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И ОБРАЗОВАНИЕ**

**PSYCHOLOGICAL SCIENCE
AND EDUCATION**

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ПСИХОЛОГИЧЕСКАЯ НАУКА И ОБРАЗОВАНИЕ

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Dear readers!

We present to your attention the first issue of the "Psychological Science and Education" journal for 2024. The journal's traditional "Developmental Psychology" section presents the results of a study on a wide age range — image detailing in children from 3 to 7 years old; the psychological well-being of teachers; the level of education and satisfaction with life in retirement. The section also presents the results of a study of Russian society's involvement in educational projects.

The "Psychology of Education" section presents the results of a study of educational modelling in high school, which can stimulate students' initiative and independence, develop their ability to analyze, and deepen their understanding of subject relations. And also, the results of a study of the role of educational and motivational factors in the academic achievements of Russian teenagers in the field of reading literacy.

The issue concludes with the transcript of the speeches of the participants of the "Functional psychological literacy of parents and teachers as a condition for building effective communication with a child" round table. The speeches of the participants of the round table were devoted to modern ideas about psychological literacy in psychology; approaches and studies in the field of the formation of psychological literacy within the "teacher-pupil", "parent-child" systems; the formation of functional psychological literacy of school teachers in communication with pupils; knowledge, skills, abilities of parents in the interaction with a child; risk factors in the development of functional psychological literacy in the communication and interaction with a child of parents and teachers in the family and in school.

We hope that readers will find interesting materials in the new issue of the "Psychological Science and Education" journal.

Image Detalization as an Indicator of Figurative and Plastic Creativity of Preschoolers

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Based on a brief description of creativity and imagination, their indicators and age characteristics, the insufficiency of research on the creativity of preschoolers is shown. A diagnostic study (1993—2000) is described, aimed at identifying the age characteristics of children 3—7 years old in detailing the motor-plastic image. 193 children participated in the diagnosis according to the author's method "Hare and Wolf"; they were asked to embody the plot of the "fairy tale" by means of the movement language. It was revealed: in the younger group, schematic movements predominate, signifying the image; in the middle group, the proportion of "complex" figurative movements is growing; in the senior and preparatory groups, "complexes" (partial and integral) prevail and the number of sequences of figurative movements that convey the phases of the character's actions is growing. Statistical analysis (according to the criteria H Kruskal-Wallis and U Mann-Whitney) revealed significant differences in image detail between different age samples and the absence of such differences between boys and girls (in different years).

Keywords: creativity; figurative-plastic creativity; compositional creativity; image; detailing of the character's image; movements language; preschoolers.

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Детализация образа как показатель образно-пластического творчества дошкольников

Горшкова Е.В.

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На основе проведенного автором анализа и краткой характеристики творчества и воображения, имеющихся данных об их свойствах и возрастных особенностях делается вывод о недостаточности исследований особенностей творчества дошкольников. Приводятся результаты диагностического обследования (1993—2000 гг.) возрастных особенностей детей 3—7 лет в детализации двигательно-пластического образа. В диагностике по авторской методике «Заяц и волк» участвовали 193 ребенка; им предлагалось воплотить сюжет «сказки» средствами языка движений. Выявлено: в младшей группе преобладают схематичные движения, обозначающие образ; в средней группе растет доля «комплексных» образных движений; в старшей и подготовительной группах преобладают «комплексы» (частичные и целостные) и растет число последовательностей образных движений, передающих фазы действий персонажа. Статистический анализ (по критериям Н Краскела-Уоллиса и U Манна-Уитни) выявил значимые различия в детализации образа между разными возрастными выборками и отсутствие таковых между мальчиками и девочками (в разные годы).

Ключевые слова: творчество; образно-пластическое творчество; сочинительское творчество; образ; детализация образа персонажа; язык движений; дошкольники.

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Introduction

One of the primary aspects of the study of preschoolers' features of figurative-plastic creativity [9] is the consideration of various views on the nature and features of creativity, its origin and development. At the same time, different interpretations of the content of creativity and related concepts are revealed. Thus, "creativity" is understood as a process [19], a type of activity or the highest level of development of any activity [15], the product of this activity [19], as the realization of the mission of humanity in cognition of the world [2; 3; 15];

"productive imagination" as a psychological process underlying creativeness [4; 5; 13] as one of the universal creative abilities [13; 14]; "creativity" — as the ability to creative activity and thinking [1; 12].

Until now, the definition of creativity "is given according to its result, which is characterized through the novelty of the product" [3, p. 64]. In contrast to this, it is proposed to consider as an indicator of creativity its mechanism, the essence of which is "the development of activities on one's own initiative", with going beyond the set task, guided by the motive "to know and

understand everything”, and not for the sake of achievement of success [3; 14]. However, in relation to preschoolers, it is also relevant to consider the step-by-stepping of development of creativity indicators, which is both age-related and individual in nature. Such research positions are aimed at an internal process and result that is significant for the creator himself and motivates him for further development. In children, the significance of the result is subjective as a reflection of novelty in their individual “story” of development.

The opposite position is presented in some modern foreign studies aimed at developing the creative potential of gifted children for the sake of their creative productivity, which requires external support provided “only to those who are ready to fully immerse themselves in this process” [18, pp. 24–25]. Obviously, only such immersion guarantees not a waste of funds on the cultivation of a future talented human who will be able to provide “returns” and multiplying the efforts invested. The shift in the focus of research from the identification of general abilities to “the search for potential abilities that are important for specific areas of activity” [18, p. 24], which can be developed from school, is becoming one of the reasons for a small number of research on preschool age, despite the emphasis on the importance of early detection in children’s abilities, including creative ones. Studies of creativity potential are conducted with children up to 6 years of age to “understand the initial emergence and development of creativity” and to develop “creative thinking” through “interactive creative tasks based on movement” [20]. “Motor creativeness” is more often understood as “new ways of harmoniously acting or appropriate behavior in new situations” [21].

In one of the foreign studies with children aged 5–6 years, creativity (the creative beginning) is seen in the use of symbolic means in the play with social roles [6]. It is noted that children’s understanding of the meaning of their role-playing actions gradually shifts the support of the meaning of game from actions with real objects and their substitutes to relations with other children, to creative comprehension of “the relationship of one’s character with other per-

sonages, taking into account the rules” [6, p. 43]. After the developmental influence, there was a “deep emotional immersion of children in their roles” [6, p. 44], a conscious correlation of the role actions of their own and other characters, which allowed children to perform “role-playing actions in the best possible way, fully representing depicted personage” [6, p. 45]. Based on the generalized description in the article, it is not clear in what exactly the “emotional immersion” in the role and “performing role actions in the best way” were manifested; However, in part, these results “overlap” with our findings below.

Measuring the productivity of creativity is one of the main areas of research both abroad [1; 6; 12; 19] and in Russian psychology [8; 12; 13]. The creation of tests of divergent (creative) thinking is associated with the concept of J. Guilford [13; 19] and the first psychometric tools that continue to be widely used in modern research and educational practice [19, p. 10]. Indicators of creative thinking are traditionally recognized as: flexibility, fluency, plasticity, accuracy, mobility (movingness), originality, elaboration, as well as an overall assessment of the nature of the response by experts [1; 7; 12; 13; 19].

Let’s briefly consider the features of productive imagination, including in relation to preschoolers. The identification of patterns of the formation of imagination in preschool childhood is important because it is during this period that the main prerequisites for its development are laid [13, p. 5]; it, according to words of L.S. Vygotsky, D.B. Elkonin, V.V. Davydov, is recognized as the “basic “psychological conquest” of preschool childhood” [14, p. 59].

The needs arising from the inability to adapt to environmental conditions are an impulse, the driving force of imagination, which becomes a source of creativity [1; 4; 5]: elements of life impressions, experiences are combined into new combinations, uniting according to the principle of a common affective tone [16] or the law of a common emotional sign [4; 5], and also — according with an idea or conception, which makes new combinations bearers of meaning [17]. Imagination, “crystallized” in the products of creative activity [16], “begins to really exist in the world” and becomes “a new active force that

changes reality. This is the full circle of creative activity of the imagination” [4, pp. 15—16], in which intellectual and emotional factors are mutually necessary [4].

L.S. Vygotsky considered it substantial for the imagination to distance from reality into a relatively “autonomous activity of consciousness, which differs from the direct cognition of reality” [5, p. 130], which is creating opportunities for free action [5].

He pointed to a turning point in the development of imagination, which coincides with the emergence of speech, by means of which the child is freed “from the power of immediate impressions, having gone beyond them” [5, p. 123]. At the same time, he emphasized that children’s imagination has a motor character, which in preschoolers is found in dramatization, which has more similar with play, where children actively depict images (characters) “through of their own body” [4, p. 89].

The author’s works on the development of figurative-plastic creativity in preschoolers [8—11, etc.] are related to the study of the features of productive imagination, which is manifested and can be actively developed in this activity. Figurative-plastic creativity is an artistic and game activity of preschoolers, in which the main means of embodiment of the images of characters in the context of the plot is the language of movements — voluntary expressive movements and bodily plastic of a child. The development of figurative-plastic creativity is assessed by five indicators [8], one

of which — the detailing of the personage’s image — characterizes the compositional creativeness of preschoolers, that is, reflects the ability of children to “connect” movements (of arms, legs, torso, head, facial expressions) into complex combinations and sequences that form the basis of the composition (or its fragments) and embody a imaginative meaning in accordance with an imaginary situation. This indicator is close to such criteria of creative thinking as “accuracy” and “elaboration” of details, but does not coincide with them, since it characterizes not only the product of creativity, but also the stages of formation of the ability to “compose” in the language of movements.

The results of the study of the features of the detailing of movement-plastic images embodied by preschoolers are described below.

Methods

The purpose of the study is to identify the age characteristics of preschoolers in the detailing of the personage’s images, considering it as an indicator of figurative-plastic creativity.

Hypothesis. During preschool childhood the detalization of images (personages) by children become more complicated step-by-step in the process of its creatively embodied by means of expressive movements.

Characteristics of the subjects: 193 children aged 3—7 from kindergartens in Moscow (Table 1). On average, the composition of boys and girls is approximately same: 51% and 49%.

Table 1

Number of groups of children

Groups Years of diagnostics	Junior	Average	Senior	Preparatory
1993	—	13	14	—
1994	32	18	15	19
1997	—	16	11	21
2000	34	—	—	—
Standard deviation	0,504	0,791	0,797	0,506
Number of children by age	66	47	40	40
% Boys	43,6	53,2	52,5	55
% Girls	56,4	46,8	47,5	45

The study scheme is an individual diagnosis and comparison of the data obtained both at four ages and within each age.

The “Hare and Wolf” technique (author: E.V. Gorshkova) was created in 1993 to identify the features of figurative-plastic creativity of preschoolers. The child was asked to embody a plot of 12 episodes using expressive movements (the procedure and evaluation system were described in detail earlier [8]).

Each episode of the “fairy tale”, embodied by a child, was evaluated in points depending on the method of detail. Based on the sum of the points, the individual level of development of the detailization of images (personages) was determined: “zero level” — skipping episodes, lack of detail; low: 0.5—2.0 points; average: 2.5—7.5 points; high: 8—12 points (qualitative characteristics of the levels are given below).

When processing the results, methods of qualitative analysis and mathematical statistics were used with the applying the SPSS program to compare the obtained data according to the H Kruskal-Wallis criterion (for three or more samples) and with their pairwise comparison according to the U Mann-Whitney criterion.

Results

The following ways of “solving” separate episodes have been discovered: skipping episode (a child does not move, stay to stand at place); movements not reflecting the image (personage); “schemes”; “complexes”; sequences of movements, which occur at all ages, but in different ratios (Table 2). Detailing the image begins with the use of “complexes” according to the image of personage.

According to quantitative analysis, the junior groups were characterized by a predominance of schematic, non-detailed, imaginative movements, as well as movements not embodying personage’s image; a high proportion of missed episodes; detailing was noted only in 25% of cases.

In the middle groups, the proportion of absences decreases by a third and the percentage of “complexes” doubles. The most typical is using of schematic movements and incomplete “complexes”. The first sequences of movements (fragments of the composition) appear, but their number is not significant (the total share of detailed solutions is 40.1%).

In the older groups, the number of missed episodes is reduced by another 2.5 times. The percentage of “complexes” is growing, and the

TTable 2

Ratio of detailization methods at different ages, %

		Groups			
		Junior (3—4 years old)	Middle (4—5 years old)	Senior (5—6 years old)	Preparatory (6—7 years old)
“Solutions”					
Refusal, skipping an episode		29,4	22,3	9,3	6,6
Not an imaginative movement		18	5,4	6,7	0,4
Single Schematic Movement (“Schematic”)		27,6	26,2	27,2	11,7
“Complexes”	Incomplete (partial image)	17,7	34,2	31,7	51,9
	Holistic (the image of the “whole body”)	2	4,1	10,3	10,7
	In general (“complexes”):	19,7	38,3	42	62,6
Sequences	(A) — variants of equivalent movements	2,4	2,7	4,4	7,7
	(B) — concretization of the action (from “schemes” and “complexes”)	2,9	5,1	9,6	10
	(B) — concretization of action (only from “complexes”)	0	0	0,4	0,2
	(D) — “cohesive tissue” (fragments of the composition)	0	0	0,4	0,8
	In general (sequences):	5,3	7,8	14,8	18,7

share of sequences is doubling (56.8% in total).

And finally, in the preparatory groups, “complexes” and sequences of figurative movements prevail (summary 81.3%).

Qualitative features by levels of detalization of personage image at different ages.

Due to the omission of episodes and the use of schematic (non-detailed) movements, the results on this indicator are reduced. Signs of detailing of the personage image are associated with the use of “complexes” and sequences of imaginative movements, which have qualitative differences at three levels of detailing, while a significant direct correlation is found with the development of the performance (emotional-figurative) expressiveness indicator (in all ages $K_{\text{кор}} \approx 0.8$) [8].

Children with a **low** level of detalization of the personage image (at any age: from 3 to 7 years old) use incomplete “complexes”, combining 2—3 figurative movements, both reflecting the image and not quite appropriate (stereotypes of figurative movements not corresponding the given image; contradiction of facial expressions and plastics). Movement sequences are almost not used. As a rule, emotional accompaniment (joyful or indifferent) rather reflects the child’s attitude towards the task being performed. and not the features of the embodied image.

Average level. Along with “complexes” of disconnected details, there appear integral, non-contradictory “complexes” in which all the components of movement correspond to the given image of personage. Sequences of movements (in 1—2 episodes of the plot for junior and middle preschoolers, and in 3—5 episodes for older ones) include not only schematic, but also incomplete “complexes” of figurative movements. The emotional experience [perezzhivanie] of the images manifests fragmentary, as a rule, “on separate episodes” however it can be quite striking when using integral “complexes” (figurative movement “with the whole body”).

High level (in a small percentage of older preschoolers). About half of the fragments of the “fairy tale” are embodied by children with the help of coherent sequences of figurative movements (in exceptional cases — even in in almost all episodes), and in the rest of the fragments they use “complexes” of movements. As a rule,

it is accompanied by an emotionally expressive performance of the personage image.

At different levels of detail, two basic principles (A and B) are found in the construction of sequences of movements.

A) Variability of movements of equivalent meaning, conveying one action with the invariable mood of the character and his movement in (unrecognizable imaginary) space; it was more often seen in the episodes “The Bunny is having fun”, “The Bunny walks”: alternating types of jumps with turns at a place and forward movement remains the same at all ages.

B) Semantic concretization, enrichment with details of character behavior are found in situations of interaction, in reactions of one character to another (the hare is scared or drives away the wolf; the wolf is scared of the hare); as a rule, the older the preschooler, the more phases of emotion development are embodied in a imaginative movement (within one episode), and the more emotionally expressive it is performed an image, with an emphasis on the emotions of the personage rather than on his characteristic plasticity; space is lived and played out in relation to an imaginary opponent.

Then complex sequences appear, consisting only of “complexive” movements; there is even a combination of several episodes into coherent fragments of the composition (options B and D — see Table 2).

The increasing detalization of the personages’ images reflects the enrichment, the growth of concretization of its content features thanks to the deepening of children’s understanding of its meaning, imaginative content.

Statistical analysis of results by ages.

For each age sample, the average values of individual totals obtained in different years were determined and compared with each other according to the Kruskal-Wallis H test and in pairwise comparison according to the Mann-Whitney U test. As a result, statistically significant differences were revealed: on the Fig. 1 it are marked with “asterisks”.

With this in mind, the data for 1993 (in the junior and senior groups) and for 1994 (in the preparatory group) were excluded from the comparison of the mean values. After subtracting them, the data were compared with similar results for all

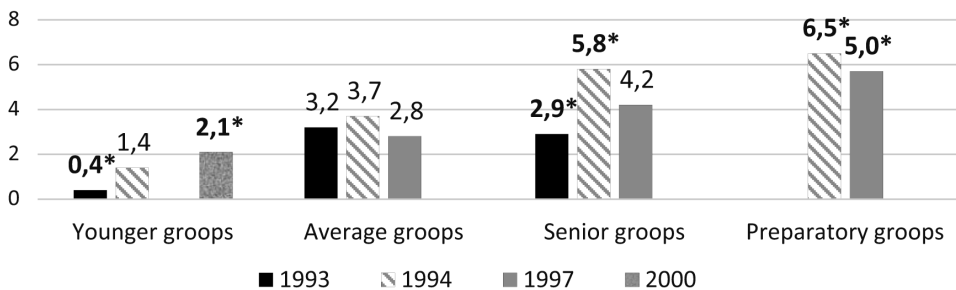


Fig. 1. Comparison of average scores for the methodology as a whole in four age group samples (in different years)

years (Fig. 2), and that did not reveal a fundamental difference in the developmental trend of the personage image detailization: during preschool childhood, there is increasing children’s ability to detail a movemental-plastic personage image.

