experimenting with self-presentation. In addition, social networks enable a private, public or intermediate 'stage' for social and personal characteristics due to flexible privacy settings [15]. Parents are similar to teenagers in their preference for communicative roles in the virtual space, which may refer to the general characteristics of digital sociality.

Special characteristics reflecting the unique role models of the digital environment (user, content creator and consumer, gamer, etc.) appear in primarily virtual self-image. At the same time, as in the 'digital identity' subcategory (social self), teenagers' self-descriptions are more diverse in the personal self than adults' self-descriptions, which, for instance, is reflected in a wide range of memes as specific artifacts of digital sociality.

Real and digital personalities in a mixed (convergent) reality. Comparative analysis of self-descriptions in the real and virtual worlds allowed us to understand how real and digital personalities correlate in mixed real-

ity. Unlike parents, teenagers' self-descriptions are more diverse in content in both worlds, and what's more, when evaluating themselves online, teenagers generate self-descriptions more easily and their self-descriptions are longer. Parents are characterized by a less rich self-image in the virtual space compared to both teenagers and their own image of the real self. It is possible that parents 'simplify' or 'impoverish' their image in the virtual world. For the younger generation, who perceive online as a proper space for constructing identity and personality formation, the self-concept in the virtual world appears to be no less cognitively complex than in the real world. Another evidence for the importance of virtual space in the process of identity building may be that adolescents, in general, more often than parents construct an emotionally positive identity, which is consistent with the data that rising generation has a more optimistic picture of the world compared to adults [11]. Additionally, teenagers give more positively colored self-descriptions in the virtual space, which confirms the importance and comfort of this environment for them. It may be determined by the online means of self-presentation, the variety of communicative spaces and other 'extensions' of and 'additions' to the personality due to which teenagers can feel more confident and independent [14]. Despite the dominant discourse in early studies on building an image of the 'ideal self' in the digital space in response to the crisis of real identity, in this study, adolescents' self-descriptions in the real world are also no less positive, which generally contributes to building a complex positive self-image in mixed reality.

The obtained results indicate a new trajectory of self-formation, which is expressed not in the construction of an alternative virtual identity that is different or antagonistic to the real one, as it was indicated in earlier studies [4], but in the convergence of real and virtual identities and, consequently, of digital and real personalities. This is clearly evidenced by the coincidence of a third of all the self-descriptions for both children and adults in the real self and virtual self. Data on the convergence of digital and real personalities have already been obtained in an array of studies [14; 19]. The number of repetitive self-descriptions in the image of the real and virtual self, as well as a similar distribution in the number of social and personal characteristics of adolescents, testifies in favor of constructing a holistic self-image in a convergent reality. This is consistent with the study data on adolescents and young people that shows stable reproduction of characteristics (usage of the same self-descriptions) of the virtual and real self among active Internet users [8]. The convergence of online and offline worlds, the evidence of which we found while studying the picture of the adolescents and adults' world [11], may also be seen in the self-reflection of adolescents in both the virtual space and real world primarily through identification with humanity, i.e., transferring yourself

as a biological species and a social unit from the real to the virtual world and not existing in it solely as a digital being, for instance, an avatar. We see a similar picture among adults, however, rather due to projecting their characteristics from the real world into the virtual one. Examples of adolescents transitioning digital characteristics from the virtual self to the real self show the emerging trend of blurring the boundaries between the two worlds, when a holistic self-concept can be formed on the basis of role models that initially arose in the digital environment. Thus, adolescents and parents' offline and online identities have significantly different content and are constructed in different ways, although the general tendency towards convergence of offline and online identities was found.

Conclusion

Identity is the most important result of the socialization of both a child and an adult, which changes at every stage of age; the process of identity formation lasts a person's entire life and is determined by a specific historical situation. It is a continuously evolving socio-psychological construct. In addition to generally noting the features of identity formation in the modern world among different generations, this study allowed to identify the following trajectories of this process amid the ongoing convergence of the modern world's realities.

The virtual self and the real self do not oppose each other but actively interact on the principle of mutual complementation. Digital space fulfils specific functions in identity formation, creating new opportunities, especially for teenagers, for identity development. For teenagers, the bright and multimedia digital space mediated by signs, graphics and video is a 'richer' and relatively safe place for their social experimentation, providing ample opportunities for communication, self-determination, self-presentation, finding 'us', and involvement in emotional intimacy. On the one hand, the transfer into cyberspace of those sides of real identity that are difficult to embody in the physical world is important with regard to building a digital identity. On the other hand, the formation of system-forming categories of human identity (for example, pan-human identity) in the digital space serves as an important basis for the integration of virtual identity with real identity. Thus, in a sense, digital identity becomes, in the end, a revised and edited version created not so much for the digital world as for the world of convergent reality.

The increase in the intensity of the Internet usage, including hyperconnectivity (when digital devices become almost constant companions of modern people), determines the qualitative changes in the perception of people of all ages of the world around and themselves in it. The study provides additional arguments for the ir-

revocable transition from the autonomization of online and offline worlds to their convergence. It is largely determined by the interaction of traditional and digital socialization and defines an important trajectory for forming the self-concept, that is, the convergence of digital and real personalities and the formation of a new type of personality as a hybrid formation, the boundaries of which are expanded due to the digital dimension. In accordance with the methodological principle of complementarity, in a hybrid personality, digital expansion in relation to the incomplete human nature that is being formed in physical reality becomes an integral component, without which description of this personality is meaningless. It can be that understanding the features of a hybrid personality will also allow to better control an integrated digital identity, which today is less controlled by an individual.

The self-image of modern teenagers and parents seems to be more differentiated compared to previous generations: not only due to the combination of two still significantly different components — the real self and the virtual self, but also due to the high differentiation of the virtual self. This indicates a greater diversity and complexity of the picture of the world of modern people and special requirements for the processes of its formation, especially in terms of integration of different components, which is especially important to take into account in the process of education and upbringing of the rising generation. Moreover, among adolescents, the influence of virtual identity on the holistic self-image is expressed in the fact that the balance of the social self and the personal self-relationship tends to shift towards the personal self, which may be a manifestation of not only age-related, but also generation-related aspects. It is possible that identification through social affiliation (i.e., through collective identity), which has dominated in one form or another throughout the history of mankind and is especially significant in collectivist cultures, may begin losing ground to self-determination through personal qualities and roles. This may also be the result of digital sociality, as the spread of technology has become one of the factors changing the driving forces of society's development, when interaction, cooperation and competition of individuals and not of social groups come to the fore.

Thus, the rising generation, in comparison with their parents, is more actively forming a picture of the combined reality of the modern world, where the virtual world does not displace reality, but complements it, which in general is the most important factor of adaptation in the modern information society. The significance of the pan-human subcategory in the virtual identity can be another indicator of experiencing convergent reality and gradual change in the assessment of the digital environment from its perception as an isolated special universe to its assessment as a living, interactive space and

an integral part of the surrounding world. Hence, due to the active 'habitation' of virtual space, adolescents, compared to their parents, master adaptive strategies

of mixed reality better, and in retrospect the strategies prove to be pre-adaptive and determine a higher readiness of new generations for change.

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Measurement of Somatic Symptoms in the General Population: Standardization of the Russian Version of the PHQ-15

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The Patient Health Questionnaire (PHQ-15) is a self-report measure assessing presence and severity of somatic symptoms [15]. The aim of this study was to standardize the Russian version of the PHQ-15. The study included 1157 respondents from the general population aged 18 to 71. In addition to the PHQ-15, the participants completed the Russian Depression, Anxiety, and Stress Scales-21 (DASS-21), evaluating the psychological distress symptoms. The results showed that 91% of the respondents reported at least one symptom bothering them in the past four weeks. Regarding gender and age specifics of somatization, the most predisposed to the psychosomatic burden were females and persons aged 35–49 years. Moreover, 28,2% of the respondents demonstrated a high level of somatization, as well as increased scores of depression, anxiety, and stress compared to the participants with low and moderate psychosomatic burden. In conclusion, the Russian version of the PHQ-15 has been successfully standardized and can be recommended for screening and monitoring of medically unexplained symptoms.

Keywords: PHQ-15, somatization, screening, monitoring, standardization, psychometric properties.

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Оценка соматических симптомов в общей популяции: стандартизация русскоязычной версии PHQ-15

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Опросник здоровья пациента (Patient Health Questionnaire-15, PHQ-15) является шкалой для самооценки наличия и тяжести соматических симптомов [15]. Целью настоящего исследования стала стандартизация русскоязычной версии PHQ-15. В исследовании приняли участие 1157 респондентов из общей популяции в возрасте от 18 до 71 года. Помимо PHQ-15 участники исследования заполнили русскоязычную версию шкал депрессии, тревоги и стресса (Depression, Anxiety, and Stress Scales-21, DASS-21), оценивающих симптомы психологического дистресса. Результаты исследования показали, что 91% респондентов сообщали по крайней мере об одном симптоме, беспокоящем их в течение прошедших четырех недель. Анализ гендерной и возрастной специфики соматизации указал на то, что наиболее предрасположенными к психосоматической нагрузке были женщины и респонденты в возрасте 35–49 лет. У 28,2% респондентов был обнаружен высокий уровень соматизации, а также повышенные показатели депрессии, тревоги и стресса по сравнению с участниками исследования с низкой и умеренной психосоматической нагрузкой. Основным выводом настоящего

исследования является заключение о том, что русскоязычная версия PHQ-15 успешно стандартизирована и может быть рекомендована для скрининга и мониторинга симптомов, не объяснимых с медицинской точки зрения.

Ключевые слова: PHQ-15, соматизация, скрининг, мониторинг, стандартизация, психометрические свойства.

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Introduction

Epidemiological studies showed that 9.6% of people in the general population meet the criteria for bodily distress syndrome and 4.5% meet the criteria for somatic symptom disorder [13]. For chronic somatic diseases, 98% of respondents reported at least one disturbing somatic symptom and 45% reported six or more such symptoms [11]. These statistics are largely similar to the results of epidemiological studies in Russia, which indicate that the prevalence of psychosomatic disorders in Russian general medical practice is 30–45% [1].

There is compelling evidence for the significant role of somatization in people's mental and physical health. Somatization is the result of psychological discomfort, which some people tend to express through bodily symptoms. Depression, anxiety, and stress can stimulate the development of somatic symptoms, especially among people with high levels of neuroticism and agreeableness [18]. Moreover, somatic symptoms often become persistent, progressing from functional to organic and sometimes even leading to disability [21]. Patients with medically unexplained symptoms stayed 41% longer in general hospitals compared to the statistical average duration of hospitalizations [12].

Other evidence provides studies confirming that somatoform disorders are one of the most serious risks for premature mortality [20]. Furthermore, 13-67% of respondents with somatoform disorders have reported suicide attempts [25].

In 2013, a systematic review of 40 instruments measuring somatic symptoms was published [28]. Based on psychometric properties and criteria of convenience and burden on respondents, the researchers concluded that the following two instruments were the most successful measures of somatic symptoms:

The Patient Health Questionnaire-15 (PHQ-15) is a measure assessing the overall somatization index and 15 specific somatic symptoms (e.g., stomach pain, back

pain, headaches, dizziness, fainting spells, feeling heart pound or race, trouble sleeping) [15]. The PHQ-15 is a short version of the PHQ examining eight disorders according to DSM-IV criteria: major depressive disorder, panic disorder, bulimia nervosa, other depressive disorder, other anxiety disorder, probable alcohol abuse or dependence, binge eating disorder, and somatoform disorder [24]. The PHQ-15 can measure somatoform disorder in both the general population and in groups of respondents with mental and physical diseases [8; 14; 15].

Somatization subscale from the Symptom Checklist-90-Revised (SCL-90-R) is a measure assessing the overall somatization index [9]. This subscale can be used both independently and as part of the other SCL-90-R scales. In addition to somatization, the SCL-90-R measures symptoms of obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. The SCL-90-R also examines three general measures of psychological distress, such as global severity index, positive symptom distress, and positive symptom total. The full version of the SCL-90-R, consisting of 90 items, has been translated and adapted into Russian [3].

The PHQ-15 has not been translated and standardized for Russian-speaking respondents, although its advantages over the SCL-90-R are that it is suitable for DSM-IV assessment of somatoform disorders and can be used as a screening and monitoring of medically unexplained symptoms [16]. In this regard, the current study was aimed to standardize the Russian version of the PHQ-15.

Method

Procedure. The participants were recruited with the help of Anketolog. The volunteers of 18 years of age or older who had no chronic diseases and were not registered with a narrow specialty physician were invited

to participate in the study. The participants completed written informed consent describing the aim of this study and mentioning the possibility to refuse participation.

Participants. Respondents (N=1157) completed the questionnaire, including 598 (51.7%) females and 559 (48.3%) males in three age categories: 313 (27.1%) respondents aged 18-34, 550 (47.5%) respondents aged 35-49, and 294 (25.4%) respondents aged 50-71.

Instruments. The participants completed the following instruments:

1. *The Patient Health Questionnaire-15 (PHQ-15)* was translated into Russian by two bilingual experts through direct translation [5].

2. The Depression, Anxiety, and Stress Scales-21 (DASS-21) contain 21 items assessing depression (e.g., “I couldn’t seem to experience any positive feeling at all”), anxiety (e.g., “I felt that I was using a lot of nervous energy”) and stress (e.g., “I found it difficult to relax”) [2].

Ethical considerations. Permission to standardize the Russian version of the PHQ-15 was obtained from the HSE Institutional Review Board.

Results

Ninety-one percent of the participants reported experiencing at least one somatic symptom during

the past four weeks. For example, 70% of the participants experienced feeling tired or having low energy, 62.4% experienced headaches, 61.1% experienced back pain, 58.1% experienced pain in arms, legs or joints, 53.7% experienced trouble sleeping, 39.9% experienced stomach pain, 34.7% experienced feeling heart pound or race, 33.7% experienced nausea, gas, or indigestion, 31% experienced dizziness, 29.5% experienced shortness of breath, 26.7% experienced constipation, loose bowels, or diarrhea, 25.1% experienced chest pain, 6.9% experienced pain or problems during sexual intercourse, and 3% experienced fainting spells. In addition, 24.7% of females reported menstrual cramps or other problems with periods. The prevalence and severity of somatic symptoms are presented in Figure 1.

Table 1 shows descriptive statistics and accumulated percentages for the Russian version of the PHQ-15 (see Table 1). Based on descriptive statistics, test norms (M = 6.73, SD = 4.82) were calculated, which can be used for practical and research purposes as indicators of low (0–4 points), medium (5-9 points), or high somatization (≥ 10 points). Thus, 38.6% of the participants had low, 33.4% had medium, and 28% had high psychosomatic burden.

Females (M = 7.75, SD = 4.52) showed more frequent and severe somatic symptoms compared to males (M = 5.63, SD = 4.52). The participants aged 35–49 (M = 7.55, SD = 4.99) demonstrated more frequent and

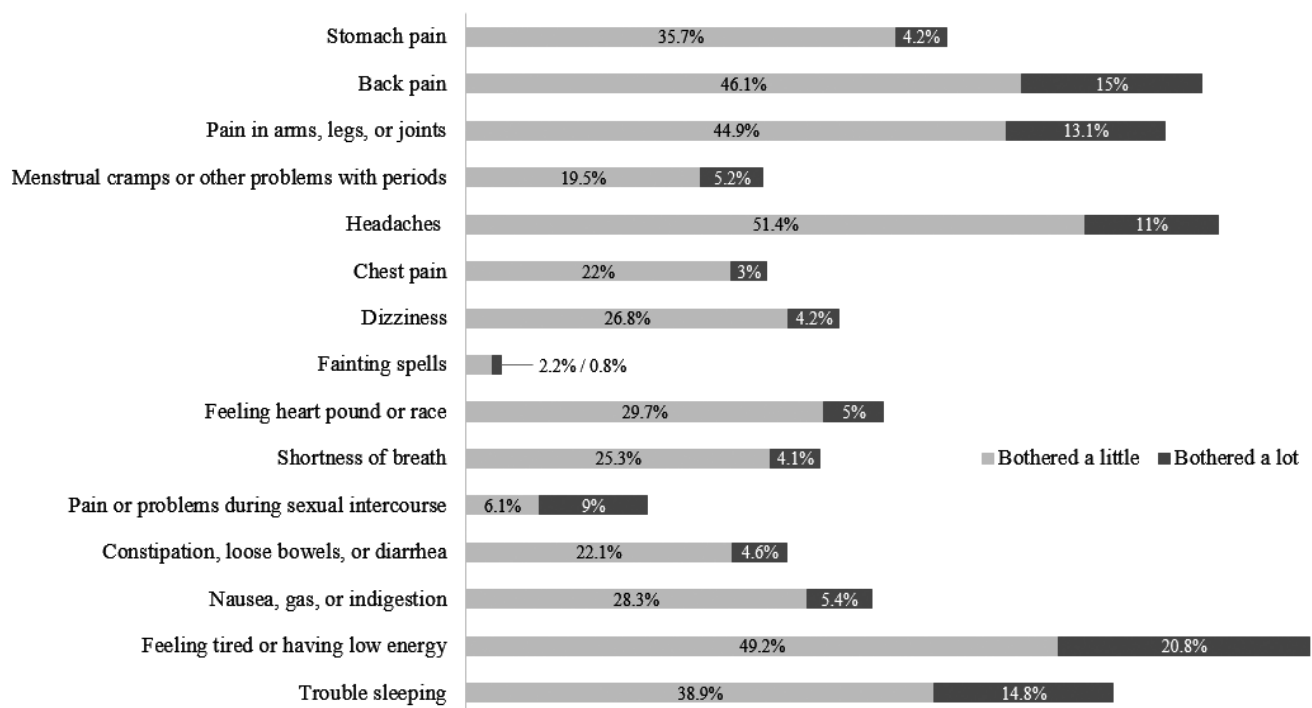


Fig. 1. Prevalence and severity of somatic symptoms in the general Russian-speaking population

severe somatic symptoms compared to the participants aged 18–34 ($M = 5.05$, $SD = 4.29$) and participants aged 50–71 ($M = 6.97$, $SD = 4.60$). These patterns were statistically significant for both gender ($t [1154.946] = 7.71$, $p < 0.001$, $d = 0.45$) and age ($F [2.1154] = 28.52$, $p < 0.001$, $\eta^2 = 0.05$).

Depression ($F [2.1143] = 332.16$, $p < 0.001$, $\eta^2 = 0.37$), anxiety ($F [2.1143] = 434.18$, $p < 0.001$, $\eta^2 = 0.43$), and stress ($F [2.1154] = 369.05$, $p < 0.001$, $\eta^2 = 0.39$) increased with the growth of number and severity of somatic symptoms (Figure 2).

Discussion

The key result of this study was the standardization of the Russian version of the PHQ-15. The adapted measure can categorize somatic symptoms in the general Russian-speaking population in terms of low (0–4 points), medium (5–9 points), and high degree of psychosomatic burden (≥ 10 points). These score ranges fully correspond to the tertiles identified during the development of the original measure [15] and later confirmed during the adaptation of the German version of the PHQ-15 [14].

Table 1

Standardization of the Russian version of the PHQ-15

PHQ-15 Score	Total sample (n=1157)	Females (n=598)			Males (n=559)		
		18–34 (n=151)	35–49 (n=298)	50–71 (n=149)	18–34 (n=162)	35–49 (n=252)	50–71 (n=145)
<i>Descriptive statistics</i>							
M	6.73	6.48	8.57	7.42	3.72	6.34	6.51
SD	4.82	4.48	5.08	4.51	3.64	4.59	4.66
<i>Total score (accumulated %)</i>							
0	9.0	5.3	4.4	2.7	25.3	10.3	8.3
1	14.5	11.9	7.7	8.1	34.0	16.7	12.4
2	21.3	19.9	11.1	12.8	43.8	25.4	20.0
3	29.3	27.8	18.8	22.1	54.3	30.2	30.3
4	38.6	40.4	25.5	32.2	66.0	38.5	40.0
5	46.8	49.7	31.5	44.3	72.2	48.0	47.6
6	53.9	54.3	37.9	47.7	81.5	57.1	56.6
7	59.6	63.6	42.6	51.7	86.4	62.7	62.8
8	66.1	71.5	51.0	57.7	90.1	68.7	69.0
9	72.0	75.5	58.4	66.4	92.0	74.6	75.2
10	77.3	81.5	64.8	72.5	93.8	80.2	80.0
11	82.8	86.1	71.1	79.2	96.9	84.5	88.3
12	87.2	89.4	78.2	85.2	97.5	89.3	90.3
13	90.5	92.1	81.9	91.3	98.1	94.0	91.0
14	93.0	94.7	86.2	95.3	98.8	94.8	93.1
15	95.2	97.4	90.9	96.0	99.4	96.4	94.5
16	96.4	97.4	93.6	97.3	99.4	97.2	95.2
17	97.8	97.4	96.0	98.7	99.4	98.4	97.9
18	98.5	97.4	97.7	98.7	99.4	99.2	99.3
19	99.0	98.7	98.3	99.3	99.4	99.6	99.3
20	99.4	100.0	98.7	99.3	100.0	99.6	99.3
21	99.5	100.0	98.7	99.3	100.0	100.0	99.3
22	99.7	100.0	99.3	100.0	100.0	100.0	99.3
23	99.9	100.0	99.7	100.0	100.0	100.0	100.0
24	99.9	100.0	99.7	100.0	100.0	100.0	100.0
25	99.9	100.0	99.7	100.0	100.0	100.0	100.0
26	100.0	100.0	100.0	100.0	100.0	100.0	100.0
27	100.0	100.0	100.0	100.0	100.0	100.0	100.0
28	100.0	100.0	100.0	100.0	100.0	100.0	100.0
29	100.0	100.0	100.0	100.0	100.0	100.0	100.0
30	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: n = number of respondents; M = mean; SD = standard deviation.

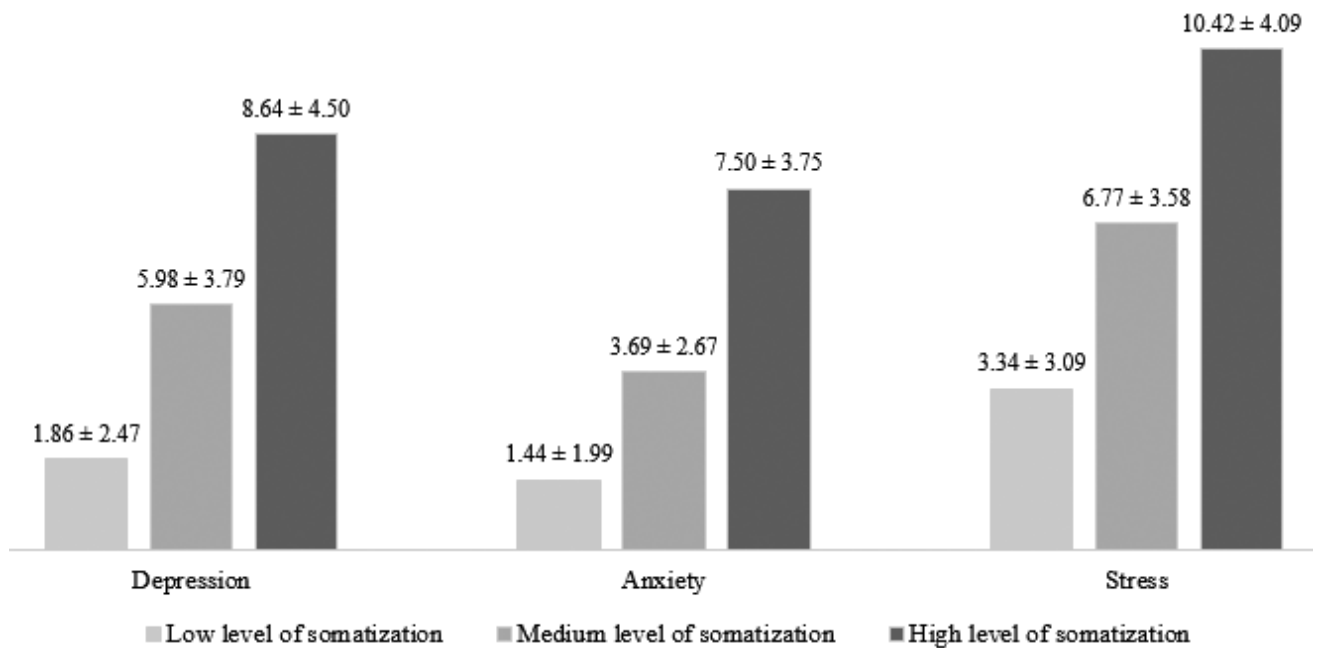


Fig. 2. Degree of psychological distress among respondents with different levels of somatization

These tertiles highlighted that 28.2% of the Russian-speaking population had high degree of somatization and 91% of the participants complained of having at least one somatic symptom bothering them in the past four weeks. These rates of psychosomatic burden surpassed typical patterns associated with the prevalence of somatic symptoms in the general population [26] and can be explained by the effect of the COVID-19 pandemic on psychological and somatic health. The pandemic increased specific anxiety associated with the fear of contracting a coronavirus infection and contributed to the development of somatization in the general population [23]. Next, symptoms of coronavirus infection have similarities with functional somatic syndromes that develop in response to viral infection and occur in a type of medically unexplained symptoms [4]. Finally, the lifestyle of many people during the COVID-19 pandemic changed, which may be associated with an objective increase in physical symptoms. Experts estimated that at the beginning of the pandemic the number of steps dropped from 10.000 to 4.600 per day and the time spent in front of phone, laptop and TV screens more than doubled to more than 5 hours per day [10].

Gender- and age-specific characteristics of somatization were also found in the general Russian-speaking population. Thus, the most frequent and severe somatic symptoms were reported by females and respondents aged 35-49 years. Previous studies showed that females are more likely to have medically unexplained symptoms

than males, except for pain or problems during sexual intercourse [6].

The relationship between age and somatization has more complex patterns. The traditional notion that there is a natural increase in the prevalence and severity of somatic burden with age has indeed been empirically confirmed [6]. Moreover, researchers periodically encounter unexpected patterns where the greatest psychosomatic burden is observed either in the youngest respondents or in so-called «middle-aged» individuals [19]. The geography of these studies suggests that cross-cultural differences between respondents are a possible reason for the contradictory data.

Finally, this study found that individuals with high psychosomatic burden had high rates of psychological distress, which is consistent with the previously found universal associations of somatization with perceived stress, anxiety, and depressive symptoms [7; 22; 27].

The current study has at least two limitations. The first limitation concerns its population character and obliges further standardization of the Russian-language version of the PHQ-15 on clinical samples. K. Kroenke and his colleagues, who developed and validated the original version of the scale, found that among patients seeking primary care, the range of PHQ-15 scores is located within quintiles rather than tertiles [15]. The range of PHQ-15 scores was redistributed as follows: somatization was considered minimal at 0–4 points, low at 5–9 points, moderate at 10-14 points, and high at 15–30 points. These quintiles need to be tested on

clinical Russian-speaking samples, but because of their universality can be used with caution for counseling purposes.

The second limitation is that this study involved adult respondents, whereas the PHQ-15 has been successfully used to screen and monitor for medically unexplained symptoms among adolescents and children over 7 years of age [17].

Conclusions

Ninety-one percent of the participants reported having at least one somatic symptom that had bothered them in the past four weeks.

More than half of the participants reported feeling tired or having low energy (70%), headaches (62.4%), back pain (61.1%), pain in arms, legs, or joints (58.1%), and trouble sleeping (53.7%).

Somatization in the general Russian-speaking population had gender- and age-specific characteristics. The most frequent and severe somatic symptoms were experienced by females, as well as respondents aged 35–49.

High rates of perceived stress, depressive and anxiety symptoms were found in 28.2% of the participants with high psychosomatic burden.

The Russian version of the Patient Health Questionnaire-15 (PHQ-15) has been successfully standardized and can be recommended for use as a screening and monitoring measure of medically unexplained symptoms.

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Psychological Resources for Coping with Fear of COVID-19 and Negative Psychological Emotional States among Students of Russia and Kazakhstan

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The article presents the analysis results of stress resistance and basic beliefs as psychological resources for coping with fear of COVID-19 and negative psychological and emotional states on the sample of Russian (N=2310) and Kazakh (N=500) students (71.2% – women, average age 19.7). A higher level of stress resistance and basic belief expression in Benevolence of the World Around and Perceiving the World as Meaningful and Social Justice among Kazakh students in comparison with Russian ones is revealed, which is determined by the peculiarities formed in the conditions of the nomadic lifestyle of the Kazakh culture, based on the principles of mutual support and mutual assistance, trust and openness. It is shown that, regardless of the country and gender, high level of stress resistance and expression of basic beliefs are accompanied by lower indicators of fear of COVID-19 and the absence of negative psychological and emotional states associated with it, which suggests the universality of these psychological resources as a buffer that mitigates the traumatic effect of the pandemic situation.

Keywords: psychological resources, stress resistance, basic personal beliefs, pandemic, coronavirus disease, fear of COVID-19, negative psychological and emotional states, Russian students, Kazakh students, Russian culture, Kazakh culture.

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Психологические ресурсы совладания со страхом перед COVID-19 и негативными психоэмоциональными состояниями у студентов России и Казахстана

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Актуальность исследования обусловлена наличием противоречия между осознанием значимости ресурсного потенциала личности в условиях распространения инфекционных заболеваний и недостаточной изученностью психологических ресурсов преодоления страха перед COVID-19 в кросс-культурном контексте. Цель исследования — изучение стрессоустойчивости и базисных убеждений личности как основных психологических ресурсов совладания со страхом перед COVID-19 и негативными психоэмоциональными состояниями у студенческой молодежи России и Казахстана. В исследовании участвовали 2310 российских и 500 казахстанских студентов (71,2% — девушки, средний возраст — 19,7). Выявлен более высокий уровень выраженности стрессоустойчивости и базисных убеждений в Благосклонности, доброжелательности мира и Осмысленности, справедливости мира у казахстанских студентов, по сравнению с российскими, что детерминировано особенностями сформировавшейся в условиях кочевого образа жизни казахской культуры, в основе которой лежат принципы взаимоподдержки и взаимопомощи, доверия и открытости. Показано, что независимо от страны и пола высокий уровень стрессоустойчивости и выраженность базисных убеждений сопровождаются более низкими показателями страха перед COVID-19 и отсутствием связанных с ним негативных психоэмоциональных состояний, что свидетельствует об универсальности данных психологических ресурсов как буфера, смягчающего травмирующее влияние ситуации пандемии.

Ключевые слова: психологические ресурсы, стрессоустойчивость, базисные убеждения личности, пандемия, коронавирусное заболевание, страх перед COVID-19, негативные психоэмоциональные состояния, российские студенты, казахстанские студенты, российская культура, казахстанская культура.

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Introduction

Coronavirus pandemic (COVID-19) as a source of stress and negative emotional experiences.

The coronavirus pandemic now acts as a massive collective and global traumatic stressor [13]. COVID-19 causes stress for many reasons. Among them are the perception of a threat to life and health (one's own or relatives and friends), worries related to actual or potential material difficulties, isolation situations, disrupted routines of personal and social life, etc. [18; 26]. Thus, the pandemic blocks the satisfaction of basic human needs for security, certainty, stability, control over one's life.

During the pandemic the number of people with psychopathological symptoms such as sleep disorders, depression, anxiety, psychosomatic disorders increased among the population [4; 18; 26]. Young students were especially vulnerable to the pandemic. Along with general stress factors, researchers note specific ones: mass implementation of e-learning, social and material restrictions, negatively affecting the mental health of students [22].

The negative emotional background caused by the coronavirus in society raises the question of the human capacity for coping with the stress of the pandemic.

A resource-based approach to the study of coping with negative emotional states.

The problem of an individual's psychological resources was addressed by many Russian researchers: V.A. Bodrov, N.E. Vodopyanova, A.N. Demin, L.G. Dikaya, T.L. Kryukova, D.A. Leontiev, V.I. Morosanova, K. Muzdybaev, S.A. Shapkin and others. They considered a resource both as an opportunity/means of overcoming stresses, and as an element of self-regulation of activity and behavior. Thus, D.A. Leontiev singles out a group of stability resources or value-semantic resources (basic beliefs, meaningfulness of life, etc.) due to which a person acquires a sense of confidence, positive self-esteem, ability to make independent decisions, and a group of self-regulation resources (locus of control, tolerance to uncertainty, propensity to risk, etc.) which determine self-regulation strategies in difficult life circumstances [12]. At the same time such psychological phenomena as optimism and resilience (or stress tolerance) are included in both resilience and self-regulation resources [12], thus confirming the close connection between both groups of resources.

Other researchers also emphasize the importance of studying the resource potential of stress resistance and the belief system of a personality in the process of overcoming life difficulties, including in the conditions of illness [1; 8]. A close connection between basic beliefs of a personality and coping behavior has been revealed: people with more positive beliefs, as a rule, more easily deal with posttraumatic experiences, use more active and less

passive coping-strategies [32]. According to R. Janoff-Bulman's theory of psychic trauma, basic beliefs of the personality are an individual's implicit ideas about the universe, other people and himself, the formation of which begins in childhood and the formation of which is influenced by various factors [17], including culture.

Culture as a predictor of attitudes toward coronavirus disease.

It is known that culture determines a person's attitude to the world, things, events [30], including attitude to the disease [21; 25]. Of particular interest is the attitude to coronavirus disease among representatives of the peoples of the so-called post-Soviet space, whose culture has both similar and different features due to the commonalities and differences in their historical destinies.

Russia and Kazakhstan belong to the group of the Eastern European countries and are united by the presence in the culture of features of both East and West. However, the expression of these features in the cultures of Kazakhstan and Russia is different. For example, Kazakh culture is more inherent to the values of collectivism and masculinity than Russian culture [5; 23]. The individualism/collectivism dichotomy is particularly important in the context of infectious disease outbreaks, as there is evidence that collectivist social norms, such as conformism, promote adherence to stricter measures of quarantine, social distancing and hygiene. Collectivism thus has a positive effect on reducing the spread of COVID-19 [27]. Based on these data, we can suggest that anxiety about family and group members may lead members of collectivist cultures to experience a more pronounced fear of coronavirus disease. At the same time, another diametrically opposite assumption is also possible: the promotion in collectivist cultures of mutual dependence, moral responsibility and care for children, the elderly, the sick and the needy creates conditions that allow one to reduce the experience of fear and other negative emotional reactions associated with COVID-19 [24].

Masculine cultures are more focused on achievement, success, recognition and competition than feminine ones. Masculinity is traditionally associated with acts of courage, bravery, heroism, overcoming fear and "managing" risk [34]. We dare to assume that in masculine cultures, to which Kazakh culture belongs, there will be a lower level of experience of fear of COVID-19 than in feminine cultures, to which Russian culture belongs.

Thus, the analysis of the works of domestic and foreign authors allows us to conclude that science has accumulated some experience in studying the resource potential of humans under conditions of the spread of infectious diseases. However, there is a lack of research aimed at studying the relationship between psychological resources and level of fear of COVID-19 and negative psycho-emotional states in young people in a cross-cultural context.

The aim of the research was to study stress resistance and basic personal beliefs as the main psychological resources of coping with fear of COVID-19 and other negative psycho-emotional states among student youth in Russia and Kazakhstan.

It is assumed that similarities and differences in psychological resources for coping with fear in Russian and Kazakh students are determined by similarities and differences between Kazakh and Russian cultures.

Method

Sample. There were 2,810 participants in the study, 82.2% (2,310 people) from Russia and 17.8% (500 people) from the Republic of Kazakhstan. The sample included 71.2% (1996 people) of women and 28.8% (806 people) of men. Of those, 72.3% of women and 27.7% of men were from Russia and 66.4% of women and 33.6% of men were from Kazakhstan ($\chi^2(1) = 6.866$; $p=0.009$). Eight people gave no information about their gender. Students from different fields of study took part in the survey: future doctors, psychologists, social workers, engineers, economists, and many others.

The study was conducted in September-October 2020, in an online format, on the Qualtrics platform (<https://www.qualtrics.com/>) among university students in Moscow, Penza, Kazan, Smolensk, Khabarovsk in Russia and Kostanay in the Republic of Kazakhstan. In this study we considered it possible to neglect the existing differences between the mentioned Russian cities by the level of development of medical infrastructure, because, firstly, the fight against COVID-19 became a priority of Russian health care: all subjects of the Russian Federation were provided with necessary material funds to expand the bed fund, equip hospitals per number of inhabitants of the region, increase salaries of specialists working in the red zone, etc. [6]. And secondly, due to the spread of various forms of remote work and study, high availability of the Internet and its use for ordering goods and services, etc., the conditions of students' adaptation to the pandemic in the studied cities was similar.

The choice of the two countries for the study is due, firstly, to the different models of action of the states in the face of COVID-19. Kazakhstan used the Chinese scheme of action – the introduction of a strict quarantine regime, while Russia adhered to another model – the gradual introduction of restrictions to contain the spread of the epidemic [9]. Second, there are differences in the psychological characteristics of cultures between Russia and Kazakhstan [23].

Instruments. A modified and tested on a Russian-speaking sample in Russia and Belarus, the COVID-19 Fear Scale [28] consisting of 9 statements was used to measure the experience of fear of coronavirus disease. For example: "I cannot sleep because of fear of coronavi-

rus-19". The degree to which the respondent agreed with each statement was assessed using a five-level Likert scale, where 1 was "strongly disagree" and 5 was "strongly agree". The total score was then calculated. We standardized the scores for the surveyed Russian-speaking sample based on the assumption that the data were normally distributed in the general population: we assigned the sum of 9 to 18 scores to the low level of fear ($n=855$), from 19 to 24 to the moderate level ($n=998$), and from 25 to 45 to the high level of fear ($n=866$). Among the respondents, 91 of them did not complete the fear scale. Cronbach's α coefficient is 0.84 and McDonald's ω coefficient is 0.86, which indicates that the used scale is highly reliable (self-consistent).

To identify other negative *psycho-emotional states* experienced by respondents during the pandemic, the questionnaire included the question "During the past month, because of COVID-19, did you feel more depressed, exhausted, lonely, nervous, angry?", which was tested in international studies [20; 31]. Each of these states was assessed positively or negatively.

The ability to cope with stressful situations was studied using the Brief Resilience Scale [29], which includes 6 statements. For example: "I tend to experience life's setbacks for a long time". The degree to which the respondent agreed with each statement was assessed using a five-level Likert scale, where 1 was "strongly disagree" and 5 was "strongly agree". The total score was then calculated, taking into account the fact that reversed Likert scale values were used for some of the statements [29]. In accordance with the instructions for processing and interpreting the results, their distribution was divided into three parts: 25%, 50% and 25%. Values corresponding to the first 25% were interpreted as low stress resistance, values accounting for 50% of the distribution meant normal stress resistance and the last 25% referred to high stress resistance. Consistent with our results, the sum of scores from 6 to 17 was attributed to low stress resistance ($n=671$), the sum of scores from 18 to 21 was considered as normal stress resistance ($n=1110$) and the sum of scores from 22 to 30 was interpreted as high stress resistance ($n=662$). 367 respondents did not complete the scale. The authors of the article received personal permission from the Scale developers to translate it into Russian, and this is the first experience of using the Brief Resilience Scale in Russia and Kazakhstan. For the scale, the values of Cronbach's α and McDonald's ω coefficients are 0.67 and 0.72 respectively, which indicates its acceptable reliability.

Basic personal beliefs were diagnosed using the Janoff-Bulman World assumptions scale (WAS) [19]. The questionnaire allows us to determine the expression of three basic beliefs that, according to the author, constitute the core of a person's subjective world and underlie a healthy sense of security, these are: 1) the belief that there is better than evil in the world; 2) the

belief that the world is full of meaning; 3) the belief in the value of one's self, the ability to control events and luck [19]. The questionnaire consists of 32 statements, the degree of agreement with which is rated on a six-level Likert scale ranging from "strongly disagree" (1) to "strongly agree" (6). The mean value of Cronbach's α across all subscales is 0.71.

The results of the empirical study were processed and analyzed using the statistical package SPSS v. 25. Student's t-test and Pearson's χ^2 criterion were used to assess the significance of differences between the samples, correlation and multiple regression analysis (stepwise method) was used to determine the relationships between the variables. A two-way analysis of variance was used to compare fear of COVID-19, stress resistance and basic beliefs in respondents of different gender in two countries (Russia and Kazakhstan). In our study, "fear of COVID-19" acted as a dependent variable, while "stress resistance" and "basic personal beliefs" acted as independent variables. In addition, "country" and "gender" were also independent variables.

Results

Level of fear and presence of negative psycho-emotional states in Russian and Kazakhstan students.

The analysis of the group mean values of the fear level obtained with the COVID-19 Fear Scale showed no statistically significant differences between the results of Russian and Kazakhstan students: 21.87 points (CO – 6.74) and 22.10 points (CO – 5.90) respectively ($t(2629)=0.665$; $p=0.506$). The final score for both groups was 21.91 (CO – 6.60). Regarding the experience of fear depending on the gender, the study found a statistically significantly higher level of fear in young women (22.69 points) compared to young men (19.98 points) ($t(2622)=9.706$; $p<0.001$) throughout the sample.

In relation to fear values, the two-way analysis of variance did not find statistically significant results of the interaction between the country of residence and gender factors ($F(1,2619)=0.019$; $p=0.891$).

Students who responded affirmatively to questions about worsening their psycho-emotional state had high-

er fear values compared to those who answered negatively to these questions: 25.93 vs. 20.49 for depressed ($t(2285)=18.003$; $p<0.001$), 26.13 vs. 20.87 for exhaustion ($t(2264)=15.160$; $p<0.001$), 23.96 vs. 21.03 for loneliness ($t(2261)=9.266$; $p<0.001$), 25.07 vs. 20.44 for nervousness ($t(2304)=16.411$; $p<0.001$), 24.54 versus 20.95 for discontent ($t(2280)=11.274$; $p<0.001$).

We will also introduce an integral index of students' psycho-emotional impairment due to COVID-19 using two categories: no knowledge of such impairment and the presence of such knowledge, whether it is a state of depression, exhaustion, loneliness, nervousness or discontent. According to the students' responses, 1,087 (38.7%) of them reported impairment in their psycho-emotional state, 1,224 (43.5%) gave a negative answer and 499 (17.8%) did not provide information. Accordingly, students who reported impairment in their psycho-emotional state had higher fear values compared to those who did not show such an impairment: 23.97 vs. 19.70 ($t(2218)=16.128$; $p<0.001$).

In relation to the fear values, a two-way analysis of variance found statistically significant results for the interaction between the factors of the country of residence and index of psycho-emotional impairment ($F(1,2216)=4.931$; $p=0.026$).

The data in Table 1 show the presence of the expression of negative psycho-emotional states depending on the country of residence and gender. Such states are more typical for Russian students compared to Kazakhstan students and for young women compared to young men.

Correlation of stress resistance level to fear level and negative psycho-emotional states.

The results of using the Brief Resilience Scale showed that the stress resistance value had higher statistical significance in case of Kazakhstan students (19.75) compared to Russian students (19.60) ($t(2441)=2.429$; $p=0.015$), and also higher in case of young men (20.60) compared to young women (18.83) ($t(2436)=10.969$; $p<0.001$). At the same time, the results of a two-way analysis of variance in relation to stress resistance values did not reveal statistically significant interaction between the country of residence and gender ($F(1,2433)=1.504$; $p=0.220$).

There is a negative correlation between fear and stress resistance values: $r = -0.312$ ($p<0.001$). At the same time,

Table 1

Psycho-emotional states of students depending on the country of residence and gender

During the last month, because of COVID-19, I felt more:	Russia (n=2310)	Kazakhstan (n=500)	Young men (n=815)	Young women (n=2003)
Depressed, % (n)	25.3 (504)**	19.1 (74)**	14.2 (100)***	28.5 (479)***
Exhausted, % (n)	18.3 (363)**	12.1 (46)**	11.9 (83)***	19.6 (326)***
Lonely, % (n)	24.8 (491)	22.4 (86)	18.2 (127)***	27.1 (450)***
Nervous, % (n)	31.6 (637)*	25.7 (101)*	19.4 (136)***	35.3 (602)***
Angry, % (n)	23.1 (459)	21.7 (84)	17.8 (126)***	25.1 (418)***

* $P<0.05$; ** $P<0.01$; *** $p<0.001$ (χ^2 test)

this correlation is the characteristic of student youth regardless of the country of residence and gender.

Students who answered positively to questions about worsening their psycho-emotional state had lower values of stress resistance, compared with those who answered negatively to this question: 17.45 vs. 19.96 for depression ($t(2353)=14.681$; $p<0.001$), 17.25 vs. 19.81 for exhaustion ($t(2333)=13.082$; $p<0.001$), 17.85 vs. 19.88 for loneliness ($t(2331)=11.697$; $p<0.001$), 17.75 vs. 20.08 for nervousness ($t(2337)=14.822$; $p<0.001$), 18.15 vs. 19.76 for discontent ($t(2347)=9.063$; $p<0.001$).

Correlation of basic beliefs to the level of fear and negative psycho-emotional states.

The analysis of the mean values obtained on the scales of the questionnaire by Janoff-Bulman revealed higher rates for Kazakhstan students compared to Russian students on two scales: *General Attitude towards the Benevolence of the World* (4.05 vs. 3.91; $t(2435)=3.064$; $p=0.002$) and *General Attitude towards the Meaningfulness of the World* (respectively: 3.63 and 3.49; $t(2447)=4.420$; $p<0.001$); in young women compared to young men, only on the scale *General Attitude towards the Benevolence of the World* (respectively 4.01 and 3.73, $t(2430)=8.061$; $p<0.001$).

Regardless of the country of residence and gender, there are weak and mostly statistically insignificant correlations between fear rates and values on three scales of the questionnaire by Janoff-Bulman: $r = 0.025$ ($p=0.232$) between fear and *General Attitude towards the Meaningfulness of the World*, $r = 0.013$ ($p=0.526$) between fear and *Belief about Self-worth* and $r = 0.051$ ($p=0.013$) between fear and *General Attitude towards the Benevolence of the World*.

The stepwise regression analysis for fear as a dependent variable revealed three main predictors. The first of these, the psycho-emotional impairment rate, explains 10.6% of fear variance ($p<0.001$), gender was the second predictor, explaining 1.9% of fear variance ($p<0.001$) and the scale *General Attitude towards the Meaningfulness of the World* was the third predictor, explaining 0.4% of fear variance ($p=0.002$). The other independent variables (*Country*, *General Attitude towards the Benevolence of the World* and *Beliefs about Self-worth*) did not show a statistically significant increase in the proportion of variance explained. The resulting value of explained variance (adjusted R^2) for the fear variable was 0.128 (12.8%).

Another rate that requires verification is the relationship between three basic personal beliefs and the psycho-emotional states of students. The emotional impairment is associated with the lower expression of all three basic personal beliefs: $t(2281)=5.132$; $p<0.001$ for *General Attitude towards the Benevolence of the World*; $t(2290)=3.071$; $p=0.002$ for *General Attitude towards the Meaningfulness of the World*; $t(2255)=5.557$; $p<0.001$ for *Belief regarding Self-worth*.

The results of the two-way analysis of variance did not reveal any statistically significant differences in the expression degree of the basic personal beliefs depending on the country and rate of psycho-emotional impairment, and depending on the gender and rate of psycho-emotional impairment.

Relationship between stress resistance and basic beliefs.

Finally, we present the results revealing the relationship between the psychological resources we study: stress resistance and basic beliefs (Figure 1).

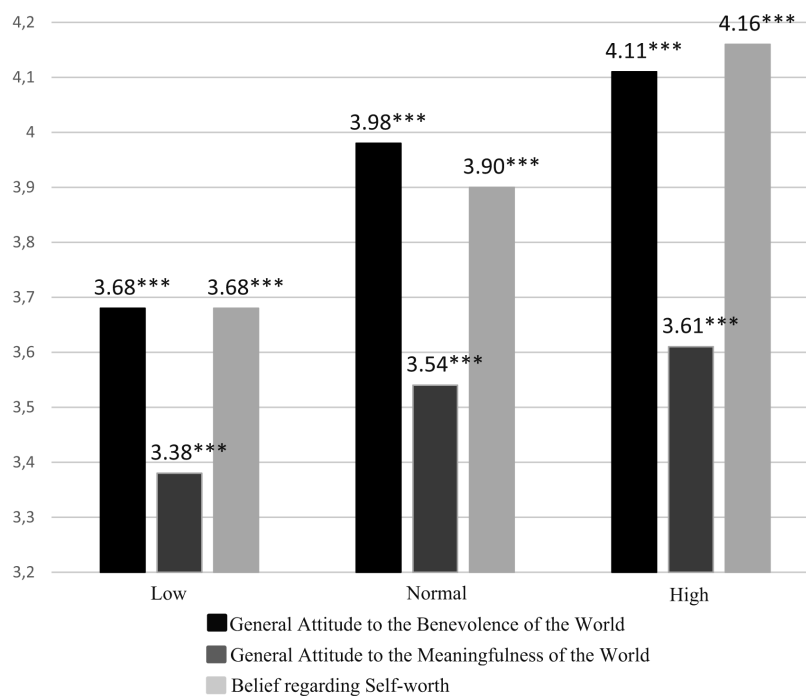


Fig. 1. Mean values of basic beliefs depending on the level of stress resistance

As shown in Figure 1, higher values of basic beliefs correspond to a higher level of stress resistance. The effect sizes (η^2) for General Attitude to the Benevolence of the World and General Attitude to the Meaningfulness of the World are insignificant: 0.039 and 0.026 respectively. The effect size for Belief regarding Self-worth is medium at 0.082.

The results of the two-way analysis of variance did not reveal any statistically significant differences in the degree of expression of basic personal beliefs depending on the country and level of stress resistance, and as well as depending on the gender and level of stress resistance.

Discussion

The absence of differences in the expression degree of COVID-19 fear between students from Russia and Kazakhstan may be related to fairly similar social policy strategies and public health support measures in both countries (quarantine, testing, development of vaccines and treatment technologies, etc.), as well as active public discussion of the most effective safety measures and counteraction to the spread of the disease [14; 15]. It is also possible that the same level of fear in Russian and Kazakhstan students can be explained by the fact that fear as a protective biological reaction of the body is more caused by individual-physiological than socio-cultural characteristics of the individual. The higher degree of fear of coronavirus disease in young women compared to young men in the whole sample is consistent with the research findings stating that the level of fear experience in women tends to be higher than in men [16]. Moreover, when looking at the interaction of two factors, gender and country, there were no differences in the intensity of fear experience, suggesting that the experience of fear is more strongly related to gender differences than to cultural differences.

However, Russians were more likely than Kazakhstanis to have experienced negative psycho-emotional states because of coronavirus in the past month. And the relationship obtained in the study between them and experience of COVID-19 fear indicates the presence of a generally more negative emotional background among Russian students, which may have been due to the higher (at the time of the survey) incidence of coronavirus infection among Russian residents [11] than among Kazakhstan residents [2]. It is likely that this emotional background among Russian students during the pandemic can be explained by the greater expression of individualistic tendencies in Russian culture than in Kazakhstan culture, which means that Russians rely less on emotional support and emotional help from others in critical situations [24].

What resources contribute to coping with fear and negative emotional states in the context of the pandemic among Russian and Kazakhstan students?

Students with *high levels of stress resistance* were found to have low levels of fear of COVID-19 and did not experience negative psycho-emotional states during the last month, which confirms the conclusion that stress resistance is an important psychological resource that reduces the vulnerability of people in stressful situations, which include the pandemic situation [1]. The universality of this resource being also that stress resistance acts as a buffer for the negative effects of COVID-19, regardless of the factor of gender and country of residence.

According to the results obtained by the Janoff-Bulman methodology, Kazakhstani students showed higher values of basic beliefs in *the Benevolence, Kindness of the World and Meaningfulness, Justice of the World* as compared to Russian students. It is likely that these differences can be explained by the peculiarities of nomadic Kazakh culture, which has retained its basic traditional norms and rules to the present day. The spiritual and moral perception of the Kazakh world is based on the principles of justice, equality, freedom, democracy [7], the need to see each other as support, mutual support, as well as the principle of “jatsynbau”, which means trust, openness. “A man lives by man” is one of the commandments of traditional Kazakh society [10].

Students (regardless of the country of residence) with a high level of basic belief in the benevolence of the surrounding world were found to have a high level of fear of coronavirus disease. This pattern was more common among young men. Whereas among young women convinced of the benevolence of the world there are equally the same numbers of individuals with different levels of fear experience of coronavirus disease.

Interestingly, our findings partially diverge from those we obtained earlier in the first phase of the pandemic, in which the highest rates of belief that there is better than evil in the world were found in the group of individuals with low levels of fear expression [3]. It is possible that this discrepancy is due to sample characteristics. Whereas the previous study involved subjects of all ages, the present research sample includes only young students who, apparently because of their youth, experiencing fear of a disease that is dangerous for themselves and their loved ones, do not lose faith in the goodness and benevolence of the world around them.

Apparently, we cannot ignore the changes in relationships with others, changes in self-image and life philosophy in general that have been taking place since the first phase of the COVID-19 pandemic. It is known that in the case of successful coping with stress, basic beliefs are restored, but only up to a certain level of “pre-traumatic” beliefs, at which the person is aware of his/her vulnerability. The person’s picture of the world in this case can

be phrased roughly as follows: "The world is benevolent and fair to me. I have the right to choose. But this is not always the case" [17, c. 52].

This assumption, in our opinion, is confirmed by the results of the analysis of the relationship between the degree of expression of basic personal beliefs and psycho-emotional states: students, who believe in the kindness of people and benevolence of the world, in its justice and controllability, and are also convinced in the value of their own self, did not experience states of depression, exhaustion, loneliness, nervousness and discontent due to coronavirus during the last month. Our findings overlap those on the influence of belief in the justice of the world on positive emotions [33].

And, as the study showed, the patterns of relationship of fear and other negative emotional states with the expression degree of basic beliefs, obtained for the entire sample, were reflected in both the Russian and Kazakhstan samples separately. However, the obtained regularities have their own specifics depending on the gender. The revealed specificity of differences between young women and young men in the relationship between fear of coronavirus and basic beliefs suggests that gender differences in this case were more significant than ethnocultural differences.

The study found a high level of stress resistance is accompanied by the expression of basic personal beliefs in *the benevolence, the meaningfulness of the world, and the self-worth*, confirming a close relationship of psychological resources. This means that these psychological resources, which can be classified as both value-semantic resources and self-regulation resources [12], reduce the vulnerability of Russian and Kazakhstan students in an uncertain pandemic situation and determine the nature of their decisions in coping with fear of coronavirus disease and negative psycho-emotional states.

Conclusions

The conducted research of stress resistance and basic beliefs, as the main psychological resources of the personality for coping with fear and other negative psycho-emotional states associated with COVID-19, among students in Russia and Kazakhstan, allows us to draw the following conclusions.

1. The majority of both Russian and Kazakhstan students have moderate levels of COVID-19 fear. Young women, regardless of their country of residence, experience higher levels of COVID-19 fear than young men. Among Russian students, as compared to Kazakhstan students, there are more of those who have experienced

negative psycho-emotional states such as depression, exhaustion, loneliness, nervousness and discontent during the last month because of coronavirus. At the same time, the proportion of young women experiencing negative psycho-emotional states is also significantly higher compared to the proportion of young men, both in Russia and Kazakhstan.

2. Kazakhstan students, compared with Russian ones, have a higher expression level of such psychological resources as stress resistance and basic beliefs in the *Benevolence, Goodness of the World, and Meaningfulness, Justice of the World*, which, in our view, can be explained by the features of Kazakh culture formed in the conditions of nomadic lifestyle, based on principles of mutual support and mutual help, trust and openness.

3. A high level of resistance to stressful events is accompanied by lower rates of COVID-19 fear and the absence of negative psycho-emotional states associated with it, regardless of the country of residence and gender, which indicates the universality of the psychological resource as a buffer mitigating the traumatic impact of the pandemic situation.

4. Students with a high level of basic belief in the benevolence of the world around them, regardless of the country of residence, were found to have a high level of fear of coronavirus disease, which was at variance with our findings obtained in the study in the first wave of COVID-19 incidence. The resolution of this contradiction requires further research, taking into account the influence of third factors, e.g., age; experience of illness of one's own, relatives, acquaintances; the level of medical education, etc. Students who were convinced not only of the benevolence of the world around them, but also of its justice and controllability, as well as of the value of their own Self, did not experience states of depression, exhaustion, loneliness, nervousness and discontent because of coronavirus during the last month, which generally indicates the resource potential of the basic personal beliefs.

5. High levels of stress resistance were associated with the expression of basic personal beliefs in *the benevolence, meaningfulness of the world, and self-worth*, which together act as a resource potential of the personality for coping with fear and negative emotionality brought on by the stressor exposure to COVID-19.

Research limitations. Using the Qualtrics online survey platform does not allow to form random samples aligned, for example, by size, gender and age. In addition, students from North Kazakhstan (Kostanai) participated in the study, which has certain limitations in extrapolating the results of the study to all Kazakhstan students.

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Kazakh Traditional Riddles as a Specific Form of Translation of Cultural-Historical Experience

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This article develops the ideas of M.M. Mukanov about the importance of a psychological approach to the product of oral creativity in ethno-historical terms. Ethnic mentality corresponds to social and historical realities of the life of the ethnos creating a unique culture. An important part of the manifestation of ethnic mentality belongs to the works of oral creativity – the product of the mental activity of many generations. John M. Dienhart (Dienhart) argued that riddles “can serve as a useful identifier of cultural norms and worldview” [34]. Thus, the article discusses riddles as a specific element of Kazakh culture, as a special cultural tradition; the role of riddles in the translation of cultural and historical experience; how exactly the peculiarities of mentality manifest themselves in riddles; what the specificity of the guessing process is. In conclusion, we discuss what the common and the different in guessing riddles compared to solving educational and creative tasks. It is shown that the difficulties of guessing are associated with the disguise of the sought under the shell of the ethnic context and a special way of “stamping” the riddle. In a creative task, the most important moment is a reflexive effort aimed at awaring and changing the way of action. And the Kazakh riddle combines the correlation of two contents according to gestalt, thinking by analogy, transduction and ethno-cultural context. In this sense, guessing the Kazakh riddle is “three in one”: mastering cultural and historical experience (the enclosed content), mastering the method of metaphorical thinking (thinking in modeling representations), mastering the ethno-cultural context. Thus, it corresponds to Archer Taylor's thesis that the riddle is a universal art [38].

Keywords: psychological anthropology, historical ethnology, ethnic mentality, riddle, aitys, metaphoricity of thinking, intellectual maturity testing, cultural-historical experience, creative task.

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Казахские традиционные загадки как специфическая форма трансляции культурно-исторического опыта

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Данная статья развивает идеи М.М. Муканова о важности психологического подхода к продукту устного народного творчества в культурно-историческом аспекте. Этнический менталитет соответствует социальным и историческим реалиям жизнедеятельности этноса, создающего уникальную культуру. Значимой частью проявления этнического менталитета являются произведения устного творчества как продукта мыслительной деятельности многих поколений. Джон М. Дайенхарт (Dienhart) подчеркивал, что загадки «могут служить полезным идентификатором культурных норм и мировоззрения» [34]. В статье рассматриваются: загадки как специфический элемент казахской культуры, как особая культурная традиция; роль загадок в трансляции культурно-исторического опыта; особая логическая конструкция загадок; специфика процесса отгадывания. В заключение обсуждается, что общего и что различного в отгадывании загадок по сравнению с решением учебных и творческих задач. Показано, что трудности отгадывания связаны с замаскированностью искомого под оболочкой этнического контекста и особым способом «штамповки» загадки. В творческой задаче важнейшим моментом является рефлексивное усилие, направленное на осознание и изменение способа действия. А в казахской загадке сочетаются соотнесение двух содержаний по гештальту, мышление аналогиями, трансдукция и этнокультурный контекст. В этом смысле отгадывание казахской загадки — «это три в одном»: освоение культурно-исторического (этнокультурного) опыта (закодированного в содержании загадки), освоение способа метафорического мышления (мышление в моделирующих представлениях), приобщение к культуре интеллектуальной состязательности. Это согласуется с идеей А. Тейлора о том, что загадка является универсальным искусством [38].