The levels of detailization of personages’ images in children of different age groups were compared in two ways.

Their percentages (Fig. 3) revealed a predominance of “complexes” of figurative move-

ments in children from 5 to 7 years old (mid-dles — preparatory groups); in the junior groups, due to a large share of schematic movements, a low level of detail prevails.

Statistical analysis of the results of four age group samples in two cycles according to the H criteria of Kruskal-Wallis and U Mann-Whitney revealed statistically significant differences between the age groups, except for the pair: senior and preparatory ($0.059 > 0.05$), however a trend

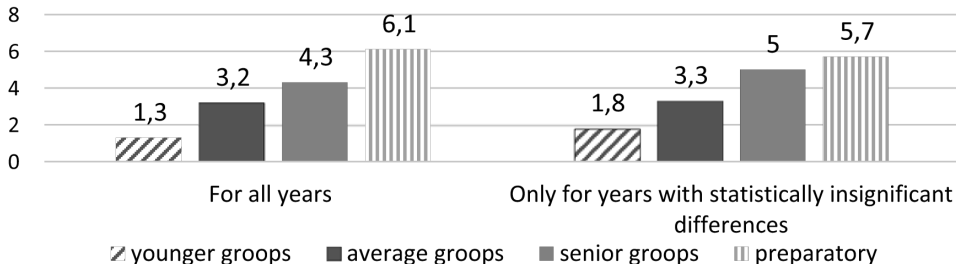


Fig. 2. Comparison of the average final results on detailization of the image differently by age

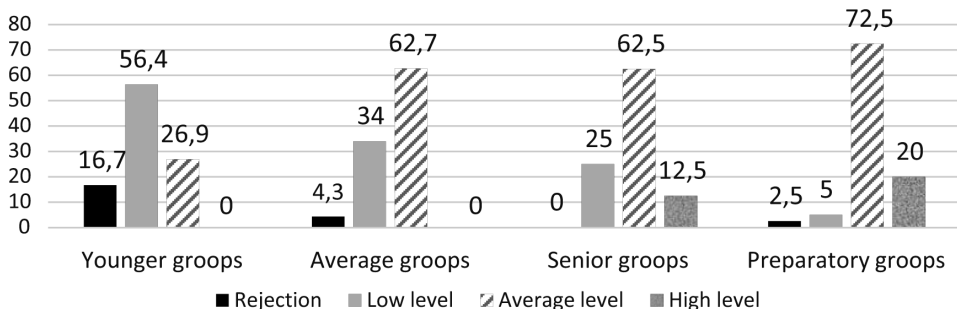


Fig. 3. Levels of detail in different age samples

towards the significance of the differences is outlined here as well.

A comparison of the levels of detail in boys and girls of the same age (separately by year) revealed (according to the Mann-Whitney U test) no statistically significant differences between them. The exceptions were the two older groups in 1994 and 1997, where girls performed significantly better than boys. Thus, it can be argued that the ability to detail an image of personage in the course of its creative embodiment through expressive movements, as a rule, does not depend on the child's gender.

Discussion

The main methods of constructing an image by means of expressive movements — “schemes”, “complexes”, sequences — are similar to the levels of the qualitative indicator of productive imagination (according to the method of O.M. Dyachenko “Dorisovyvanie figur”¹) [13]. For example, schematic (non-detailed) imaginative movements are similar to schematic object images in a drawing and prevail in junior preschoolers; “complexes” of imaginative movements are analogous to filling an object image with details (in the picture) and become characteristic of the middle preschool age; and the sequences of imaginative movements, which form the basis of the movement-plastic composition, are analogous to the levels of actions and plot in the drawing. This allows us to assume that the detailing of the image as an indicator of the composing movement-plastic creativity of preschoolers reflects the general trends in the development of the quality of children's imagination. At the same time the originality of the motor and plastic image reflects the development of the quantitative indicator of imagination [10].

Non-integral “complexes” as the most characteristic way for a preschooler to detail an image (character) take place because the figurative movement is not performed by the whole body, and semantic contradictions may arise between the expressive movements of different parts of the body. This is due to the fact that during the embodi-

ment of the image also are observed child's own expressive movements as a “breaking through” involuntary manifestation of his mood about completing the task [9]. The appearance of holistic, consistent “complexes” (the embodiment of the image “with the whole body”) occurs as a result of the child's arbitrary restraint of his own emotional reactions, so as not to destroy the embodied image. This confirms L.S. Vygotsky's words: in solving an important task for a personality, “the activity of imagination is not subordinated to the subjective whims of emotional logic” [5, p. 127], even when the figurative content embodied by a child can be emotionally saturated. Exactly it becomes significant and motivates the creative activity of the child. But this trend becomes obvious and continues to develop in the older preschool age.

Detailing is especially closely related to “reincarnation”, getting used to an image (an indicator of creativity of performance or expressiveness of performance) [8]. In improvisation, where composition and performance occur simultaneously, the emotionally expressive living of the image is an impulse to enrich the details of the image structure. Image detailing is the construction of an image reflecting its structural expressiveness (content) [9]: the more complex the image detailing, the richer its content, the more the child comprehends the image, the more he is involved in the creative process.

The peculiarities of detailing the motor-plastic image revealed in preschoolers (“complexes” and “sequences” of movements of varying complexity) thanks to the “dryness” of obvious signs allow us to separate the construction of the image (actual detail as an indicator of “composition”) from his emotional living (an indicator of creative actor playing); this helps not only researchers, but also practical teachers to see and analyze the features of children's imaginative-plastic creativity.

According to the diagnostics, the combination of the character's characteristic plasticity and the peculiarities of his experiences (emotions) in the integral figurative movement is practically not found in preschoolers. However,

¹ Unfortunately, an adequate translation of the name of the technique could not be found, so it is given in Latin transcription from Russian. The task for the child is to draw a given abstract figure to a complete object image.

this feature has a place only in the spontaneous development of creativity in children aged 3—7 years. As studies show [9; 11], with the purposeful development of imaginative-plastic creativity based on teaching children the language of expressive movements, such a combination is achieved thanks to a certain technique that allows expanding the zone of both nearest and actual development of children.

The revealed absence of statistically significant differences between boys and girls in the detail of the image during its creative embodiment through expressive movements is consistent with the data of other studies: the absence of differences in the creative abilities of women and men [7], the absence of a significant difference in the “motor creativity” of boys and girls of preschool age [21].

A comparison of the results described in this article on detailing the movement-plastic image of a personage with similar data obtained using the same diagnostic method in children who purposefully studied the language of movements as a means of developing figurative-plastic creativity may be a subject of future publications.

Conclusion

As a result of the study, the age characteristics of preschoolers in terms of the indicator of “detailing” of the movement-plastic image during its creative embodiment were revealed: the ways of “solutions” in the construction of the image; the ratio of the types of detailing at different ages and in the perspective of its complication from junior group to preparatory group. Individual characteristics which ahead of the age-related trend in the development of detailing (or lagging from it) were also revealed; that can be explained by the peculiarities of the child’s personal experience and abilities.

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The hypothesis of the study about the complication of children’s detailing of the images (characters) during its creative embodiment by helping of expressive movements during preschool childhood is confirmed, which can be considered as a stage-by-stage development of the indicator, the main tendency of which is from “complexes” — to alternation “complexes” with simple “sequences”, and then to their compositional combination.

The age peculiarities of preschoolers in the use of various ways of “solutions” of the movement-plastic image and varieties of its detailing are shown: in children of the junior groups there is a predominance of “schematic” movements denoting the personage image, along with a large share of missed episodes of the plot; in the middle groups, along with “schemes”, “complexes” are used; in the senior and preparatory groups, a combination of “complexes” and sequences of movements, the latter become the prologue for the creation of a figurative and plastic composition.

In preschoolers (with spontaneous development, without special learning) the detailing of the movement-plastic image can be observed in the junior group as an emerging tendency (in the form of single “complexes” imaginative movements), but its active spontaneous development occurs in the middle group and especially in the older preschool age.

As a rule, the ability to detail the images of personages in the process of their creative embodiment by the help of expressive movements does not depend on the child’s gender.

The results obtained complement the understanding of the peculiarities of the development of productive imagination and creative abilities of preschoolers both in theoretical and practical plans.

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Subjective Well-being of Teachers in Contemporary Situation: Emotional, Personal and Metacognitive Predictors

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This study aims to comprehensively explore the emotional, personal, and metacognitive predictors of the psychological well-being of teachers. The article presents the results of identifying personality traits, features of the emotional sphere and regulation of emotions, as well as features of metacognition that can influence well-being of teachers in modern conditions. To measure these characteristics, the following methods were used: a short portrait questionnaire of the Big Five; methodology “Differential Scale of Emotions”; methodology for diagnosing the subjective well-being of the individual; Metacognitive Awareness Inventory; test “Differential Type of Reflection”; Cognitive Emotion Regulation Questionnaire and the author’s self-assessment questionnaire of metacognitive behavior “Metacognitive Skills in the Structure of Educational and Professional Activities”. Study sample: 106 people aged 20 to 75 years (average age 45,85) — teachers, lecturers, heads of departments of higher educational institutions and colleges. It is shown that the higher levels of metacognitive involvement correspond to the higher levels of subjective well-being. A high index of positive emotions, higher levels of trait conscientiousness and conscious use of metacognitive skills, positive revision and acceptance strategies, and lower acute negative emotions index also have a positive effect. The results described can be helpful in preventative and therapeutic work with the symptoms of professional burnout of teachers.

Keywords: psychological well-being; subjective well-being; metacognitive skills; metacognition; emotions; personality traits.

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Авторами представлены результаты работы, которая была направлена на комплексное изучение эмоционально-личностных и метакогнитивных предикторов психологического благополучия преподавателей. Целью исследования было выявление личностных черт, особенностей эмоциональной сферы и регуляции эмоций, а также особенностей метакогниций, способных оказывать влияние на уровень благополучия преподавателей в современных условиях. Для исследования заявленных показателей использовались следующие методики: короткий портретный опросник Большой пятерки; методика «Шкала дифференциальных эмоций»; методика диагностики субъективного благополучия личности; опросник метакогнитивной включенности в деятельность; тест «Дифференциальный тип рефлексии»; опросник «Когнитивная регуляция эмоций» и анкета самооценки метакогнитивного поведения «Метакогнитивные навыки в структуре учебно-профессиональной деятельности». Выборка исследования: 106 человек в возрасте от 20 до 75 лет (средний возраст — 45,85) — учителя, преподаватели, заведующие кафедрами высших учебных заведений и колледжей. Показано, что чем выше уровень метакогнитивной включенности, тем выше уровень субъективного благополучия. Установлена связь между уровнем субъективного благополучия, высоким индексом позитивных эмоций, высокими показателями сознательности и осознанности использования метакогнитивных навыков, стратегии принятия и позитивного пересмотра, а также низкими значениями индекса острых негативных эмоций. Описанные результаты могут помочь в решении задач профилактики и коррекции симптомов профессионального выгорания преподавателей.

Ключевые слова: психологическое благополучие; субъективное благополучие; метапознание; метакогнитивные навыки; эмоционально-личностные характеристики.

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Introduction

Pedagogical activity places considerable demands on the teacher's personality and is classified as a profession with an elevated risk of burnout and emotional exhaustion [9; 18; 20]. Concurrently, there is an active development of the psychological safety discourse within educational environments with a growing focus on the psychological component, particularly concerning the well-being of participants in the educational process [2]. While research on student well-being has been more extensively explored quantitatively, the psychological characteristics of teaching activity, especially at the college and higher school levels, remain largely underdeveloped [7; 25; 30]. Nevertheless, the significance and potential impact of teachers in the educational process cannot be overstated. Numerous studies have demonstrated that the quality of education is significantly influenced by the competence of teachers and educators, and students' motivation and performance are correlated with the psychological characteristics and well-being of teachers [1; 28; 30; 21; 22; 23].

Currently, we are experiencing a unique situation marked by continuous and profound socio-economic and political transformations in our country, which act as both stressors and catalysts for personal transformation. Since the onset of the COVID-19 pandemic, the format of the educational process has undergone significant changes. Distance or hybrid learning is

coupled with complete or partial absence from the workplace, alterations in forms of knowledge assessment, and challenges in emotional communication. These changes often introduce additional problems in solving routine tasks, potentially leading to a decline in educational motivation and student performance, thereby negatively impacting their well-being [2; 6; 16]. For teachers, a notable consequence of this format shift has been the challenges in communication and the blurring of boundaries in contact with students [6; 11; 13]. The heightened overall anxiety levels among students make them more insistent on prompt feedback from teachers, such as quickly obtaining clarifications, discussing challenges, certification issues, and gaining points. This increased demand for swift communication may serve as an additional source of stress, contributing to emotional exhaustion [7; 24].

Contemporary scientific consensus affirms that the subjective well-being of teachers is intricately linked to their professional endeavors. The efficacy, motivation, and ability of teachers to foster optimal learning conditions hinge on their emotional state and satisfaction levels [12; 20; 30]. Furthermore, recent literature extensively explores the correlation between well-being and "positive" personality traits within the affective sphere. It has been established that well-being is reliably connected to successful adaptation in the workplace, stress levels, coping mechanisms, emotional regulation, and the effec-

tiveness of teachers' professional activities [7; 11; 12; 30]. The well-being of teachers exhibits significant variation based on gender, with a noted association between women's well-being and the intensity of the conflict arising from balancing household responsibilities and work in education [15]. Prominent negative factors, often leading to attrition from the profession, encompass high social responsibility, elevated stress and emotional involvement, instantaneous feedback, a competitive team environment, rigorous demands across various teaching activities, and standardization of performance metrics [26]. Skills related to self-organization, "meta-resources," and personal traits like awareness, hard work, curiosity, energy, and optimism are increasingly recognized as supportive factors for well-being [12; 21; 27; 29]. In the work of I.V. Morosanova, "meta-resource" pertains to conscious self-regulation and the rational utilization of individual resources, facilitating effective planning, organization, and goal achievement in personal development and self-realization across diverse domains [10].

In the broader context, metacognitive skills, encompassing the ability to define goals, plan, analyze processes, and evaluate the outcomes of one's cognitive activities, play a pivotal role in preventing and correcting emotional burnout among teachers [8]. Moreover, a high level of metacognitive skills development is reliably linked to the formation of constructive coping mechanisms in navigating challenging life situations, as well as overcoming dysfunctional and addictive behavior [14; 17; 19].

Therefore, the relevance of studying the subjective well-being of teachers arises from the imperative to ensure psychological safety within educational institutions. This issue is especially pressing in the aftermath of the changes wrought by the COVID-19 pandemic, acting as stressors for all participants in the educational process, which could adversely impact the overall quality of education. Existing studies on the well-being of teachers primarily focus on examining connections with various

personality traits or individual psychological facets of professional activity, either neglecting the influence of metacognitive skills and the emotional sphere or considering them exclusively as independent variables. This limitation impedes a comprehensive understanding of the mechanisms governing the formation and maintenance of a high level of well-being. Subjective well-being is regarded as a multifaceted and multidimensional construct that integrates an affective component, an individual's assessment, and their attitude toward their own life and personality [4; 30]. Drawing on the aforementioned research results and theoretical generalizations, we conclude that an individual's subjective well-being is intricately entwined with their personal characteristics, emotional sphere, and the development of metacognitive skills. We hypothesize that these characteristics can be deemed significant predictors of the level of well-being.

The aim of this study was to identify a complex of emotional, personal, and metacognitive predictors of teachers' subjective well-being.

Methods

The study involved 106 participants (68% women) aged between 20 and 75 years, with an average age of 45.85. Participants included teachers, lecturers, and heads of departments from higher educational institutions and colleges in the Southern Federal District of the Russian Federation. Approximately 67% of the sample had a background in higher education, with professional experience spanning 3 to 39 years, and 74% having over a decade of experience in the field of education. Data collection occurred through electronic testing from March 15 to April 18, 2022. All participants provided informed consent, were apprised of the study's objectives, and were informed about the subsequent use and publication of results.

To elucidate socio-psychological characteristics and assess metacognitive skills, we used a survey method. Participants reported gender, age, education level, position, work experience in education, and rated the sever-

ity of professional stress and coping success on a 10-point scale.

Psychological testing encompassed personal characteristics, emotional sphere traits, and metacognitive behavior, utilizing various methods: Short Portrait Questionnaire of the Big Five (B5-10, M.S. Egorova and O.V. Parshikova, 2016; 10 statements (answers were scored on 6- point scale, where 1 is not at all like me, and 6 is very similar to me), 5 scales by factors, for each scale the sum of points on direct and reverse questions was assessed, min 2 points, max 12 points; Cronbach's $\alpha > 0.5$); Methodology Scale of Differential Emotions (DSE, adaptation by A.V. Leonova and M.S. Kapitsa, 2003; 30 adjectives describing emotional experiences, answers were rated on a 5-point scale, where 1 — no experience at all, and 5 — experience expressed to the maximum extent), 10 scales of enlarged emotions, for each scale the sum of points was assessed, min. 3 points, max. 15 points); method for diagnosing the subjective well-being of an individual (R.M. Shamionov, T.V. Beskova, 2018; 34 statements (answers were assessed on a 5-point scale, where 1 — completely disagree, and 5 — completely agree), 5 scales by type of well-being, for each scale, not the sum of points was assessed, but the average value, min 1 point, max 5 points; Cronbach's $\alpha > 0.75$); questionnaire of metacognitive involvement in activity (G. Schrow, R. Dennison, adaptation by A.V. Karpov, 1994; 52 statements (answers were assessed on a 5-point scale, where 1 — completely disagree, and 5 — completely agree), the overall total points, min 52 points, max 260 points); Self-assessment scale of metacognitive behavior (D. LaCosta, adapted by A.V. Karpov, 1998; 12 strategies (answers were assessed on a 5-point scale, where 1 is very rarely, and 5 is very often), the total score was assessed, min. 12 points, max 60 points); test Differential type of reflection (D.A. Leontyev, E.M. Lapteva, E.N. Osin, A.Zh. Salikhova, 2009; 30 statements (answers were assessed on a 4-point scale, where 1 — no, and 4 — yes), 3 scales by types of reflection,

for each scale the sum of points was assessed according to the key, on the Systemic Reflection scale min. 12 points, max. 48 points, on the Introspection and Quasi-reflection scales min. 9 points, max 36 points, Cronbach's α from 0.78 to 0.85); questionnaire "Cognitive regulation of emotions" by N. Garnefsky and V. Craig (adapted by O.L. Pisareva, 2007; 36 statements (answers were assessed on a 5-point scale, where 1 is never, and 5 is always), 9 scales in accordance with the main ways of cognitive regulation of emotions, for each scale the sum of points was assessed according to the key, min 4 points, max 20 points; Cronbach's α from 0.7 to 0.87).