Ключевые слова: психологическая антропология, историческая этнология, этнический менталитет, загадка, айтыс, метафоричность мышления, проверка интеллектуальной зрелости, культурно-исторический опыт, творческая задача.

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Introduction

Currently, the influence of globalization leads to the blurring of ethno-cultural boundaries, the interpenetration and reassessment of cultural values, the loss of ethnically significant ancestral experience.

The Kazakhs are one of ethnic groups living in Russia. Therefore, an appeal to their ethnic mentality may be of interest when studying the anthropological problems of Russian peoples. The fact that the traditions of Kazakh culture are alive here and continue to develop is

evidenced, for example, by the activities of many public organizations engaged in the preservation, support and development of Kazakh culture.

The appeal to riddles and other small genres of folklore allows, as V.F. Petrenko noted [26], to approach the study of the peculiarities of the human psyche not abstractly, exploring a certain non-historical subject, but in the context of a certain peculiar cultural structure characteristic of a particular people. The appeal to riddles and other small genres of folklore allows, as V.F. Petrenko [26] noted, to approach the study of the

peculiarities of the human psyche not abstractly, exploring a certain non-historical subject, but in the context of a certain peculiar structure of culture characteristic of a particular people.

Address to the ethnic mentality of the Kazakh ethnic group allows you to clearly understand the essence and originality of its culture. The ethnic mentality corresponds to the social and historical realities of life and life support of the ethnic group. An ethnic group creates a unique culture. Their dominant cultural themes have a universal character, and its form differs from one nation to another in its originality, reflecting the specifics of this ethnic group. The ethnic mentality of the Kazakhs is based on a systematic combination of many endogenous and exogenous factors that have influenced the ethnos throughout its historical path. At the same time, cultural factors acting mainly in time dimensions were combined with environmental factors acting in the coordinates of space, sometimes called geocultural factors.

An important part of the manifestation of ethnic mentality is the works of oral folk art. Therefore, oral folk art, in which the relations between the phenomena of reality reflected by consciousness and their assessment are fixed, is an important source in the study of ethnic mentality. Riddles, proverbs, phraseological units, like any other type of oral creativity, are the product of the mental activity of many generations.

In the pre-written period of the history of the Kazakh ethnos, oral creativity was widespread, which, according to M.M. Mukanov, was associated with their nomadic lifestyle and the specifics of cattle breeding [21]. According to E.D. Tursunov [29], such a variety of Kazakh art as aitys originally had a ritual character, and then turned into a specific genre of artistic folklore.

Ethno-mental paradigms are reflected in such a genre of folklore as the riddle. Archer Taylor [38, p. 3] even states "the riddle is a universal art." [38, p. 3]. In riddles, people create a poetic image of everything that surrounds them: objects, events, phenomena, people, animals, etc. The riddle is suggestive, makes you think about the qualities and properties of objects and phenomena. Therefore, it introduces the worldview, attitude to the environment, feelings and thinking, language features and development of public consciousness of people.

The object of analysis in this article is the riddle as a phenomenon of folk culture, a specific form of artistic consciousness of the Kazakh people and the translation of cultural and historical experience accumulated by generations in the pre-written period of its history.

Riddle as a phenomenon of folk culture

If thinking is the cognition of the world, then mentality is the manner of thinking, its originality.

By definition of O.A. Kukoba [16], by ethnic mentality is meant the deep level of mass consciousness, what

representatives of historical-psychological and cultural-anthropological thought called a kind of "psychological equipment" of any social community, which allowed it to perceive both the environment and themselves in its own way. This "psychological equipment" manifests itself in the worldview and worldview characteristic of this community, which has an emotional, axiological and behavioral expression.

This definition is quite consistent with the views of prominent Russian psychologists and ethnologists on this problem. Thus, V.F. Petrenko [26, p.23] notes: "Human perception and awareness of the world, the processes of its memory, thinking and imagination are armed and at the same time limited by that concrete historical system of meanings bearing the aggregate social experience, which is inherent in a particular social community, a particular culture". Ethnologist S.V. Lurie writes about the formation of ethnic constants [18, p. 297]: "In the process of adaptation, adaptation of an ethnos to the surrounding unfavorable natural and social environment, often unconscious ethnic constants are formed, which help the ethnos to survive and develop. These ethnic constants represent a kind of unchanging form of ordering experience, the content of which is the real experience of the cultural and historical life of the people. It is the ethnic constants that serve as the prism through which the ethnos looks at the world".

The first Kazakh doctor of psychological sciences Mazhit Mukanov [22, p. 88] wrote about metaphorical thinking as an important characteristic for guessing Kazakh riddles: "Firstly, the nomadic way of life is rich in all sorts of adventures, and secondly, it allows you to constantly change the place and thus makes it possible to encounter new objects of reality every time. This creates the prerequisites for the mental comparison of distant objects, the construction of various metaphors, and the frequent use of allegorical speech".

Guessing riddles, being a measure of the intellectual maturity of each of the parties in the competition, was widely practiced in life, especially among nomadic peoples. They were popular among young people. The works of M.M. Mukanov contain the idea of the reflexive function of folklore, which carries the age-old experience and system of values of the people. In his opinion [21] riddles, proverbs, sayings in traditional culture act as a kind of reflection for everyday consciousness, understood as a process of critical comprehension of current activity and the basis for the transition to a new activity.

The social role of riddles was studied by David Evans [35], Annike Kaivola-Bregenhoy [36]. The social basis of riddles is connected with the production process, with the way of life of the people, and this connection is felt in what object and how it is conveyed, by what image, by what metaphor it is expressed. In their content, riddles can include almost all areas of human life and vary depending on the interests and customs of the society in which they are used. And since Kazakhs are mostly pastoralists, a good third, if not half, of

the Kazakh riddles concern cattle breeding, or borrow comparisons from there.

Many scientists felt the need to create unique definitions of the riddle corresponding to the studied culture. So far, there is not a single definition of the riddle and its distinctive features that have entered into general circulation.

Of interest is John M. Dienhart's [34] statement that riddles "can serve as a useful identifier of cultural norms and worldviews". Roger D. Abrahams says about the specific use of riddles in different communities: "riddles are equally formulaic, competitive, confusing and witty, but they fit into the life of the group and reveal its values and expressive habits in a variety of ways" [32, p. 156].

The root of the Russian word "riddle" (from the verb "to guess") seems to indicate exactly this and the guessing process itself is predominantly probabilistic in nature (divination may or may not come true). In the Kazakh language, the riddle is transmitted as "zhumbak" (from the verb "zhum" – which means "to close", "to hide"). This value, of course, indicates not the process of divination, but finding something hidden, not directly given in the text. Finding what lies beyond the immediate given presupposes the work of thinking. We will use the term "riddle" in this sense.

This understanding of the riddle brings it closer to the Russian word "task". Analyzing the etymology of the word task, S.L. Rubinstein [28] emphasized the presence of hidden content in the task ("given"), which must be revealed, extracted from the conditions ("data").

Riddles, as a special phenomenon of folk culture, attracted the attention of a wide variety of researchers not only in Kazakhstan itself.

The first collectors and publishers of Kazakh riddles were prominent Russian folklorists-orientalists: V.V. Radlov, P. M. Melioransky, A.V. Vasiljev, D.A. Divaev and others. A number of riddles were published in periodicals [2; 18], printed in the form of anthologies or individual books [5]. In 1903, in Kazan, Nurzhan Naushabayev – one of the participants of the competition of improvising singers – published his text under the title "Zhumbak. Nurzhan and Sapargali aitys".

In 1940, for the first time there was a collection of Kazakh folk riddles called "Zhumbaktar", which can be ranked among the complete collections ("Riddles", compiled by S. Amanzholov). The same collection was supplemented and reissued in 1959 by S. Amanzholov, T. Zhanuzakov ("Kazakh folk riddles"). In the last collection there are about a thousand folk and eight competitive riddles. In 2003, a new edition of "Kazakh riddles" was published, prepared by Sarsen Amanzholov. In our research, we used the materials of these publications.

The riddle as a form of translation of cultural and historical experience

Riddles appear in ancient times, and the art of guessing-solving riddles has been developing and polishing

for many centuries. Such a long existence of riddles in the Kazakh culture, the interest of various scientists in them, which has persisted for more than two centuries, suggests that riddles play an important role in the life of people, in its development.

One of the explanations for the emergence of riddles as a cultural tradition can be found in K. Levi-Strauss [37, p. 23], who noted that the human mind could not have arisen and achieved such high perfection if people were limited only to satisfying immediate needs for food, clothing, etc. This could happen only due to the presence of mediated interests, i.e. the fascination with motives that are not directly related to work (the desire to know the unknown, to reflect alone with oneself, to have a discussion with others, etc.).

But from the thesis about the presence of spiritual needs, along with material ones, it is impossible to explain why it is the riddles and the special intellectual culture developing in connection with them that becomes so important in the life of this ethnic group.

It can be assumed that riddles acquire a particularly important role precisely in the preservation, maintenance, development and translation of the cultural and historical experience of an ethnic group in the absence of writing and the institution of education as such.

Riddles differ from other types of folklore in that they act on the guesser with entertainment, causing his thinking to work. This is because the riddle affects a person unexpectedly, like a play on words and a paradox. Unlike proverbs, riddles are considered as a type of activity, including those intended for special occasions, when organizing public competitions and mass events.

For example, in order to show their endurance, people participated in sports. In the same way, in the early stages of the historical process, in their moments of leisure, they asked each other riddles in order to test intellectual maturity. The literature has repeatedly emphasized the fact that riddles are a battle of wits, and they are aimed at developing the speed of the mind.

The obvious purpose of riddles seems to be entertainment. However, the riddle also has other functions. Riddles can be considered as a tool of education, if we understand "education" in the context of the process of transmitting culture, as a way of fixing and transmitting the social value experience of older generations, knowledge about the life and traditions of one's ethnic group. Questions enclosed in riddles, as it were, replaced school knowledge, teaching children quick thinking, intellectual skills and classification. This especially applies to those periods in the life of ethnic communities when there was (or still is not) specially organized education. It was in the life of such tribes and peoples that riddles, proverbs and other winged words replaced for people what is called education in our time.

Riddles, therefore, is a social event that values entertainment, intelligence, getting the right answer. Solving riddles requires from a person his own (subjective) activity, intellectual tension, imagination, thus "learning

activity” in the form of guessing and solving riddles in which cultural experience is encrypted, becomes a source of personal and intellectual development in the interaction of a child and an adult, which is exactly consistent with one of the basic provisions of L.S. Vygotsky’s cultural-historical psychology [7].

It is important to note that in the development of the individual, not only the improvement of the ability to guess, but also the mastery of the art of deeply “encrypting” the hidden object plays a significant role.

Specifics of Kazakh traditional riddles

The antiquity of the origin of Kazakh riddles is proved not only by the archaic nature of many of their verbal components and the very structure of riddles, but also by examples from extant historical monuments (Codex Cumanicus, dictionary of Mahmud of Kashgar, etc.).

There were various kinds of riddles in Kazakh society. In this article, we will limit ourselves to considering two of their types: ordinary and competitive.

Ordinary (subject) riddles are more ancient in form. Competitive riddles developed on the basis of simple folk riddles, and are an expanded form of simple (ordinary) riddles.

An example of an ordinary riddle is a riddle on the topic of cattle breeding: “There are 12 mares, 8 of them foaled (give offspring), and 4 are not foaled.” It is not easy to solve it without knowing the ethno-cultural context. We are talking about the main bones of animals used for food. In 8 bones they have bone marrow (“offspring”), and in 4 there is no bone marrow (for example, a scapula, etc.).

Another riddle requires knowledge of national musical traditions. “The stomach is like a pumpkin, the leg is like a stick. If you touch her, she cries, and people like crying.” The answer is the *dombra*, a national musical instrument. Even in an ordinary riddle, not only the appearance of the instrument is transmitted, but also the aesthetic cultural experience: the sound of the *dombra* is compared to crying, but at the same time brings pleasure to the listener.

The riddle about a person is widely known, although most do not know that this is also an “ordinary” Kazakh riddle: “In the morning on four legs, in the afternoon on two, and in the evening on three.” There are three main age periods of a person: infancy (a child moves on all fours), adulthood (on two legs), old age (“on three legs”, i.e. a person walks leaning on a stick).

Of particular interest are the competitive (controversial) riddles. Oral competitions associated with guessing paradoxical riddles were widely developed in India, Afghanistan, among the Bedouin tribes of modern Saudi Arabia. It can be assumed that almost all peoples have gone through this method of developing the mind by organizing polemics.

The distribution of riddles among the Kazakhs to test the mind and resourcefulness in the early periods, we can

judge from the surviving legends. So, in the past, a shepherd, poor Ayaz became an adviser to the khan thanks to his intelligence and wisdom. He withstood several trials of Khan Madan. Ayaz proved to the khan that the worst herb is cattail, the worst bird is magpie. (Ayaz proved to Khan that cattail is the worst of herbs, magpie is the worst of birds (“Cattail does not burn when thrown into the fire and cattle do not eat it; magpie, although beautiful with feathers, there is no agreement between magpies: two magpies don’t fly together, two magpies don’t sit together. There is no benefit to a person from it, it is not good for food”). Having solved these complex riddles, Ayaz thereby saved 40 envious, stupid viziers from death. Later, at the request of the people, he was elected khan [14, pp. 198–211].

Similar traditions have been preserved about the wise orator Zhirenshe. During the period when Khan Zhanibek was on the Kazakh throne (XV century), competitions were often held to solve riddles. Tradition tells us that one day Zhanibek announced to the audience that the person who took the first place in guessing riddles would be appointed vizier. This person was Zhirenshe (he is known in history under the name Zhirenshe eloquent). He saved the viziers, who were unable to answer the Khan’s question “What is the distance between a lie and the truth? “Zhirenshe found the answer: “What you hear with your ears may be a lie, but what you see with your eyes is absolutely true, so the distance between the lie and truth is equal to the distance between the ear and eye”. The Khan was satisfied, and the viziers were freed [8, p. 299].

If the riddles that we call ordinary have passed through a certain selection from generation to generation and their content, to a certain extent, has been established and is normative for this community, then competitive riddles are made impromptu, when one challenges the other to a competition.

It can be assumed that competitive riddles arose under the influence of the most common art form of the Kazakhs called *aitys*. “Aitys as a common type of creativity among Kazakhs, — writes M.M. Mukanov, — has been known for a long time. Its essence lies in the fact that two or more persons (often specially invited for this purpose), in the presence of a significant number of people, strive to show justice, the truth of their own point of view and refute the opinion of the opposite side. The topic of *aitys* was not announced in advance; one of the parties impromptu (often accompanying his performance by playing the *dombra*) begins to talk about some topic in the form of a verse (often about himself or about a person who enters into a competition with him). The other side at this time listens attentively to the speaker and at the same time prepares an answer to himself. After many hours of polemic, one of the parties often admits to being defeated (although not always) ... Aitys are usually divided into household and *aitys akyns*. However, there are no sharp differences between them. Both types of *aitys*, with rare exceptions, are conducted in verse form” [22, p. 92].

It is possible that oral contests took place with the help of ordinary arguments and arguments, and then, in order to test each party's level of intellectual maturity, the oral contest was clothed in the form of riddles. Kazakh writer S. Mukanov noticed the peculiar features of competitive riddles: "Competitive riddles are one of the most difficult types in the competition of akyns. Here it is not enough to be only an akyn (poet), resourcefulness and ingenuity are also necessary" [24, p.201]. To this, psychologist Mazhit Mukanov [22, p.92] adds that aitys among Kazakhs, being a bright, exciting spectacle, served to test people's ability to logically construct thoughts in their specific form.

Aitys-riddles are the most difficult form of aitys. It was a live poetic duel in which the participants honed their skills, created new images, and addressed current topics. In this verbal competition, not only wit and eloquence should be shown, but also broad knowledge and ingenuity. Here akyns express their thoughts allegorically. The audience is never passive. For the author of the riddle and the audience, the game would be boring if all the riddles were easily solved.

Aitys-riddle is held at celebrations on the day of the naming of a child, at youth parties, parties, rinks, feasts and weddings. Kazakh scholar-educator Chokan Valikhanov [4, c. 283] in his manuscript discovered in 1857, among the forms of Kazakh songs, singled out the form he called "kaim" (from the Kazakh word "kaimdasu" – to enter into a verbal or song contest; the same as aitys in our time): "Kaim are songs used at weddings, consisting of questions and answers between young men and girls; they consist of quatrains in which the first two verses rhyme with the fourth. These songs sometimes contain riddles, epigrams and, finally, comic abuse, reaching the most desperate cynicism of expressions". That is, he recorded the existence of such a form of competition. The audience is never passive. For the riddler and audience the game would be boring if all riddles were easy to guess.

Now the debate in the riddles is very rare. It used to happen that several people gave their answer to the riddle of one akyn at once. So, the girl Yrsty is famous for autism mystery with sixteen poets. She made a wish: "Do you have a caravan camel to pack a Yurt? Having loaded a Yurt, how to free a draught camel? Do you have the means to make the old young"? Sixteen akyns from the lower reaches of the Syr Darya tried to answer this riddle, but only Bazar-Zhyrau gave the correct answer: "If a person is always happy and cheerful, does not know grief and sorrow, he does not grow old" [Aitys 1966].

The competition between Sapargali Alimbetov (1880–1957) and Nurzhan Naushabayev (1859–1919) has been preserved in the memory of the people. Here is an example of a riddle from this aitys, made by Sapargali [1, pp. 462–474]:

"Kus cordim, ozi zhansyz, bir ayagy. Tenizde salgan zholy sairap zhatyr".

(I saw a non-living one-legged bird. The road it built at sea is sparkling).

Response of Sapargali:

"Zhansyz kus bir ayakty munyn-kalam, Teniz, mysal, kagazgoi, zholy-n-zhazu / Жансыз құс бір аяқты, мұның — қалам. Теңіз, мысал, қағазғой, жолың — жазу".

(A dead bird with one leg, this is a pen. The sea, for example, a sheet of paper, the road – writing).

Akyn Sapargali in his riddle compared a pencil or pen with a one-legged bird, and paper with a boundless water surface. Akyn Nurzhan immediately guessed the hidden image. This contest vividly illustrates the peculiar game of images, both of the author and guesser.

The riddles that were taken out at the above-mentioned gatherings have been preserved to this day. The texts of competitive riddles are published in many publications, and are also stored in a number of manuscript library collections of the Republic.

Competitive riddles were usually clothed in verse form. Kazakh writer M.O. Auezov said that "the riddle is poetic in nature. And akyns-improvisers highly appreciate the riddle, often choose it for poetic competitions, so many Kazakh riddles exist in poetic form" [12, p. 11].

In this regard, the poetic text of one riddle in the published form is sometimes several pages. This feature is explained by the fact that the Creator of the riddle, if it happens impromptu, is forced to think not only about how to hide deeply what should be guessed, but also about the elegance and folding of the poetic text. The elegance and folding of the verse sometimes lead to excessive verbosity. The poetic text, significantly increasing the redundancy of the message, creates difficulties for guessing. Therefore, in the voluminous text of a poetic riddle, it is difficult to determine which lines are relevant to the riddle and which are not. If we also take into account the case when there are many contextual riddles inside one poetic riddle, then the difficulty of guessing increases many times.

The rhythmic form, apparently, reflects the ethno-psychological and ethno-cultural features of the Kazakh people, which has been noted by Russian researchers more than once in the past. Thus, the outstanding orientalist-turkologist V. Radlov [28, p. 332] was able to catch the music of the Kazakh speech: "The Kyrgyz stand out among all their neighbors with the gift of speech. The speech of each Kyrgyz flows smoothly and freely. The Kyrgyz has such a command of the word that he can not only pronounce long improvisations in verse, but also his usual speech differs in a certain rhythm in the construction of phrases and periods, so that it is often similar to poems. It is figurative, the expressions are clear and precise, there is nothing surprising in the fact that such a people had a particularly rich folk literature". Similarly, the Russian researcher V.I. Massalsky spoke about the Kazakhs: "The distinctive feature of the Kyrgyz is the love of poetry and the ability to express their thoughts not only clearly and elegantly, but also eloquently. Hence the high development of oral folk literature, characterized by richness and diversity" [19, p. 370].

Peculiarities of Kazakh traditional guessing of riddles

From generation to generation, not only the riddles themselves were passed on, but also the ways of guessing them.

Usually in riddles, not the main signs of objects and phenomena, but their hidden signs are put away. The allusive form is given to riddles not only to make puzzles more difficult, it is also designed to reveal the inner hidden properties of things that are related to proverbs, as another genre of folklore, as noted by M.M. Mukanov¹.

The generation of riddles and search riddles can be represented as a competition between two players, in which the strategy of the first player (the author) is good, if no one can guess the riddle. On the contrary, the strategy of the solver (the second player) is good if he can solve the riddles of the creator of the plot. Thus, the competition turns into a struggle between the strategies of enigmatic (“encryption”) and unraveling (“decryption”) in the cultural context (subjects of life, natural phenomena, features of the way of life and mentality, life values, lessons, wisdom, etc.).

In the riddle, the similarity between what is given and what needs to be guessed is veiled by all sorts of subtleties. Complex associative connections are shown in each order. The mysterious object is deeply hidden under the cover of various means (transmission in poetic form, multiple meanings of connections, etc.). However, this method of creating a structure of riddles for those who guess them is just as entertaining as it allows you to test the degree of your intellectual maturity. As already noted above, the texts of riddles were often poetic (or in other words, there was an aesthetic way of transmitting information). This was done in order to increase the impact on the opponent and the public, to cause additional interest in the process. It is difficult for the solver to establish what is used in the text exclusively for the purpose of rhyming, and what refers directly to the meaning (mental side of information).

Take, for example, the riddle: “Torde torteui otyr tor-emin dep, esikte ekeui otyr olemindep” (four people sit in the place of honor — proud, and two are offended at the door). In this case, the translation is done correctly, but for the Russian reader and even for the younger generation of Kazakhs, it is not clear what is being discussed here. This is explained by the fact that the one who created the riddle, to the Kazakh word “tor” (living room), selected the word case, the translation is done correctly, but for the Russian reader and even for the younger generation of Kazakhs, it is not clear what is being discussed here. This is explained by the fact that the one who created the riddle, to the Kazakh word “tor” (living room), selected the word “torteu”, which means “four”, according to the rhyme. Meanwhile,

the word “four” has nothing to do with the content of the riddle, but was chosen by the author in order to provide rhyming. Not only native speakers of another language, but even some Kazakh folklorists do not always realize that the word “torteui” is selected by the similarity of sound with the word “tor”. Meanwhile, the things that are inside the yurt (tor) do not have to be four, but may be more or less. (Answer: a place of honor — a place for guests inside the house and door jambs at the entrance, where guests have never been seated).

In riddles, it is difficult to find the usual logic for a modern person. Therefore, we found it possible to interpret the method of “stamping” the riddle, as well as its context in a broad sense, as factors influencing the solution (decryption) of the riddle from the standpoint of the hypothesis of linguistic relativity.

Each riddle reveals complex associative connections that a person observes in the process of his life in nature.

Difficulties caused by metaphoricality are especially evident in solving competing riddles. Special efforts are required from the author to achieve the masking of the desired object. The complexity of creating a riddle is aggravated by the fact that the author must think not only about the masking of the answer, but also about the need to dress the content in a poetic form. Simultaneous compliance with these requirements is an even greater burden for the mind. For the solver, these difficulties are reversed. From the wide variety of riddle lines (the length of the text of these riddles can sometimes reach several pages), he must choose the one that relates to the object in question, and keep it in the field of attention.

In addition, we note that the model of the considered variety of the Kazakh riddle is often not interrogative. The “question” in it, as a rule, is not at all interrogative in form, but, at least outwardly, is a statement. This is seen, for example, in the Sapargali riddle above. Let’s give them in a short translation: “I saw a strange creature with a hat on its head; it hisses privately, the water in it tastes better than honey...(samovar) “; “There is a house without windows and doors: when it breaks down, a living thing comes out of there...(egg) “; “There is a bag that gets into it, does not pass out of itself, it does not have a permanent place, occasionally a live one gives birth ... (mesh net) “ [1].

It should be noted that if the guessing of ordinary riddles is based on the similarity of shape or color, etc., then the guessing of competitive riddles requires reliance mainly on a functional feature. Barely noticeable functional signs are difficult to detect. Compilers of competitive riddles made riddles difficult not for fun, but when they were solved, the intellectual maturity of a person in public competitions was tested. Therefore, the authors tried to encrypt the answer so that the participants of the opposite side could not guess it.

¹ There is a significant difference between riddles and proverbs. Obyasnyaya prikyi inoskazatel'nogo karakta poslovits, M.M. Mukanov [22, p. 91] writes: “It is logical to assume that the reason for the allusion of Kazakh proverbs is related to the general problem of finding, and the function of allusion had its roots in various kinds of ideas related to the fantastic reflection of reality. Otherwise, it is difficult to imagine why a person who wants to communicate to another does not always communicate directly, but his own judgments are supported by a statement (metaphor).

This feature of the “device” of the riddle and the process of its guessing significantly distinguishes the traditional Kazakh riddle from the usual educational task and brings it closer to what in psychology has been called “creative tasks” or “tasks for consideration” [27]. When solving a learning task, the main load falls on memory and logical reasoning. Solving a learning task, a person understands what exactly from his experience can be used to find a solution and correctly applies this knowledge. When solving a creative task, a person is faced with a situation where his understanding is erroneous, the method is inadequate, and the success of the search depends on whether he can overcome his way of acting. Therefore, when solving a creative task, a large load falls on imagination and reflection [11].

But in Kazakh riddles, both processes (guessing and solving) are further complicated by the requirement to take care not only to hide the hidden object well and dress it in the clothes of a metaphor, but also about the elegance of the descriptive part, compliance with its forms of versification, aesthetic appeal, which the competition itself turns into a theatrical spectacle. Therefore, creating and guessing riddles is not an easy task for people.

The complexity of the riddle from the point of view of versification, although pleasant to the ear, only complicates perception, creating a barrier to differentiating the main plot of the riddle from the redundant moments of the poetic text.

Riddles, which we have called ordinary, are in some cases as difficult to guess as competitive riddles. The difficulties of guessing them are associated with the disguise of the desired under the shell of the ethnic context. The ability to solve riddles is based on models learned together with cultural practices. Dan Ben Amos suggested that “every explanation can be valid as long as it is offered by a native speaker who shares the cultural experience of the community and has an adequate familiarity with traditional knowledge” [33, pp. 249–250].

The connection between the text of the riddle and the hidden object is based not on essential, but on random (I would like to say pragmatic) signs. These random signs, which are hinted at by the riddle, are different in each ethnic group. If this were not the case, i.e. the connection would be unambiguous, then there would be no problem in guessing riddles, and the riddle would turn into a typical educational task, which explicitly contains a method of action to be learned.

The ambiguity and random nature of the connections in the riddle is expressed in the fact that the guesser goes from a private object to recognizing its hidden quality in another private object. Such a course of thought can be called a conclusion by analogy. The conclusion by analogy in psychological terms is often based on association by similarity. It is possible that association by similarity plays an exceptional role in solving riddles. The fact is that the object in the text of the riddle to some extent seems similar to another object (which is encrypted in it). Therefore, when the subject is offered to guess a riddle,

he sorts out objects in his memory that resemble the hidden object. Of course, the condition of the riddle may not always coincide with the answer of the guesser, but he still sees at least a distant resemblance to the subject.

Most riddles require the guesser to identify the object specified in the allusive general statements. As you know, inference by analogy, including transduction, is a process of thought transition from the private to the private. It seems to us that this kind of connection is the basis of the process of guessing traditional Kazakh riddles. In search of an answer, the guesser puts forward hypotheses that may contain an analogy with the original text of the riddle. As a holistic picture of the connections of essential elements is built, the requirements for the desired analogy are concretized. When the essential features of the desired object or situation are identified, the transition to the identification of a similar object is carried out. The sudden discovery of the coincidence of objects by similarity is often experienced as an insight [23] – a phenomenon that has become the main object of research in the European tradition of productive thinking [9] and in the psychology of creative thinking in Russia (S.L. Rubinstein [29], Ya.A. Ponomarev [27], A.V. Brushlinsky [3], V.K. Zaretskyi [10; 11], B.D. Elkonin [31] and others).

In the mindset of the guesser, a great role is played by sorting through various options in order to find what is needed, but both creative tasks and Kazakh riddles cannot be solved by sorting through options.

The correlation of the text of the riddle with the hidden object depends primarily on the hypothesis put forward, on the guess. Very rarely, the guesser guesses the hidden object “on the move”. One by one, he puts forward particular hypotheses in which the vision of the problem situation contained in the riddle changes. And the new options are derived from the new “picture” of the situation. The solution is the experience of the coincidence of two images: the image contained in the riddle, and the image in the riddle, in which the hidden content is extracted.

Conclusion

The use of methods of ethnopsychology (psychological anthropology), historical ethnology and cultural-historical psychology seems to be very productive for studying the role of riddles in the cultural, intellectual, personal development of representatives of the corresponding ethnos in the pre-written period. Kazakh riddles are a vivid example of the traditional form of broadcasting cultural and historical experience from generation to generation, compensating for the lack of an educational institution in the modern sense of the word. As a genre, riddles belong in all cultures to the archaic layer of folklore. But the images and poetic comments of even simple riddles are clearly part of the general literary culture. They remain in the culture of a written person

not only as a message, as a reminder of a faded tradition, but also contain in a kind of encrypted form the unique historically formed ways of thinking, features of mentality, forms of storage, accumulation and transmission of cultural and historical experience of an ethnic group that supports its integrity and uniqueness.

The traditional Kazakh riddles reflect the ethnomental paradigms of the Kazakh people. Acquaintance with them gives an opportunity to get acquainted with the historical context of the life of Kazakh society.

In simple folk riddles, external signs of objects are usually given, and in competitive ones, in parallel, their most essential qualities and causes of phenomena are outlined. In simple riddles, the answer is usually expressed in one word or a simple sentence. In competitive riddles, the answer, like the very basis of the riddle, results in the form of poetically rhymed poetic lines.

If the ordinary riddles are intended mainly for entertainment, then the competitive riddles had a deeper purpose. The practice of solving riddles seemed to replace school knowledge, teaching children quick thinking, intellectual skills and classification. Competitive riddles, composed mainly by improvisational poets, propagandized the importance of knowledge, art, and technology. Public and social topics were also touched upon in the competitive riddles. That is, for centuries riddles, as part of oral folk art, performed various social functions, the main of which should be considered an educational function – the translation of cultural and historical experience.

The ethnic orientation of the riddle is connected with its very psychological and logical nature. The psychological and logical nature of riddles can be interpreted both

in terms of the way they are guessed, and in terms of the ambiguity of the answer.

In simple folk riddles, external signs of objects are usually given, and in competitive ones, in parallel, their most significant qualities and causes of the phenomenon are outlined. In simple riddles, the answer is usually expressed in one word or a simple sentence. In competitive riddles, the answer, like the very basis of the riddle, takes the form of poetically rhymed lines of verse.

If the usual riddles were intended mainly for entertainment, then the competitive riddles had a deeper purpose. The practice of solving riddles seemed to replace school knowledge, teaching children quick thinking, intellectual skills and classification. Competitive riddles, composed mainly by improvising poets, promoted the importance of knowledge, art, and technology. The competitive riddles also touched on social and social topics. That is, for centuries, riddles, as a part of the oral folk art, performed many social functions, including the function of transmitting cultural information from one generation to another.

We have considered the process of guessing riddles in two ways: firstly, in terms of the influence of the ethnic context on the guessing process; secondly, in terms of how mental activity proceeds in the process of searching for the desired.

The difficulties of guessing them are connected with the disguise of the sought under the shell of the ethnic context and a special way of "stamping" the riddle. The poetic form of the riddle, although pleasant to the ear, makes it difficult to perceive, creating a barrier to differentiating the main plot of the riddle from the redundant moments of the poetic text.

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Comparative Analysis of the Effectiveness of Individual and Group Forms of Language Learning in the Zone of Proximal Development in Middle School Age

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The research is devoted to the problem of organization of language learning in the zone of proximal development by means of actualization of language intuition. Hypotheses are tested: training to translate texts containing quasi-words in the zone of proximal development leads to growth of the level of language competence; under specific conditions, training in a small group in the zone of proximal development is no less effective compared to the individual teaching of each pupil. The sample consisted of 74 children under 12 years old. An intergroup two-factor experiment was conducted (presence / absence of training — individual / group work). The author's technique "Translation of texts consisting of quasi-words into Russian" was used. The teacher's assistance in translating quasi-words into Russian in the form of reflexive cooperation with the child, encouraging him to recreate the integral meaning of the text in combination with checking the meanings of quasi-words for compliance with the morphological / grammatical context is the optimal strategy for teaching using quasi-texts. Training leads to improved skills of completing unfinished words in sentences in Russian. The effectiveness of training in a small group indicates the possibility of taking into account the zone of proximal development of each child in group work.

Keywords: zone of proximal development, quasi-language, assessment of the development of the Russian language, reflection of the child on the facts of the language, language, language competence, language learning.

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Сравнительный анализ результативности индивидуальной и групповой форм языкового обучения в зоне ближайшего развития в среднем школьном возрасте

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Исследование посвящено проблеме организации языкового обучения в зоне ближайшего развития посредством актуализации языковой интуиции. Проверяются гипотезы: обучение переводу текстов, содержащих квазислова, в зоне ближайшего развития ребенка приводит к повышению уровня языковой компетенции; при определенных условиях обучение в малой группе в зоне ближайшего развития является не менее результативным по сравнению с работой педагога с каждым учеником в отдельности. Выборка состояла из 74 детей в возрасте 12 лет. Проводился межгрупповой двухфакторный эксперимент (наличие/отсутствие обучения — индивидуальная/групповая работа). Использовалась авторская методика «Перевод на русский язык текстов, состоящих из квазислов». Оптимальной стратегией обучения с использованием квазитекстов является помощь педагога в переводе квазислов на русский язык в форме рефлексивного сотрудничества с ребенком, побуждающего его к воссозданию целостного смысла текста в сочетании с проверкой значений квазислов на соответствие морфологическому/грамматическому контексту. Обучение приводит к улучшению навыков дополнения незаконченных слов в предложениях на русском языке. Результативность обучения в малой группе указывает на возможность учета зоны ближайшего развития каждого ребенка при групповом обучении.

Ключевые слова: зона ближайшего развития, квазиязык, оценка развития русского языка, рефлексия ребенка на факты языка, язык, языковая компетенция, языковое обучение.

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Introduction

The study of the native language and its use in speech practice is the most important area of the formation of the child's personality throughout the entire speech ontogenesis. At school age, due to the growing gap between the enrichment of speech experience in everyday life and the need to acquire the language knowledge at school, which, to a significant extent, are of a formal nature, the organization of effective language learning becomes a psychological and pedagogical problem. Especially acute, against the background of the emerging crisis of educational activity, the problem becomes in middle school age [4]. To solve it, it is necessary to use such forms of organization of the educational process and such methodical support that allow for language learning and diagnostics of the language acquisition's level in the zone of proximal development (ZPD) of pupil [2].

The need to use unusual linguistic tasks in the course of teaching, which are not reproductive, but search, problematic, in nature, actualizing the creative independence of pupil in working with the text, is acutely felt within the framework of pedagogical practice [7; 11; 12]. To organize effective language learning, linguistic tasks should create conditions for the actualization of the child's language intuition (sense of language). The significance of this characteristic for language learning can be understood within the framework proposed by E.D. Bozhovich. It has an original approach to understanding language competence as an integral psychological system consisting of three mutually reinforcing components — language knowledge, speech experience and sense of language [4]. The sense of language allows a child to intuitively understand separate utterances and texts based on hidden semantic connections, identify systemic aspects of language in speech, monitor and check the speech product for compliance with the norm

of use, evaluate the correctness and appropriateness of using certain language units in a given speech context, as well as — in conditions of lack of knowledge. On the basis of unconscious generalization, the child's inner images of linguistic phenomena are formed [4; 6; 24]. The importance of appealing to the child's sense of language in the course of teaching is noted by many teachers; sense of language is regarded as the most important methodical category in the practice of language teaching [3; 11; 24].

We believe that the methodical technique of actualizing the sense of language in a child can be the use of quasi-words in the construction of linguistic tasks. In such words, the root bases are meaningless, but the morphological /grammatical rules of their structure are similar to the rules of the Russian language. The task of adequately translating quasi-language constructions into Russian, taking into account the linguistic context, creates conditions for the child's reflexive attitude to language phenomena [23].

The idea of using a quasi-language to actualize language reflection is not new. Back in the 30s of the XX century, linguist L.V. Shcherba offered students of the linguistics course to analyze the sentence "*Glo-kaya kuzdra shteko budlanula bokra i kurdyachit bokry-onka*" in order to identify linguistic rules [20]. The phrase turns out to be meaningful due to the fact that the quasi-words retain all the necessary morphological features of real words of the Russian language and are grammatically related to each other. The effectiveness of using quasi-language material for the purposes of language learning was shown earlier in a sample of younger schoolchildren. After the children were offered tasks for the formation of case endings of quasi-words, for the adequate solution of which it was necessary to apply the rules of the formation of cases of Russian words, the pupils used the experience gained quite effectively when solving problems for the formation of case endings of "Russian" nouns [22]. We assume that in older ages, to test the hypothesis about the influence of quasi-language tasks on improving of the knowledge of the Russian language, it is necessary to use the text level in the construction of quasi-linguistic tasks.

As E.D. Bozhovich notes, in the course of working with unusual language material, schoolchildren can focus both on the grammar rules studied at school ("grammarians") and semantic component of utterances ("semantics"). Semantic orientation prevails because it corresponds, in the terminology of L.S. Vygotsky [8], to "spontaneous" learning and accumulation of speech experience during communication. Taking into account its grammatical component when working with language material is the result of "reactive" learning according to the teacher's program, and causes less interest among schoolchildren. Teaching "grammarians" to take into account the semantics of utterance when performing tasks, and teaching "semantics" to focus on the grammatical structure of utterances is a difficult problem in

the process of school education. Only the integration of these components during the formation of language competence allows a child to treat the sentence / text as an integral language sign [3]. We assumed that the task of translating texts with quasi-words into Russian would allow a child, along with taking into account the semantics of the text, to reflexively treat its grammatical component. The formation of such strategy will be effective, if a pupil cooperates with a teacher, corresponding to the principle of diagnostics and learning in the child's ZPD.

The concept of "zone of proximal development" (ZPD), developed by L.S. Vygotsky, is of crucial importance for the theory and practice of diagnosing of the child's mental development. In general terms, what a child is able to do at the moment only in cooperation with an adult is the child's ZPD. Using the concept of ZPD researcher can predict which cognitive tasks a child will be able to solve independently without the help of an adult in the near future [9]. The principle of diagnosing of the child's mental development in ZPD has become the leading principle of organizing and conducting of learning in domestic and foreign psychological and pedagogical practice [1].

Learning work in the ZPD is possible if many conditions are met. The child-adult cooperation should occur during the performance of certain tasks corresponding to the studied area of mental development. The tasks must be cognitively difficult so that the child can solve them with the assistance of an adult. The educator must respond in a dosed, timely and adequate manner to the mistakes and correct decisions of the child, offering him such assistance that allows the learner to reach a new level of understanding of the problem solution. It is necessary for an adult to ensure the emotional and motivational involvement of a child in the learning process, to reinforce his cognitive activity and initiative at all stages of interaction, and, ultimately, to contribute to the formation of a child as a subject of his own activity [2; 13—16; 21]. This list of conditions, which does not pretend to be complete, demonstrates the complexity of the implementation in practice of the ZPD principle when educational work with a child is being organized.

There are very few studies of language development taking into account the principle of ZPD. In addition to our research mentioned earlier [22], it is necessary to note the work of E.D. Bozhovich, in which the possibilities of creating conditions for the diagnosis of language competence through indirect cooperation with a pupil, i.e. through specially organized stimulus material, with which each pupil worked independently, were studied. The levels of help were created by: offering children different rules for operating with language material samples in solving problems of converting personal sentences into impersonal ones; including phraseological units that needed to be explained in different contexts of sentences with varying degrees of difficulty for understanding. Various types of work with language material were found de-

pending on the zone of actual development of children, the dynamics of changes during the transition from task to task with varying complexity was revealed. It has been revealed that the possibilities of diagnosing of ZPD of language competence in the absence of interaction of the teacher directly with each pupil are limited by methodical possibilities and the actual level of language competence of pupils [2]. Thus, empirically, the question of teaching a child in ZPD in the field of language competence in the course of cooperation with an adult, involving the level of a sentence / text, has not been worked out.

Considering the concept of ZPD, L.S. Vygotsky noted that its identification is possible not only in the context of cooperation with an adult, but also in interaction with peers [10]. As G.A. Zuckerman notes, developing interaction in the ZPD is more effective if it is deployed within the framework of the “adult – study group” community [21]. From the point of view of A.-N. Perret-Clermont, the members of the study group should have such characteristics that, in the situation of solving the problem, would lead to a socio-cognitive conflict. The creation of groups in which participants have different levels of knowledge and development of intellectual abilities, and, therefore, can express different points of view on the solution of a problem task, makes it possible to actualize socio-psychological conditions for cognitively intense activity of all participants in the educational process [25]. Important parameters for the formation of study groups can be: the levels of intellectual development and cognitive activity of a pupil, his competence in a certain area in which learning takes place; the sociometric status of pupil. Differences of children in these characteristics in one group may be one of the conditions for making an “individual contribution” to group work [5]. Taking into account the socio-psychological context there are created learning, emotional-motivational and cognitive prerequisites for effective cooperation of the teacher with a group of pupils in the ZPD [19]. Verification of this provision in the context of language learning in the ZPD seems to be an urgent task. Taking into account in the experimental study all the factors discussed above that determine the activity of a child in a small study group is the subject of a separate study. In our study, the selection of pupils into small groups was carried out only according to one criterion – the level of language competence assessed by the teacher. On the one hand, such selection of pupils allowed to ensure the equivalence of experimental and control groups to each other in terms of language competence, and on the other hand, selection of pupils allowed to create conditions for a cognitively rich discussion in groups in which children with different levels of language competence jointly solved the tasks set by the experimenter.

The purpose of the study was to compare individual and group forms of learning in a child’s ZPD from the point of view of effectiveness in improving of the level of language competence in middle school age.

A research scheme was implemented in the study that allows to test **hypotheses**:

- learning to the translation of texts containing quasi-words in the ZPD improves the level of language competence in middle school age;
- the group form of organization (in a small group in cooperation with a teacher) of solving quasi-language tasks provides approximately the same increase in the level of language competence in Russian as the individual form of learning (a pupil in cooperation with a teacher).

The most important results are presented.

Sample

The study involved three 6th graders from different secondary schools in Moscow. In each class, the experiment was conducted on samples of 24–25 pupils aged 12 years.

Research Method and Procedure

The research scheme was an inter-group two-factor (presence / absence of learning in the ZPD – individual / group work) experiment without preliminary testing of the level of language competence in Russian.

At **the first stage**, the Russian language teacher in each class assessed the level of knowledge of children on a 5-point scale. The estimates were used for stratified selection of children into groups. Each class was divided into four subgroups, there was approximately an equal number of subjects in each subgroup. Two experimental and two control groups were created from the subgroups. Each group included one subgroup from the class.

At **the second stage**, an experiment was conducted. The author’s technique “Translation of texts consisting of quasi-words into Russian” was used. It includes five texts with different plots. The texts contained mainly quasi-words, which are formed in accordance with morphemic / word-formation models of Russian words (for example, sentences from text No. 1: “*Gal na odnom garote Kiremet’. Na garote eshche gali sarapushki, babary i paritki*” [“*Kirem gals in garot. There were also sarapushkies, babars and paritkies in garot*”]). Each text consisted of a unique set of quasi-words, in different texts the same Russian word could be represented by different quasi-words. The child was given a task to translate the text into Russian. Russian instructions noted that the roots of quasi-words may differ in sound and number of syllables from the roots of Russian words, but the way they are formed and used in sentences corresponds to the rules of the Russian language. The indicators were analyzed:

- a) semantic correspondence of the translation of quasi-words to the general meaning of the text and relevance of the translation option in this sentence (“Semantics”);
- b) taking into account when translating the morphemic / word-formation model of the quasi-word and the

possibility of adequate translation taking into account the language rules of other quasi-words in the text derived from the quasi-root of this word ("Grammar");

c) a variant of the translation of the quasi-word according to the principle of sound similarity (the decoding is based on the sound similarity of the quasi-root of the word with a certain Russian word) ("Sound similarity").

Each answer was rated from 0 to 2 points. For each text, the points were converted into percentages of the maximum possible amount of points for each text. In pilot studies, the equivalence of texts to each other in terms of the level of complexity of working with them has been proved [23].

At the introductory stage, each pupil individually translated text No. 1. Then experimental learning was carried out with each subsample from the class using texts No. 2–4.

At the formative stage, learning was carried out in two experimental groups. In two control groups, the work with artificial texts was similar to the work carried out at the introductory stage. Working with each text took one training session (conducted in one day).

In the experimental group "Individual learning" (one subgroup from each class, 6–7 subjects in each subgroup, a total of 3 subgroups – 20 children) during the learning stage, each child independently translated quasi-texts. After completing each task, the experimenter teaches each child based on the nature of his mistakes, allowing the child to correct his translation based on the assistance of the experimenter. When the child was guided when translating into account the general meaning of the text without focusing on the morphology of words and their grammatical role in sentences, the experimenter suggested turning to the analysis of the meanings of quasi-words within the framework of the language rules set by the text, similar to the rules of the Russian language. If the child was mainly aimed at morphological / word-formation analysis of quasi-words, taking into account their grammatical role in sentences, but the semantic integrity of the text was violated, the experimenter suggested that the child reflexive the meanings of individual words that are key to understanding of the entire text. Thus, the experimenter, in the course of cooperation with a child, provided assistance similar to the tactics of "process assistance" developed within the framework of the reflexive activity approach [17], i.e. sought to help realize incorrect decisions and find ways to overcome difficulties in translating quasi-texts. The purpose of this learning was to develop the only correct approach for the child, from our point of view, to the translation of experimental texts into Russian: to recreate the general meaning of the text and meanings of words in combination with checking the translation for compliance with the proposed morphological and grammatical context.

In a similar way, children from the experimental group "Group learning" (one subgroup from each class, 6 subjects in each subgroup, a total of 3 subgroups – 18 children) learned with the difference that children were asked to decode "artificial" texts in pairs, after

which the experimenter conducted a discussion of translations with the whole group, based on the nature of children's mistakes, giving each child the opportunity to express their translation options, allowing all children to adjust their translations based on group decisions. When pairs formed, teachers' assessment scores were taken into account: in each pair, children had different ratings.

In the control groups, the experimenter did not interfere in the course of the children's work, i.e., there was not teaching in the ZPD.

In the control group "Individual work" (one subgroup from each class, 6 subjects in each subgroup, a total of 3 subgroups – 18 children), the children were performing the same task as at the introductory stage.

In the control group "Group work" (one subgroup from each class, 6 subjects in each subgroup, a total of 3 subgroups – 18 children), children were asked to decode "artificial" texts in pairs, after that the whole group had the opportunity to independently discuss their translations and adjust them depending on the results of the discussion. The experimenter only recorded the final decision of the group.

At the final stage of the experiment, each pupil individually translated text No. 5.

At *the third stage*, diagnostics of the general level of language competence in Russian was carried out in each class in the form of a lesson. The C-test was used (U. Ratz, N.B. Mikhailova). The test includes 5 small texts in which words with missing parts occur with a certain frequency. The subject needs to read the text and complete the unfinished words semantically / grammatically correctly. Each correct execution is estimated at 1 point. "Raw" scores were converted into equivalents of school ratings in accordance with the test manual [18]. Estimates of the parameters of the C-test were recognized by us as indicators of the level of learning result of children.

Statistical data processing was carried out using the STATISTICA 12 package. The following methods were used: ANOVA to compare several related or unrelated samples by level of characteristic; Newman–Keils criterion for *Post Hoc* analysis procedure.

Results

Based on the teachers' expert assessment scores, each class was divided into four, approximately equal, parts (6–7 pupils in each part). Approximately equal number of children who received ratings "3", "4" and "5" from teachers were selected for each group. The subgroups from each class were randomly distributed into two experimental and two control samples. No differences were found between them in the performance of the task with experimental text No. 1.

Differences in the indicators of "Semantics" and "Grammar" of translations of texts No. 5 and No. 1 in the groups "Individual learning" and "Group learning"

($p < 0.001$) were revealed: the average percentage of correct translations of quasi-words into Russian increased in both groups. The results of the translation text No. 5 in the group “Individual learning” were higher than in the group “Group learning” ($p < 0.05$) on both indicators. In the control groups, the change in all parameters was statistically insignificant. At the same time, if there were no differences in the indicators “Semantics” and “Grammar” between the group “Group learning” and the control groups, then in the group “Individual learning” there was a tendency to higher scores on these indicators compared to the control groups ($p < 0.10$).

Taking into account the factor of teachers’ assessments shows that in the group “Individual learning”, an increase in the percentage of words correctly translated

into Russian in terms of their semantic and grammatical correspondence to the context was demonstrated by all children, regardless of expert assessment scores ($0.01 < p < 0.001$). An increase in children’s scores, regardless of teachers’ assessment scores, was found in the “Group learning” sample by the indicator “Grammar” ($p \leq 0.05$). The semantic correctness of the translation of quasi-textual material has significantly increased only in children previously rated by teachers as “four” ($p < 0.01$, in all other subgroups the level of significance of the increase is $0.06 < p < 0.17$). In the control groups selected on the basis of teachers’ assessment scores, no significant increase was found in any of the indicators of the effectiveness of translation of experimental texts. The distinctions clearly described are shown in Figures 1 and 2.

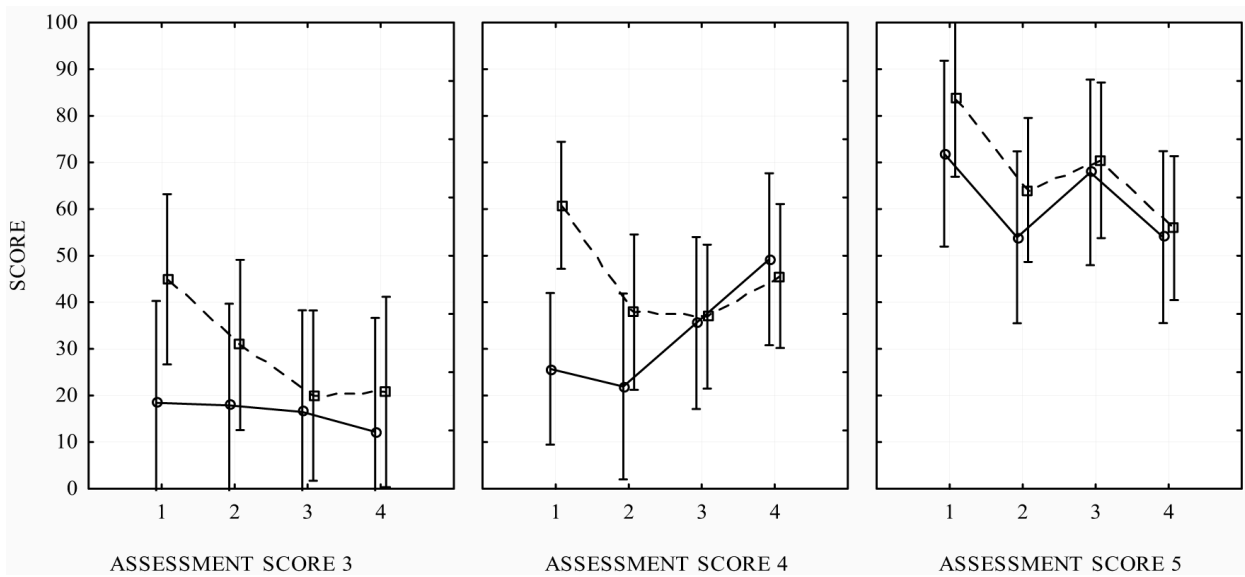


Fig. 1. Inter- and intra-group differences based on the results of preliminary test using text No. 1 and final test using text No. 5, taking into account preliminary expert assessment scores on the characteristic “Semantics”: ——— — preliminary test; ——— — final test; groups 1 — “Individual learning”, 2 — “Group learning”, 3 — “Individual work”, 4 — “Group work”

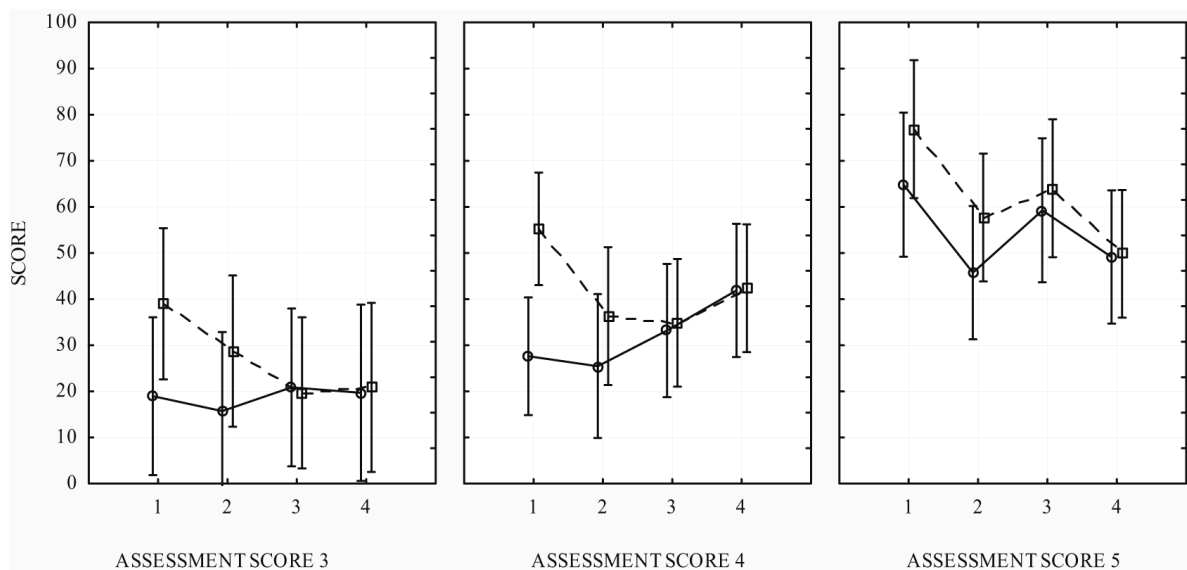


Fig. 2. Inter- and intra-group differences based on the results of preliminary test using text No. 1 and final test using text No. 5, taking into account preliminary expert assessment scores on the characteristic “Grammar”

Differences were found between the groups according to the level of performance of the C-test. The pupils from the group "Individual learning" had the highest scores. Although this group did not differ statistically significantly from the "Group learning" sample, its scores were higher compared to the "Individual work" ($p < 0.05$) and "Group work" ($p < 0.05$) groups. The analysis of the results taking into account expert assessment scores showed that if there are no differences between children according to the C-test scores depending on expert assessment scores in experimental groups, then there are distinct differences in the level of language competence between pupils with teachers' assessment rating scores "3" and "5" ($p < 0.05$ and $p < 0.001$, respectively) in control groups. In the absence of inter-group differences between pupils with teachers' assessment rating scores "4" and also between pupils with teachers' assessment rating scores "5", children who received rating "3" from teachers had school ratings on the C-test higher than pupils with rating "3" from both control groups ($p < 0.005$) after the individual teaching of the experimenter in the child's ZBR. A less pronounced effect was observed in pupils with teachers' assessment rating scores "3" from the group "Group learning" ($p \leq 0.05$). The results are shown graphically in Figure 3.

Discussion

The learning in the ZPD proved to be effective in both experimental samples. However, since there were differences in the parameters "Semantics" and "Grammar" of text No. 5 between the groups "Individual learning" and "Group learning", the effect of this learning is more pronounced in the first group. The small differences between the "Individual learning" group and control groups are explained by the fact that at the introductory

stage, the control groups had slightly higher results than both experimental samples.

Differences in the estimates of the effectiveness of the translation of experimental texts No. 1 and No. 5 in subgroups, taking into account the teachers' expert assessment scores, show that individualized teaching of each pupil in the ZPD leads to an improvement in the skills of translating quasi-language material. The positive effect of the learning in the conditions of a small group was less pronounced. Independent work on the translation of quasi-texts does not improve the quality of translation. Due to the objective complexity of the tasks, it can be assumed that their solution without the assessment of an adult remains, using the V.K. Zaretsky's term, in the individual "zone of unbearable difficulty" of pupils [14]. In the case of group work, uncontrolled by the experimenter, pupils could collectively offer such versions of translations of quasi-words, which often distanced them from the correct solution of the linguistic task, and socio-psychological processes arising during the discussion led to collective uncritical adoption of these decisions. The proposed tasks are quite difficult for children in middle school age. Apparently, this is the reason why the joint solution of tasks in subgroups composed of pupils of different levels of knowledge of the Russian language did not lead to positive results. It is also known that the introduction of forms of pupil collaboration into the learning process is a difficult task until the age of 13–15 years [19]. The relative effectiveness was shown by the situation of discussing of translations by a group together with an experimenter who helped resolve the contradictions that arose in children, which is proof of the importance of the role of an adult in the effective use of the social context of learning to achieve learning goals [19; 25]. It should be noted that in the case of group teaching children with different levels of language competence, learning in an individual ZPD was

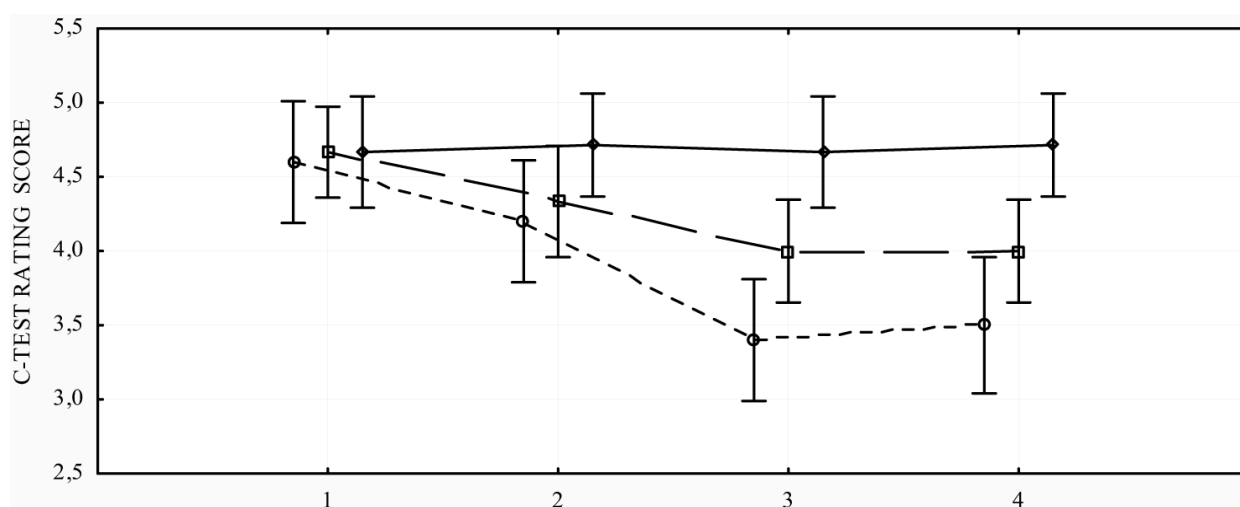


Fig. 3. Inter- and intra-group differences in C-test rating scores of the depending on the factor of expert assessments: - - - - expert rating "3"; - - - - expert rating "4"; - - - - expert rating "5"

an ideal goal, which, nevertheless, the experimenter sought to get as close as possible. He could analyze and generalize specific mistakes in the answers of pupils, use typical examples of mistakes to formulate helpful questions that bring children closer to understanding their strategies for translating quasi-texts into Russian. At the same time, it was necessary to promptly provide such assistance, which for the majority of pupils in the group would relate to the individual ZPD of each of them. The correct answers of children for whom the solution of the proposed tasks was still carried out in the zone of actual development were used by the experimenter for joint reflection of the methods of action with the pupils.