Additionally, to investigate metacognitive characteristics, we employed the author's self-assessment questionnaire of metacognitive behavior Metacognitive Skills in the Structure of Educational and Professional Activities. This questionnaire consisted of 9 questions designed to evaluate the utilization and awareness of key forms of metacognitive behavior, including metaplanning, procedural skills, and metacognitive control [3].

The statistical methods employed for processing the acquired results included the Shapiro-Wilk test, analysis of covariance (ANCOVA), one-way analysis of variance (ANOVA), and post hoc analysis utilizing Dunn's method, along with Student's t-test. The statistical analysis of the results was performed using the freely available JASP Computer software package (Version 0.16, 2021).

The data analysis procedure unfolded across several stages:

In the initial stage, questionnaire data and the outcomes of descriptive statistics calculations were scrutinized to provide an overarching characterization of the studied sample.

Subsequently, as a preliminary analysis and to determine a fixed factor for covariance analysis, differences in the subjective well-being of respondents were assessed based on metacognitive acceleration skills, metacognitive involvement, and systemic reflection. This involved one-way analysis of

variance (ANOVA), Dunn's post-hoc test, and Student's t-test.

In the third stage, an analysis of covariance (ANCOVA) was conducted to explore predictors of teachers' subjective well-being. The level of metacognitive involvement served as a factor, while the awareness of metacognitive skills and emotional and personal characteristics were considered as covariates.

The choice of ANCOVA over regression analysis was motivated by the study's aim, which involved examining a substantial number of factors presumed to influence well-being. The emotions, personality traits and metacognitions according to previous studies, including our own data, are significantly and closely correlated. Additionally, since metacognitive involvement had five levels of expression, regression analysis could potentially complicate result interpretation and necessitate additional analytical steps to control for covariates. In ANCOVA, we utilized a third type of sums of squares, enabling the consideration of both the interaction between the

factor and covariates and the relationships among the covariates.

Results

The majority of respondents perceive a significant number of stressful situations at work, with a sample average of 5.30 out of 10 points. Remarkably, they generally handle the workload well, rating it at 7.87 out of 10 points. Interestingly, there appears to be an inverse linear relationship between self-assessed professional stress and subjective perceptions of academic success, as illustrated in Figure 1. Respondents who report low levels of professional stress tend to provide higher ratings for coping with the workload, while those who rate their professional stress higher are more likely to indicate lower coping ratings.

Examining the key indicators of subjective well-being (see Table 1), the highest scores were observed on the social-normative well-being scale, with an average value of 4.11 points. This value corresponds to a high level

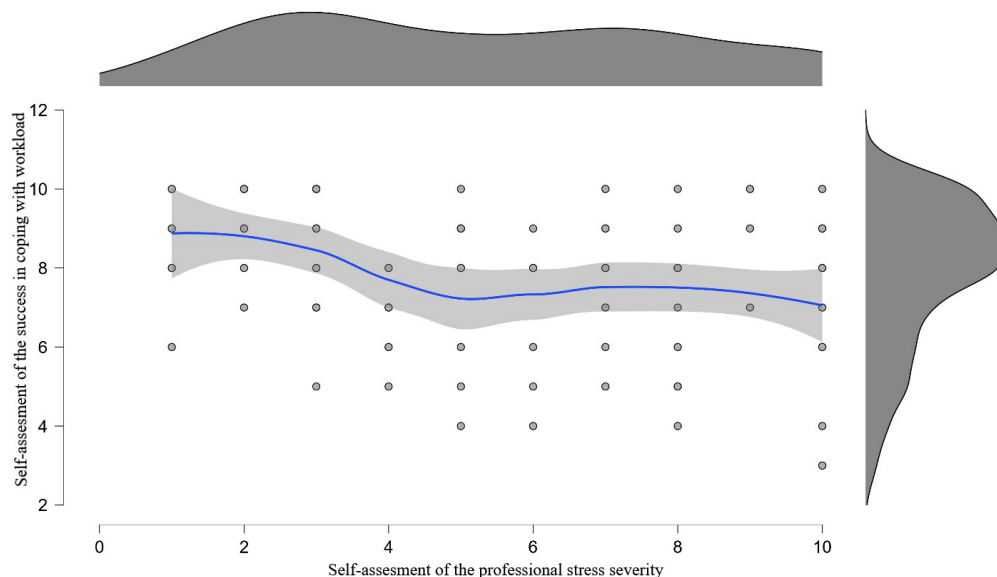


Fig. 1. Analysis of the survey results on the severity of professional stress and success in coping with workload

on the scale, suggesting that respondents generally perceive their lives as aligning with social norms and moral values. The lowest scores were on the hedonic well-being scale (3.43); however, these values fall within the normative range for well-being components. The empirical averages on the scales of emotional well-being (3.76), ego-well-being (3.62), and existential-activity well-being (3.68) also align with normative ranges. The overall indicator of subjective well-being is at an average level, portraying the sample positively.

Testing for the normality of the distribution using the Shapiro-Wilk test indicated that, for the sample as a whole, most indicators of subjective well-being follow a normal distribution. A similar pattern was observed for the aggregated characteristics of metacognition (metacognitive involvement and the level of development of metacognitive skills). However, for most indicators of the emotional sphere, the distribution in the sample deviates from normal (Shapiro-Wilk $p < 0.05$). It is important to note that there were no extremely high or low values in the sample, and all average values fall within the normative range according to the methods employed. Therefore, further parametric methods will be employed for the analysis of differences.

To investigate the assumption that metacognitive components of teachers' activities may act as supporting factors for teachers' subjective well-being, a comparative analysis of well-being levels in subgroups of teachers with different levels of metacognitive skills development, metacognitive involvement, and systemic reflection was con-

ducted. The results suggest that the highest level of subjective well-being in the teacher sample is associated with elevated levels of metacognitive skills, metacognitive involvement, and systemic reflection (Fig. 2). The distribution of comparison groups is outlined below:

1. According to the level of development of metacognitive skills: group 2 (reduced level) — 2 people, women; group 3 (intermediate level) — 18 people, of which 50% are women; group 3 (increased level) — 59 people, of which 72% were women; group 5 (high level) — 27 people, 85% of them are women. No low level was detected in the sample.

2. According to the level of systemic reflection: group 2 (average level) — 25 people, of which 64% are women; group 3 (high level) — 81 people, of which 75% were women. No low level was detected in the sample.

3. According to the level of metacognitive involvement: group 4 (increased level) — 50 people, 66% of them are women; group 5 (high level) — 56 people, of which 78% are women. Low, reduced and average levels were not identified in the sample.

Given the uneven distribution of respondents across groups based on the level of metacognitive skills and the results of the normality test (Shapiro-Wilk $p = 0.149$), we opted for a one-way analysis of variance without excluding of the smaller groups, but with conducting a post hoc analysis using Dunn's method for pairwise comparisons. Significant differences were observed only when comparing the high level (level 5 in the figure) with other groups (ANOVA and

Table 1

Main indicators of subjective well-being (N=106)

	Means	Standard Deviation	Shapiro-Wilk Test	p-value of Shapiro-Wilk
Emotional well-being	3,76	0,63	0,98	0,059
Existential-activity well-being	3,68	0,60	0,98	0,229
Ego-well-being	3,62	0,64	0,98	0,056
Hedonic well-being	3,43	0,76	0,98	0,142
Social-normative well-being	4,11	0,51	0,95	< 0,001
Subjective well-being	3,72	0,55	0,98	0,074

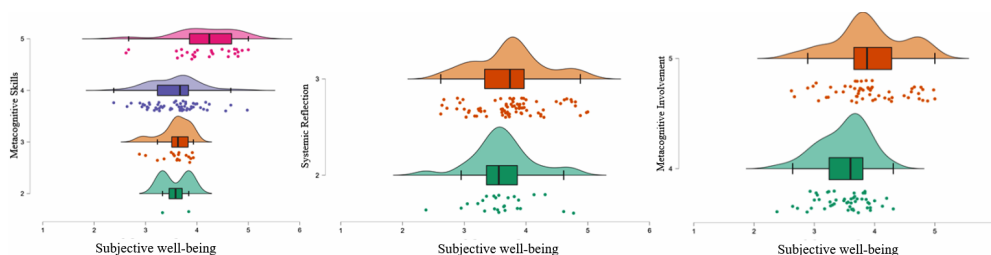


Fig. 2. Analysis of the impact of metacognitive skills, systemic reflection, and metacognitive involvement on subjective well-being

Dunn's post-hoc test, $p < 0.001$). No significant differences were found in the level of systemic reflection (Student's t-test at $p = 0.338$). However, significant differences were noted based on the level of metacognitive involvement (Student's t-test at $p < 0.001$). Since these differences highlight variations in well-being between individuals with high and elevated levels of metacognitive involvement, we hypothesized that this indicator was the most effective in discriminating the sample as the primary factor. Notably, in our previous study using a similar protocol on a

student sample, which identified three levels (medium, increased, and high), metacognitive involvement was also a significant factor [4].

To examine the predictors of teachers' subjective well-being, we employed analysis of covariance (ANCOVA). The level of metacognitive involvement served as the primary factor, while the awareness of metacognitive skills and emotional and personal characteristics were considered as covariates (Table 2).

The analysis revealed significant effects from the consciousness index ($F = 4.71$,

Table 2

Results of ANCOVA covariance analysis of predictors of teachers' subjective well-being

	Sum of squares	Mean square	η^2	F	p
Level of metacognitive involvement	0,09	0,09	0,01	0,69	0,410
Extraversion	0,02	0,02	<0,01	0,14	0,709
Benevolence	0,09	0,08	<0,01	0,66	0,420
Consciousness	0,58	0,58	0,03	4,71	0,033
Neuroticism	0,10	0,01	0,01	0,80	0,375
<i>Openness to experience</i>	<i>0,37</i>	<i>0,37</i>	<i>0,02</i>	<i>3,01</i>	<i>0,086</i>
Index of Positive Emotions	2,11	2,11	0,12	17,05	< ,001
Index of Anxious-Depressive Emotions	0,47	0,47	0,08	3,80	0,055
Index of acute negative emotions	1,50	1,50	0,03	12,17	< ,001
Decreased reflection on cognitive operations	0,01	0,01	<0,01	0,07	0,788
Degree of awareness of using metacognitive skills	0,64	0,64	0,04	5,15	0,026
Self-accusation	0,03	0,03	<0,01	0,20	0,656
Acceptance	0,78	0,78	0,04	6,32	0,014
Concentration	0,05	0,05	<0,01	0,41	0,524

	Sum of squares	Mean square	η^2	F	p
Positive refocus	0,03	0,03	<0,01	0,25	0,620
Refocus on planning	0,01	0,01	<0,01	0,07	0,794
Positive revision	0,52	0,52	0,03	4,17	0,044
Placement in perspective	0,002	0,002	<0,01	0,02	0,888
Catastrophization	0,003	0,003	<0,01	0,03	0,868
Accusation	0,31	0,31	0,02	2,54	0,115
Residuals	10,49	0,12			

F-statistic: 4,17, df2=105,00; p-value: 0,044 (III type of sum of squares)

$p < 0.033$), index of positive emotions ($F = 17.05$, $p < 0.001$), index of acute negative emotions ($F = 12.17$, $p < 0.001$), degree of awareness of using metacognitive skills ($F = 5.15$, $p < 0.026$), adoption strategy ($F = 6.32$, $p = 0.014$), and positive revision ($F = 4.17$, $p < 0.044$). Trends toward a significant effect were observed for openness to experience ($F = 3.01$, $p = 0.086$) and the index of anxious-depressive emotions ($F = 3.80$, $p = 0.055$). It's noteworthy that the effect size indicates a small effect for

all significant effects, except for the index of positive emotions (medium effect, $\eta^2 = 0.12$).

When scrutinizing the influence of personal characteristics, emotional sphere traits, and awareness of metacognitive skills, higher subjective well-being rates were observed among teachers with high levels of consciousness, positive emotions, and low values of acute negative emotions. Well-being was also associated with coping strategies such as acceptance and positive revision (Fig. 3).

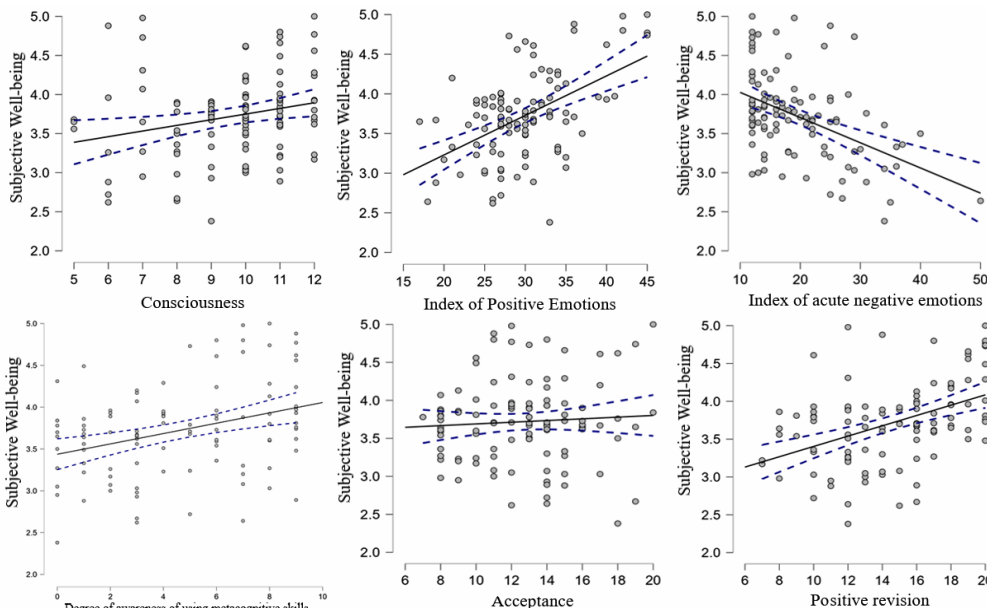


Fig. 3. Analysis of the influence of personal characteristics, characteristics of the emotional sphere and awareness of the use of metacognitive skills

Discussion

The presented research highlights the substantial role of personal traits, emotional states, and metacognitive skills in sustaining a heightened level of subjective well-being among teachers. Consistent with previous studies, the positive influence of conscientiousness aligns with the supporting impact of positive personality traits on well-being and professional success [12; 21; 27; 29]. The finding related to the positive effect of conscientiousness, along with the identified trend in openness to experience, is in harmony with modern research conducted on samples not exclusive to teachers and students but also encompassing professionals from diverse fields [30]. However, the anticipated significant effects of extraversion and neuroticism on well-being were not established. This might be attributed to the unique nature of covariance analysis construction, which allows for the measurement of each variable's distinctive contribution after accounting for the influence of correlations between predictor variables. Despite the possibility of correlations between covariates and the dependent variable, we consider this method the most precise and essential, given the frequent correlation between personality traits and emotional sphere characteristics.

Previous theoretical and empirical studies on teacher samples have extensively explored the connection between subjective well-being and emotions, including emotional and professional burnout [12; 20; 30]. Our results regarding emotional regulation, specifically the positive impact of positive and acute negative emotions and the identified trend in the index of anxious-depressive emotions, also align with existing literature [7; 17; 30]. And while the subjective assessment of experienced emotions does not equate to the well-being construct, it likely stands as one of the most significant factors, providing individuals with information about their condition when evaluating their well-being level.

The presented model is likely specific to the teacher sample, differing from the model derived from a student sample in our previous work [4]. Despite apparent similarities, especially in the direction of effects, it is noteworthy that the awareness of using metacognitive skills becomes particularly crucial for teachers. This outcome is unsurprising, considering that both the level of development and awareness of metacognitive skills may be associated with respondents' age (the average age of teachers in the sample is 20 years higher). Moreover, these distinctions could arise from professional activity characteristics and other factors, such as length of service.

In conclusion, the results align with existing well-being concepts and empirical research across various samples. The intrinsic value and scientific novelty of these findings lie in their ability to elucidate how the metacognitive component integrates into the known structure of personal factors and which cognitive emotion regulation strategies most effectively contribute to teachers' subjective well-being. A notable limitation of this work is the lack of consideration for job satisfaction and burnout indicators, as well as the absence of a comparative analysis based on gender, age, and length of professional activity. Addressing and analyzing these factors constitute promising avenues for further exploration of the discussed topic.

Conclusions

The study aimed to comprehensively investigate emotional, personal, and metacognitive predictors of teachers' subjective well-being. The findings generally affirm the initial hypothesis, underscoring that personality traits, emotional parameters, and metacognition can serve as predictors of well-being. The highest level of subjective well-being among teachers is associated with elevated levels of metacognitive skills, metacognitive involvement, and systemic reflection.