The inter-group differences in the C-test scores give grounds to assert that a relatively high level of learning in operating with language material is achieved by children who have undergone individualized learning. The children were sensitive to the assistance in the ZPD provided by the experimenter, they had a transfer of the experience gained to solving similar tasks in Russian. The analysis, taking into account the teachers' assessment scores, shows that learning in the ZPD led to smoothing out the differences in the level of language competence that existed between children before the experiment. If the children in the experimental groups after the teaching did not differ from each other in the C-test scores depending on the teachers' assessment scores of knowledge of the Russian language, then the C-test scores generally corresponded to the teachers' assessment scores in the control groups. Taking into account the factor of expert assessments allows to say that the teaching in the ZPD led to an improvement in the skills of semantically / grammatically correct addition of unfinished words in sentences in those children who had a low level of knowledge of the Russian language before the experiment.

The proposed teaching program using quasi-language tools allows to teach not only each pupil, but also a small group, taking into account individual ZPD. This

aspect is important for the practice of school education. Paired work of children with subsequent teacher-controlled group discussion helps pupils with low level of language competence to make clear progress in a relatively short time in understanding the language rules, which corresponds to the ideas about the importance of social interaction for effective learning [5; 19; 25]. For pupils with high level of language competence, classes with the use of more complex quasi-language tasks are necessary.

Conclusions

- The use of texts consisting of quasi-words in which the root bases are a meaningless set of syllables, but their word formation and grammatical roles correspond to the rules of the Russian language, during learning in the zone of proximal development leads to an improvement in the skills of semantically / grammatically correct addition of unfinished words in Russian sentences.
- The greatest effectiveness in improving the level of language competence is observed in children with a low level of language knowledge.
- The optimal strategy of language learning using quasi-texts is the teacher's assistance in translating quasi-words into Russian in the form of reflexive cooperation with a child, encouraging him to recreate the integral meaning of the text in combination with checking the meanings of quasi-words for compliance with morphological and grammatical context.
- The group learning in the form of cooperation of pupils with each other and an adult, during which the teacher uses typical mistakes of children for joint reflection of translation strategies in the zone of proximal development of the majority of pupils in the group, uses the correct answers of pupils with high level of language competence as material for a reflexive discussion of the way to solve linguistic tasks by the whole group, leads to increased efficiency of language learning.

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В поисках субъекта учебной деятельности

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Наше исследование интерпсихического взаимодействия учителя и первоклассников проведено методом микроанализа двух кейсов постановки одной и той же учебной задачи. Этот метод клинического исследования позволяет предметизировать теоретические представления о природе интерпсихического действия: 1) и ребенок, и взрослый впервые решают новую для себя задачу, действуя по собственным замыслам и инициативам; 2) неаддитивный эффект интерпсихического действия может быть достигнут, если инициативы всех участников пересекаются, а замыслы координируются. Сделав реконструкцию учительских намерений и детских прочтений задачи, предложенной учителем, работающим в деятельности или традиционной парадигме, мы выделили продуктивные и контрпродуктивные действия взрослого, которые могут открыть или заблокировать возможности инициативного поведения детей при конструировании новых понятий, снизить или усилить потенциал исполнительского, нерассуждающего поведения. Рождение детских инициатив при постановке учебной задачи, рассмотренное на уровне функционального генеза, в онтогенезе видится как развитие умения учиться — высшего проявления учебной субъектности человека, способного к самостоятельному выходу за пределы собственных знаний и умений для поиска способов действия в новых ситуациях.

Ключевые слова: субъект учебной деятельности, умение учиться, учебная задача, учебное сообщество, понятийная инициатива, пересечение инициатив ученика и учителя.

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In Search of the Subject of Learning Activity

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Our research on the interpsychological interaction of teachers and first graders was carried out by microanalysis of two cases when the identical learning tasks were set. This method of clinical research makes it possible to expose the theoretical dimensions of an interpsychological action when (1) both a child and adult solve a new task for the first time, acting on their own accord and on their own initiatives and designs, (2) the nonadditive effect of interpsychological action can be achieved when the initiatives of all participants intersect and their designs are coordinated. By reconstructing the teacher's intentions and children's interpretations of the task proposed by the teacher, working in the activity-based or traditional paradigm, we identified productive and counterproductive adult actions that can open or block opportunities for children's proactive behavior in constructing new concepts and reduce or enhance the potential of executive, nonreasoning behavior. The birth of children's initiatives when setting a learning task, when elucidated at the level of functional genesis, is seen in ontogenesis as the development of the ability to learn, that is considered as the top manifestation of the subject of learning activity, capable of independently going beyond his or her own knowledge and skills to find new ways of action in novel situations.

Keywords: subject of learning activity, ability to learn, learning task, learning community, concept initiative, intersection of student's and teacher's initiatives.

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Постановка проблемы: направленность детского действия в ситуации учебной задачи

Ребенок становится субъектом, «автором, хозяином» [11 с. 161] своих действий, поступков и проступков задолго до того, как он становится школьником. Значительный предшествующий опыт субъектного поведения младшего школьника может быть обогащен, если ребенку удастся, оставаясь субъектом множества дошкольных дел (общение и сотрудничество, игра и конструирование, двигательное, вокальное, коммуникативное, познавательное экспериментирование, и пр.), стать еще и субъектом учебной деятельности. В этой статье речь пойдет о том, кто такой «субъект учебной деятельности», каковы педагогические условия его рождения, роста и развития, по каким диагностическим критериям мы можем судить о том, что ученик или группа учеников действуют субъектно в ситуации учения—обучения.

Появлению и укоренению субъектной позиции ребенка способствует образовательная среда, открывающая перед ним следующие возможности [12]:

- действие *по собственной инициативе* (от лат. *initium* — начало), само-побуждение к началу и продолжению какого-либо дела или недаяния VS пассивность;
- действие *по собственному замыслу*, или действие независимое, свободное, творческое VS подражательность;
- действие *без посторонней помощи* VS беспомощность.

Применительно к учебной деятельности это означает следующее:

- *детская инициатива* направлена на разрешение понятийного противоречия;
- *детский замысел* содержит начальный, смутный план разрешения понятийного противоречия;
- *автономные, индивидуализированные действия ребенка* опираются на освоенные ранее средства анализа понятийного противоречия, но дети пробуют применить их в новых обстоятельствах.

Известно, что проявления учебной субъектности особенно заметны в ситуации постановки и решения учебной задачи [15]. Сейчас термином «учебная задача» нередко называется любое задание учителя, связанное с содержанием урока. Напомним, что Д.Б. Эльконин и В.В. Давыдов ввели в психолого-педагогический узус термин «учебная задача» специально для того, чтобы выделить в массе школьных заданий особый класс задач, требующих открытия и освоения общего способа решения широкого круга конкретно-практических задач [5; 16].

Классические определения учебной задачи написаны с позиции проектировщика учебной деятельности, создателя замысла предстоящего события. Здесь учебная задача будет рассмотрена с позиции педагога, реализующего этот замысел и пытающегося определить, что происходит на уроке «здесь и сейчас»: какую задачу решают дети — учебную, практическую или коммуникативную. Исследование направленности детского действия в ситуации учебной задачи мы начнем с точки возможного рождения субъекта учебной деятельности и рассмотрим

(а) самое начало школьного обучения, (б) самое начало работы в ситуации учебной задачи — этап ее постановки. Далее будет проанализирована постановка первой учебной задачи на материале букваря Д.Б. Эльконина.

Направленность детского действия при постановке учебной задачи: case study

Понятийное содержание учебных задач букваря главным образом сконцентрировано вокруг вопроса об отношении звуков и букв при обозначении мягкости/твердости согласных. При решении первой учебной задачи дети открывают способ обозначения мягкости/твердости букв согласных с помощью букв гласных. Перед этим дети учатся выделять звуки в словах, различать гласные и согласные звуки, согласные мягкие и твердые, записывать звуковой состав слов с помощью схем.

Самый первый шаг постановки самой первой учебной задачи в букваре Эльконина начинается с игровой ситуации «найти путь в лабиринте» (рис. 1).

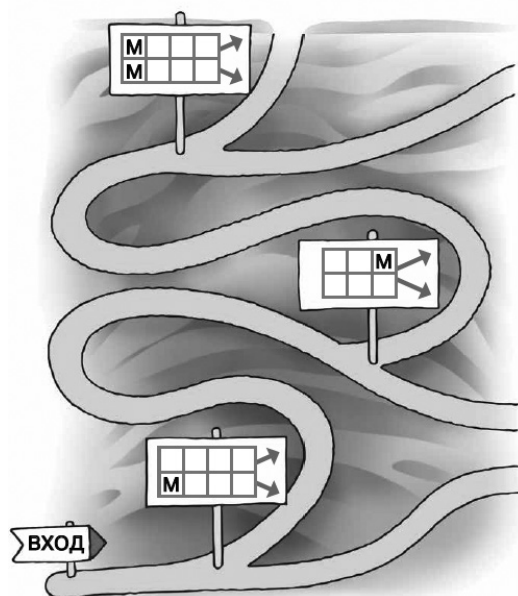


Рис. 1. Материал для постановки первой учебной задачи в букваре Д.Б. Эльконина

Вот проектный замысел этой ситуации из методического пособия, с которым учителя знакомятся до того, как приходят в класс к детям [13]:

Первая развилка: одна дорога ведёт к МОРЮ, где мы можем утонуть, другая — к ЛУЖЕ, которую мы легко перейдем вброд. Покажите, куда нам идти? Объясните, почему вы так думаете? Что нам помогло в выборе пути? (Буква эМ.)

Вторая развилка: на одном указателе написано ДОМ, на другом — ЛЕС. В лесу мы заблудимся. Покажите, куда нам идти? Объясните, почему вы так думаете? Что нам помогло в выборе пути? (Буква эМ.)

Третья развилка: на одной дороге заложена МИНА, другая дорога ведет на МОСТ, по которому мы придем к дому. Покажите, куда нам идти? Объясните, почему вы не знаете? (Или: почему вы все показываете в разные стороны?)

Комментарий. Важно понимать, что это **первое** приближение к основной проблеме букваря: на букве согласного не написано, как её читать — мягко или твёрдо; об этом сообщает следующая буква. Если в этот момент кто-то из первоклассников сформулирует, что мы не знаем, мягко или твёрдо нужно читать букву эМ, обязательно **запишите эту мысль**¹. Если никто из детей не формулирует подобную догадку, учитель сообщает: «Я попыталась почистить эти старинные дорожные указатели и нашла ещё одну букву (рис. 2). Буква эН нам поможет?»

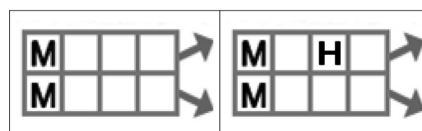


Рис. 2. Как отличить слово МОСТ от слова МИНА. Два этапа работы: переход от нерешаемой задачи (слева) к решаемой (справа)

Содержательным центром этого игрового эпизода является вопрос о том, как узнать, где написано МОСТ, а где МИНА. Детям предстоит выяснить, что *угадать* ответ невозможно, т. е. признать задачу *нерешаемой*. Иными словами, задача требует от учеников определяющей рефлексии — остановки действия и трудного признания: «я этого не знаю», «это сделать невозможно».

Представленные ниже фрагменты двух уроков (табл. 1) показывают, насколько по-разному эта кульминационная ситуация может складываться в разных классах, у разных учителей. Эти фрагменты основаны на видеозаписях уроков. Имена первоклассников изменены, их вербальные и невербальные высказывания оставлены без изменений.

Таблица 1

События двух уроков и комментарии к ним

Первый учитель (У1). Ноябрь.

Эпизоды урока (6 мин.)	Комментарий
1. У1: Смотрим. Последняя развилка. Одна стрелка указывает на МОСТ, а другая предупреждает, что там будет МИНА. 2. Голоса: Мина? Мина!!! Мина снизу... 3. У1: Заминировано, как в войну, а мост безопасен. Куда пойдём? 4. Голоса: Вниз! Вверх!	На доске — схема лабиринта (рис. 1). Дети активны, заинтригованы, готовы действовать в заданной практической ситуации: искать мину. Немедленно переходят к гаданиям

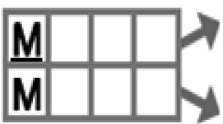
¹ Работа с детскими догадками описана в работе Г.А. Цукерман с соавт. [15].

<p>5. У1: Просто гадать не получится. Кто знает, поднимает руку, выходит и показывает. 6. Коля (<i>у доски «читает» схему</i>): МИНА (<i>указывает вверх</i>), МОСТ (<i>указывает вниз</i>). 7. У1: Согласны? 8. Дети жестами показывают свое согласие («плюс») или несогласие («минус») с мнением Коли. Несколько учеников показывают знак ловушки, который обозначает, что на вопрос ответить невозможно. 9. У1: Смотри на класс. Спроси, почему не согласны. 10. Коля (<i>обращается к Глебу</i>): Почему ты не согласен? 11. Глеб: Наоборот! Вверх — МОСТ</p>	<p>Реплики 7–10 показывают, что учителю за три месяца удалось сформировать в классе навыки невербального взаимооценивания. Но здесь оценочная инициатива принадлежит учителю (реплики 7, 9). Что пока еще не удалось сделать в этом классе, показывают реплики 5–6. Учитель пытается напрямую пресечь попытки действовать наугад, но у него не получается: Коля (реплика 6) и Глеб (реплика 11), как и многие их одноклассники (реплики 2, 4), еще не различают модальности «угадать» и «доказать»</p>
<p>12. У1: Соня, ты одна из первых показала, что это какая-то ловушка. Почему? 13. Соня: Потому что тут два звука начинаются на Мэ. 14. У1: Ух! 15. Вера: Мина — это ловушка</p>	<p>«Не попадаться в ловушки», т. е. отличить решаемую задачу от нерешаемой или недоопределенной — это особая доблесть, которая первоклассникам еще трудна. Соня (реплика 13) демонстрирует полное понимание понятийной интриги задачи. Реплика девочки означает: в словах МИНА и МОСТ буква эМ обозначает два <i>разных</i> звука — мягкий и твердый согласный. С помощью буквы эМ мы не можем их различить. Мы не узнаем, почему учитель (реплика 14) реагирует на Сонино высказывание чисто эмоционально, не пытаясь переадресовать его классу и выяснить, насколько эта мысль понятна другим детям. Ясно, что Вере (реплика 15) Сонина мысль непонятна: Вера переводит понятийное размышление Сони в житейское</p>
<p>16. Боря (<i>выходит к доске</i>): Я думаю, что здесь МОСТ (<i>указывает вниз</i>), а здесь МИНА. 17. У1: Почему? 18. Боря: Потому что здесь может быть такая река. И здесь может стоять мост. (<i>Указывает на пустое место вне звуко-буквенных схем.</i>) 19. У1: А может быть там два моста, один безопасный, другой заминированный</p>	<p>Боря демонстрирует гадательную стратегию решения задачи на псевдо-учебной основе. Вероятно, он усвоил, что в подобных ситуациях учитель ожидает <i>доказательств</i> и лучшим доказательством является указание на <i>схему</i>. Но мальчик использует схему (рис. 1) несодержательно — игнорируя понятийное содержание схемы, толкует ее по-житейски</p>
<p>20. Ваня (<i>тянет руку</i>): Я знаю. 21. У1: Ваня, какая у тебя идея? 22. Ваня: Позвать Тома? 23. У1: Давайте попробуем Тома позвать. 24. Хор: Тооооо! 25. У1 (<i>смотрит в телефон</i>): Все. Сигнал получен. Том нам присылает одну букву. (<i>Вписывает букву Н в верхнюю схему — рис. 2.</i>) Покажите рукой вверх или вниз, куда мы сейчас должны пойти... 26. Все дети показывают правильное направление. 27. У1: Мы пришли к цели (<i>рисует значок победы</i>)</p>	<p>Ваня действует по собственной инициативе (реплика 20) и по собственному замыслу (реплика 22). Учитель подхватывает Ванину инициативу (реплика 23) и действует так, как советует методичка (реплика 25), внося в сухую методичку игровой элемент — используя мобильную связь с волшебником Томом</p>

Второй учитель (У2). Декабрь.

Эпизоды урока (5 мин.)	Комментарий
<p>1. У2: Здесь надо быть осторожными. Одна стрелка ведет к МИНАМ, а другая стрелка на МОСТ, который нам нужен. (<i>Мхатовская пауза.</i>)</p>	<p>Маша, безусловно, действует импульсивно, нарушая правила школьной дисциплины. Но она знает, что здесь это безопасно. Приглашая детей подумать (<i>пауза маркирует ситуации размышления</i>), учитель «говорит»: сейчас ваши мысли важнее всего, даже важнее правил поведения «настоящих первоклассников».</p>
<p>2. Маша (<i>некоторое время тянула руку, не выдержала и подбежала к учительнице</i>): Я хочу сказать про звуки. Надо спросить про звуки. Если мягкий, значит МИНЫ, если твердый, тогда МОСТ. 3. Несколько детей показывают «плюсы», Сима показывает «минус»</p>	<p>Содержание Машинной мысли (я знаю, чего именно я не знаю!) чрезвычайно насыщено (реплика 2). В сущности, девочка переводит нерешаемую задачу в недоопределенную: указывает недостающее условие задачи. В этом классе тоже существуют навыки невербального взаимооценивания. Но здесь оценочная инициатива принадлежит ученикам (реплика 3).</p>

² Том и Тим — братья-волшебники, заботящиеся о благополучии твердых и мягких согласных звуков в букваре Д.Б. Эльконина. Этих обаятельных лингвистических персонажей, воплощающих фонетические понятия, создала Е.А. Бугрименко [1].

Эпизоды урока (5 мин.)	Комментарий
4. У2 (Маше): Давай у Сима спросим, почему минус. 5. Сима: Потому что мы не можем узнать, где мягко и где твердо. 6. Голоса: Надо спросить у Тима и Тома. 7. Федя: А как они попадут к нам? 8. Ася: Позовем	Сима (реплика 5) продолжает понятийное размышление порывистой Маши, соглашаясь с ней (мы, действительно, должны отличить мягкий согласный звук от твердого); добавляя толику трезвости: мы не знаем, КАК это сделать в данных обстоятельствах. Класс вспоминает о волшебных помощниках, которые уже не раз помогали детям (реплики 6–8)
9. У2: Я услышала две хороших мысли. Сима говорит, что мы не можем узнать, где мягкий, а где твердый звук. А Маша говорит: если узнаем, то это нам поможет. Если мягкий согласный — пойдем по этой стрелке (показывает вниз)? 10. Хор: Нет! 11. У2: А если твердый? 12. Хор: Дааа!!!	Учительское резюме мыслей Маши и Сима возвращает внимание класса к понятийному содержанию задачи (реплика 9). Также учитель убеждается, что высказанные мысли понятны классу (реплики 10–12)
13. У2: Тим и Том могут ответить только на один ваш вопрос. Посовещайтесь. 14. У доски Маша, к ней подходят еще 5 детей. Сбились в кружок, шепчутся. 15. Ева: Мы все решили! Надо спросить: какой здесь звук — мягкий или твердый?	Детское предложение воспользоваться волшебной помощью услышано и рационализировано учителем (реплика 13). Детям предложено самостоятельно сделать самый трудный шаг: сформулировать недостающие условия недоопределенной задачи. Реплики 14–15 демонстрируют способность детей этого класса к продуктивной самоорганизации
16. У2: Вы спросите про какое слово? 17. Дети у доски (пошептавшись): В первом слове первый звук мягкий?	В этом эпизоде учитель хочет добиться четкой однозначной формулировки недостающего условия задачи (реплика 16) и убеждается, что дети на это способны и не нуждаются в дополнительной помощи (реплика 17)
18. У2: Нет, не мягкий. 19. Дети у доски показывают пальчиками на верхнюю строчку и кричат: МОСТ!!! 20. Учитель подписывает под первой буквой верхней схемы значок твердости (одной горизонтальной черточкой):	Учитель дает однозначный, предельно лаконичный ответ на запрос учеников о недостающей информации, используя язык схем (реплика 18 и 20). Дети, сформулировавшие запрос, понимают ответ сходу; по эмоциональности их реакции видно, что для них задача решена (реплика 19)
	
21. У2 (детям, сидящим за партами): Кто знает, почему так ликует группа у доски? 22. Дети: Потому, что мы нашли МОСТ! 23. Многие дети выходят к доске, обнимаются. 24. У2: Мы с вами спаслись!	Учителю необходимо понять, насколько работа группы у доски оказалась заметной и понятной остальным ученикам, которые лишь наблюдали за происходящим. Оказалось, что наблюдатели чрезвычайно активно участвовали в решении задачи (реплики 22 и 23). Задача решена, но не так, как предлагается в методике, а так, как предложили дети

Между этими двумя эпизодами много общего. Во-первых, общими являются **замыслы обоих учителей**: поставить перед первоклассниками задачу, которую невозможно решить на основе знаний и умений, уже освоенных детьми. Первоклассники уже умеют определять мягкость и твердость согласных звуков и обозначать ее с помощью значков звуковых схем, где мягкость и твердость согласных определяется однозначно. В описанном эпизоде они впервые могут обнаружить, что букву согласного в отличие от звуковой записи можно прочитать и мягко, и твердо. Отношение звуковой и буквенной записи неоднозначно, противоречиво. Разрешение этого противоречия может (не гарантированно) привести к открытию общего способа обозначения мягкости и твердости букв согласных, лежащего в основе решения широкого круга практических задач чтения и письма.

Реализация проектного замысла, содержащегося в сюжете учебной задачи, возможна, если дети ответят на учительский «вызов» собственными инициа-

тивами и собственными замыслами, т. е. субъектно. Подчеркнем, что учительские формулировки задачи в сравниваемых эпизодах были практически одинаковы. Это не означает, однако, что задача учителя одинаково прочитывается детьми. По направленности детских инициатив можно реконструировать **детские прочтения задачи**. Первому учителю класс ответил серией попыток угадать ответ, второму — внятным запросом информации, необходимой для решения недоопределенной задачи. Мы полагаем, что различия сравниваемых групп первоклассников объясняются, прежде всего, тем, что сделали два учителя для подготовки детей к встрече с первой учебной задачей. Дело в том, что на первой ступени школьного обучения черты субъектности проявляются, прежде всего, в **совместных действиях учебного сообщества** одноклассников и учителя [12; 18]. Различая условия становления учебной субъектности и ее психологические «органы» (прежде всего определяющую рефлексию), мы ищем самые ранние ее проявления не там, где их еще нет, не в индивидуальных действиях

учеников, а в *интерпсихических действиях* взрослого и детей, в которых впервые возникают зародыши будущих психологических новообразований [2].

В обоих классах учителя начали строить учебное сообщество. Об этом свидетельствуют, например, возникающие иногда знаки взаимной оценки. Главная разница между двумя классами в том, что в первом взаимнооценивание инициировано учителем, а во втором дети сами оценивают высказывание одноклассницы. Только второй учитель сделал возможным самостоятельное объединение детей в группу. Едва ли это различие можно объяснить только дошкольным уровнем подготовки детей, здесь видна существенная разница в работе учителя по выращиванию учебного сообщества.

Реконструкция учительских намерений при постановке первой учебной задачи: case study

Пробуждать детские инициативы, детские замыслы предстоящего действия и помочь ребенку в реализации и проверке этого замысла — вот, казалось бы, смысловой центр действий учителя, намеренного воспитывать в своих учениках субъектов учебной деятельности. Однако это прекраснотушное намерение не достигнет цели, если учитель откажется от своего собственного замысла — ориентировать учеников на понятный содержание новой задачи и на действия партнеров по решению этой задачи. Иными словами, интерпсихическое действие может быть описано лишь с учетом того, что каждый его участник *впервые решает новую для себя задачу*, действуя по собственному замыслу и по собственной инициативе. Если ребенок при помощи взрослого впервые решает новую задачу, а взрослый, заранее зная способ и результат решения, предлагает методически выверенные, хорошо структурированные пошаговые инструкции, дозированные образцы и подсказки, то «правильный

ответ» скорее всего будет получен в любом классе. А вот родятся или погибнут при этом детские замыслы и инициативы — это непредсказуемо. Чтобы описать учебное интерпсихическое действие, необходимо определить, какую *новую* задачу впервые решает учитель, вступая «здесь и сейчас» в учебное взаимодействие с детьми, если он знает ответ(ы) на понятную задачу, поставленную перед учениками?

Этот вопрос невероятно труден для педагогов, только начинающих практиковать деятельностный подход в образовании. Вот далеко не полный перечень трудностей, которые испытывает педагог, стремящийся воплотить в своем классе принципы и подходы деятельностной педагогики, но еще не вставший на путь САМОизменения: постоянное желание *контролировать* каждый детский шаг и *направлять* детей к правильному решению, поскорее *достигнуть результата* и другие поведенческие и когнитивные стереотипы традиционной педагогики [17].

Наш первый учитель работает по системе Эльконины—Давыдова всего третий месяц, у второго учителя за плечами пять нелегких лет работы по этой системе³. Сравним некоторые управленческие приемы работы двух учителей (табл. 2).

Итак, какую же новую задачу (подчеркнем: задачу с негарантированным успехом) решает каждый учитель в этом эпизоде? Первый учитель решает главным образом задачу профессионального самоутверждения: я могу привести моих учеников к успеху кратчайшим путем и постоянно удерживать ситуацию под контролем. Эту задачу на каждом уроке решает начинающий учитель [4]. Второй учитель решает главным образом задачу детско-взрослого взаимодействия: уловить направления детской инициативы, понять замыслы детей и скоординировать их со своими замыслами.

Каждый учитель решает собственную задачу успешно. Какую задачу при этом решают дети? Это зависит от того, *где пересекаются инициативы и замыслы учеников и учителя*.

Таблица 2

Управленческие приемы работы учителей

Первый учитель	Второй учитель
1. Как учитель знакомит учеников с сюжетом новой задачи?	
У1: Смотрим. Последняя развилка. Одна стрелка указывает на МОСТ, а другая предупреждает, что там будет МИНА. /.../ Куда пойдем? /.../ Кто знает, поднимает руку, выходит и показывает	У2: Здесь надо быть осторожными. Одна стрелка ведет к МИНАМ, а другая стрелка на МОСТ, который нам нужен. (<i>Долгая пауза.</i>) Маша (<i>некоторое время тянула руку, не выдержала и подбежала к учительнице</i>): Я хочу сказать про звуки. Надо спросить про звуки...
ЭКСПЕРТНЫЕ СПЕКУЛЯЦИИ. Первый учитель напоминает ученикам, которые уже возбуждены сюжетом задачи и высказывают мнения вслух, с места, что на уроке так делать нельзя. Второй учитель намеренно держит паузу, за которой следует грубое нарушение дисциплины, чрезвычайно содержательное для дальнейшего решения задачи. Это и последующие нарушения установленного школьного порядка не повлекли ни одного дисциплинарного замечания. Учительские приоритеты (здесь: содержание задачи VS дисциплина) расставлены однозначно. Скоро эти приоритеты передадутся большинству учеников. Задумайтесь, в каком классе содержание обучения будет вызывать больший интерес, а в каком быстрее сложатся навыки произвольной саморегуляции поведения на уроке	
2. Как учитель организует оценочное взаимодействие детей?	

³ Дело не в возрасте и не в педагогическом стаже — оба учителя молоды, оба не новички в школе.

Первый учитель	Второй учитель
Коля (выходит к доске, показывает): МИНА (вверх), МОСТ (вниз). У1 (классу): Согласны? Дети жестами показывают свое согласие («плюс») или несогласие («минус») с мнением Коли. У1 (Коле): Смотри на класс. Спроси, почему не согласны. Коля (обращается к Глебу): Почему ты не согласен? Глеб: Наоборот! Вверх — МОСТ	Маша высказывает свое мнение. Несколько детей показывают «плюсы», Сима показывает «минус». У2 (Маше): Давай у Симы спросим, почему минус. Сима: Мы не можем узнать, где мягко и где твердо
ЭКСПЕРТНЫЕ СПЕКУЛЯЦИИ. Первый учитель направляет детское взаимодействие в каждой точке, давая соответствующие указания. Второй учитель уже приучил учеников к тому, что каждая мысль, высказанная на уроке, адресована тебе лично и ждет твоего ответа. Первый учитель использует повелительное наклонение глагола («спроси»), второй приглашает к общему действию («давай спросим»). Задумайтесь, в каком классе новые правила учебного диалога привьются легче	
3) Как учитель завершает решение задачи?	
У1: Мы пришли к цели (рисует значок победы)	У2: Мы с вами спаслись!
ЭКСПЕРТНЫЕ СПЕКУЛЯЦИИ. Оба учителя констатируют успешное решение задачи. Первый учитель делает это в деловом тоне, второй — весьма эмоционально. Казалось бы, такие стилистические особенности поведения относятся к сфере индивидуальных предпочтений и вкусов, о которых, как известно, не спорят. Однако следует принять во внимание редко обсуждаемую характеристику зоны ближайшего эмоционального развития первоклассников. Им предстоит осваивать копинг-стратегии реагирования на трудности, победы и поражения, неизбежные в учении [10]. В сфере познания трудности преодолеваются легче, если они сопровождаются интеллектуальными эмоциями, такими как удивление, сомнение, озадаченность, догадка и пр. Опытный учитель придает важнейшее значение эмоциональному переживанию задачи, зная, что эмоциями люди друг от друга заражаются, и для многих первоклассников сейчас главное не понятийный результат интеллектуального усилия, а вообще переживание трудностей, усилий по их преодолению и радость открытия	

Встреча инициативных действий учителя и учеников: case study

Неаддитивный эффект интерпсихического действия может быть достигнут только там, где инициативы всех участников *пересекаются* [12]. Где должны пересечься учебные замыслы и инициативы детей и взрослых, чтобы дети впервые смогли построить новое понятие, открыть новый способ действия, а для начала понять, что прежние способы действия не работают в новой задаче?