Covariance analysis results, considering variable interactions, lead to the conclusion that teachers experience significantly higher subjective well-being when they possess a high index of positive emotions. Additionally, a substantial impact is observed with a heightened sense of responsibility and organization (conscientiousness), increased awareness of metacognitive skills, a prevalence of positive emotions, and the ability to constructively engage with one's emotions—finding gratitude in challenging situations and utilizing it for developmental purposes

(acceptance and positive revision). A high index of acute negative emotions exhibits destructive potential.

The study's outcomes can address burn-out prevention, enhance well-being, and support the professional development of teachers in secondary education and higher education. Raising awareness about the use of metacognitive skills and fostering constructive strategies for cognitive emotion regulation will contribute to sustaining subjective satisfaction amid changing socio-political and economic conditions.

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Education as a Factor of Life Satisfaction in Retirement

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Despite ample evidence of the positive impact of education on people's lives, the duration of this effect have not been sufficiently explored. The purpose of the present study is to identify how the level of education affects various aspects of life satisfaction in retirement. In order to realize the goal, a structural model of the influence of education on life satisfaction in retirement was developed and verified on a sample of pensioners from the industrial region of Russia ($n=291$), highlighting the role of cognitive phenomena (psychological age and basic beliefs). The results of the analysis of the empirical model confirm the main hypothesis: a higher level of education increases life satisfaction in retirement, both directly and indirectly — through cognitive structures. It affects all measured indicators of satisfaction: psychological well-being, income satisfaction, perception and attitude towards retirement period of life, subjective assessment of health. The results of the study expand the understanding of the role of education as a factor of late socialization, and also serve as a basis for recommendations on the content of the learning process.

Keywords: education; life satisfaction; retirement age; psychological age; baseline beliefs; perception of retirement; subjective income; subjective evaluation of health.

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Несмотря на многочисленные доказательства позитивного влияния образования на жизнь людей, недостаточно изучены факты и механизмы продолжительности этого эффекта. Цель настоящего исследования заключается в том, чтобы выявить, как уровень образования влияет на различные аспекты удовлетворенности жизнью на пенсии. Для реализации цели была разработана и верифицирована на выборке пенсионеров индустриального региона России ($n=291$) структурная модель влияния образования на удовлетворенность жизнью на пенсии, в которой особо выделена роль когнитивных феноменов (субъективный возраст и базисные убеждения). Результаты анализа эмпирической модели в целом подтверждают основную гипотезу: более высокий уровень образования усиливает удовлетворенность жизнью на пенсии, как напрямую, так и опосредованно — через когнитивные структуры. При этом обнаруженное влияние затрагивает все измеряемые показатели удовлетворенности: субъективное благополучие, удовлетворенность доходом, восприятие и отношение к пенсионному периоду жизни, субъективная оценка здоровья. Результаты исследования расширяют представление о роли образования как факторе поздней социализации, а также служат основанием для рекомендаций по наполнению процесса обучения.

Ключевые слова: образование; удовлетворенность жизнью; пенсионный возраст; субъективный возраст; базисные убеждения; восприятие пенсии; субъективный доход; субъективная оценка здоровья.

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Introduction

In the 21st century, a new trend has emerged related to education in the “third age.” The relevance of obtaining or increasing the level of education in pre-retirement and retirement age has several reasons. Firstly, it is due to the increase in life expectancy and, consequently, the extension of professional longevity. Secondly, the possibility of continuing work in old age is influenced by the nature of the profession: heavy physical labor becomes practically impossible due to health problems, and intellectual work based on rich professional experience and unique professional knowledge comes to the forefront. Thirdly, there is a shortage of labor force — often there is no opportunity to replace employees of retirement age (younger personnel lack the corresponding experience, qualifications, knowledge, etc.).

On the other hand, research interest is increasingly focused on the individual as the recipient of transformations in the surrounding reality from scientific-technical and socio-economic points of view. Society and the individual form an ecosystem in which the individual, on the one hand, is formed and develops, and on the other hand, actively participates in social life, changing it.

Moreover, for society, the most socially significant is a developed individual with a wide range of social competencies, and education is one of them. The right to education in the Russian Federation is an inalienable right of the individual and is guaranteed to everyone [9]. The state actively participates in shaping a socially positive perception of education among citizens, acting through the system of social prestige (increasing social status due to the possibility of obtaining well-paid jobs, honorary titles of scientists, social

guarantees, etc.) and coercion (educational censor, hierarchy of education, competitive basis for admission to certain specialties, internships, etc.) [15]. Gradually, obtaining education becomes a value orientation, and modern individuals get used to the idea that learning will be necessary throughout their lives [35]. This trend is born not only out of the requirement for continuous self-improvement and qualification enhancement but also out of the necessity to stay informed about technical devices and society’s achievements capable of elevating the quality of life to a new level. This becomes particularly relevant for elderly people, as they, due to their age, are oriented towards being in a safe and stable environment, thus striving to avoid interaction with information and communication technologies [25].

Quality of life for pensioners is a complex meta-characteristic that reflects the degree of satisfaction or dissatisfaction with one’s life [11]. Contemporary studies note that in recent years, quality of life has often been reduced to a individual assessment of health or psychological parameters, such as well-being, happiness, or life satisfaction [32], with researchers paying attention to a wide range of factors, aiming to create a multi-component model [28].

Previously, education as a factor of life satisfaction for pensioners was considered an intermediate link in assessing other factors influencing individual emotional and psychophysiological well-being of elderly individuals. For example, a study on the relationship between life satisfaction and individual characteristics of working and non-working pensioners found that working pensioners had higher overall life satisfaction due to maintaining social contacts in the workplace and a sense of professional significance [23]. The effectiveness of

continuing professional activity in old age is also supported by other studies [5; 19]. There is a direct correlation between professional suitability and employability in the labor market in old age and the level of education, as certain professions where work experience in the field makes a person indispensable and highly skilled, such as in medicine, law, science, etc. Conversely, this cannot be said for individuals engaged in manual labor, where physical work plays a key role, as human health is a limited resource, despite the compensatory capabilities of the body. Thus, education can serve as a buffer, compensating for age-related health issues [31].

Education also serves as a factor of vertical social mobility within the framework of professional activity, and, consequently, there is a positive correlation between the level of education and material well-being [30]. The latter ensures an increase in the population's life satisfaction: this effect is known as the "Istelrin paradox," which states that the population of a country is happier as their income levels rise [21]. The validity of the "Istelrin paradox" is confirmed by the results obtained from a Russian sample [21].

Taking into account the results of the study on the social well-being of Russian pensioners, which indicate a pessimistic perception of their financial situation [7], it can be argued that education as a factor of life satisfaction in retirement has a delayed positive effect in the form of a more stable financial position, provided that professional activity throughout one's life has been productive and financially successful.

Education and its degree of influence on life satisfaction have been studied among other socio-structural factors in a domestic study on determinants of life satisfaction using the example of Russian and European societies [1]. Using a method of multidimensional regression analysis, a less significant role of this variable

relative to other factors of human capital (health status, income, social status) has been established. It is worth noting that there are variables that received a negative coefficient (gender, children, religious views), therefore education, despite its even minor influence, is still recognized as a necessary element of this complex social construct [1].

The insignificant degree of influence of education as a factor of life satisfaction can be explained by the unstable, downward-sloping effect of well-being from education due to the expansion of knowledge areas and the emergence of new discoveries, increased information about various subjects, compilation of facts, opinions, hypotheses, or in other words — the constant movement in all spheres of society's life, as well as the fluctuating situation in the economy. For instance, one hypothesis of a study on the individual well-being of Chinese society was the assumption of a positive relationship between education, happiness levels, and moral satisfaction in society. However, as was found, in 2015 the education indicator was assessed as positive, while two years later, in 2017, it was assessed as negative due to its close connection with the social context: stresses from an unstable economic situation, a complex labor market situation, stagnation in wage levels, and reduced employment opportunities diminish this effect [38].

Our assumption that education is a factor with rather indirect influence on the level of life satisfaction among pensioners is supported by a study on intergenerational interactions between family members, specifically — grandparents and grandchildren. During the study, an "educational gradient" was identified, which is the correlation between two hypothetical statements, leading researchers to conclude that high-educated grandparents had high-quality relationships with their descendants, associated with less negative affect and loneliness

[40]. This finding may indicate that grandparents with higher levels of education are better able to leverage their family ties as a barrier against negative life events, ultimately increasing the level of individual life satisfaction [40].

Another study dedicated to the model of successful aging confirms the role of education as a factor indirectly influencing the individual and social well-being of elderly individuals [30]. Through the construction of a structural model, the authors identified several components that positively impact the personal well-being of retirees, both directly and indirectly. It was found that education serves as an initial component in the relationship between cognitive functioning and social resources, which has a positive effect on the personal perception of life satisfaction in old age [29].

In a multi-level analysis of the relationship between income levels and education in the context of social inequality through the assessment of personal life satisfaction among elderly individuals in Hong Kong, Chinese researchers found that elderly individuals with a more adequate disposable income, as well as those with higher education, demonstrated higher subjective well-being. Thus, higher income and a smaller proportion of the population with a low level of education are associated with a lower risk of lower subjective well-being [37].

According to domestic researchers, education can influence the life satisfaction of elderly individuals through work on the psycho-emotional sphere aimed at creating motivation and developing cognitive skills, which is achieved through existing education and life experience [8]. In this regard, a concept of non-formal education for pre-retirement and retirement age individuals has been proposed, aimed at strengthening and maintaining the cognitive abilities of elderly individuals [5]. Non-formal education contributes to the actualization of the internal life forces of its participants, their

creative abilities, and the pro-social position of the individual, thereby evoking a sense of security, relevance, and belonging to an important reference group [5].

Based on the results of the analysis of existing studies dedicated to exploring education as a factor of retirees' life satisfaction, it can be concluded that it exerts an indirect influence on the subjective level of life satisfaction in most cases. However, from the perspective of active aging and the socialization of elderly individuals through joint educational processes, it can be argued that education as a factor of life satisfaction is a direct object of influence and an important element of the system for working with retired individuals. Additionally, education is an important component of social capital [33], which is formed throughout an individual's life [34]. The value of education lies in its flexible nature: there are no age or subject restrictions for the process of acquiring knowledge, and individuals of any age, given the appropriate level of motivation and interest, are capable of learning new things and "building" new neural connections, which organize our thinking process and aid in decision-making. This is also an important aspect of cognitive meta-subject outcomes in the process of acquiring new knowledge [2; 3]. However, the role of cognitive factors in the process of education's influence on retirees' life satisfaction has not been specifically studied.

Nevertheless, there are certain prerequisites for such research. For example, the connection between life satisfaction in pre-retirement age and the cognitive assessment of life path parameters, such as overall activity throughout life, optimism, the presence of cooperation and collaboration strategies with the environment throughout life, orientation towards the future and present, has been demonstrated [12]. The same author identified a connection between locus of control and life satisfaction in retirement age [13].

To fill the “gap” in knowledge, the goal of the present study was set to investigate the influence of education level on life satisfaction in retirement. The main hypothesis of the study was the assumption that a higher level of education enhances life satisfaction in retirement, both directly and indirectly through cognitive structures (see Figure 1).

According to the model, the level of education contributes to maintaining various aspects of life satisfaction in retirement. This influence can occur directly and indirectly. In the latter case, basic beliefs about oneself and the world, as well as subjective age, act as mediators of this influence. Subsequently, the theoretical model was subjected to empirical testing.

Methods and Sample

In this study, the level of education of respondents was determined using questionnaire data graded as follows: 1 — elementary, 2 — secondary (school), 3 — vocational, 4 — higher. Thus, a higher value of this indicator in the model corresponds to a higher level of education among respondents.

Life satisfaction in retirement was diagnosed using the following indicators:

1. Life satisfaction as a component of subjective well-being [18];
2. Subjective income assessment as an indicator of subjective economic well-being [6];

3. Subjective assessment of physical condition as satisfaction with health;

4. General perception and attitude towards the retirement period as a qualitative indicator of life satisfaction in retirement. Let us delve into the measurement methodology of each indicator.

To diagnose the level of life satisfaction of retirees, the Satisfaction with Life Scale by E. Diener in the adaptation of D.A. Leontiev and E.N. Osin was applied [18]. This questionnaire has proven itself well in the Russian sample due to its simple and unambiguous internal structure. The Satisfaction with Life Scale, developed by E. Diener in accordance with his theoretical positions, allows measuring the level of subjective well-being and comparing the indicators of different individuals, demonstrating how one person is more prosperous, satisfied, and positive than another [10].

To diagnose subjective economic well-being, the scale of subjective income level by A. Fennema in the adaptation of O.S. Deyneka was used [6]. Respondents were asked to assess their income level on a 7-point scale, where 1 — barely making ends meet, and 7 — very high. This methodology is widely used in research in economic psychology as an indirect indicator of subjective economic well-being of individuals.

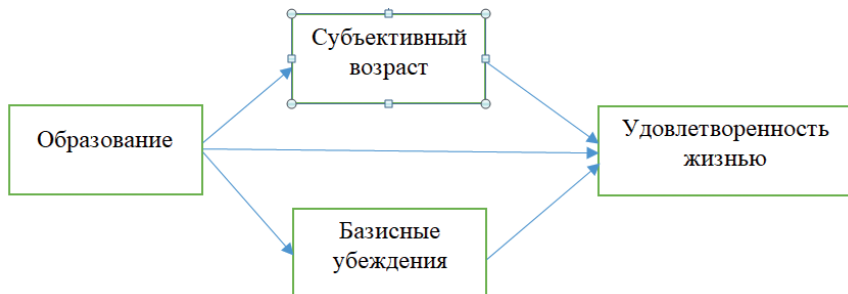


Fig. 1. Theoretical model of the influence of education on life satisfaction in retirement: the role of subjective age and basic beliefs

The subjective assessment of the level of health was conducted using an author's scale for assessing the physical condition of respondents. The assessment was carried out using a 5-point Likert scale when answering the question "Evaluate Your Physical Condition":

1. Very poor;
2. Poor;
3. Satisfactory;
4. Good;

5. Excellent. Thus, a higher value of this indicator in the model corresponds to greater satisfaction with the level of health among respondents.

The diagnosis of the general perception and attitude towards life in retirement was conducted using open-ended questions. Respondents were asked to complete the sentence: "Life in retirement is...". The responses obtained underwent thematic analysis, which allowed for the identification of three semantic categories: 1 — negative perception of retirement (e.g., "sadness", "idleness", "death", etc.), 2 — neutral attitude towards life in retirement (e.g., "another stage in life", "continuation of the journey", etc.), 3 — positive perception of retirement (e.g., "dream", "rest", "life for oneself", "freedom", etc.). Thus, a higher value of this indicator in the model corresponds to greater life satisfaction in retirement.

For the diagnosis of subjective age, the "Age-of-Me" method was applied [27]. The questionnaire consists of four statements with missing values, into which respondents need to insert a certain number: 1. I feel like I am _ years old; 2. I believe I look _ years old; 3. In my opinion, I act like a _-year-old person; 4. My interests mainly correspond to the interests of a _-year-old person. The first statement characterizes the cognitive-emotional (feel-age) age — the age a person "feels". The second statement reflects the biological (physical) age (look-age) — the "age" a person looks. The

third statement conveys the social age (do-age) — the "age" a person acts. The fourth statement describes the intellectual age of a person (interest-age) — it is the "age" at which a person shows their interests. The result is calculated as the difference between the chronological age and the age (number) entered in the statements by respondents. Thus, the higher the indicator of the method, the younger the subjective age diagnosed.

For the diagnosis of basic beliefs, the Scale of Basic Beliefs of Personality by R. Janoff-Bulman in the modification of M.A. Padun and A.V. Kotelnikova was used [28]. The scale allows measuring the deep beliefs of a person about the surrounding world and about their own self. The methodology includes 37 statements, the answers to which are distributed among 5 subscales: Friendliness of the surrounding world (basic belief about the friendliness-hostility of the surrounding world), Justice (basic belief that the world is fair and everyone gets what they deserve), Self-image (basic belief in the value and significance of one's self), Luck (belief in one's own luck and fortune), Control (basic belief in the possibility of controlling events in life). Data processing was carried out using the statistical package SPSS 24.0, including the AMOS module. To conclude about the correspondence of the model of the influence of education on life satisfaction in retirement to the initial data, the method of structural equation modeling was applied, using recommended criteria values [14] confirming the model's consistency: p — significance level of the criterion, $\chi^2 > 0.05$, $CFI > 0.95$, $RMSEA < 0.05$, $GFI > 0.9$, $PCLOSE = 0.5$. All diagnosed indicators entered the model in their original form except for the subscales of basic beliefs, which were subjected to factor analysis beforehand and were combined into one factor.