Чтобы ответить на этот вопрос, восстановим синопсис действий каждого учителя (слева — номера реплик из табл. 1).

ПЕРВЫЙ УЧИТЕЛЬ

2—11: Дети пытаются решить задачу наугад. Учителю не удается остановить тенденцию к угадыванию.

12—14: Соня указывает, в чем состоит содержательная трудность задачи, какой информации недостает для ее решения; учитель не воспользовался предложением девочки.

15—19: Новые попытки решить задачу наугад, которые учитель вновь не может остановить.

20—27: Ваня предлагает позвать волшебного помощника, учитель подхватывает это предложение и дает подсказку: сообщает информацию, достаточную для решения задачи, но *не запрошенную детьми* (Соня пыталась запросить иную информацию).

ВТОРОЙ УЧИТЕЛЬ

2: Маша делает запрос на информацию, недостающую для решения задачи.

3—5: Дети оценивают предложение Маши. Сима указывает на невозможность получить недостающую информацию.

6—8: Дети договариваются, как запросить недостающую информацию у волшебных помощников.

9—12: Учитель резюмирует детские предложения и убеждается в том, что класс их понимает и поддерживает.

13—18: По точно сформулированному запросу детей волшебники предоставляют информацию, необходимую и достаточную для решения задачи.

19—24: Эмоциональное переживание победы, преодоления интеллектуальной трудности.

Оба класса охотно обратились к волшебной помощи, которая не раз выручала детей на предыдущих уроках. В одном классе волшебники выручили детей из безвыходной ситуации, принесли *готовую подсказку, ответили на незаданный вопрос*: «Где написано МОСТ?». Нерешаемая задача так и осталась для детей не решаемой без посторонней помощи. Первый учитель оставил без внимания содержательную детскую инициативу и поддержал детский «крик о помощи», содействуя классу в решении конкретно-практической задачи (найти мост). В другом классе волшебники ответили на детский вопрос, в котором потенциально содержался общий вопрос большинства учебных задач букваря: как узнать, мягкий или твердый звук обозначен буквой согласного. Дети сами превратили нерешаемую задачу в недоопределенную и доопределили ее. Ясно, что только второму учителю удалось *поставить учебную задачу*, точнее, начать движение в этом направлении. Учителю это удалось благодаря тому, что он подхватил содержательную детскую инициативу, объединил вокруг нее детей и подпитал ее эмоциональной энергией.

Не будем гадать, что бы случилось на уроке, если бы второй учитель вместо того, чтобы выслушать по-

рывистую нарушительницу школьных правил, вернул бы ее за парту и разрешил говорить только после того, как ее вызовут отвечать; вместо того, чтобы вести содержательное обсуждение с группой детей, собравшихся у доски без приглашения учителя, отправил бы всех по местам и попросил высказываться по очереди; не усиливал эмоциональное переживание победы в группе детей, решивших задачу, не приглашал остальных присоединиться к ликованиям, а просто поблагодарил за дельные мысли и перешел к следующей задаче.

По счастью, ни перед одним учителем не стоит выбор между поощрением детской инициативы и контролем над порядком в классе. Это не взаимоисключающие, а взаимодополнительные направления педагогических усилий в ситуации, когда дети нуждаются в помощи взрослых для решения тех или иных новых задач. Поощряя и поддерживая детскую инициативу в ситуации постановки учебной задачи, взрослый способствует рождению и укреплению *одной из потенциальных возможностей* младших школьников: способности к определяющей рефлексии, к знанию о своем незнании. Побуждая и усиливая правилосообразное поведение детей, взрослый способствует становлению другой потенциальной возможности младших школьников — способности к произвольной и осознанной саморегуляции.

Поддержку детских действий при выполнении заданий, лежащих в зоне ближайшего развития, принято называть «скаффолдинг» [6]. Английское слово scaffold имеет два значения: 1) строительные леса, используемые при сооружении здания; 2) виселица, эшафот. Вводя метафору scaffolding в психолого-педагогический обиход, Дж. Брунер и его коллеги акцентировали первое значение слова [20], отвечая на вопрос: какие действия взрослого ведут к тому, чтобы *открыть* для ребенка определенную возможность развития. Все, кто продолжает использовать эту блестящую метафору, стыдливо обходят второе значение слова scaffold, между тем именно оно позволяет описывать развитие более полно, указывая, какие возможности развития затрудняются и даже блокируются определенными действиями взрослых.

Рассмотренные здесь пятиминутные эпизоды обучения, разумеется, не могут дать оснований для обсуждения того, какие возможности развития открывает и закрывает та или иная система обучения: здесь речь идет о событиях иного масштаба. В масштабе начальной ступени образования традиционная система с ее акцентом на готовые образцы действия и учительский контроль за воспроизведением этих образцов снижает интеллектуальную инициативу многих детей и повышает склонность к некритичному выполнению инструкций. При этом учитель может работать традиционно даже по учебникам, казалось бы, ориентирующим педагога на иные образовательные принципы. Система Эльконина—Давыдова, напротив, открывает для многих детей возможности инициативного поведения в новых недоопределенных ситуациях [12] и снижает потенциал исполнительского, нерассуждающего поведения. Разумеется, это возможно лишь в том

случае, когда педагог (а точнее — педагогическое сообщество) преодолевает вековые практики школы как института тотального контроля и начинает строить школу как пространство развития учебной самостоятельности детей и подростков.

Заключение.

Поиск субъекта учебной деятельности

В поисках субъекта учебной деятельности разные авторы обращаются к разным образовательным сферам, например, к культуре участия (партиципаторности) детей в разных сторонах жизни школы [9], к неформальному образованию [8], к поляризованным образовательным пространствам [7]. Мы пошли более традиционным путем: обратились к уроку и методом микроанализа проанализировали два учебных эпизода, произошедших в двух классах в первые месяцы школьной жизни. Мы выбрали эти эпизоды потому, что они были построены по одному и тому же замыслу: дети первый раз встречаются с ситуацией, в которой возможна постановка учебной задачи — отделение известного от неизвестного и появление запроса на недостающую информацию.

Первая встреча с учебной задачей не является роковой; если в первый раз что-то не вышло, впереди еще десятки учебных задач. Но почему в усилиях разглядеть будущее учебной субъектности мы так пристально вглядываемся именно в место постановки учебной задачи?

Напомним двухфазное строение учебной задачи. Первая фаза — постановка вопроса о том, каких знаний нам не хватает для решения этой задачи. Вторая фаза — решение задачи в модельной форме. О том, почему, зачем и как решение учебной задачи происходит именно посредством моделей и как при этом проявляется детская инициативность и самостоятельность, написано немало [3; 12; 19]. Здесь мы сосредоточились на этапе постановки учебной задачи, чтобы показать, как в детско-взрослом сообществе появляется учебная инициатива, направленная на отделение известного от неизвестного.

Рождение детской инициативы, направленной на постановку и решение учебных задач, важно само по себе: в этот момент дети действительно ощущают себя хозяевами, авторами, актерами происходящего на уроке. Однако в этом сиюминутном событии не менее важен вектор будущего. Главным метапредметным результатом учебной деятельности признано *умение учиться* — высшее проявление учебной субъектности, характеристика субъекта самообразования, способного к самостоятельному выходу за пределы собственной компетентности для поиска способов действия в новых ситуациях [14]. В умении учиться выделены две составляющих: 1) *рефлексивная составляющая умения учиться* делает человека способным определять, каких именно знаний и умений ему не хватает для действий в новой ситуации; 2) *поисковая составляющая умения учиться* делает человека способным разыскивать и осваивать недостающие знания и умения.

Сравним две фазы учебной задачи и две составляющих умения учиться. Сходство очевидно: сначала учащийся (учащий себя) решает вопрос, чего именно я не знаю, затем ищет недостающую информацию. Основное различие тоже бросается в глаза: умение учиться — характеристика индивида, умение ставить и решать учебные задачи — характеристика учебного сообщества (по крайней мере, на ранних этапах обучения).

Мы описали, что делает учитель для того, чтобы чудо первого САМОстоятельного усилия ребен-

ка при постановке учебной задачи случилось. В заключение скажем о том, чего учитель, помогающий ребенку сделать первый шаг в самостоятельном конструировании понятий, НЕ делает:

- не дает образцы, не говорит «делай как я»;
- не оценивает неудачи, радуется усилию;
- не сомневается в конечном успехе, но не знает,

что будет в следующий момент И ОРИЕНТИРУЕТСЯ ИМЕННО НА СЛЕДУЮЩИЙ МОМЕНТ: на движение ребенка «здесь и сейчас». Вот эта ориентация педагогического действия загадочна.

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Actor Training: Competencies or Aptitude

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This paper examines the concepts of “competence” and “aptitude” in the federal state educational standards. The study substantiates the need for returning to the theoretical notions of aptitude, as developed in domestic psychology, when training specialists for creative professions. The authors analyse the content dynamics of the higher education standards in the acting profession across 2002, 2010, 2017 and 2021. The notion of aptitude is considered from the standpoint of S.L. Rubinstein's and A.N. Leontiev's activity theory and B.M. Teplov's concept of individual differences. Content analysis of the concepts of “competence” and “aptitude” demonstrates that the competence-based approach helps sustain the graduate's universal characteristics, which does not align with the educational process in the acting profession, focused on the individual approach and talent development. The authors note that the content of competencies does not account for the subject's unique characteristics, and is reduced to knowledge, skills, and abilities. The study thus emphasises the relevance of establishing a psycho-pedagogical service in higher education for creative professions.

Keywords: competencies, competence-based approach, actor training, abilities, developmental learning theory, FSES standards.

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Обучение актеров: компетенции или способности

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Рассмотрено содержание понятий «компетентность» и «способность» в федеральных государственных образовательных стандартах. Обоснована необходимость возврата к теоретическим представлениям о способностях, разработанных в отечественной психологии, при подготовке специалистов творческих профессий. Приведен анализ динамики содержания образовательных стандартов высшего образования по специальности «Актерское искусство» редакций 2002, 2010, 2017 и 2021 гг. Рассматриваются подходы к проблеме способностей в рамках теории деятельности С.Л. Рубинштейна, А.Н. Леонтьева и концепции индивидуальных различий Б.М. Теплова. Анализ содержательных характеристик понятий «компетентности» и «способности» показал, что компетентностный подход фиксирует универсальные характеристики выпускника, тогда как образовательный процесс при освоении актерской профессии ориентирован на индивидуальный подход и развитие одаренности. Отмечено, что содержание компетенций не учитывает характеристики субъекта деятельности и сводится к знаниям, умениям и навыкам. Сделан акцент на актуальности создания психолого-педагогической службы в системе высшего образования для творческих специальностей.

Ключевые слова: компетенции, компетентностный подход, обучение актеров, способности, теория развивающего обучения, ФГОС.

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Introduction

It is a known fact that over the last 20 years, Russia has been undergoing an active transition to a new paradigm of educational outcomes, founded upon the competence-based approach. This approach assumes that educational outcomes should be expressed not as knowledge, skills and abilities (KSA), but as a set of motivational, value-centric cognitive components, or competencies [7]. The integrative educational *outcomes* achieved through this approach should ensure the young professional's competence. According to the Strategy for Modernising General Education Content, developed in 2001, the concept of competence is broader than the concept of knowledge or ability or skill. In fact, it encompasses all of its concepts, while at the same time obviously not amounting to their simple additive sum. Conceptually, it belongs to a different category. The concept of competence includes not only cognitive components and operational technological components, but also motivational, ethical, social, and behavioural components [33, p. 16]. It should be noted that one of the objectives of implementing the competence-based approach at the higher education level is to ensure that graduates become involved in their professional field as successfully as possible.

The competencies that students should acquire in the education process are laid down in the Federal State Educational Standards (hereafter FSES) for each level of education. The approach to FSES content was established in 2007 and has not changed significantly since then. The adoption of the new Federal Law on Education in the Russian Federation in 2012 regulated the use of the FSES. According to this law, the quality of education is determined by the curricula's FSES compliance. At the same time, another criterion for the quality

of education is provided: “correspondence to the needs of the student”. However, this is not directly reflected in the law [11].

According to the current FSES concept, this criterion is defined as a set of *compulsory requirements* that are used to assess the both the student's training and the activities of the educational organisation. However, the FSES sets the rules for curriculum structure without touching on the details of educational content.

A review by N.V. Knyaginina points out that most of the domestic researchers' publications related to the FSES “have no clear scientific relevance and limited practical value” [12]. Most articles deal with the differences between the different FSES generations, mainly aiming to support the work of methodologists. Another group of articles reflects practical experience in arranging a FSES-compliant education process in different fields [12]. For the purposes of this article, it is important to mention several works that have focused specifically on critiquing some aspects of the FSES concept.

G.B. Golub and co-authors have written an article on competencies in higher education, where they point out the problems with assessing the student competencies that are listed in the FSES. As the main issue, the author cites the overly generalised nature of competence descriptions and suggest options for making them more specific. The approach boils down to identifying what can constitute educational outcomes from the wording of the general professional competence descriptions. This is then intended to serve as basis for identifying specifically knowledge-based educational outcomes: “knowledge-based outcomes should be formulated as indicator corresponding to a given content unit and the level of its mastery <...> the resulting statements should be considered as minimum requirements for the forma-

tion of the general competence in question” [3, p. 160]. Accordingly, education control is limited to the knowledge-based outcomes that were previously identified. For example, the general competence that is described as “refusal to tolerate corrupt behaviour, high level of legal awareness and legal culture” can be assessed only insofar as it concerns what the student has learned, i. e. “the student can explain the social meaning of law and to identify signs of corrupt behaviour in a given situation” [3, p. 170]. In the same paper, the authors present the results of an expert analysis of 200 higher education standards (FSES) in different areas. They note that the concept of competencies is essentially substituted by academic outcomes (knowledge, skills and abilities) and that some competencies (like tolerance, civic stance etc.) cannot be measured [3; 12]. V.S. Senashenko [25] also points to the lack of integrity in the FSES being developed. V.S. Lazarev holds a similar point of view regarding general education and suggests that the replacement of KSA with competencies has been surface-level [13]. We are inclined to agree the above comments, with one caveat: in the above examples of the specific nature of educational outcomes, the concept of “aptitude” is also eliminated.

Noting the shortcomings of the FSES, T.A. Pereskokova and V.P. Solovyov highlight the lack of a student-centric approach, typical of the Bologna Process, in domestic educational standards. The FSES mainly contains requirements for the control and organisation of the educational process [22; 32]. At the same time, the individual characteristics, interests and motivation of the students, i. e. the essentials of their subjectivity, are left out of the picture.

A very interesting comparison of educational standard concepts is given in the work of O. Kh. Miroshnikova. The author notes that the FSES system currently used in Russia correlates with the US idea of educational standards, wherein all students are expected to achieve the same results. It is interesting to note that the US has not joined the Bologna Process and uses its own system of higher education. At the same time, the actual term “competence” in foreign education implies “a high degree of education individualisation and differentiation, which involves assessing how well the goals set by the student together with the educator have been achieved” [12; 16]. However, we must note that the issue of individualisation is one of the core issues in B.M. Teplov’s discussion of aptitude, where the problem of individual differences is central [35].

It should be noted that the authors of the works cited review the concept of the FSES as a whole, in relation to the entire education system. The present article, however, will examine select features of the FSES, in particular the competence-based approach, in relation to the act-

ing profession. Mastering creative professions notably presupposes having aptitude in a particular field, such as music, painting, acting, etc. It is for this purpose that admission to art universities involves special *creative tests* designed to determine whether applicants do possess said aptitude. In addition, according to the FSES concept, graduates should acquire an identical, pre-approved set of competencies. However, the specifics of developing artistic aptitude, where compensatory mechanisms and the individual nature of the activity play an important role, remain a grey area.

A competence-based approach to actor training

Over the course of competence-based learning in higher education institutions, the content of the competencies to be mastered has changed considerably. The current FSES standards for higher education are in their third generation (3++). In this context, it is interesting to analyse the changes in the content of the FSES for the acting profession (specialist degree) from 2002 to 2021.

For this purpose, we analysed the parts of the FSES that record the requirements for a theatre graduate (acting competencies): FSES for 2002, 2010, 2017 and 2021.

The first thing worth noting is the significant differences in structure, content and wording between the 2002 educational standard and the FSES for 2010, 2017 and 2021. This is due to the fact that FSES 2002 was created during a period of transition, when the competence-based approach had not yet been fully implemented in Russian higher education. This educational standard contains the lowest number of requirements (10) for the graduate’s professional qualifications compared to the later FSES. In comparison, the number of competencies to be formed by graduates in their field is 39 both in FSES 2010 and in FSES 2017. All the requirements specified in the 2002 standard are, however, of direct relevance to the acting profession. For instance, a graduate should “be fully capable of perceiving the world in artistic terms”, possess “visual thinking”, “know the methods of creating a fictional persona through acting, as required by the respective type of performing arts”, “have the skills required for independently performing their role (part, number) according to the director’s plan”, “have well-developed, professional vocal skills”, be proficient in “the art of speech as an aspect of the national cultural heritage”, etc. [5].

Starting from 2010, the FSES for acting, according to the general methodology of the FSES, has included three categories of competencies: general cultural competencies (renamed into “universal competencies” in 2021), general professional competencies, and profes-

sional competencies. The content of general cultural competencies is the same for all specialisations and requires the actor, as well as any other professional with higher education, to possess an aptitude for activities that are not directly related to their work but are evidently meant to reflect their overall education level, such as “navigating existential, life, and cultural values” [36]; “abstract thinking, analysis, synthesis” [38]; or “approaching problem situations critically and systemically and developing a strategy of action” [37]. In quantitative terms, we can note that the number of competencies at this level did not change in 2010, 2017 or 2021 and includes 10 units.

The content of the general professional competencies is also quite removed from the actual activities of professional actors. The FSES 2010 and 2017 outline 9 competencies in this group. They differ in several aspects and mostly describe what any person with higher education should know how to do: “scientifically organise their work, independently evaluate the results of their activities, master the skills of independent work, including scientific research, artistic and creative work” [36], “independently seek employment in the labour market, master economic evaluation methods for assessing their art projects and intellectual work” [38], “use special means and methods to achieve creative discoveries, individually or as part of a group” [38] etc.

Interestingly, FSES 2021 contains only 5 general professional competencies, which differ significantly in their content from the previous editions. On the one hand, there is an emphasis on the creative nature of the graduates’ professional activity (“the aptitude <...> for comprehending a work of art in a broad cultural and historical context in connection with aesthetic ideas of a particular historical period”). On the other hand, the relationship between the actor and the government is outlined as well (“awareness of the contemporary cultural policy of the Russian Federation”). The aptitude for leadership and teaching in the arts and culture is listed as well.

Finally, it is worth mentioning the professional competencies that are directly relevant to the activities of a theatre school graduate. FSES 2010 and 2017 have the longest list of professional competencies, with about 20 descriptions that do not differ much between the two. These include the wording used in the 2002 standard, as well as new statements. On the whole, the list accounts for various aspects of an actor’s professional work, including: readiness to create a fictional persona, ability to communicate with an audience, willingness to show creative initiative, aptitude for work in a creative team, various qualities related to speech, bodywork, the basics of musical literacy, singing and ensemble skills, and capacity for keeping in shape and maintaining the psychological and physical balance necessary for creative work.

It is important to emphasise that as of today, FSES 2021 *does not contain a “professional competencies” section at all*. In order to identify the necessary competencies while developing the curriculum, higher education institutions are expected to refer to the professional standards corresponding to the specialisations of their graduates, *if such standards are available*. In the absence of such professional standards, professional competencies *are defined by universities themselves*. There are currently two professional standards that can apply to the acting profession: “Teaching extracurriculars for children and adults” and “Vocational training, vocational education and further vocational education”, both intended for teachers. This means that, when developing curricula and compiling a list of professional competences for their graduates, theatre schools are obligated to include competencies that comply the two aforementioned professional standards for teachers, as well as, at their discretion, any other professional competencies.

On the five curricula and actor competencies

Studies of the curricula designed at five major Russian theatre schools – Studio School of the MKhAT, B. Shchukin Theatre Institute, Yaroslavl State Theatre Institute, Russian Institute of Theatre Arts – GITIS, and the Higher Theatre School (Institute) named after M.S. Schepkin – have shown that the curriculum writers use the wording that was established in the previous editions of the FSES [18; 19; 20; 21]. However, it is worth noting that, compared to 2010 and 2017, the number of professional competencies on the 2021 curricula has decreased from 21 to 7–11 (depending on the specific school).

We have analysed the content dynamics of professional competencies from 2010–2017 to 2021.

Figures 1 and 2 illustrate the integration of competencies relevant to the actor’s presentation of their fictional persona, as well as the various aspects of language use and stage speech. These competencies have undergone a number of changes.

While in the 2010–2017 standards, the character presentation competencies (see Figure 1) were formulated in some detail, in 2021, the three respective competencies were merged into one. This integration has led to the loss of an important component of the actor’s stage presentation: developing the aptitude “for sensual and artistic perception of the world, for figurative thinking” [36; 38], which was mentioned in the FSES of 2010 and 2017. In this context, it should be emphasised that the current educational curricula do not cover the development of the *actor’s thinking*, or the development of *certain artistic skills, whatsoever*.

With regard to competencies reflecting the students' mastery of different speech aspects, the most significant changes have taken place between 2010–2017 and 2021 (see Figure 2). Specifically, we no longer see the competence that calls for mastering the Russian language and the art of speech as part of the national heritage. Comprehension of the playwright's artistic language and imagery is also gone, as are the detailed descriptions of the vari-

ous characteristics and functions of stage speech. Instead, the relevant competence is formulated in a rather short and utilitarian way. In this new wording, stage speech appears to be purely auxiliary and instrumental. One might assume that the brevity of the wording gives universities the necessary freedom to educate their students according to their own perceptions of the discipline, without forcing educators into a bureaucratic box. However, from our

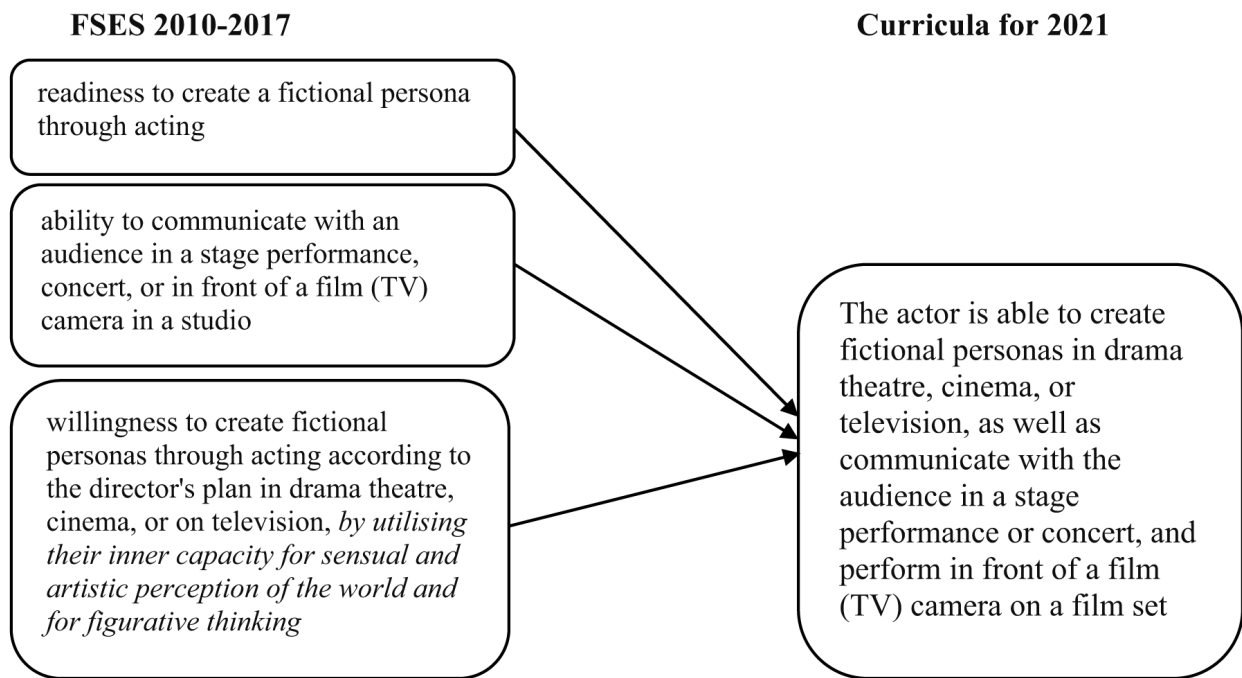


Fig. 1. Changes in the content of the competencies relevant to the actor's presentation of their stage character

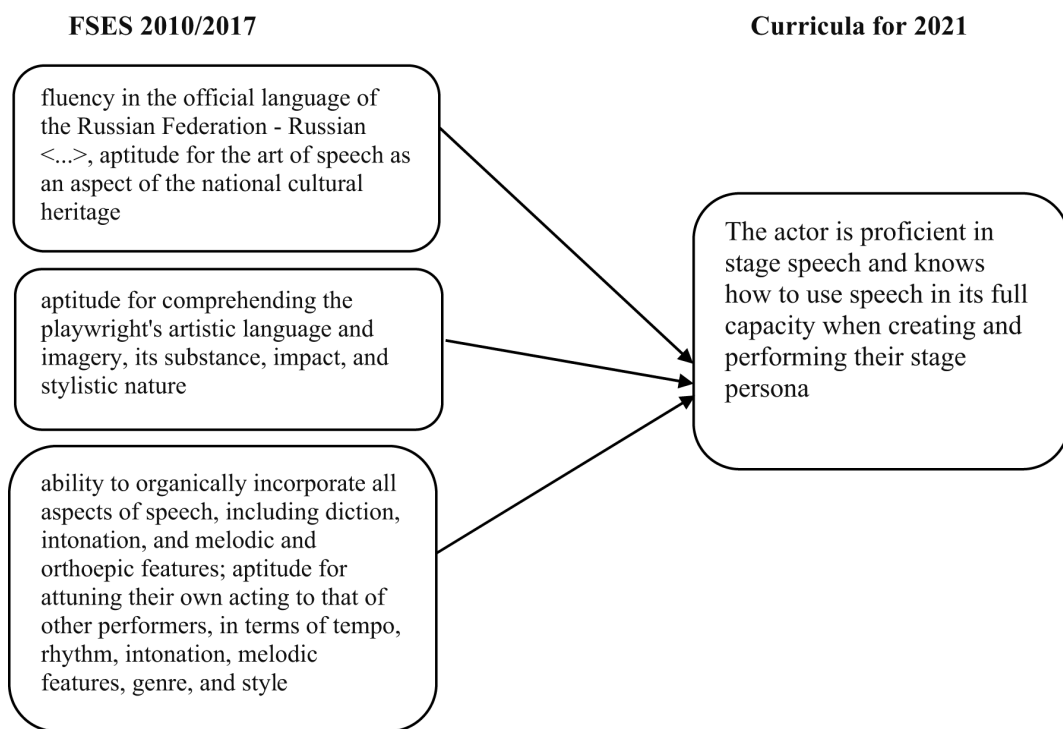


Fig. 2. Changes in the content of the actor's speech competencies

point of view, the cut content is extremely important for the training of future actors, since theatre schools traditionally teach stage speech as a discipline.

It should be noted that the tendency towards cutting the wording is also true of other professional competencies in stage movement, dance and musical disciplines. In general, this may make it easier to design educational curricula and meet the requirements of the FSES. But there is another side to the problem: detailing the specific qualitative characteristics of discipline mastery often involves parameters that are difficult to define and operationalise, such as “dancing in an organic, highly musical, convincing, confident, and emotionally contagious way” [36].

Finally, we must mention a number of professional competencies that were present in the previous FSES (2010 and 2017), but not in theatre school curricula for 2021. These include:

- “willingness to show creative initiative while preparing for a drama, film, television film, circus or variety performance”;
- “the ability to work with art history research, analyse works of literature and art, and use professional concepts and terminology”;
- “mastery of acting analysis, both in theory and in practice, and the ability to embody works of fiction, including drama, prose and poetry, on stage”;
- “the ability to navigate easily through the creative heritage of outstanding masters of domestic and foreign drama theatre”.

It should be added that the competence described as “the ability to work with art history research” can, in a sense, be correlated with the general professional competence from the 2021 standard: “the ability to apply theoretical and historical knowledge in their work; aptitude for comprehending a work of art in a broad cultural and historical context in connection with aesthetic ideas of a particular historical period”. However, the other competencies listed above are not reflected in the FSES or in the curricula for 2021. It should be noted that, given that the FSES and the curricula developed on its basis do not mention how the actor should “embody works of fiction, including drama, prose and poetry, on stage”, be willing “to show creative initiative” while preparing for their performance, or “navigate easily through the creative heritage of outstanding masters of domestic and foreign drama theatre”, this begs the question: is this kind of training truly meant to educate actors as professionals that rely on the global experience in dramatic art? We find this quite dubious.

On aptitude for acting

We should pay special attention to the terms used in formulating the competencies. The word “aptitude”

makes recurring appearances. For example, in FSES 2021, all 10 universal competencies as well as 5 general professional competencies, are formulated using this term. This prompts the conclusion that educational standards often use the concepts of competence and aptitude interchangeably. Moreover, the term “aptitude” in this context lacks scientific psychological content. It is therefore important to look at the understanding of aptitude in Russian psychology.

For instance, one of the definitions of aptitude provided in the Complete Dictionary of Psychology matches the concept introduced by B.M. Teplov: “Aptitude comprises individual and psychological features that distinguish one person from another and determine how well a person can perform an activity or series of activities. These features cannot be equated to knowledge, skills, or abilities, but they do determine the ease and speed of learning new types and means of activity” [2; 35, p. 16]. At the same time, Teplov noted that temperament or character traits (Teplov’s examples include hot temper, lethargy, and sluggishness) do not constitute aptitude, because successfully performing an activity is not conditional upon them. However, it is worth noting here that the characteristics listed above can be categorised as professional qualities or components of professional performance: a person’s individual features that are necessary for them to succeed at their activity (1; 10). Moreover, for a number of professions, particularly creative professions, such aspects of temperament and personality can be very important, and acting is no exception.

For example, contemporary researchers of actor psychology point to a number of characteristics that are important for professional acting: flexibility and stamina while working and communicating with people, ability to predict the consequences of one’s behaviour, sensitivity to non-verbal and verbal expression [15]. Comparative test studies based on a variety of samples have highlighted the specific psychological characteristics indicative of an individual’s predisposition to acting: sociability, courage, willingness to take risks, emotional sensitivity, inclination towards the artistic perception of the world [4; 23; 27; 28; 29; 30; 41], demonstrativeness, rich imagination, femininity, intellectual flexibility [9; 17].

Similar trends have been noted in foreign works. For example, comparative personality studies among actors and non-actors, using variations of the “Big Five” personality traits and other techniques, point to the qualities typical of actors: openness, extraversion, neuroticism, and higher scores for social intelligence and tolerance for uncertainty [39; 41]. Empathy and awareness of other people’s mental state can also be added to this list [40]. In addition, several studies have shown that there is a complex of specific personality traits that can be seen as

a type of aptitude that ensures the actor's success when influencing the audience. Notably, the presence of these traits cannot be attributed solely to education [42].

It is therefore important to revisit and expand on the stance taken by Teplov, whose studies on the nature of aptitude specifically emphasised the role of the individual's inborn characteristics, as they are what, in a large number of cases, lies at the foundation of aptitude. At the same time, aptitude itself emerges and develops throughout human life, in the process of activity, represented in comprehensive cultural form. In this case, according to Teplov's ideas, the notion of aptitude should be explored specifically from the standpoint of individual differences: "no one would speak of aptitude when dealing with qualities that are equal in all people" [35, p. 30].

It should be emphasised that B.M. Teplov reviews his concept of aptitude is in the context of giftedness, which in turn is crucial in analysing acting aptitude. For example, he points out that different aptitudes not only change and improve throughout their development process, but also influence one another. The resulting unique combinations of aptitudes, which determine greater or lesser success in a given activity, are what Teplov calls giftedness.

In this regard, we should note that, when referring to the actual practical side of aptitude development, Teplov highlighted a crucial point that has to do with the compensatory mechanisms of activity. In other words, an individual's lack of aptitude for a specific activity can be compensated for by a combination of aptitudes for other activities. In essence, it means that the aptitude for carrying out a given activity in its culturally developed form cannot be reduced to a single universal aptitude: "It is precisely because of the vast range of compensation capabilities, any and all attempts to reduce, for example, musical talent, gift for music, musicality and the like to a single aptitude are doomed to failure" [34, p. 220]. This is true of any *creative activity*, including acting. We shall therefore conclude that the logic of improving the competence-based approach, as shown above, is based attempts to identify the most generalised competences, while neglecting the idea of triggering compensatory mechanisms during creative activity.

The topic of aptitude took is particularly expanded upon in the academic discussion between A.N. Leontiev and S. L. Rubinstein. Both authors agree on two main points: 1) aptitude is based on naturally inborn qualities; 2) aptitude is expressed and shared through human activity, which in turn is expressed through the products of material and spiritual culture.

What they do disagree upon comes down to what determines aptitude. From Leontiev's point of view, aptitude, like all other human mental functions, is entirely determined by the objects and circumstances surround-

ing an individual's development. In other words, the specific aptitudes that will be nurtured within the individual depend on the environment where they develop, the objects around them, and the courses of action that are offered to the individual by the surrounding physical and cultural environment [14].

Rubinstein, on the other hand, notes that Leontief pays too much attention to external causes and conditions of mental development, while barely considering internal determinants. This emphasis on external factors in aptitude development essentially reduces aptitude to "absorbing a set of historically developed operations" [24, p. 13]. On the one hand, this approach to aptitude makes it accessible for almost any individual to gain, while on the other hand, it erases manifestations of individuality, and therefore the potential for nurturing giftedness. The individuality that Rubinstein writes about is, in this case, determined by the subject's activity during the formation and development of their aptitude. For instance, using mental aptitude as an example, Rubinstein notes that it is not enough to merely master ready-made action patterns. Creating "internal conditions for their productive use" is also essential [24, p. 15]. The successful development of mental aptitude requires considering the relationship between the internal and external conditions that determine them. Here, we must mention what is perhaps the key criterion: "Nothing is such an obvious indicator of mental giftedness as the constant emergence of new thoughts in the individual's mind" [24, p. 20]

In analysing this discussion, E.V. Ilyenkov additionally defines one of the most important components of aptitude: "the ability to take action where there is no predetermined way of acting, or no indication as to which specific pre-set operation should be chosen. After all, the ability to act in a situation of this kind is precisely what distinguishes someone with aptitude from someone 'inept', a more capable person from a less capable one..." [8, p. 69].

Note that the central point of the polemics between Leontiev and Rubinstein is the subject that is performing actions, and this subject's abilities. This discussion was productively continued by D.B. Elkonin and V.V. Davydov in their theory and practice of developmental learning [6]. And perhaps it is here, in the context of aptitude, that such basic aspects of subjectivity as initiative, autonomy and responsibility gain fundamental importance [26]. Characteristically, the very idea of the subject's formation follows the logic of L. S. Vygotsky's concept of proximal development zone: more broadly, the relationship between the child and the adult as a cultural mediator. We believe that these two particular points are fundamental in addressing the development of creativity.

Returning to the competence approach in relation to the Leontiev-Rubinstein discussion, we note that in,

the FSES the term “*aptitude*” is used for describing the students’ shared outcomes of completing an educational programme. In this respect, this use of the term is close to A.N. Leontiev’s interpretation of aptitude as a set of operations, which, as we noted, S.L. Rubinstein was justifiably critical of. In addition to this, there is another side to the issue: mastering competencies usually implies undergoing the assessment of one’s knowledge, skills and abilities, which, as we have tried to show, creative aptitude (in our case, acting) cannot be reduced to in a psychological sense.

Conclusions

1. The competence-based approach that underpins the modern FSES aims to ensure the uniform and universal nature of the academic environment, provide all students with equal opportunities, and make high-quality education more accessible. However, the creative nature of the acting profession and the peculiarities of mastering it call for identifying and developing a very unique set of aptitudes, which B. M. Teplov calls giftedness. The analysis in the article shows that the task of identifying the student’s aptitude for acting is addressed at the university application stage. The educational process itself focuses on the individual approach and the further development of the student’s set of aptitudes that make them a gifted actor. Thus, the notion of apti-

tude, rather than competence, is central to the development of psychological criteria for successful training in the acting profession.

2. The analysis of approaches to the concept of aptitude in Russian psychology (B.M. Teplov, A.N. Leontiev, S.L. Rubinstein) and developmental learning theory (D.B. Elkonin, V.V. Davydov) allowed us to conclude that aptitude is an important characteristic of an individual’s subjectivity (motivation, goal-setting, etc.). At the same time, subjective characteristics not usually captured by the term “competence”, the essence of which is limited to the acquisition of knowledge, skills and abilities. Thus, during training for creative professions, the development of aptitudes, as explored by the activity theory, is what can lay the psychological foundation for organising the educational process.

3. Establishing a psycho-pedagogical service in higher education is, we believe, highly relevant to training students in creative professions. This service should provide, on the one hand, psychological and pedagogical support for the educational process and, on the other hand, psychological support for students. In both cases, it is the term “aptitude” rather than “competence” that can serve as a key concept when addressing the students’ personal problems in the context of their professional work. The work of such a psychological service will not only contribute to the harmonious development of the students’ personalities, but will also improve the academic value of the training process.

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Assessing Use of Language as Mediating Mean in Science Teaching in Activity Theory Terms: A Discourse Analysis in Socioculturally Diverse Classroom Settings in Greece

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In this study, language is considered as mediating mean in science teaching within socioculturally diverse settings. It assesses how language can work in activity theory terms to understand scientific concepts. The particular interest concerns the nature of the Greek language which can give chances to approach more systematically scientific concepts. This research was conducted in two different classes of 5th grade pupils with socioculturally diverse characteristics in a Greek primary school through a discourse analysis tool that was used in other researches about science teaching. Language use took place in the context of activity theory, being a mediating mean. The results of the present study, lead to the conclusion that use of language in science teaching even in socioculturally diverse classroom settings can contribute to a better understanding of the scientific concepts, making scientific language familiar to pupils and facilitating them to appropriate it more effectively.

Keywords: language, science teaching, activity theory, discourse analysis, socioculturally diverse classroom settings.

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Оценка использования языка как средства опосредования при обучении естественным наукам с точки зрения теории деятельности: дискурсивный анализ в условиях социокультурного многообразия образовательной среды в Греции

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В этом исследовании язык рассматривается в качестве средства опосредования при обучении естественным наукам в условиях социокультурного многообразия образовательной среды. Оценивается, каким образом язык может способствовать пониманию научных концепций с точки зрения теории деятельности. Особый интерес вызывает специфика греческого языка, которая открывает возможности для более системного подхода к освоению научных понятий. Исследование было проведено на двух 5-х классах начальной греческой школы, отличающихся социокультурным многообразием, с применением методики дискурсивного анализа, использовавшейся также в других исследованиях, посвященных обучению естественным наукам. Язык использовался нами в соответствии с положениями теории деятельности, а именно — как средство опосредования. Результаты нашего исследования показывают, что использование языка при обучении естественным наукам в классе

даже в условиях социокультурного многообразия может способствовать лучшему пониманию научных понятий, делая научную терминологию более привычной для детей, а процесс овладения ею более эффективным.

Ключевые слова: язык, обучение естественным наукам, теория деятельности, дискурсивный анализ, социокультурное многообразие образовательной среды.

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Introduction

In modern societies, science education is a priority as modern societies require scientific and technological literacy for all citizens [16]. The request about “Science for all” regards science education as a fundamental right for everyone regardless of their background, nationality, language, and sociocultural conditions. It is suggested that scientific literacy is necessary for all people’s personal, social, economic, and mental future. To correspond to society’s requirements about science for all, there should be some decisive changes in school science as far as science education is concerned.

Special emphasis has been given to socioculturally diverse science teaching, since there is a great cultural divergence in science classrooms, either because of students’ different ethnicity or because of their different sociocultural and economic backgrounds. In such a context, the culture of science and school science and students’ culture is usually in dissent creating barriers for learning science [1; 4].

In these settings, language can play an important role. Sociocultural learning theories support that language mediates so that pupils could understand scientific concepts [26]. This implies that language can be a tool for pupils to cross the borders between scientific concepts and their experiences. Science terminology understanding is also culturally dependent. The term used to express a given scientific concept might imply something else in a non-scientific context. Thus, the meaning of these terms could vary from culture to culture [8].

In this study, students’ group activities in socioculturally diverse science teaching are analyzed in the context of classroom discourse [5]. The activities are linguistically orientated in order to help students to appropriate the meaning of difficult science concepts.

The role of language in socioculturally diverse science teaching settings

It is argued that in modern science there are three types of language: science language, school science language, and students’ language. Science as a discipline has its own language, its terms that sometimes differ a lot from the common language. Due to this fact, science seems to be alien to pupils. The significance of language use in a multilingual science class has been investigated in research conducted in South Africa using mixed re-

search methods and found that a translanguaging-informed pedagogy can contribute to meaning-making in the science classroom [3].

The language of science and scientific communication plays a significant role in mythmaking; school science language plays an equally prominent role in creating barriers to universal access [8]. Hence, language usage is an important target for curriculum reform, especially in the context of multicultural and antiracist education.

School science language is often more complex than the language, pupils encounter in other areas of the curriculum, with longer sentences, more complex grammatical forms, and less familiar vocabulary [22]. Moreover, it is frequently depersonalized (through nominalization and the use of passive voice), emotionally detached, humourless, remote from real life, and uninviting.

Apart from the above two languages in science teaching, pupils have their own language which is influenced by their sociocultural background [17]. According to Bernstein, pupils talk either in the elaborated or the restricted code. In the former case pupils has almost no difficulty understanding the language of science but in the latter one pupil faces a lot of problems because of science language complexity [2].

Science language is depersonalized through excessive nominalization (replacement of active verbs by abstract nouns) and almost exclusive reliance on passive voice. For many pupils, all this constitutes such a formidable barrier that they are dissuaded from seeking entry to science. What is interesting here is why pupils react in such diverse ways to the experiences of school science, and why so many of those who shy away from science are members of ethnic minority groups [12; 21].

Pupils are said to have a ‘linguistic deficiency’ if they are not at home with the ponderous style of textbook science and teachers who feel obliged to imitate it in order to maintain standards. They also seem to assume that individual *words* are carriers of meaning as if a dictionary could really help pupils make sense of unfamiliar ways of using language [14]. This can be explained by a sociological perspective since, according to Bernstein, there are pupils – especially those who come from a lower economic or social background or they come from a foreign country – talk a restricted linguistic code that differs from that of school science, which is elaborated enough [2].

It has been suggested that scientific concepts can be analyzed and defined by means of comprehensiveness,

precision, consistency, and circularity. In such cases, a definition should be made comprehensive by including more features of definitions, but it can be overwhelming to have too many details in every feature. The definition should be reasonably precise and be internally consistent with respect to its common features [27].

In this context, the importance of language to constituting meaning in science learning has been recognized. Research on diversity and equity stimulates science educators to examine the nature of science and science education [13]. What counts as science or what should be taught in school science is critically important because this definition determines the school science curriculum. Western science, as traditionally practiced in the science community and taught in school science, is the “high-status knowledge” to which every student should have access in order to function competently in the mainstream, global economy, and information society.

In relevant research where discourse analysis was used to investigate science language demands in multilingual classrooms [20], there was also a focus on linguistic analysis in science activities but the pupils were from secondary education and studying in English.

To achieve equitable outcomes with diverse students, teachers need to have both knowledge of science and understanding of the students’ languages and cultures. It is a challenge for teachers to integrate science and students’ languages and cultures in ways that are meaningful and relevant to their students [13].

Activity theory in teaching science: utilizing language as a mediating tool

Recently, activity theory is presented as one of the most interesting views about learning and teaching. Vygotsky, on whom views activity theory has been based, described the dual nature of psychological tools [24]. On the one hand, they are externally-oriented, serving as the means through which humans affect material objects towards which activity is directed. However, they are also internally oriented in that they serve in the self-regulation of individuals as well as social negotiation of meaningful activity. In the educational context, teachers’ knowledge serves similarly as both externally- and internally-oriented tools.

Activity theory as Engeström has suggested it, allows us to examine the relations of participants (teacher-students) and the object as they are mediated by basic elements that constitute an activity system, that is to say, tools, community (school classroom), division of labour and rules [7].

The construction of this activity system, after careful analysis of the data, allowed us to consider the complexity of factors that influence how the activity of science outreach is practiced. First, note that the subject of the system is not an individual outreach scientist or even a panel of scientists. The subject is diverse, flexible, and consists of a community of people working towards a common object. The object is the “central issue” of the activity system. It brings meaning to the system because it connects the actions of individuals to collective activity [6]. The subject and object exist as a central dialectical

unit, but the subject does not act directly on the object. Rather, the actions of the subject toward the object are mediated by a variety of factors, which form the rest of the system [17]. The subject and object cannot be made sense of outside the context of the (or a) system of these mediated factors.

Engeström has represented his views by forming a triangle as is presented below in Figure 1.

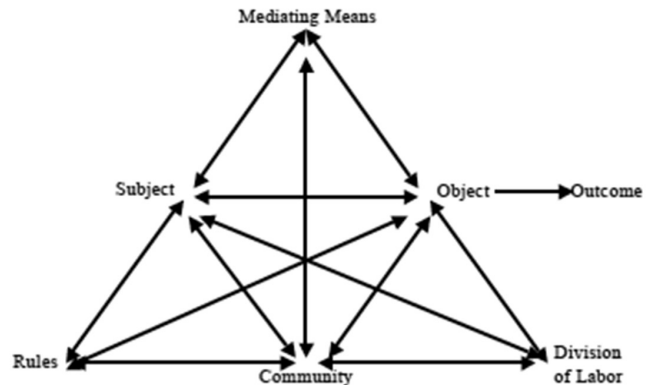


Fig. 1. Engeström's Activity System Model [6]

Scientific concepts are concepts that cannot be learned spontaneously in engagement with everyday life [23]. According to Engeström's model, learning is a human activity, where tools such as language mediate the process between the subject (teacher, pupils) and object (science) which is turned into outcomes with the help of tools (e.g., language) leading to transform scientific concepts to familiar ones for pupils through activities with linguistic analysis [19]. In Science Education, language, which can be expressed in several modes of communication, is the main mediational instrument between the teacher, knowledge, and students [15]. So, in this study, activity theory is used as a model where pupils that work in groups, discuss the results of the group activity in the classroom approaching science teaching through linguistic analysis of scientific concepts in order to manage the meaning-making concerning these concepts.

Research Methodology

The main research question is to what extent language can contribute to achieving satisfying learning outcomes in science teaching and consequently how pupils negotiate meaning when they have to deal with scientific terms. To investigate this question, we videotaped and audiotaped the teacher-students' discourses during science lessons in socioculturally diverse science classrooms. Discourse analysis is selected because it has an analytic commitment to studying discourse as talk in social practices.

Discourse analysis is particularly used in cases that investigate what takes place in the school classroom [23]. Especially in science teaching Roth (2004) supports that discourse analysis can be used to clarify what happens in the school classroom during teaching highlighting the crucial role of language which is the main

subject in discourse analysis [18]. Finally, Lemke marks that the cultural dimension of discourses meaning can be understood in the context of activity [14].

Through discourse and joint action, two or more people build a body of common knowledge which becomes the contextual basis for further communication. Over messages, things actually said, are only a small part of the total communication.

Two classes were observed, in the first of which, there were 26 pupils (11 years old) of different sociocultural backgrounds (different nationality, gender, socioeconomic and educational status of the family, etc.), and in the second 18 pupils (11 years old) of different sociocultural background as well. Data collected included audio and videotapes of the lessons. In order to discuss the language role in multicultural science settings, we preferred a microanalysis of a selected episode. The tool of analysis was based on the work of Kaartinen and Kumpulainen (2001), who examined the meaning of negotiation in science communities of various levels [10]. The analysis focused on the dimension of discourse moves, which highlights the nature of conversational exchanges between the members of the learning and consequently sheds light on the participatory roles during a science lesson. The results are presented in Table 1.

According to Table 1, discourse moves identified in the analysis method are initiating, continuing, extending, explaining, questioning, repeating, agreeing/disagreeing, replying, tutoring, commenting, and concluding. Initiation moves are those that begin a new topic. Continuing moves are considered as reflecting pupils' interpretation of a situation while extending moves are thought to bring in new perspectives which expand joint explanation building. Explaining moves provide information and are usually based on reasoning. Questioning moves ask for information so as to form a joint understanding. Repeating moves repeat ideas that have already emerged during the discourse. Agreeing and disagreeing

moves refer to the acceptance or rejection of proposals or explanations that have been presented previously during discussion. Replying moves refer to responses to explicit questions. Tutoring moves imply the guidance, support, and re-voice of the social activity in question. Commenting moves are statements uttered in course of discourse to give personal remarks or assessments of a situation. Finally, the concluding moves draw together the explanation of the building process.

According to the discourse analysis tool which is used in this study, there is a more specific investigation about the cultural focus of social interaction. The categories for this part of discourse analysis are activity mode, identity mode, material mode, and semiotic mode. Activity mode describes an interaction that focuses on procedural elements, such as negotiating working strategies for joint investigation. Identity mode presents the interaction that highlights the negotiation of personal and cultural meanings. Material mode concerns interaction that focuses on the physical features of the learning situation. Finally, semiotic mode describes an interaction that highlights the interaction in which the meaning-making is made visible through mediational tools.

The selection of this tool can be justified by the fact that the use of the language can contribute to the negotiation of meaning so as scientific concepts to be understood. By pointing to discourse moves as they are categorized by Kaartinen and Kumpulainen (2001), we are able to mark how smoothly pupils of socioculturally different backgrounds can cross the borders between science language, school science language, and pupils' language. To investigate the role of language in multicultural science settings, we present two dialogues that have taken place in socioculturally diverse classes.

Design of the learning environment

The learning environment is formed so that pupils are able to appropriate scientific knowledge. To achieve

Table 1

Discourse analysis method

Social interaction in communal activity	
Analytic Categories	Definition
Discourse moves	
Initiating	Begins new thematic or strategic interaction episodes
Continuing	Elaborates or furthers collective meaning-making
Extending	Brings in new perspectives
Explaining	Provides information often based on reasoning
Questioning	Requests' information in order to establish a joint understanding
Repeating	Repeats ideas or views that have emerged in the preceding interaction
Agreeing/disagreeing	Expresses acceptance or rejection of ideas or explanations
Replying	Responds to questions
Tutoring	Guides, supports or re-voices social learning activity
Commenting	Gives personal remarks or evaluations of the situation
Concluding	Draws together an explanation of building processes
Cultural focus	
Activity mode	Focuses on procedural elements, such as negotiating working strategies for a joint investigation
Identity mode	Highlights the role negotiation between community members
Material mode	Concentrates on physical features of the learning situation
Semiotic mode	Highlights the visibility of meaning-making via mediational tools

the best learning outcomes, we apply teaching strategies linguistically orientated in order to make science language familiar even for pupils that face linguistic problems due to their culture, either their foreign nationality or their family background (socio-economic status, their parents' educational level, etc.).

In an activity theory context, language is the mediating mean that can help pupils to negotiate the meaning of science as far as scientific concepts understanding. In a whole class (community) discussion, there are rules that promote social interaction between teachers and pupils who have to participate in specific linguistically orientated tasks (a division of labour).

We initiate the use of the dictionary, in order to achieve making scientific concepts familiar to pupils, an approach that has been suggested previously in the research [7]. Moreover, we attempt to make an initial linguistic analysis of these concepts concerning the root of words, their origins but also their connection with everyday life. This resulted in the linguistic interaction between pupil-teacher concepts meaning, which contributes to the pupils' best understanding of scientific concepts.

Engestrom's model in this study has the suggested form as it has been presented in other studies. Tools and artifacts have culturally produced the means like language that subjects use to perform the activity. Community refers to all the participants who share the same object, and shapes and direct individual actions to the collective activity. Division of labour refers to the way subjects have their specific roles taking the appropriate responsibilities in the context of the activity [11].

Data Analysis

The following dialogues concern teaching science in socioculturally diverse classroom settings and refer to two different classes of the 5th grade. The first one takes place in a class of 26 pupils, organized into groups of five or six members. Among these pupils are those from foreign countries, pupils with learning problems, and pupils of different cultures. The second one takes place in a class of 18 pupils, organized in groups of five or six members. Among these pupils, there are those from foreign countries, pupils with learning problems, and pupils of different cultures as well.

1. *Transparent-translucent-opaque bodies*

The observed class in the first case was organized in groups and the lesson referred to the unit: **transparent-translucent-opaque bodies**. In the Greek language, these three words have the same root. They can be seen as transparent, semi-transparent, no-transparent bodies. In order to make these words familiar to pupils, we took advantage of their roots, and using a dictionary, tried to bring pupils closer to these scientific terms. We use pupils' knowledge from the language lessons about how a word meaning changes if we add the prefixes semi and no.

The following dialogue (Table 2) implies a process of linguistic development in science teaching. Before pupils engage in an activity of classifying bodies in transparent-translucent-opaque¹, there is a discussion between the teacher and pupils to clarify these terms so they are understood.

Table 2

Discourse Analysis about Transparent, semi-transparent, no-transparent bodies

	Participant	Transcription	Social interaction		
			Discourse moves	Cultural focus	Thematic description
1	Teacherwhat is said in bold?	Questioning	Semiotic mode	Highlighting interactions in which there is an effort to investigate what pupils know
2	Pupil 1	Transparent, semi-transparent, no-transparent bodies	Replying		
3	Teacher	Do we understand what these words mean?	Questioning		
4	Pupils	Yes	Replying		
5	Pupils	No	Replying		
6	Teacher	Some of you said no. You have dictionaries on your desks. Do we know what <i>transparent</i> means?	Questioning	Material mode	Interaction that concentrates on the use of the dictionary
7	Pupil 2	It is a thing like gel that we can see from the other side as well.	Initiating	Semiotic mode	Highlighting interactions in which the meaning-making is based on definitions by the dictionary
8	Teacher	No transparent?	Questioning		
9	Pupil 3	It means the opposite that cannot be seen from the other side	Replying, continuing		
10	Teacher	When in front of a word we put the prefix <i>non</i>	Initiating		
11	Pupil 4	It is the opposite	Explaining		

¹ In the Greek language there are particular prefixes that can utilize to understand scientific concepts. In this case, opaque body in Greek is expressed as no transparent body and translucent body is expressed as semitransparent. This makes it more convenient to understand the meaning of these concepts through linguistic analysis and the use of a dictionary which is a common activity in language lessons.

	Participant	Transcription	Social interaction		
			Discourse moves	Cultural focus	Thematic description
12	Teacher	It has the opposite meaning. I want groups to find what <i>transparent</i> and <i>semi-transparent</i> means	Tutoring	Activity mode	Interaction that focuses on activity based on dictionary
13	Pupil 5	I found the word <i>semi-transparent</i>	Continuing		
14	Teacher	Tell us what your dictionary says about <i>semi-transparent</i>	Initiating		
15	Pupil 6	Whatever is penetrated by light to an extent	Continuing		
16	Teacher	The dictionary says something very good	Commenting		
17	Pupil 6	Whatever is penetrated by light to an extent	Repeating		
18	Teacher	Whatever is penetrated by light to an extent, did you understand it?	Questioning		
19	Pupil 7	Yes, when light penetrates a body less than a transparent one	Explaining		
20	Teacher	Yes, it is right, what else have you found? Tell us about <i>transparent</i>	Commenting, questioning, tutoring		
21	Pupil 8	What has transparency, the obvious	Replying		
22	Teacher	The obvious, the one who has transparency. Have you found the word <i>transparent</i> ?	Repeating, questioning		
23	Pupil 9	The one who lets the light pass through it and allows us to see things that are behind	Replying		
24	Teacher	This definition is very good and it will help us do the activity. By this definition, we shall understand what <i>transparent</i> means. Repeat it	Commenting, tutoring		
25	Pupil 9	The one who lets the light pass through it and allows us to see things that are behind	Repeating		
26	Teacher	We understand what <i>transparent</i> means. The transparent body lets light pass through it. <i>Semi-transparent</i> means what lets light pass but less	Explaining		
27	Pupil 4	<i>Non-transparent</i> : the impenetrable by light, the suspect (it is a meaning of everyday use of this word)	Initiating, extending		
28	Teacher	Yes, we use this word in everyday life except physics. This word means someone that does something in secret, but we talk about science. Let's go to the activity	Commenting		

As we can see from Table 2, there is a variety of discourse moves in this dialogue between teacher and pupils. The teacher not only questions or initiates but also comments on what is said. He tutors the pupils encouraging them to continue their effort and explaining when it is necessary. The teacher poses crucial questions for the clarification of these scientific terms (e.g., "Whatever is penetrated by light to an extent, did you understand it?"). He comments on some of the pupils' statements, such as "This definition is very good and it will help us to do the activity", and even when he repeats pupils' statements, he does so in order to use it as feedback to go on.

On the other hand, pupils, after investigating in their dictionaries, continue what the teacher says by reflecting on their interpretation according to what they have found

in dictionaries about these terms. They extend what they find even beyond the field of science (e.g., "No-transparent: the impenetrable by light, the suspect", bringing in new perspectives, implying that the scientific concept may have a different meaning in everyday life. They are able to explain their understanding of concepts as Pupil 7 does when saying "Yes, when the light penetrates a body less than a transparent one". Particular emphasis should be given to Pupil 7, a girl from Albania who due to her nationality faces some linguistic problems. She actively participates in searching and this engagement with the dictionary helps her understand scientific concepts.

Concerning cultural focus, there is mainly a semiotic mode during the effort to make clear how to make the meaning through linguistic analysis of scientific terms.

Moreover, the material mode includes the use of the dictionary while the activity mode focuses on how the activity takes place.

Apart from that, during this linguistic-orientated action in science teaching, both the teacher and pupils seek for negotiating the meaning of scientific concepts. The dictionary plays a mediating role in pupils' effort to appropriate knowledge through the linguistic analysis of scientific words and the consequent dialogue during this action.

2. *Self-luminous and hetero-luminous objects*

The observed class in the second case was organized in groups and the lesson referred to the unit: the light sources. This episode has to do with the concepts of *self-luminous and hetero-luminous*. Both words have their second part in common (luminous). Their difference consists in their first part that changes their meaning. The pupils discuss with the teacher after having searched for the meaning of these words in dictionaries². The results are provided in Table 3.

According to Table 3, in the second dialogue, there is a variety of discourse moves as well. The teacher questions and initiates but also comments on what is said explains and extends the meaning of scientific concepts, for instance, "Hetero in ancient Greek means the other", analyses linguistically the origins of these concepts, which can help pupils appropriate this scientific concept.