The sample was randomly selected from retirees residing in the city of Che-

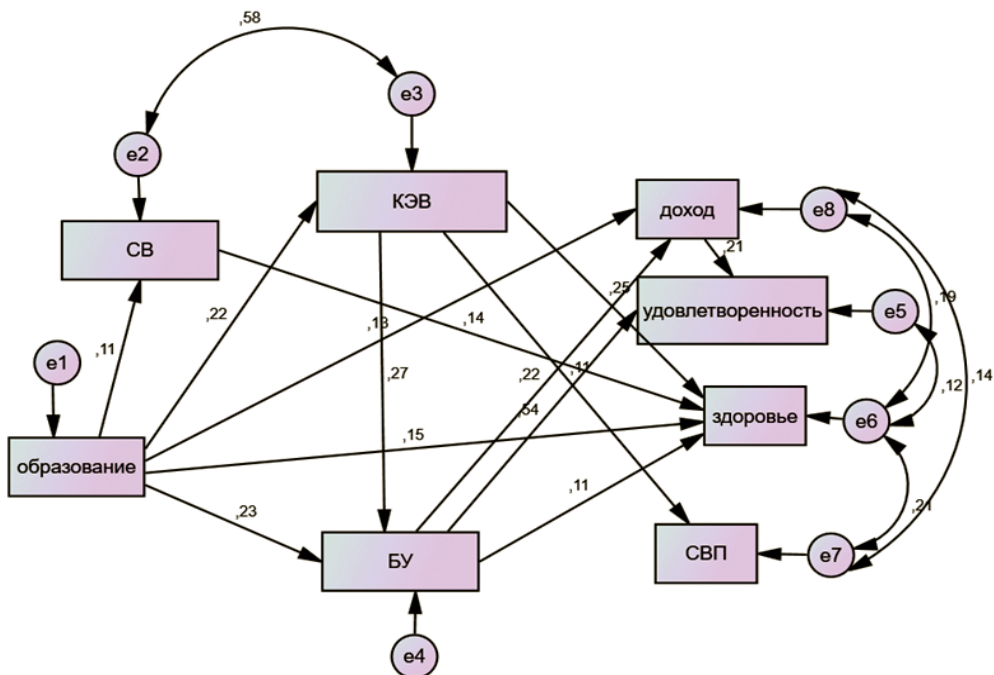
lyabinsk (Chelyabinsk Oblast, Russia) and included various categories (living alone, in families, in nursing homes, etc.), different types of professions, education levels, marital and work statuses. Chelyabinsk Oblast is one of the largest economic units of the Russian Federation. The industrial development of the region is determined by metallurgical, mechanical engineering, fuel and energy, construction, and agro-industrial sectors. The metallurgical sector, which produces more than 60% of industrial products, is the leader in the economy.

A total of 291 individuals were surveyed (average age — 65.5 years, 16% have disabilities, 53% are married, 47% have higher education, 16% reside in nursing homes, 34% are men). The criteria for inclusion in

the sample were pensioner status for at least one year and the absence of a psychiatric diagnosis (clinical norm). The criterion for exclusion from the sample, accordingly, was the absence of pensioner status. Questionnaires were offered to respondents in paper format, filled out individually under the researcher’s observation.

Results

The structural equation modeling results showed satisfactory fit indices for the empirical data to the theoretical model (CMIN=14.583, df=10, p=0.148; GFI=0.988; CFI=0.990; RMSEA=0.040; Pclose=0.607) (see Figure 2). All elements of the model demonstrate significant relationships (see table).



CMIN=14,583; df=10; p=,148; CFI=,990; RMSEA=,040; GFI=,988; Pclose=,607

Fig. 2. Model of the influence of education on life satisfaction in retirement: the role of subjective age and basic beliefs: SA — subjective age, CEA — cognitive-emotional age, BB — basic beliefs, LSP — life satisfaction in retirement

Analysis Results

The results of the empirical model analysis overall confirm the main hypothesis: a higher level of education enhances life satisfaction in retirement, both directly and indirectly through cognitive structures. Specifically, education level directly influences the increase in two out of four indicators of life satisfaction, namely income level satisfaction and health satisfaction. The first association is quite explainable: individuals with higher education are more likely to qualify for higher-paying jobs, which contributes to a higher pension supplement. Additionally, individuals earning more money and possessing knowledge of how to manage it may create opportunities for additional income during retirement. Furthermore, the model demonstrates that a high level of education, by enhancing satisfaction with income level, also significantly contributes to increasing retirees' overall subjective well-being.

The second association — the influence of education level on health status — can be explained by a greater volume of knowledge in healthcare and medicine, as well

as a clearer understanding of where to address potential knowledge gaps. Moreover, higher education can instill a mindset towards increasing personal awareness, including regarding one's own health, which implies a more attentive attitude towards one's physical condition and timely disease prevention.

Education contributes to improving the physical well-being of retirees both directly and indirectly, mediated through subjective age (cognitive-emotional and social) and basic beliefs. This can be explained by the fact that for retirees with higher education who feel younger and strive to engage in various social activities, maintaining their physical condition becomes more important (e.g., regularly undergoing disease prevention measures, maintaining a certain level of physical activity, etc.). All of this collectively leads to improved subjective health indicators.

A similar connection can be observed regarding basic beliefs. Based on the results obtained, a higher level of education shapes and/or maintains positive basic beliefs, which in turn contribute to retirees'

Table

Regression coefficients of the model

			Estimate	S.E.	C.R.	P	Label
CEA	←	education	4,305	1,096	3,930	***	
BB	←	education	,310	,073	4,217	***	
BB	←	CEA	,019	,004	4,945	***	
SA	←	education	1,629	,846	1,926	,054	
income	←	education	,178	,081	2,203	,028	
income	←		,227	,061	3,734	***	
health	←	education	,156	,056	2,790	,005	
health	←	SA	,010	,004	2,231	,026	
health	←	SEA	,014	,004	3,859	***	
LSP	←	SEA	,007	,004	1,893	,058	
health	←	BB	,088	,004	2,014	,044	
satisfaction	←	BB	,871	,077	11,325	***	
satisfaction	←	income	,321	,074	4,336	***	

SA — subjective age, CEA — cognitive-emotional age, BB — basic beliefs, LSP — life satisfaction in retirement, *** — $P \leq 0.001$.

perception of better physical well-being. This influence can be explained from a psychosomatic perspective as the impact of a system of positive beliefs on improving respondents' physical condition.

Moreover, education, through positive basic beliefs, influences not only the perceived health level but also the overall subjective well-being of retirees by more than half. From this, it can be assumed that higher education should not only impart a certain level of professional knowledge to students but also instill a system of positive attitudes towards oneself and the surrounding world, self-confidence, trust in oneself, as well as trust in other people and social institutions (the educational function of educational institutions).

Finally, another important relationship to note is the influence of education on the subjective perception and attitude towards life in retirement through feeling younger relative to one's physical age. Presumably, knowledge acquired during education, as well as social capital (social connections), contribute to cognitive-emotional "youth extension," which allows for the formation of more positive expectations about the retirement period, full of freedom, creativity, and self-realization.

Interestingly, the level of education and life satisfaction in retirement did not reveal any associations with respondents' intellectual age, which characterizes interests "according to age." It can be hypothesized that the habit of learning, which is formed as levels of education are acquired, shapes a broad range of interests regardless of any specific age.

Discussion

The findings of the study align with existing literature on the indirect influence of education on income satisfaction in older age [20; 35; 36], as well as on satisfaction with health status [30]. In the latter case, the relationship can be both direct

and mediated, for instance, through a younger subjective age (feeling younger, engaging in social activities typical of younger individuals, etc.). Furthermore, the study demonstrates the significant role of positive foundational beliefs, likely supported by education, in shaping not only higher levels of physical health but also greater satisfaction with financial status in retirement. Thus, these findings enrich the scientific understanding of the role of cognitive factors in enhancing the quality of life for retirees and successful late-life socialization.

Although the study did not identify a correlation between education and the familial or occupational status of retirees, nor with other demographic characteristics, its results indirectly confirm the significance of social capital for feeling happier in retirement [33; 39]. It is conceivable that ample social capital, formed in part through educational experiences, enables maintaining a positive self-perception in retirement by feeling younger compared to one's chronological age.

Conclusion

The obtained results emphasize the crucial role of the educational component in fostering positive foundational beliefs during learning, thereby contributing to increased life satisfaction in later years. Furthermore, the study broadens the understanding of the diagnostic potential for subjective well-being among the elderly by examining various facets of life satisfaction, encompassing not only its material aspects but also qualitative perceptions and attitudes towards life in retirement.

In conclusion, the study convincingly demonstrates that education can be a factor directly and indirectly enhancing life satisfaction in retirement. Education can impact several pathways to enhance the subjective well-being of retirees:

1. Income enhancement. Higher levels of education increase the likelihood of obtaining better-paying jobs, leading to higher incomes during both working years and retirement.

2. Improved physical well-being. Higher education enables individuals to prioritize health and better care for themselves. Additionally, education fosters positive foundational beliefs and social capital accumulation, which also influence increased satisfaction with health status in later life.

3. Transformation of perceptions of retirement as a period for creativity, self-realization, and development. Education can shape these perceptions by forming a younger self-image.

4. Enhancement of overall social well-being. The educational process can motivate participation in various social activities, volunteer work, and charitable initiatives, fostering a sense of youthfulness and thereby contributing to increased life satisfaction.

However, the study is limited by using data from one single region characterized by a predominance of the industrial sector, which may pose challenges in generalizing the results to the broader population. Future research should expand the sample to include representatives from regions with diverse social statuses and specializations.

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Assessment of the Degree of Involvement of Russians in Enlightenment Projects

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The article deals with the issues of involvement of Russian society in the enlightenment projects in present day. The material is based on the results of an online survey of 1213 respondents (54,7% men, 43,3% women), dedicated to assessing the degree of awareness of Russians about existing enlightenment platforms and projects implemented in recent years. As part of the survey, the degree of involvement of respondents in enlightenment projects was recorded based on the identification of the first mentioned (top-of-mind) enlightenment project (knowledge without a hint), knowledge of enlightenment projects with a hint was determined, and the depth for immersion in an enlightenment container and preparation was measured, it is recommended to use one or another enlightenment product. The key channels of perception of advertising information about the main enlightenment projects implemented in the media and network space of Runet were also digitized. According to the data obtained, 53,8% of the respondents could not name a single project on their own (without prompting), more than 13% noted educational projects in social networks and 7% — projects on TV (excluding projects of the TV channel “Culture”). With the induced knowledge, 81,3% of respondents noted enlightenment projects of the TV channel “Culture” (81,3% of respondents replied that they were aware of this project), projects of the Russian Society “Knowledge” (36,6%), and Arzamas platforms (28%). Only 20% of respondents, on average, will see the enlightenment content to the end. Half of the respondents are not ready to recommend any of the projects (or do not know about them), while 22,9% express loyalty to the TV channel “Culture”, but on average less than 10% of respondents are ready to recommend the remaining sites. Based on the data obtained, the authors conclude about the quality of enlightenment projects as an indirect indication of the depth of immersion in enlightenment content and the willingness to recommend this or that enlightenment project to their colleagues and/or acquaintances, friends.

Keywords: enlightenment projects; quality of enlightenment; attention switching; brand awareness; top-of-mind methodology; enlightenment; social networks; educational projects; social media.

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Оценка степени вовлеченности россиян в просветительские проекты

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Рассматриваются вопросы вовлеченности российского общества в просветительские проекты современной России. Материал построен на результатах онлайн-опроса 1213 респондентов (54,7% мужчин, 43,3% женщин), посвященного оценке степени осведомленности россиян о существующих просветительских площадках и проектах, реализованных в последние годы. В рамках опроса фиксировалась степень вовлеченности опрошенных в просветительские проекты на основе выявления первого вспоминаемого (top-of-mind) просветительского проекта (знание без подсказки), определялось знание просветительских проектов с подсказкой, а также замерялась глубина погружения в просветительский контент и готовность рекомендовать тот или иной просветительский продукт. Также оценивались ключевые каналы восприятия рекламной информации об основных просветительских проектах, реализуемых в медиа и сетевом пространстве Рунета. Согласно полученным данным, 53,8% не смогли назвать ни одного проекта самостоятельно (без подсказки), более 13% отметили просветительские проекты в социальных сетях и 7% — проекты на телевидении (исключая проекты телеканала «Культура»). С наведенным знанием 81,3% опрошенных отметили просветительские проекты телеканала «Культура» (81,3% респондентов ответили, что данный проект им известен), проекты Российского общества «Знание» (36,6%) и платформы Arzamas (28%). Лишь 20% респондентов в среднем смотрят просветительский контент до конца. Половина респондентов не готова рекомендовать ни один из проектов (либо не знает о них), при этом 22,9% выражают лояльность телеканалу «Культура», а вот рекомендовать остальные площадки в среднем готовы менее 10% опрошенных. На основе полученных данных авторами делается вывод о качестве проектов как об опосредованном показателе глубины погружения в просветительский контент и готовности рекомендовать тот или иной проект своим коллегам и/или знакомым, друзьям.

Ключевые слова: просветительские проекты; качество просвещения; переключаемость внимания; узнаваемость бренда; методика топ-офф-майд; просветительство; социальные сети; образовательные проекты; социальные медиа.

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Introduction

One of the primary goals of the state scale at the present stage is the upbringing of an educated, erudite, highly cultured and harmonious person capable of adequately fulfilling his civic duties, working to build up the cultural and scientific potential of the country. The key environments for fulfilling this task are the fields of education and enlightenment.

The concepts of “education” and “enlightenment” are often identified by the ordinary consciousness. Although, upon closer examination, education is a basic layer (the formation of a personality with a set of knowledge suitable for a full—fledged life in society), and enlightenment is a deeper one, associated with the concept of intellectuality, erudition, a rich inner world, etc. It can be assumed that the phrase “educated person” in everyday discourse can be interpreted only as “superficially informed”, while “enlightened person”, on the contrary, as “knowing more than others”.

The sphere of education, despite permanent reform and frequent changes in the “rules of the game”, has fairly clear guidelines: it defines the customer (state) and the consumer of services (target audience), the regulatory framework is verified, the places of provision of educational services (schools, colleges, universities, etc.) are institutionalized, according to special FSES — federal state educational standards predict the results and assess the quality.

Enlightenment is also an important tool of state policy in addressing the issue of improving the standard and quality of life of the population, including in the light of global challenges [1; 9; 12; 17]. Enlightenment makes it possible to focus the attention of the population [23] on the most pressing issues, for example, related to health [11; 15], to increase the level of relevant knowledge and compe-

tencies of Russians, to lay down certain ideological attitudes (which was quite vividly used back in the Soviet period). The decree of the President of Russia in 2022 designated national values¹. Federal and regional budgetary funds are allocated for the implementation of educational projects, but the tasks set for “public enlightenment» are often very vague, and the specific target audience is not clear and transparent in every case.

If enlightenment impact on specified age and professional groups (students, government officials, doctors, etc.) is possible directly through educational and professional organizations, then the widespread involvement of the Russian population in enlightenment projects is a more difficult challenge. A partial solution to this problem is due to the fact that the last decade has sharply shifted the bias of the information field towards the network space, which made it possible to integrate key enlightenment platforms and platforms into it [8; 16].

“People previously known as the audience” [32], using the capabilities of social media, are currently able to independently unite their interests and produce enlightenment content. User hash tags related to education and enlightenment in many micro blogs of social networks allow you to create digital spaces both for personal training of teachers [20] and for educational work with students [30].

According to a study by Chinese colleagues [37], social networks provide teachers with various assistance in obtaining diverse skills. For example, social networks DingTalk and TikTok have a negative impact on teachers’ academic performance, while WeChat has a positive impact. In addition, the level of user identification, as well as the degree of involvement in social networks, are also important factors influencing the extent to which social

¹ Decree of the President of the Russian Federation No. 474-FL "On the approval of the Foundations of State Policy for the Preservation and strengthening of traditional Russian spiritual and moral values." URL: <http://www.kremlin.ru/acts/bank/48502>

networks can act as a platform and tool for developing professional learning skills and stimulating the development of education.

The abundance of enlightenment content produced creates a serious shortage of user time in order to understand and evaluate the degree of its usefulness. Herbert Simon [34] in 1969 tried to give the first brief description of the concept of the attention economy: “an increase in the volume of information will inevitably lead to a shortage of resources for those who consume this information. Information absorbs the attention of its recipients. Therefore, an abundance of information generates a lack of attention.” And if attention is focused cognitive activity on a particular piece of information and at the same time a limited resource, therefore, there is considerable competition for it.

In a society of the like economy [14] and competition for eyeballs [10], new media produce a need for such key values as attention, respect, recognition and reputation, and at the same time satisfy it [2]. Metrics on social networks that record the viewing of posted content in new media (including likes or reposts, etc.) are not guaranteed immersion in text or video material, and the emotional response to such content may vary depending on the interests of the individual. Push notifications [22] (pop-up notifications on the phone or computer screen) will not always provide an opportunity for a layman with FoMO² syndrome to finish reading a long read [31].

New media, using entertainment content, try to break through the information noise, attracting the attention of the consumer of information and influencing his expenses (temporary, financial, etc.). S. Watzl argues that attention is taking into account the structure of priorities [36].

According to V. Hendrix, Facebook³ users post more than half a million comments per minute, 500 hours of video are uploaded to YouTube every minute, and 6,000 tweets are sent to Twitter⁴ every second [28]. In such a density of information placement, enlightenment projects should have competitive content [16] in order to compete for priorities in a situation of attention deficit. The quality of an enlightenment product is a means of competition for the attention of a person, and the result of competition indirectly indicates the very quality of the enlightenment product.

Moving away from assessing the economic performance of certain programs (both public and implemented through commercial or private initiative), it is still necessary to answer seemingly simple but very relevant questions — *how interesting the enlightenment product is to a wide audience and how much Russian society is involved in the field of enlightenment at the moment.*

The answers received will make it possible to clearly identify and use the most promising channels for promoting enlightenment platforms and projects and indirectly determine the quality of the enlightenment product. In this regard, a detailed assessment of the interest of Russians in the enlightenment product [3] as such and an analysis of the effectiveness of already conducted (ongoing) activities to promote and advertise the products of various content makers is relevant.

The method and its features, characteristics of the sample

In the period from October 23 to November 10, 2021, a sociological study of the enlightenment preferences of the population of the Russian Federation was conducted.

² Fear of missing out.

³ Instagram Facebook and Instagram were banned in Russia by the court, which recognized Meta as an extremist organization. URL: <https://rg.ru/2022/03/21/reg-cfo/sud-zapretil-v-rossii-instagram-i-facebook-za-ekstremistskuiu-deiatelnost.html>

⁴ Access to Twitter has been restricted in Russia. URL: <https://ria.ru/20220304/twitter-1776621289.html>

The study was conducted in the format of an anonymous online survey through a formalized panel of the Yandex network platform “Toloka” using an algorithm that includes a ban on re-filling out forms by the same respondents, as well as blocking (culling) questionnaires filled out too quickly, i.e. in a time incommensurable with the possibility of adequately perceiving the question and formulating an answer to it (“speedsters”).

The study was conducted with the key aim of assessing the degree of awareness of Russians about existing enlightenment platforms and projects. The objectives of the study include:

- assessment of the awareness of the enlightenment project among other enlightenment platforms/products using “spontaneous knowledge” and “knowledge with a hint” (top-of-mind);

- recording the degree of involvement of respondents in enlightenment projects;

- determining the depth of immersion in enlightenment content;

- identification of key channels for the perception of advertising information about enlightenment projects.

The methodology for assessing brand awareness or brand awareness (brand awareness) is aimed at measuring the ability of the target audience to remember (knowledge is assessed without a hint) or to learn (knowledge is assessed with a hint) the title/brand of a company or product. This technique was borrowed by us in order to conduct this research from the arsenal of marketing tools for a differential approach to the evaluated product (from spontaneous and induced knowledge to willingness to recommend this product) and indirectly indicates the health of the brand (the degree of loyalty to it of the target audience) and its position among the positions of similar brands of other players (competitors).

The questionnaire included 5 main questions to identify enlightenment preferences and a social passport characterizing the re-

spondent (level of education, gender, age, level of urbanization, marital status, degree of religiosity, income level).

The study involved 1,213 respondents aged 11 to 90 years living in Russia (54.7% of men and 43.3% of women). Among the respondents, 3 age groups were identified, surveyed in equal proportions: from 11 to 25 years old; from 25 to 50 years old; from 50 to 90 years old.

According to the level of education, the audience of respondents is differentiated as follows: higher education — 48.7%; incomplete higher education — 12.4%; secondary (including specialized secondary) education — 37.7%.

The audience of respondents is localized in Russian cities: the largest number in district centers (35.7%); residents of regional centers are represented in the amount of 32.3% of the total number of respondents; residents of large cities with a population of more than 1 million people — 23.1%; residents of Moscow — 8.9%.

Analysis of the results obtained

Respondents were asked to name at least 3 online youth enlightenment projects dedicated to the most outstanding pages of Russian history and key achievements of Russian science (Table 1). Slightly more than half of the respondents (53.8%) could not name a single project. More than 13% mentioned enlightenment projects on social networks and 7% — projects on television (excluding projects of the TV channel “Culture”). In a single sample block, we combined enlightenment projects of a patriotic nature, as cultivating love for a large and small Homeland (“Immortal Regiment”, “I remember, I am proud”, “Russia is a country of opportunities”, “My country is my Russia”, “Pushkin Map”), they were indicated by about 5% survey participants. The projects of the Znanie Society of the Kultura TV channel (3%) were among the top ten in terms of the number of mentions. Among other “named” enlightenment projects

and platforms, the most popular were: Arzamas (key topics — history, culture) — 5.9%, “Post—science” — 2.2% (exact sciences, anthropology, philosophy, etc.), “Science 2.0” and “Science PRO” — 1.7% (a wide range of sciences — anthropology, archaeology, astrophysics, biology, linguistics, medicine, cosmonautics, etc.). Among others, the global resource “Wikipedia” (1.2%), the encyclopedia “Great Minds of Russia” (1.2%), the online publication about modern culture and art Colta (0.7%), the enlightenment TV program “Galileo” (0.4%), the popular science magazine “Schrodinger’s Cat” and the volunteer the Gutenberg Smoking Room project (0.4%), a network resource for online education Coursera (0.3%). The channel of the Russian anthropologist Stanislav Drobyshevsky, the enlightenment project of the psychologist Mikhail Labkovsky, the Dmitry Zimin prize “Enlightener”, the portal about the

origin of man “Anthropogenesis”, the federal project “#НАОСТРИЕНАУКИ”, the multiplatform channel “History of Everything” and a number of other popular science projects were mentioned once.

The next set of questions evaluated the list of enlightenment projects offered to the respondent for fame (knowledge with a hint) from 9 titles in terms of the fact of their fame. From the point of view of fame (Table. 2) the highest scores were given to the Kultura TV channel (81.3% of respondents replied that they were aware of this project), the least recognizable is the international science popularization project Science Slam (10.6%), the format of which implies short speeches by scientists in an informal atmosphere. The projects of the Russian society “Znanie”, which are in second place, are much less well-known than the projects of the TC “Culture” (36.6%), but they are more well-known than the projects

Table 1

The number of mentions of the most famous enlightenment projects (spontaneous knowledge)

Enlightenment project	Number of mentions (%)
I do not know such projects	53,8
Enlightenment projects on social networks	13,7
Enlightenment projects on TV (except for the Kultura channel)	7,3
Arzamas Enlightenment Project	5,9
Enlightenment projects of patriotic orientation “I remember, I am proud”, “The Immortal Regiment”, “Pushkin’s Map”, “Russia is a country of opportunities”, “My country is my Russia”	5,1
Kultura TV Channel	3,0
Enlightenment project “Post-Science”	2,2
Enlightenment projects about science “Science 2.0”, “Science PRO”	1,7
Enlightenment projects of the Russian Society “Znanie”	1,3
Great minds of Russia	1,2
Wikipedia	1,2
Colta	0,7
Galileo	0,4
Schrodinger’s Cat/Gutenberg’s Smoking Room	0,4
Coursera	0,3
Others (no more than 1 mentions)	1,1

of the Arzamas platform, which is third with a 28% popularity index.

Table 2
Assessment of knowledge with the help of enlightenment projects

№	Title of the enlightenment project (organizer)	Known (%)
1	Kultura TV Channel	81,3
2	Russian Society "Znanie"	36,6
3	Arzamas	28,0
4	"Post-Science"	26,1
5	Schrodinger's Cat	24,2
6	Coursera	16,7
7	Colta	12,5
8	Gutenberg's Smoking Room	11,8
9	Science Slam	10,6

Each of these projects (sites) has a corresponding group (public page) in the most popular Russian social network VKontakte. As of June 1, 2023, the number of subscribers to these resources is as follows (see Table 3).

The audience of the group of the Russian society "Znanie" on the VKontakte social network almost doubles the audience of the Culture TV channel, but in fact it is the Culture channel that is recognized by respondents as much more well-known. Even more

evident are the indicators of the popularity of the Arzamas and PostNauka platforms with more than half a million VKontakte audience, but only 28% and 26.1% of respondents are known, respectively.

It cannot be denied that the Kultura TV channel is a long—standing, monumental brand on a federal scale. However, the recognition indicators of the Znanie Society and Arzamas in comparison with the audience of their pages on social networks indicate that a significant part of the content they publish may pass by subscribers (who simply skip their publications by "scrolling" the feed).

In general, our conclusions are confirmed by an analysis of the depth of respondents' immersion in the content of the enlightenment platforms they are looking for (Table 4) — the Kultura TV channel tops the TOP, but all other sites are popular with only a small part of the respondents (they are regularly viewed/ studied by only 3% to 9% of respondents). The index of "viewability" is also quite low (on average, only 20% of respondents get acquainted with the content to the end), which, in our opinion, may be due to the so-called "clip thinking" and a high degree of attention switching for most of the audience, who are used to getting acquainted with chronologically short content (memes, videos in the

Table 3
The number of subscribers of groups (public pages) of specified enlightenment projects (sites) on the VKontakte social network (as of 06/01/2023)

№	Title of the enlightenment project (organizer)	URL	Number of subscribers
1	Kultura TV Channel	https://vk.com/tvkultura	131679
2	Russian Society "Znanie"	https://vk.com/znanierussia	247967
3	Arzamas	https://vk.com/arzamas.academy	587522
4	"Post-Science"	https://vk.com/postnauka	510290
5	Schrodinger's Cat	https://vk.com/kot_sch	55851
6	Coursera	https://vk.com/courserarussia	16285
7	Colta	There is no VKontakte page, there is a Telegram channel (4.3 thousand subscribers)	
8	Gutenberg's Smoking Room	https://vk.com/kurilka.gutenberg	91670
9	Science Slam	https://vk.com/scienceslamrussia	9031

format Shorts, Reels) and not ready to waste time watching long video lectures and documentaries, listening to long podcasts, etc.

As part of the questionnaire, respondents were also asked to list those enlightenment projects that they could recommend to their friends for viewing. The sample shows (Table 5) that exactly half of the respondents are not ready to recommend any of the projects (or do not know about them), while 22.9% express loyalty to the Kultura TV channel, but on average less than 10% of respondents are ready to recommend the rest of the sites.

The following projects/titles were mentioned less than 10 times as possible recom-

mendations: Moya Planeta TV channel, Discovery TV channel, Heads and Tails show, Galileo program, Redroom project, encyclopedia “Great Minds of Russia”, projects “Science 2.0”, “Science PRO”, etc.

The final question suggested noting those resources (from the given ones) on which the respondent saw advertisements for enlightenment projects (Table 6). The leaders, obviously, were the YouTube video hosting (24.9% of respondents often saw advertisements), television channels (19.9%) and the VKontakte social network (17.1%).

No significant age differences were found in the responses of respondents to the knowl-

Table 4

The depth of immersion in the content

№	Title of the enlightenment project (organizer)	I watch it quite regularly (%)	I started watching it once, but I didn't finish it (%)	I saw the ad, but I didn't watch it (%)
1	Kultura TV Channel	28,6	36,9	34,5
2	“Post-Science”	8,7	19,6	71,6
3	Arzamas	7,9	17,3	74,8
4	Russian Society “Znanie”	7,8	23,0	69,2
5	Schrodinger’s Cat	6,6	18,0	75,4
6	Coursera	6,1	17,7	76,2
7	Gutenberg’s Smoking Room	4,4	15,2	80,4
8	Science Slam	3,5	14,5	82,0
9	Colta	3,1	14,4	82,6

Table 5

Willingness to recommend enlightenment projects to others

Title of the enlightenment project (organizer)	Number of mentions (%)
I don't know/I'm not ready to recommend any	50,0
Kultura TV Channel	22,9
Arzamas	8,4
Coursera	3,3
“Post-Science”	3,2
Schrodinger’s Cat	2,6
Enlightenment projects of the Russian Society “Znanie”	2,5
Gutenberg’s Smoking Room	1,1
Enlightenment projects on TV (NTV, Russia, etc.)	1,0
Colta	0,8

Table 6

Advertising channels for enlightenment products

Channel	I've seen it often	I've rarely seen it	I haven't seen it
YouTube Video Hosting	24,9	33,3	41,7
Television	19,9	32,6	47,5
Vkontakte social network	17,1	29,3	53,6
Social network Instagram ⁵	12,2	26,3	61,5
Telegram Messenger	10,3	17,7	71,9
Newspapers	9,1	16,5	74,4
Outdoor advertising	8,7	19,4	71,9
Social network Facebook ⁶	8,3	13,8	77,9
Odnoklassniki social network	7,5	12,7	79,8
Radio	7,0	17,0	76,0

edge of enlightenment projects, however, a very noticeable trend was the choice of the older respondents of the TV viewing format, and the consumption of social media content by young people.

The analysis of correlations showed that women are significantly more likely than men to know the enlightenment projects of the Russian society “Znanie” ($p<0.05$), “Arzamas” ($p<0.05$) and the TV channel “Culture” ($p<0.001$). Moreover, women demonstrate a significantly higher degree of involvement in the projects of the Russian society “Znanie” ($p<0.05$) and enlightenment projects “Arzamas” ($p<0.05$). The analysis of age characteristics showed that older people are more aware and involved in all enlightenment projects presented in Table 2 ($p<0.001$).

Knowledge with a hint about Coursera enlightenment projects turned out to be positively significant ($p<0.001$) related to the level of education of the respondents. At the same time, more educated Russians were involved in enlightenment projects “Schrodinger’s Cat” ($p<0.01$), Science Slam ($p<0.01$), “Coursera” ($p<0.001$).

Finally, the subjective levels of income and urbanization of the respondents are also

associated with the degree of involvement in enlightenment projects and knowledge with a hint: in large cities, respondents with a higher subjective income level are significantly more involved in enlightenment projects “Coursera” ($p<0.001$), “Arzamas” ($p<0.05$) and “Gutenberg’s Smoking Room” ($p<0.05$).

Conclusions and discussion

In general, the survey results showed the following:

— the respondents are not sufficiently aware of the ongoing enlightenment projects (slightly more than half of the respondents do not know about them). As it was shown earlier, for the successful implementation of an enlightenment product, all marketing measures to promote it were effective: the enlightenment organization creating it must have a powerful internal culture, broadcast to the external environment (through symbols, trademarks, etc.). In addition, the product itself must solve current and future tasks of society and the individual, among which experts highlight traditional values (life, human health), skills of the future and self-employment, media, digital, political, financial and

⁵ Currently, the Instagram social network is blocked for use on the territory of the Russian Federation.

⁶ Currently, the Instagram social network is blocked for use on the territory of the Russian Federation.

legal literacy, healthcare, family values. Product promotion can be ensured by the implementation of four main directions: advertising, public relations, direct marketing (sales) and sales promotion. The choice of tools depends on the gender, age, quantitative and qualitative characteristics of the target audience [5];

— there is actually no top-of-mind brand in the field of Russian enlightenment (the Kultura TV channel is more recognizable, but in this case this is hardly related to the nature of the content broadcast on it, most likely, it is known due to its monosyllabic title and long-standing presence in the federal television broadcasting network). Enlightenment, which has moved mainly to the video format, is forced to compete with the entertainment genre of many programs. For the youth audience, the implemented format of enlightenment is inextricably linked with the game format and carnival [4]: business games, case studies, entertainment stories, etc. For a more age group, the traditional format will be attractive — lectures, discussion clubs, etc.;

— if we talk about the social network segment of enlightenment platforms, it can be noted that many posts even in popular public sites (Kultura, Russian Society Znanie, Arzamas, etc.) have low coverage or, with sufficiently high coverage, do not receive audience feedback (“I like” marks, reposts, comments). At a glance, this happens with massive content (long videos, podcasts) and content on unpopular topics (highly specialized, outside the mass agenda). This may be due to the “clip thinking” and the high degree of attention switching of the majority of the audience, who prefer to “scroll” the tape [13] and not immerse themselves in the content deeply;

— the key channels for the perception of advertising information about enlightenment projects are the YouTube video hosting, television and the VKontakte network.

The modern promotion of enlightenment content in new media, including social networks, occurs through infotainment [6; 7] and a culture of participation, including the use of rhetorical forms (memes) [24], and also carries ethical problems [19; 21]. E. Jenkins and M. Kuzinets [29] argue that various rhetorical forms are easier to attract attention and are remembered because of the attention-saving context in which memes circulate. The memes themselves are examples of a “culture of participation.” In addition, memes spread the very concept of a culture of participation [33]. Commercial enlightenment projects often resort to disinformation and fakery in search of popular appeal and sensationalism [18]. In this regard, enlightenment projects in the interests of the State should be distinguished by their placement and have such designations.

In addition to the insufficient promotion of educational projects among ordinary people, it is necessary to note the rather moderate demand of Russians for educational content. By analogy with the concept of lifelong learning (LLL — lifelong learning), proclaimed by the Unesco Declaration in 1997 in Hamburg (UNESCO, 1997) [35], lifelong learning (LLE — lifelong enlightenment) broadens horizons and benefits both individuals [25], acting against a number of diseases (such as Alzheimer’s and Parkinson’s), and society, developing independence and a sense of responsibility in people [26; 27].

A survey by SuperJob⁷ conducted in 2022 showed that 51% of Russians are going to undergo training without any participation from the employer in the coming year. Among the types of study are trainings, seminars, advanced training courses and additional education. Moreover, there are age differences. It turned out that the older the respondents,

⁷ Every second Russian plans to study without the help of an employer. URL: <https://www.superjob.ru/research/articles/113546/kazhdyj-vtoroj-rossiyanin-planiruet-projti-obuchenie-bez-pomoschi-rabotodatelay/>

the less likely they plan to study. Thus, 57% of respondents plan to study among people under the age of 24, but 47% of people aged 45 and older plan to study.

Russians who are interested in enlightenment explain their continuous interest in new knowledge not by the possibility of career advancement or increased earnings (5th and 6th places in the rating of interests in new knowledge), but by personal growth, self-development, expansion of knowledge and other non-material incentives.

The survey conducted by us in 2017 in Russia [3] revealed gender and age differences in interest in enlightenment content, which are harmoniously combined with the data obtained two years later. Thus, boys have a higher interest in programming (22%), technology (23%), military-patriotic activities (16%), while girls prefer music (32%), cooking (33%), foreign languages (25%), art

(27%), psychological training (21%), master classes in style and fashion (23%).

In addition, the enlightenment preferences of Russians, as can be seen from these measurements, continue to be influenced by mass culture, which undoubtedly actualizes the problem of preserving and transmitting spiritual heritage in intergenerational interaction.

Limitations and prospects of the present study

As part of the continuation of the study of the phenomenon of modern enlightenment, it is worth analyzing in more detail the attitude of the audience to specific educational content (in particular, to evaluate the coverage of posts on various topics and the response to them on social networks). The survey was conducted before Meta resources (Instagram and Facebook) were blocked on the territory of the Russian Federation.