Moreover, pupils continue, reflecting on what the teacher says, reply to the teachers' questions or initiations and extend offering new perspectives in knowledge (e.g., "Self-luminous is an adjective"). By doing so, they manage to have a complete image of what scientific concepts under consideration mean, combining this knowledge with

knowledge of another lesson, e.g., language lessons by recognizing that these words are adjectives. Especially, pupil 4 who is a boy coming from Albania not only participates in telling what he found but also replies to the question that the teacher makes to detect the level of understanding. The answer to the question "For example, is the sun self-luminous or hetero-luminous?" shows that this boy has understood what self-luminous is.

The above dialogue shows that pupils can construct their own understanding about certain scientific concepts, when they have various linguistic stimulants or when they take action to investigate the interpretation of such concepts.

Both dialogues point to the fact that pupils who are engaged in a linguistic task and particularly use the dictionary, become more familiar with scientific concepts that seem to be alien. The use of the dictionary in connection with the linguistic analysis of these words contributes to the effective negotiation of concepts' meaning.

Discussion

The use of language in science teaching which is the topic of this study, has been investigated by other studies. In Wong et al. study, there is a systematic framework to analyze scientific concepts by using definitions [27]. In our study, the scientific concepts are approached linguistically, by analyzing scientific concepts in their parts to understand the meaning of the concept, taking advantage of special features of the Greek language. Furthermore, the use of vocabulary has been suggested in other studies marking that there should be a more systemat-

Table 3

Discourse Analysis about Self-luminous and hetero-luminous objects

	Participant	Transcription	Social interaction		
			Discourse moves	Cultural focus	Thematic description
1	Teacher	Let this group tell us what <i>self-luminous</i> is	Questioning	Activity mode	There is a discussion in the context of the activity
2	Pupil 1	<i>Self-luminous</i> , what lights by itself	Replying		
3	Teacher	The one that has its own light, you found so, because if we say it lights, this implies that there is a human intervention. Tell again	Continuing, commenting		
4	Pupil 2	Mister, we have written in a different way. <i>Self-luminous</i> is adjective, has its own light	Extending		
5	Pupil 3	The one that produces the light on its own	Continuing		
6	Teacher	This is <i>self-luminous</i> , and the group has found the word <i>hetero-luminous</i> . Tell us	Initiating		
7	Pupil 4	<i>Hetero-luminous</i> is what takes the light from another	Replying		
8	Teacher	<i>Hetero-luminous</i> . Tell us loudly	Initiating		
9	Pupil 4	What takes the light from another	Continuing		
10	Teacher	<i>Hetero</i> in ancient Greek means <i>the other</i> , so what is <i>self-luminous</i> and what is <i>hetero-luminous</i> ? For example, the sun is self-luminous or hetero-luminous?	Explaining, tutoring	Semiotic mode	Linguistic analysis of scientific concepts
11	Pupil 4	Self-luminous	Replying		

² In this case there is the utilization of composite words using dictionaries. In this special example, ancient Greek adjective "hetero" was utilized.

ic approach to this tool [20]. In our study, vocabulary works as a tool, and a linguistic analysis follows leading to pupils' familiarization with the scientific concepts to make meaning in science teaching.

Moreover, in terms of cultural diversity, Charamba tries to understand the role of language in science teaching by using interview responses and pre- and post-test scores and manages to show that monolingual-oriented pedagogies in the Physics classroom hinder multilingual students' full understanding of scientific concepts leading to academic underachievement [3]. On the other hand, our study approaches the role of language in culturally diverse settings through a discourse analysis in the context of the activity theory model showing that concepts should be familiar to students in order to be understood.

Finally, concerning the activity theory context in science teaching, it has been suggested that science communication is one of the means that the science teacher can use to foster teaching activities leading to a model that aims to understand the teacher's movements for using science communication in the classroom [15]. In our study, the activity theory is used as a methodological approach in forming science teaching activities.

Conclusions

In the context of multicultural science settings, the meaning-making processes of scientific concepts imply that pupils who are active and engaged in a linguistic-orientated task that attempts to make it easier for them to negotiate these concepts, can be led to a deeper understanding. Language plays a mediating role within a socio-cultural approach and facilitates pupils' appropriation of knowledge, taking advantage of features that language has (in this study, the features that the Greek language has, but something similar may take place in other languages as well). Both the presentation of the episodes and the discussion concerning the relation of this study with other relevant ones lead to the following conclusions:

- The use of language (e.g. dictionary use) can contribute to the clarification of some difficult scientific

concepts, making a distinction between the scientific use of language and everyday use of language, without rejecting the latter. Furthermore, scientific concepts become more familiar for pupils, especially those who face linguistic difficulties due to their culture (e.g., nationality, family culture).

- The dialogue between the teacher and pupils can lead to an explanation of concepts since the negotiation of their meaning creates suitable conditions for a socio-culturally constructed activity and successful performance in science teaching through different discourse moves and forms of cultural focus.

- Through language, there can be a crossing between science and students' worldview borders that are usually in contrast (science vs students' worldview). The smoother crossings that are succeeded through linguistic approaches in science teaching can help pupils' better understanding of scientific concepts.

To sum up, pupils' increased use of certain ways of using the language leads to better learning and conceptual understanding of science. Moreover, we have provided empirical support for the conception of science education as induction into a community of discourse or practice. Full participation in practice requires that one is oriented towards certain aspects of experience, that one frames one's activity in particular and that one interacts with the physical and social environment in appropriate ways. Pupils reach understanding through a gradual linguistic process, starting with dictionary use and continuing with linguistic analysis, leading pupils to the meaning-making as can be seen in both episodes.

As far as perspectives for further research, this study can trigger a multiple utilization of language in a science activity, which might be approached by various methodologies, not only discourse analysis. It could be extended to written language as well in the context of content analysis or include more artifacts such as ICT (e.g., using electronic vocabulary or other relevant Internet resources). The suggested ideas concern mainly qualitative research, in the context of the activity theory, considering language as a meditational tool.

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The Formation of Speech and Consciousness in Anthropogenesis: Evolutionary Drivers and Socio-Psychological Mechanisms

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The work is aimed at the theoretical reconstruction of the genesis of articulate speech and main abilities of consciousness based on evolutionary regularities and socio-psychological mechanisms. The basic concepts of the conceptual apparatus of reconstruction are presented: “abilities”, “attitudes”, “interiorization”, “interactive ritual”, “niches”, “social orders”, group and individual “concerns”, “communicative concerns”, “supporting structures”, including “magic wands” with a special potential for flexibility and multifunctionality. In ontogeny, human attitudes and abilities are formed through the mechanisms of interiorization (according to L.S. Vygotsky) and interactive ritual (according to E. Durkheim, E. Goffman, R. Collins). To reconstruct human traits folding in anthropogenesis is to represent a regular stepwise transformation of initial ingredients — features of the most ancient hominids, probably similar to features of the apes closest to *Homo sapiens* — chimpanzees and bonobos. Particular attention is paid to pre-rituals that form the internal and behavioral attitudes of apes, as well as their abilities for sign communication and learning new signs. It is shown what sequence of challenges and responses, new concerns and supporting structures led hominids to the formation of joint intentionality (M. Tomasello), self-domestication (D.K. Belyaev, R. Wrangham), normative rituals, the first group rules and internal normative attitudes (C. Lovejoy, D. Dor et al.). This complex phenomenon of normativity, the corresponding social orders and renewed communicative concerns became the main drivers of articulate speech development, the abilities of consciousness that are closely associated with it.

Keywords: the origin of language, cognitive evolution, articulate speech, consciousness, attitudes, abilities, social orders, normativity, rituals, joint intentionality, communicative concerns.

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Становление речи и сознания в антропогенезе: эволюционные драйверы и социально-психологические механизмы

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Работа направлена на теоретическую реконструкцию генезиса членораздельной речи и основных способностей сознания на основе эволюционных закономерностей и социально-психологических механизмов. Представлены базовые понятия концептуального аппарата реконструкции: «способности», «установки», «интериоризация», «интерактивный ритуал», «ниши», «социальные порядки», групповые и индивидуальные «заботы», «коммуникативные заботы», «обеспечивающие структуры», в том числе «волшебные палочки» с особым потенциалом гибкости и полифункциональности. В онтогенезе человеческие установки и способности формируются через механизмы интериоризации (по

Л.С. Выготскому) и интерактивного ритуала (по Э. Дюркгейму, И. Гофману, Р. Коллинзу). Реконструкция складывания человеческих черт в антропогенезе предполагает мысленное восстановление закономерного ступенчатого преобразования начальных ингредиентов — черт древнейших гоминид, вероятно, аналогичных особенностям наиболее близких к *Homo sapiens* человекообразных обезьян — шимпанзе и бонобо. Особое внимание уделено предритуалам, формирующим внутренние и поведенческие установки антропоидов, а также их способностям к знаковой коммуникации и обучению новым знакам. Показано, какая последовательность вызовов и ответов, новых природных, социальных забот и обеспечивающих их структур привела гоминид к складыванию совместной интенциональности (М. Томаселло), самоодомашниванию (Д. К. Беляев, Р. Рэнгем), нормативных ритуалов, первых групповых правил и внутренних нормативных установок (К. Лавджой, Д. Дор и др.). Этот комплексный феномен нормативности, соответствующие черты социальных порядков и обновлявшиеся коммуникативные заботы стали главными драйверами развития членораздельной речи, тесно сопряженных с ней способностей сознания.

Ключевые слова: происхождение языка, когнитивная эволюция, членораздельная речь, сознание, установки, способности, социальные порядки, нормативность, ритуалы, совместная интенциональность, коммуникативные заботы.

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The Problem of the Language Rubicon and Vygotsky's Ideas on the Genesis of Speech and Thinking

The origin of articulated speech, language, and consciousness is still among the “eternal problems” of philosophical and scientific cognition. That is why the continuing growth of research in this field is not surprising (see review in the book [3]). The most mysterious remains the “linguistic Rubicon” — the breakthrough from the sign system of animal communication to the beginning of articulate speech, the further stages of the development of which don't seem so surprising anymore.

L.S. Vygotsky attached great importance to W. Koehler's observation about the gap between the chimpanzees' sign communication and their ability to think practically. He noted the same gap in the early stage of development of children with subsequent connection. L.S. Vygotsky captured this similarity in his significant theoretical conclusions:

“Apes detect humanoid intelligence in some respects (rudiments of tool use) and humanoid speech in quite other respects (phonetics of speech, emotional function, and rudiments of social function of speech). Apes do not exhibit a relationship characteristic of humans — a close relationship between thinking and speech. One and the other are not connected in chimpanzees” [4, p. 757].

On the one hand, this thesis indicates that the potential ingredients for the formation of speech communication were already present in the predecessors of hominids (in the era of separation from anthropoids); on the other hand, there was a very high barrier (the “language Rubicon”) that hominids overcame for several million years, while their closest relatives remained without articulated speech.

Conceptual Tools as Key Concepts of Reconstruction

Attitudes are internal structures that regulate an individual's psyche and behavior (L. Lange, W. Thomas, F. Znanietzky, D. Uznadze [12]).

Abilities (including coagulated, automated skills) are operational properties of attitudes acquired through repetition, practice, and training. We will be interested in the formation during anthropogenesis of abilities to articulate and recognize speech, but here we will also understand the development of consciousness as a layering of special abilities to focus attention and operate with various kinds of mental representations. These abilities arise and grow as individuals practice and thus already have attitudes — a mindset of repetition and training. But where do the attitudes themselves come from?

Interiorization — transformation of external social interactions into “higher psychological functions” (L.S. Vygotsky, A.R. Luria), in other words, into mental structures that control behavior, i.e., into the very attitudes [4; 5].

Interactive ritual is an interaction of two or more individuals in a “here and now” situation with a common focus of attention, automatic reactions of each to the manifestations of others, synchronized actions and psychophysiological rhythms, and common emotional arousal of one or another modality. Full-fledged, successful rituals lead to formation, strengthening of social relations (solidarity with comrades-in-arms, bowing before leaders, authorities, estrangement to the rejected), as well as feelings, beliefs regarding sacral objects.

Hereafter, for simplicity, we will understand “ritual” in this broad sociopsychological (and micro-sociologi-

cal) sense. Thus, interiorization is the core of ritual as a kind of “social machine for the production of attitudes.

Attitudes are formed and reinforced in rituals through the positive reinforcement mechanism [10], and the interaction of participants, complex cognitive and emotional processes in rituals here play the role of operant attempts.

Caring is an objective need, or a need analogous to a function in evolutionary biology, but without rigid attachment to an organism; rather, it is a characteristic of a dynamic interaction of a living system with its environment. Along with individual needs, there are group concerns (cf. “social needs”). Besides natural (and later techno-natural) niches there are social niches, or social orders, systems of typical interactions and relations with this or that configuration of positions, corresponding patterns of behavior, with different access to each other, to benefits, resources, and in the long run with norms, institutions, practices. The renewal of orders to provide for certain challenges and concerns (usually basic — in the spheres of sustenance, security, status-prestige, sexuality, parenthood) supplies individuals and groups with new challenges and concerns (superstructural — above all in the spheres of social relations, communications and technology).

Concerns are initially expressed through challenges-threats and challenges-opportunities, and prospective responses become behavioral strategies, practices that lead to the formation of providing structures [24].

Such structures (adaptations in the broad sense and related elements, restrictions, connections, processes) can be of a very different nature: an organ, a property of an organ (for example, brain, larynx), innate assignments (including those for mastering speech) and gene mechanisms of their formation. Structures of group and individual care provision are considered to be an attitude and corresponding type of behavior, a social practice, a social institution, an element, a rule or construct of language, a capacity of consciousness.

Some flexible structures with especially great potential for modification and polyfunctionality are called magic wands. The skillful hand, the brain, the larynx, tools, rituals, attitudes, signs and meanings, abilities to use them, patterns transmitted through generations — all this falls into this class of structures. Prehistory and history have deployed such major magic wands as: language, consciousness, technology, intergenerational transmission, mythologies, thinking, cognition, art.

To reconstruct the intermediate stages of evolution, we should also take into account that no structure can emerge “out of nothing”: there are always some initial ingredients whose combination and modification constitute the structure’s formation.

So, abilities (including abilities of speech and consciousness) are formed together with attitudes, which, through interiorization and rituals, form as structures providing cares. The latter are formed by encompassing (techno)natural niches and social orders, which are themselves structures of providing care for survival in these niches.

At the beginning of the causal chain there is a renewal, including the “construction” of niches and orders [20].

Children’s Learning and Social Control of Speech “Correctness”

Thanks to the works of L.S. Vygotsky and J. Piaget, it became clear what an exceptional role interaction with adults plays in a child’s cognitive development. The transfer of patterns from adults to children was and remains the basis of cultural transmission. Patterns here are gradually released from the optional behavioral “additives” peculiar to a particular generation.

Let us note the presence of all components of interactive ritual in each interaction between the adult and the acquiring speech child: a common focus of attention (on what the child does and pronounces), the emotion of solidarity, explicit expressions of support from elders, approval when pronouncing correctly, instant corrections for mistakes, the child’s attempts to correct articulation, and again positive reinforcement for success. Connections of solidarity and joy of inclusion in rituals of general success of mutual understanding were and remain a powerful motive for mastering of the sign system new to the child, and with it, the whole complex of behavioral norms.

Animal Pre-Consciousness and Peculiarities of Apes’ Behavior

There is no doubt that animals with sharp eyes, sensitive ears and noses perceive the world around them and behave quite adequately with respect to different objects, according to their “meanings”. Moreover, the most developed animals have the ability to retain the “meanings” of objects that have disappeared from the field of vision. The field of sensory (visual, auditory and olfactory) attention of animals can be rightly considered an evolutionary stage of pre-consciousness, or zero stage of development of consciousness.

There are important features of the psyche, behavior of apes, especially chimpanzees and bonobos, probably similar to those features of the most ancient hominids that became the ingredients of future sapient (characteristic for humans) structures. Along with the complex system of sign communication, emotional pre-rituals, which will be discussed further, we should point out the inclination and high ability of apes to imitate actions, good trainability and teachability, including in mastering new actions and signs, and developed practical thinking [4; 5].

Pre-Rituals in the Animal World

The most vivid analogs of ritual actions in primates and other higher mammals living in groups are fights of

males (demonstrative or bloody, including among apes), which result in “imprinting” into the psyche of the winner and loser of the corresponding structures, settings, which will determine their behavior until a new rival fight [6].

Thus, hierarchical relations of dominance are established in the group with the establishment of priority access to prey and females, to hunting in the territory. When the weakened head of the group loses the fight to the strengthened rival, both of them develop mental structures regulating further behavior, which can be expressed approximately in the following way: “now I am the defeated, everything here is no longer mine, and I will have to leave” or “now I am the leader, all this territory and all females are mine, I will not let anyone here”.

Other examples of pre-rituals are establishing and maintaining relationships of acceptance, friendship (“solidarity”), sexual partnership, parenthood through grooming, touching, exchange of certain sounds [6]. “Mating games” and “courtship” among mammals and birds play the same role when forming pairs, since further partner and parental behavior (albeit mostly instinctive) is already directed to the partner, which is fixed just in the partnership pre-rituals.

In apes, positive reinforcement is not limited to a treat, as in trained animals, or to momentary access to a female to win a fight with a rival during the rutting period in many herbivores. Important motivators for chimpanzees and bonobos and very significant for us are feelings, emotions, and usually related to the level of social, group membership, and attitude on the part of significant others.

The Animal “Language” is a Part of the “Episodic Mind”

Many social animals, including apes, communicate with each other quite effectively by means of differentiated sound signals, the so-called “animal language” or “animal communication system” [13]. Simple meanings of signals (the appearance of a dangerous predator, threat, an agreement to obey, invitation to play, be friends, become a sexual partner, etc.) are conveyed by simple sounds.

The language of those monkeys whose life is important for different group behavior, adequate to different external threats or different situations within groups, turns out to be rather complex with many differentiated and easily recognizable sounds. This conclusion has received solid empirical substantiation thanks to a technique with tape-recording of different sounds and subsequent video-recording of monkeys’ behavior. Such is the “episodic mind” according to M. Donald [17].

It should be assumed that our common ancestor with the apes had approximately the same level of development of the sign system, otherwise it would be necessary to consider the ways of communication of chimpanzees and bonobos degraded, for which there is no reason.

Ability to Learn New Signs

The laryngeal anatomy of apes imposes strong limitations on the ability to produce clearly distinguishable sounds and cohesive combinations of sounds (words). Bonobos are trained to use graphemes (signs with meaning of objects and actions). The most talented and famous of them, Kanzi, learned several hundred such tablets by communicating with experimenters by pressing keys, after which the tablets appeared on the screen [21].

Kanzi made ample use of combinations of these “words”, i.e., protophrases, displaying the learned graphemes (usually denoting something tasty, as well as “give” and “want to eat”) in no particular order. M. Donald rightly observed that such successes are the result not only and not so much of the innate biological abilities of the monkeys themselves, but also of a culture of signs, meanings, and attempts at human communication brought in from outside by experimenters [17, p. 29].

Differences in Attention Structure and Ritual Behavior

A curious peculiarity was revealed by M. Tomasello: monkeys never point at anything, including meaningful things (for example, a treat or a toy), to each other. They usually draw attention to themselves by their behavior and sometimes show with their movements what they are going to do [25, p. 129].

The lack of the ability to point is common for wild animals. Dogs can muzzle or bark to indicate to people where something is (e.g., a padded duck). This ability is probably due to the long evolution of dogs in the human cultural space. However, dogs cannot point at an object to other dogs and keep their joint attention on it for a long time.

Specially trained chimpanzees can point to an experimenter for a treat to get it, but there is no evidence that they would do anything like that in the natural environment. A seemingly small detail. However, it is our ability to jointly focus our attention on the same object that underlies full human interactive rituals, so this “detail” turns out to be quite significant.

The ability of humans to point and understand directions, to respond to them adequately, is one of the specific features of our species.

Children even before they have mastered speech, at 12–14 months of age, are already quite confident in responding to instructions and are able to point at their own discretion.

It is precisely because of the absence of clear indicative gestures in animals that there is no full-fledged joint intentionality, when attention is focused not on themselves, not on the situation of their interaction, not on the practical goal (as in hunting), but on the object of common interest and their mutual communication [11; 14; 25]. Ac-

cordingly, in animal pre-rituals there are no separate symbols with autonomy of meaning from a specific emotional situation, no ability to keep the joint focus of attention on an object for a long time, and no shared, shareable subjective reality (at least, it cannot be judged).

The Descent of Hominids to the Ground and the Transition of Dominance to Egalitarian Coalitions

At the descent to land, early hominids fell into a highly competitive niche of gatherers and, alas, inferior scavengers, with the need to stick together for protection against formidable predators and to bring food from afar to women left with children in the stay [2; 22].

According to the known morphological traits, there was a self-domestication: large jaws disappeared, cranial ridges and shafts decreased, and sexual dimorphism (the difference in size and strength between males and females) decreased. It is reasonable to believe that this process included not only anatomical, but also significant social and cognitive transformations towards equality and intragroup solidarity [1; 7; 26].

There are several explanations of egalitarianism that do not contradict but complement each other: distant group violence (stoning), the appearance of lethal weapons (choppers), coalitions of mothers against aggressors to protect children and themselves from violence, negative sexual selection of aggressive alpha males.

Hominids drove away competitive scavengers from their prey with stones [2], but it was also necessary to drive predators away from the camp, protecting small children, so females were able to throw stones as well as males. They were also the least tolerant of internecine clashes and fights, because the winning males became a threat to the children of the defeated, and females were threatened with sexual violence [7; 19; 23].

The version of the group stoning of the strongest opponents [15] is supplemented here by a quite plausible alliance between mothers and a group of relatively weak males, who together confronted large bullies and rapists.

The rudimentary choppers used to cut up carcasses were a new weapon that could not only severely injure but also kill. Since among the higher mammals it was more often a demonstration of threats (who would be afraid of whom) instead of fights, without a real fight, the single aggressors were more likely to yield to a coalition of weaker males, more so supported by females.

Finally, even in the absence of sure victories in skirmishes, females that were in alliance against aggressive males avoided mating with them by all means. It is possible that it was the latter factor of negative sexual selection that became the most effective for hominid self-domestication both in morphology (gracilization) and behavioral traits (orientation towards group mem-

bership and solidarity rather than personal dominance through violence and intimidation).

In group life, the main outcome of these processes, which took a very long period (approximately from 8–7 to 2.5–1.5 million years ago), was the transition of dominance from aggressive alpha males to solidary and relatively egalitarian coalitions. The dominance of males (as in most known hunter-gatherer groups) or females (as in bonobo groups) was not so important.

The Ultra-Micro Level: From Self-training to Normative Rituals

From millions of years, let us move on to minutes and seconds, the main social actions in “here and now” situations that shaped the psyche and behavior of the participants. Hominids were certainly no less sensitive and intelligent than apes, so they learned to react adequately to the mood of their tribesmen. The members of the dominant coalition, and then the rest of the group, responded to inappropriate behavior by amicably expressing a common emotion of disapproval with facial expressions, postures, and certain audible signals, reinforced by the threat of group punishment. Solidary and useful for the group behavior (generosity in sharing, protection of the weak, arrangement of a camp, making a convenient tool), on the contrary, was encouraged, but also amicably and with special vocalization.

Already in these actions, one began to form joint intentionality, group cognitive involvement in a situation, someone’s behavior with keeping a common focus of attention and experiencing a common emotion [14; 25, p. 305]. What took place is best qualified as self-training. Indeed, the group systematically censured, ridiculed those who allowed violence, rudeness, greed, cowardice, and expressed approval of the skillful, fortunate, generous, ready to help fellow tribesmen.

Group control over time was provided by soft but perfectly recognizable signs of approval (smiles, patting) and disapproval (scoffing, angry face, contemptuous glances), which are still used in all human communities today.

Sound cues have by no means disappeared. Friendly loud yelling, previously used to frighten the intruder, was no longer necessary. A soft but clearly discernible signal uttered by just one member of the dominant coalition, accompanied by appropriate intonation and facial expressions, was already quite sufficient.

Shift of the Regulative Instance from the Other Person to the Sign

It is extremely important that, over time, the standard audible signals signifying disapproval or approval acquired their regulatory power over individual behavior through interiorization. The mechanism of interioriza-

tion itself is already present in animals' pre-rituals: after a fight the loser gets the attitude of subordination, and the winner — the attitude of domination (see above). At the same time, the whole emotional situation with fear of the victor or triumph over the defeated opponent is "imprinted" in the animal's psyche. The whole situation with the emotion has been interiorized here.

Now consider what happens in the training process. A well-trained dog "understands" commands "lie down!", "sit!", "voice!", "may!", "ugh!", "near!", etc., obeys them even if someone else (in something similar to the master) pronounces these words with an authoritative intonation. There is no interiorization here, because social interaction is still required for "correct" behavior. Recognition and execution of multiple commands by a dog or a circus animal can be traditionally described in terms of conditioned reflexes according to I. Pavlov or in terms of operant conditioning according to B. Skinner [10], but it can also be described as a formed attitude according to Dm. Uznadze [12] — mood and ability to respond with a learned action to clearly pronounced words spoken by a person.

The notion of "self-training" is significant here because each hominid as an object of "training" was to some extent also its subject, because it learned and was capable not only of recognizing, but also of uttering the same sound signals that signified group approval or disapproval of someone's actions or what was going on in general.

Let us present the three stages of hominid self-training almost exactly according to the stages of formation of mental structures according to L.S. Vygotsky [4]:

1) repetitive situations with a friendly expression of group approval or disapproval of someone's action, accompanied by a specific, well-recognized sound signal;

2) the participant, being alone and wishing to do something disapproved (for example, to eat the extracted food instead of taking it to the parking lot and sharing it), himself loudly utters words of disapproval, imagining displeasure of his tribesmen, and refuses to break; or on the contrary, he does not want to do something approved (to go for prey to a dangerous place, cross a cold river, share the extracted food), but loudly utters encouraging signals and overpowers himself;

3) the same as in item 2, but the sounds are pronounced "in mind," i.e., the attitude is interiorized and attached to the sign.

Thus, the widespread ability of animals to form attitudes in pre-rituals without interiorization is here combined with the ability to interiorize sound signals and obey them thanks to talk in mind. Adherents of psychoanalysis have every right to see here the birth of the instance of the "Super-Ego."

Let's consider difference of new moral feelings — shame and pride — from emotions of animals similar to them on external expression. According to their visible signs (a downcast look, the lowered head and shoulders, hunched over) shame really is related to more ancient

experience of subordination, oppression. However, shame is a more complex, superstructural feeling, since it includes not only recognition of one's failure and weakness, but also a certain violation of a rule. The main thing becomes not fear of punishment, but the experience of inappropriateness of the behavior.

Pride, similarly expressed by humans, apes and probably ancient hominids (straight posture, raised head, straightened shoulders, straight gaze, burning eyes) means not only and not so much victory in a fight and power advantage, as the very "moral force" according to E. Durkheim, i.e., sense of legitimacy of their behavior, justification of their high social membership in the group, that is prestige [18, p. 176].

Normativity and New Communicative Concerns

With the emergence of normativity, the basic spheres and types of concerns, security, sustenance, prestige, sexuality, parenthood, remained, but social conditions and permissible ways of achieving the corresponding interests and goals were steadily becoming more difficult and complicated. This forced hominids to search for new answers, and in the same chosen "rut" of coordinating actions through communication [8].

Normativity became a magic wand, generating new rules and relations, and hence new social orders. In this new environment, the communication and recognition of more and more signs became critical to individual and group concerns. The more signals appeared, the more criteria to distinguish and recognize them began to be demanded [8, p. 24]. This was achieved by distinguishing syllables and then phonemes, thanks to which syncretic signals turned into proto-syllables (still tied to situations). Distinguishing syllables, phonemes and their meanings became a lexical magic wand, i.e., a mechanism for generating multiple protowords.

Thus, the pre-speech as a stage of language evolution between the communicative system of animals (as well as infant humming in ontogenesis) and protolanguage (with an established phonetic structure and ordering of words autonomous from the situation and semantically related to each other) — appeared.

Pre-speech is characterized by rudimentary differentiation of proto-syllables (early pre-speech) and differentiation of syllables with basic phonemes (late pre-speech), use of proto-words (with situational, unrelated meanings), and reactive proto-phrases (pronounced in response to a situation a set of protowords without a meaningful order).

Normative settings, the ability to execute and control the execution of rules served as the basis for articulatory standardization, without which the recognition of pronounced combinations of sounds is impossible.

In the absence of the overwhelming power of alpha males, a renewed need to coordinate sentences for decision-making emerged. An entirely new communicative concern of persuasion appeared, involving mutual understanding, and here it was no longer possible to do without mimics and gestures alone [8, p. 23].

The struggle for dominance through intimidation with violence has been replaced by competition for leadership and prestige through mobilization of support based on correct behavior.

The seemingly “natural” order of speaking, where one speaks and the rest remain silent, is a particular norm that was developed and consolidated, probably by transposing the rule of strict order of access to food at communal meals.

The prohibition of sexual violence led to an increase in the importance of courtship and flirtation, which also began to be carried out through aural communication.

Among the first abilities of consciousness associated with increased linguistic complexity were:

- The ability to jointly focus attention on emotionally meaningful disapproved or approved by the group of fellow tribesmen in the situation at hand (initially in normative rituals);

- The ability to distinguish, distinguish belonging relations, follow the appropriate rules of access both to goods and resources (tasty food, tools, places) and to fellow tribesmen (especially in the sexual sphere);

- The ability to distinguish more complex and diverse rules, to recognize others' and one's actions falling under them; to feel shame, pride, anger, respect when comparing actions with norms, moral attitudes;

- The ability to fix attention to “tomorrow” and “yesterday,” and then to hold attention to the alternating days, to orient oneself in them (probably, in connection with the necessity to support the fire, to prepare fuel).

The reconstruction of these complex processes in connection with the renewal of techno-natural niches, social orders, and communicative concerns requires a separate exposition.

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