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Learning Self-Reliance and Initiative of High School Students in Educational Modeling

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The task of the work is to present initiative and independent educational modeling as the highest possible achievement of high school students (15—17 years old). The application of the "case study" within the framework of a multi-year genetic-modeling experiment made it possible to describe the precedents of educational modeling in high school, demonstrating the initiative and independence of students in modeling. An analysis was carried out of video recordings of 14 lessons on setting and solving one educational problem, the results of a focus group with 5 teachers and written work of 20 eleventh grade students. Due to prior learning based on the principles of learning activities, students of this age are able to invent and analyze modeling tools necessary to capture implicit subject relations, as well as to transform the model by holding the problem for the time necessary to solve it. In this case, the training model acquires the features of an exploratory model. It is shown that the model is not only a means of fixing subject relations for the classroom community, but also a way of expressing their understanding, i.e. a means of communication.

Keywords: learning modeling; high school students; learning task; learning try-out learning initiative; learning self-reliance.

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Самостоятельность и инициативность старших школьников в учебном моделировании

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Задачей работы является представление инициативного и самостоятельного учебного моделирования как высшего возможного достижения учеников старшей школы (15—17 лет). Применение «case study» в рамках многолетнего генетико-моделирующего эксперимента позволило описать прецеденты учебного моделирования в старшей школе, демонстрирующие инициативность и самостоятельность учеников в моделировании. Был осуществлен анализ видеозаписей 14 уроков постановки и решения одной учебной задачи, результатов фокус-группы с 5 учителями и письменных работ 20 учеников одиннадцатого класса. Показано, что при условии предшествующего обучения, основанного на принципах учебной деятельности, ученики этого возраста способны самостоятельно изобретать и анализировать модельные средства, необходимые для фиксации неявных предметных отношений, а также преобразовывать модель, удерживая задачу в течение времени, необходимого для ее решения. Учебная модель при этом приобретает черты исследовательской. Она является для учебного сообщества не только средством фиксации предметных отношений, но и способом выражения своего понимания, то есть средством коммуникации.

Ключевые слова: учебное моделирование; старшие школьники; учебная задача; учебная проба; учебная инициатива; учебная самостоятельность.

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Introduction

One of the founders of the theory of learning activity, V.V. Davydov, identified the problems of the subject of learning activity, the connection between the formation of learning activity and the devel-

opment of the personality of a student, as well as the problem of the development of learning activity itself as the most important unresolved problems of the theory [2]. In the almost three decades since then, these issues have been subjected to theoretical

and experimental development ([see, for example, [6; 7; 8; 10; 11; 13; 16]), but are still far from final solutions. This is partly due to the fact that the main research method in this area is the genetic-modeling method, which determines the necessity of preliminary long-term design and implementation of educational courses based on logical-subject and logical-psychological analysis. The development and testing of such courses for middle school in 2000—2023 made it possible to discover and describe some phenomena which characterise changes in the nature of learning activity of adolescents compared to that of younger students, and to build hypotheses regarding the dynamics of learning activity and the development of its subject [11].

According to B.D. Elkonin, the key issue of the theory of developmental learning today is the question of mastering and dynamics of modeling: how it is tested in collaborative activities in elementary school; how the model becomes its own tool; how and when the model is transformed by students themselves [10]. This is not accidental, since modeling is the center and “soul” of learning activity. Changes in the nature of involvement of students in educational modeling should most vividly demonstrate the dynamics of learning activity and its subject in the course of age development.

The task of this article is to describe the precedents of educational modeling at biology lessons in middle and high school. The material of the research is the study of microevolution as a key and difficult task of teaching biology [3; 13; 15]. The ultimate goal is to present initiative and independent educational modeling as the highest possible achievement of the age, i.e., according to D.B. Elkonin, the norm of age development [12].

Methods

The main method used for data collection is a formative experiment within the framework of biology course, which

allows us to observe the setting and solution of a learning task on the discovery of the concept of natural selection (Moscow gymnasium, 8-10 grades in different years, 8—11th grades of biology specialized classes). We have presented a description of this genetic-modeling experiment in earlier papers [3; 11; 13; 25]. The experiment involved a case study, traditionally used to study such precedents in teaching [15; 18; 20]. It relied on the included observation and analysis of video recordings of 14 lessons in 4 classes (three 9th grades and 11th grade, 108 students in total), which provided an opportunity to capture the events of collaborative learning activity. The video recordings were used to assess the measure of the autonomy of the students' work (recording the main stages of their work, moments and nature of the involvement of the teacher in independent work of the class).

In order to clarify and test the hypotheses, there was formed a focus group with 5 teachers working in different classes (all worked with experimental classes during last 4—10 years). The task in the focus group was to record the subjective perceptions of teachers about the autonomy of students in the process of modeling and their readiness to provide students with this opportunity, as well as to describe a variety of initiatives of children in modeling microevolution during ten years of experimental work.

The analysis of the written work of 20 eleventh grade students (9 boys, 11 girls) made it possible to analyze their involvement in collaborative learning activity, as well as their perceptions of the process and results of collaborative educational modeling.

Results

For the first few years of the development and implementation of the New Biology course, the learning task of discovering natural selection was reproduced according to a single scheme in different schools

and grades (from 8 to 11). This significantly increased the efficiency of learning compared to traditional learning [3; 9; 13]. Mastering the specific skills which are required to organize the setting and solving of a learning task in the classroom made it possible for teachers to make their own trials. The trials consisted in giving more freedom to students in setting a learning task and creating an educational model.

The “traditional” way of working in this part of the course has been described in detail [3; 9], but it is necessary to highlight the essential stages of this movement so that the changes and their consequences, tested by teachers later, become clear.

1. Students discover a contradiction in their own explanations of evolutionary change: mutations are random, while evolutionary change appears to be purposeful.

2. Emergence of the idea of developing an evolving model object.

3. Development of the model object: forms of its “existence”, rules of its “life” (about 1—2 lessons) — paper squares of two colors, on the back side of which their genotype is written down, laid out on a certain background.

4. Game modeling. Discovering the fact of population dynamics depending on environmental factors (approximately 2 lessons).

5. Analyzing the results obtained. Distinguishing between guiding and non-guiding factors, discovering the fact of natural selection (approximately 2 lessons).

6. Familiarization with the theory of C. Darwin and the term “natural selection”.

7. Solving problems for final comprehension of the discovered regularities.

The educational model was developed by a community of methodologists, teachers and psychologists. The teacher, presenting in advance the final format of the educational model, organized the activity of students who were discovering these subject relations for the first time.

Unlike most teaching strategies, in the system of D.B. Elkonin—V.V. Davydov, students are almost never offered a ready-made educational model. Educational modeling is the fixation by students of essential subject relations in a sign-symbolic form and the subsequent transformation of this sign-symbolic form: each class always reinvents this “wheel”.

Working out the rules of the “game” (creation of an educational model) is more important than the actual game modeling of microevolution¹. By proposing rules, students demonstrate their understanding of biological phenomena, elaborate it in the discussion, and, already at this stage, compare the created model and reality, repeatedly making such transitions. However, the teacher’s precise questions and remarks lead to the development of very clear rules. For example:

T (teacher): How many traits shall we take?

S (students): Let’s take 5! Let’s take 2!

T: It is probably best to choose the easiest option for research.

S: Then let’s take one, because Mendel did that at first.

Up to 6th or 7th grade, students do not notice or easily forgive such interference by the teacher, wondering how it happened that they were searching on their own, not knowing what they would find, while the

¹ A considerable number of ready-made computer models of evolution are known, including those in Moscow Electronic School and Russian Electronic School. The use of ready-made models of evolution to demonstrate regularities to students somewhat increases the efficiency of learning [14]. But ready-made models cannot replace independent development and implementation of a educational model: the mechanism “stitched” into a ready-made computer program is hidden and makes the results of this program indistinguishable from magic for the user and, therefore, unconvincing. In addition, dice and coin tosses allow students to feel “with their own skin” the probabilistic nature of evolutionary factors.

teacher guessed in advance what would happen.

In high school, some students feel the artificiality of the situation: it seems that they are given independence in developing the rules, but it turns out that the teacher has prepared all the materials (a box with cut papers of two colors, etc.). Perhaps that is why some students started to behave more passively, not offering additional ideas. In the process of the game, these students did not try to ensure the accuracy of following the rules: if the model is ready in advance, the results are already known.

The teacher, according to the teachers who participated in the focus group, could suffer from the role of “imposer”, but did not deviate from the developed logic due to the fear of “moving in the wrong direction”, “wasting time”, etc. The risk in departing from the established model is also that the changed model may not explicitly show the regularities that the students are supposed to discover. Therefore, the teacher must be quick to think several steps ahead when making changes. It is important to understand the effect that a modeling rule introduced by the students will have on the model.

After several runs of this fragment of the course in different classes, teachers began to feel more confident in their abilities and understanding of the situation, which led to trial actions on their part. This was manifested in accepting the options proposed by the students, if they were sensible to such an extent that it was incorrect to impose one’s own, premeditated option, as it was no better than the one proposed by the children. For example, in one class, students did not want to introduce into the model a “predator” that destroys lighter colored specimens because they are better seen against the background. A student said that this was “childish” and suggested introducing the factor of ultraviolet radiation, since the dark-colored papers would be better protected from it than the lighter-

colored ones. The teacher did not block this suggestion because they realized that it was quite consistent with reality and such a change would not ruin the model. Moreover, it turned out that now the “survival” of the papers no longer depended on the will and consciousness of the “predator”, but was determined by the roll of a die.

In many classes, students on their own initiative wrote programs for processing the obtained data, programs that accelerated the most time-consuming and lengthy stages of paper modeling. Frequent attempts to switch from “manual” modeling to virtual modeling — creation of computer programs simulating evolution — were noted.

Attempts of students to not choose paper as a model object, as well as to choose not only color as a phenotypic trait, were still suppressed by teachers: it seemed to them “very difficult to think of another working model and not to get confused”.

Over the years, teachers began to allow for more extensive changes. For example, in one biology class, a different way of assigning selectivity was proposed: specimens in a simulated population were designed to be sensitive or insensitive to an antibiotic. To determine which of them would survive and which would die, children threw a handful of grains from a bag onto a table with papers representing living creatures. If a grain landed on a piece of paper, it “survived” if it was resistant according to its genotype and “did not survive” if it was not resistant.

Trials of the teachers were supported by the increased confidence that even with considerable variation the model remained operational, as well as by the fact that the teachers noticed the effect of giving students the freedom to formulate the rules of modeling. The involvement of students was higher.

This led teachers to identify the fundamental points in modeling which needed to be controlled (there are only four) as opposed to those which could be varied.

The most recent episode of setting and solving this educational task (biology specialized eleventh grade, academic year 2022-2023) fully demonstrated the potential of the class as a learning community in relation to modeling. The teacher took the risk of allowing the children almost complete freedom in setting and solving the problem. This was possible because of his confidence in the skills of the students and the sufficient time he was able to allocate to the task.

Good preparation of students was expressed in successful mastering of the previous material and familiarity with the next topic, Evolution. However, as in other similar cases, the knowledge preceding the new topic was formal. Children were surprisingly successful compared to previous classes in solving the task about a giraffe which preceded the setting of the educational task, probably because this material is often found in textbooks and other books about evolution. However, a similar task on bacteria showed lack of understanding of the mechanism of microevolution. This corresponds to our ideas about the necessity of modeling to fully master the concept.

The setting of the educational task and the choice of the way to solve it took place during the discussion of the results of the previous work. Here is a shortened dialogue between the teacher (T) and the students (S):

T: What did you get?

S: Evolution is happening. Modifications are not inherited and mutations are not directed.

T: Can mutations be the basis of evolution?

S: It is not clear.

T: How do you find out? What are some ways to prove or disprove in science in general?

S: Read books and articles on the subject. Do an experiment. We would like to do it ourselves.

T: A real experiment is impossible in our conditions.

S: We can also do some modeling. On a computer.

T: I guess you can do it without a computer too... So what should we do: read textbooks or do modeling?

The students then went straight into developing rules for modeling.

The first suggestion was to take a word that can mutate (for example, vowels can be replaced by consonants) as a "living creature". However, the elaboration of this version showed that it was difficult to fulfill, and the students began to think of another alternative: with plasticine balls and "sausages". The whole work on developing the rules, testing them and changing them lasted five lessons, during which the students were active and independent. The teacher intervened in the process only a few times, namely:

1. Sometimes asking if this happens in nature.

2. Initiating an analysis of the situation when they noticed that the process was taking too long and becoming boring — the students had originally set a very low rate of reproduction in the model.

3. Holding on to the idea that the students had not included the non-guiding factors of evolution in the model from the beginning, suggesting to add a cold winter at the stage of re-analyzing the rules of the game.

4. Pointing out the insufficiently marked difference between flat "sausages" and balls made of plasticine: if you act with your hands, you may not feel the difference.

5. Suggesting to strengthen the action of one of the acting factors chosen by the students in a situation where it was found that they act in opposite directions with equal force.

6. Organizing the simultaneous creation of an Excel file to process the data for all groups.

After the simulation, the students were asked to write a report on how they acted: “Describe what was memorable, what was interesting”. The task was not compulsory. Of the 20 students who took part in the modeling, more than a half wrote reports. As the task was vaguely formulated, the reports varied: short and long (up to three pages), concise and full, less and more reflective. The results of this work are presented in Table.

In 10 reports, students used the word “we” when describing the modeling process, for example: “We decided to model the process of evolution...”, “We divided the specimens into groups of 5 bibcas², with genotypes AA and aa (balls and sausages)...”, “We began our model of evolution with the idea of text...”, “Our hypothesis did not fit, because we did not know how to make mutations...”, etc. One report was entirely devoted to analyzing the model and one’s attitude to it. Another paper did

not use the word “we” because the whole description was a detailed analysis of the interaction between groups (“some people believed”) and individual students, mentioned by name.

The majority (see the Table) understood the modeling process as a work of thought with hypothesis generation, testing and correction. Students recorded mainly significant moments in the development of the model, pointed out the turns of collaborative thinking, e.g.: “...according to the results of round 1, three out of four groups did not show a significant increase in the population, so it was decided, that there will be better to use schizogony instead of non binary division ...”, or “The predator ate with closed eyes tactilely. Since the meet balls stood out more, it ate them more often than the sausages. The results were not very realistic and we decided to add more conditions”.

The overwhelming majority had their own point of view on the course and results

Table

Analysis of the students’ reports on the progress and results of the modeling

Characteristics of collective educational modeling highlighted in students’ works	Number of students who highlighted these characteristics (out of 12)	Number of mentions in one report
Problem setting and choosing the solution method	2	1—2
Description of an unsuccessful modeling attempt	4	3—4
Recording of the essential points of the modeling (frequency of mutations included in the model, their probabilistic nature...)	10	4—10
Recording of non-essential (external) moments of modeling, e.g. a name invented for “living beings”	8	1—3
Recording of turns of thought (rejection of ideas)	8	1—5
Evaluative and reflective judgments about the process and results of modeling	10	1—8
Pointing to one’s actions or role in this work	4	1
Pointing to the role or actions of another student	3	1—4
Pointing to the actions or role of different groups	8	1—3
Pointing to the actions or role of the teacher	2	1—2

² “Bibcas” was the name students gave to the specimens of the population the evolution of which they modeled (the name of the fictitious animals). Children’s work is cited without change.

of the modeling, expressing evaluative and reflexive feedback on the course, intermediate and final results of the modeling, and on the peculiarities of the model being created, for example: “It seems to me that the facts are too balanced and monotonous (obviously, they mean factors — *author’s note*). I think we could add some single intervention like an epidemic or other cataclysm.”, “...now and in the lesson, it is not clear at all what conclusions can be drawn from the model in theory. But it made the term gene pool very clear”, “First of all, I remember Anya’s first model well, because at that time I was thinking about some model myself, and Anya’s idea seemed very reasonable, unusual and very interesting”, “We have a strangely selective predator, however, it is not immediately clear how it works, how exactly it influences evolution — we have not formulated it correctly”, etc.

While detailed descriptions of their own actions in the first person plural or singular were present in all the works, brief indications of the teacher’s involvement were found only in two works.

An interesting fact revealing the students’ engagement in the process is that one of the modeling participants left the New Year disco to go to the biology classroom, where the teacher found him writing formulas on the blackboard. The student wanted to look at cases of combinations of variables in their model. Later, the teacher gave him the opportunity to share this with the class.

Solving a learning task and discovering the mechanism of microevolution does not imply full mastery of the concept. It is necessary to solve tasks in which the concept is specified and clarified, as well as to perform learning trials — solving tasks of a special type in which there is no requirement or hint to apply the concept.

It is interesting that in this case, in the very process of solving the learning task, the students made this learning trial in relation to

an earlier model they had built — they proactively used a model/concept introduced in the biology course four years earlier. This is the concept of the relation of the surface area and volume of a body to heat absorption. The “living things”, which were invented by the students and the populations of which had evolved, differed precisely on the basis of the body surface area at constant volume (flat “sausages” and balls) and that is why they “survived” differently in cold winters and hot summers. This shows the expansion of the functional field of this model/comprehension [4] and its mastering by most of the students in the class.

The comprehension of the concept of natural selection and other factors of micro-evolution occurred by analyzing real examples, in each of which students discovered the action of different factors: driving selection on the example of wingless island insects, migration of beetles of Lake Erie, etc. In the work of comprehension and specification of the discovered concept, we saw no significant differences from the traditional course of this work in the New Biology course. The process was neither faster nor simpler.

However, the question “What is Darwin’s main merit?”, which was posed to students after the modeling but BEFORE the class had studied Darwin’s theory, made this class stand out from the others. Most answers to a similar question in other classes identified Darwin’s main merit as “proving the ancestry of man from monkeys”. In this class, most students wrote that Darwin discovered “the true mechanism of evolution” and “created a correct theory of evolution”. Four papers out of twenty said, “Darwin proved that evolution is based on mutations”, which is certainly incorrect (in Darwin’s time, mutations were not yet known), but demonstrates that modeling “triggered” a process of rethinking earlier ideas.

Due to the independence and involvement of students in modeling, the concept of natural selection acquired a strong personal

meaning for students. This was discovered while watching a film shown on the Culture channel dedicated to Darwin's jubilee. Without commenting on the film in advance, the teacher asked students to describe their impressions. Most of the works gave a detailed, critical and emotional analysis of the film, which revealed its true intention and was based on the analysis of facts and their contradictions. The following are some quotations from the students' works:

- "... I saw two valid facts that "disprove" Darwin's theory (and the film, made for the anniversary of his birth date, was most likely made for this purpose). The first is that ancestors were found together with already existing species. I really want to ask the authors of the film: does their so eagerly defended grandmother exist if she lives at the same time with them? The second is that the Darwinists themselves do not believe it, and all the evidence is falsification. I was sincerely waiting for an explanation of the falsifications, but there was none".

- "..... it was not the monkey theory, but the theory of natural selection that "turned the idea of the world creation upside down"; this is the major Darwin's point..."

- "Darwin in his theory only talked about the creation of new species from old ones, not the creation of old ones (or rather, the old one)... It is good that young people do not watch TV nowadays..."

- "The law of embryonic similarity has been shamelessly reformulated..."

- "There are no questions about the video, music and the narrator, but there are questions to the author of the text, because there were factual and conceptual errors..."

One student expressed his criticism of the position of the authors of the film in a poem:

"We don't need steps to be our guide.
No need for a forest's abode.
Perhaps a meteorite, or comet bright,
But not natural selection's code".

Discussion

During the first years of elementary school education according to the system of D.B. Elkonin—V.V. Davydov, children's skills of educational modeling gradually take shape and grow. In the process of collaborative work, students begin to actively use sign-symbolic means proposed by the teacher to depict invisible object relations, and then actively suggest their own ways of schematic fixation [1; 8] and transform the model, acting as a whole class and then independently.

New subjects are introduced in middle school. The specificity of subject concepts makes developers look for specific forms of educational models, which only partially reproduce the features of research models of the corresponding field of science. Therefore, students get involved in educational modeling as if anew, mastering new modeling languages. For many fifth-graders, involvement in modeling, indeed, occurs for the first time due to the fact that the majority of schools in which the D.B. Elkonin—V.V. Davydov system continues to be practiced only work with this system in elementary, or, on the contrary, only in middle school, many students at this stage go from one school to another. We do not have comparative data on whether involving children in educational modeling is easier or more difficult at this stage compared to elementary school. However, in the conditions of education according to the D.B. Elkonin—V.V. Davydov system, in middle school even a newly recruited class quickly begins to behave as a learning community, solving learning tasks together.

In middle school, the very nature of modeling changes [11], the complexity of educational models increases, sometimes to such an extent that it becomes difficult, and sometimes impossible, for the teacher to keep and anticipate the possibilities of changing models in the course of discus-

sion and collaborative development. The microevolution model discussed in this article approaches exploratory science models in complexity and nature. For example, the students' proactive introduction of two selective factors acting in opposite directions led to the manifestation not of classical driving selection but of selection on balanced polymorphism. Participating in the creation of a completely new model, the teacher cannot operate "in autopilot". His/her interest and position not as an expert but as a helper, an almost equal participant in the development, strengthen the students' involvement in solving the problem.

The analysis of children's reports shows that the class in the situation of solving a learning task behaves and feels like a learning community, acting together, consciously and purposefully. Pupils are able to conduct a discussion without the teacher's help, keep a goal indefinitely, break into groups and coordinate collaborative work. Students do not give much importance to the teacher's work in this situation, accepting him or her as one of the knowledgeable and appropriate equal members of the community. This is evidenced by the low number of mentions of the teacher's interference in the process in the children's reports.

When creating an educational model, students act in a subject-specific manner, relying on the key subject concepts they have previously mastered, independently and proactively propose meaningful hypotheses, identifying subject relations that can be the basis of the model. They consciously select a model form and analyze its suitability to model specific relations, rejecting unsuitable variants. Students' reflexive attitude to the modeling process

manifests itself in critical remarks during the process, in insightful assessments of its intermediate and final results.

The intervention of the teacher in this process is necessary only if the students do not independently retain the essential facts that the model should reflect. In the last case described, such intervention was required once (introduction of a non-selective factor³). Sometimes the teacher makes an organizational intervention, such as coordinating work of the group, because he or she sees the whole class without participating in group work. In this case, this was also the only intervention.

Thus, it can be recorded that at the high school stage, the model becomes a means of students' own research action, which confirms earlier hypotheses [1]. High school students invent model means themselves, which allows them to demonstrate their own understanding and ensure interaction in the learning community.

Needless to say, the process of independent educational modeling takes 2—3 times more class time than teacher-directed work, primarily because there are more dead-end moves to be played and rejected than in a tightly controlled situation. However, the result of independent modeling is not only a completed educational model, but also the very experience of such modeling [5]. The question of whether it is more important to spend learning time on students gaining experience in proactive independent research or on familiarizing them with an abundance of specific knowledge remains a question about the values of education.

Conclusions

1. Educational modeling in high school can be an independent and proactive ac-

³ It is important that this point is not necessary for the discovery of natural selection, but is important for a broader and more accurate understanding of microevolution.

tion of the class learning community, provided that there have been previous years of studying in the form of learning activity and that the class at this age stage is given the opportunity to be a proper subject of its learning activity.

2. The educational model created by the class acquires the features of a research model.

3. When developing such model, students act on the basis of the key subject concepts/models they have previously mastered, they are able to invent new model means, analyze the suitability of sign-symbolic forms for modeling the subject relations under study.

4. The model independently created by the students becomes for them not only a means of fixing subject relations to obtain new knowledge about the studied object, but also a means of presenting their own understanding and a means of organizing subject communication with other participants of the learning and research community.

5. When conducting initiative educational modeling, students are able to independently keep the framework of the task, control the process of its solution, and coordinate the actions of the learning and research community, which can be considered the highest age-related achievement, i.e. the norm of age development.

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Educational and Motivational Predictors of Academic Achievement (Based on PISA 2018)

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Academic achievements of teenage students are an important indicator of their further success and adaptation to life in adult society. The material of the study was the data collected for the international project PISA 2018 on a representative sample of Russian teenagers ($N=7608$). The article presents the results of studying the role of educational and motivational factors (controlling for gender and family environment) of academic achievements of Russian teenagers based on the material of PISA 2018 on reading literacy. We confirmed that regarding the environmental (family and teacher) factors in the academic achievements of schoolchildren, the role of SES as an important predictor of schoolchildren's academic achievements, the role of teacher support for active involvement in reading is significantly positive, and Teacher-directed instruction is negative factor. The study confirmed an important contribution of motivational variables to reading literacy, reading engagement was proved to be a positive predictor, and fixed mindset about intelligence was proved to be a negative predictor of reading literacy competence. The discussion shows that the data obtained generally corresponds to international data on predictors of academic achievement among schoolchildren based on the PISA 2018. The results obtained can be used in the context of teacher training and for improving the quality of education in Russian schools.

Keywords: academic achievements; motivation for reading; teaching strategies; PISA.

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Образовательные и мотивационные предикторы академических достижений (на материале данных PISA 2018 по чтению)

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Представлены результаты изучения роли образовательных и мотивационных факторов (при контроле пола и особенностей семейной среды) академических достижений российских подростков на материале PISA 2018 по читательской грамотности. Подчеркивается, что академические достижения школьников-подростков — важный показатель их дальнейшей успешности и адаптации к жизни во взрослом социуме. Материалом исследования стали данные, собранные на репрезентативной выборке российских подростков ($N=7608$). Подтверждена роль социально-экономического и культурного статуса семьи (СЭС) как важного предиктора академических достижений школьников. В отношении вклада средовых (семейных и учительских) факторов показана значимая позитивная роль поддержки учителем активной вовлеченности в чтение и негативная роль директивного обучения. Подтвержден важный вклад мотивационных переменных в читательскую грамотность, в частности, увлеченности чтением как позитивного предиктора и установок на фиксированные способности как негативного предиктора компетентности в области читательской грамотности. В обсуждении показано, что полученные данные в целом хорошо согласуются с международными данными, описывающими предикторы академических достижений школьников на материале PISA 2018. Результаты могут использоваться в контексте обучения учителей и повышения качества образования в российских школах.

Ключевые слова: академические достижения; увлеченность чтением; стратегии преподавания; PISA.

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Introduction

The international PISA studies, conducted since 2000, make it possible to assess the quality of education in different countries and take measures to improve it. Assessment of students' educational achievements is carried out in three main areas — reading literacy, mathematical literacy and natural science literacy. The study is carried out in three-year cycles, with each cycle focusing on one of the three areas indicated above. The relevance of this study is due to the importance of analyzing the factors behind the achievements of schoolchildren and the possible specificity of these factors for each participating country [4; 12]. At the family level, the only universal variable showing positive associations with success in PISA tests is the family's socioeconomic and cultural status (SES) [8; 9] (even though discussions about approaches to its assessment continue (see [7])).

77 countries took part in the PISA 2018 study. Russian teenagers showed results higher than the average for all participating countries (453 points), but slightly lower than the OECD average. At the same time, the results shown by Moscow schoolchildren were third in the world, after China (4 provinces) and Singapore. Compared to previous measurements from 2000—2012, there was a continuation of the positive dynamics of the results of Russian schoolchildren.

Since 2009, indicators of the quality of education have been included in the PISA diagnostic battery for schoolchildren. These indicators are constantly expanded and refined. There are studies on the role of disciplinary climate in the classroom [4; 14; 16; 19]. Disciplinary climate was found to explain 11% of interschool variation in reading achievement across countries [14]. However, in 12 of 65 countries no connections were found, which may indicate a certain ambiguity of this educational strat-

egy, which is part of an integral educational system with its priorities, values, and goals. Similar inconsistent findings were found for the teacher support dimension [16].

Another teaching style variable that has been extensively studied in PISA is teacher-directed instruction. It involves technologies in which the teacher is the primary agent of learning, as opposed to student-mediated learning in which students take more responsibility for their own and peers' learning. The results of research obtained as part of the PISA 2015 project on the impact of directive instruction, assessed as the teacher's ability to explain scientific ideas, on educational results in natural science indicate its effectiveness [5]. However, the data obtained from the analysis of the PISA 2018 results [12; 16], generally do not confirm this result. The analysis shows that the conflicting results on directive learning are related to its specific operationalization in different studies (in particular, PISA 2015 and PISA 2018). It could be also the fact that teacher directed instruction can have different consequences in classes with different levels of preparedness: for example, it can be used deliberately in classes with low achievements in order to adapt instruction to the level of students' preparation.

The role of another pedagogical factor — the teacher's stimulation of reading engagement was studied using data from 12 thousand schoolchildren from three countries — Turkey, China and Mexico [12]. It was shown that in all three countries this indicator made a positive contribution to the academic achievements of schoolchildren, but the extent of this contribution varied: it was most significant for Chinese students and least significant for Mexican students.

The study of the role of psychological variables as predictors of achievement in PISA tests indicates the contribution of two main factors: intrinsic motivation and

its analogues [3; 17] and academic self-efficacy [13]. This generally corresponds to the data of recent meta-analyses dedicated to the association of various motivational and personal factors to students' academic achievements [10; 18].

This article attempts to study the role of educational and motivational factors (controlling for gender and characteristics of the family environment) in the academic achievements of Russian adolescents using the PISA 2018 reading literacy test. Reading literacy is described as an understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society [15]. Based on the literature review, specific hypotheses were put forward regarding two types of educational factors (teachers' behavior and family support) and two main motivational factors. First, we hypothesized that teacher-directed instruction, which frustrates students' need for autonomy, would contribute negatively to reading literacy achievement, while teacher's stimulation of reading engagement perceived by student would contribute positively to PISA scores. Secondly, we hypothesized that enjoyment of reading (analogue of intrinsic motivation) would be the most important positive predictor of reading achievement, and that the fixed mindset (in accordance with C. Dweck's theory) would be the most important negative motivational predictor of reading achievement.

Method

Sample. This study used a representative sample of students from the PISA 2018, including 7.608 15-year-olds from 263 educational organizations in 43 regions of Russia. The sample includes 3.861 (50.7%) girls and 3.747 (49.3%) boys.

Measures. The data used in the analysis was obtained from PISA 2018 using measurements developed by a consortium of organizations specifically for PISA's

goals. They include test items to assess reading literacy, as well as a number of scales assessing certain characteristics of students and the learning environment. Reliability and validity of these scales were shown by the organizers PISA [15]. To make the most of PISA data, when selecting variables for analysis of reading scores predictors, we included all available personal and motivational characteristics of students, as well as characteristics of their perception of the school environment and the teacher. We also used in our analysis:

- 1) gender (0 — female, 1 — male);
- 2) immigrant background of the family (1 — native resident, 2 — first- or second-generation immigrant);
- 3) the language used at home most of the time (1 — Russian, 2 — other);
- 4) skipping classes or days of school (if responding to the question "In the last two full weeks of school, how often:" the student assessed the items "I skipped a whole school day" and "I skipped some classes", choosing the option "Never", then he received 0, in all other cases — 1);
- 5) arriving late for school (if responding to the same question the student rated the item "I arrived late for school" by choosing the option "Never", then s/he received 0, otherwise — 1);

6) index of economic, social and cultural status. SES estimates, presented by PISA organizers in the form of a standardized quantitative index, are made up of three other indicators with equal weights: maximum parental level of education, maximum professional status of parents and items available in the home, including books (for more information on the composition and calculation of the SES index see [16, pp. 216—217].

We considered the following characteristics of the educational and family environment as perceived by a teenager among the possible predictors of reading literacy scores.

1) Characteristics of teacher behavior:

- Teacher's stimulation of reading engagement (4 items, for example, "The teacher encourages students to express their opinion about a text");
- Disciplinary climate (5 items, for example, "Students don't listen to what the teacher says");
- Teacher-directed instruction (4 items, for example, "The teacher sets clear goals for our learning");
- Teacher support (4 items, for example, "The teacher gives extra help when students need it");
- Adaptive instruction (3 items, for example, "The teacher adapts the lesson to my class's needs and knowledge");
- Teacher enthusiasm (4 items, for example, "The enthusiasm of the teacher inspired me");
- Teacher feedback (3 items, e.g., "The teacher gives me feedback on my strengths in this subject").

2) Characteristics of the school environment:

- Perception of competitiveness at school (3 items, for example, "Students seem to value competition");
- Perception of cooperation at school (3 items, e.g., "Students seem to value cooperation");
- Exposure to bullying (6 items, e.g., "I was threatened by other students").

3) Parents' emotional support (3 items, e.g., "My parents support me when I am facing difficulties at school").

Also, a number of motivational characteristics were considered among the likely predictors of reading achievements:

- Enjoyment of reading (5 items, for example, "Reading is one of my favorite hobbies");
- Fixed mindset (1 item: "Your intelligence is something about you that you can't change very much");
- Mastery goal orientation (3 items, e.g., "My goal is to completely master the material presented in my classes");

- Achievement motivation (3 items, e.g., "I find satisfaction in working as hard as I can");
- General self-efficacy (5 items, e.g., "I usually manage one way or another");
- Fear of failure (3 items, e.g., "When I am failing, I worry about what others think of me");
- Competitiveness (3 items, e.g., "I enjoy working in situations involving competition with others");
- Value of school (3 items, e.g., "Trying hard at school will help me get a good job").

A four-point response scale is used in each of the measures listed above, with the exception of mastery goal orientation, where the response scale includes five gradations. Scores for these measures were calculated by the PISA organizers using the two-parameter IRT model and standardized based on a general sample from all OECD countries [16, p. 212].

Data analysis methods. To assess the impact of each variable to PISA reading literacy scores regression analysis (RA) was carried out in the Mplus 8 program using the maximum likelihood method with a robust estimate of standard errors (MLR) while considering replication weights (taking them into account provides a more accurate estimate of the standard errors of the parameters, but does not allow determine the fit indexes of the model). During RA and structural equation modeling we used Mplus option for multiple imputation analysis, which was recommended by organizers of PISA to calculate 10 possible reading literacy scores. The RA was carried out step by step: at the first step, the basic indicators describing the child and his family were included in the model, a set of variables describing the student's perception of the school environment, teacher and parents was added to the next model, and at the last step a set of motivational variables was added to the model.

To analyze the possible mediating role of motivational factors, structural equation modeling was carried out in Mplus 8 using the MLR method and cluster design (considering the distribution of students by school), which allows to obtain unbiased estimates of standard errors [11]. To be able to assess the fit of the model to the data, we used full weights instead of replication weights during structural modeling. The statistical significance of mediated effects was assessed using bootstrap analysis (5000 samples).

Results

The results of the RA (see Table) demonstrate that in the first model, SES shows the greatest positive relation to the reading literacy scores. Gender is also associated with scores: they are slightly lower for boys. Reading literacy is related to the language used at home most of the time: if it differs

from Russian, then the grades are lower. Skipping classes or days of school and arriving late for school showed negative relations with reading literacy.

After adding indicators of perceived school environment and parental support to the model (Model 2 in the table), all variables considered (with the exception of skipping classes or days of school) continue to show statistically significant associations with scores and SES remains the strongest predictor. Among the indicators of the school environment, the strongest positive relationship is demonstrated by teacher’s stimulation of reading engagement and adaptive instruction. Parents’ emotional support and the perception of cooperation at school also show a positive association to PISA scores. Reading literacy was found to be negatively related to teacher-directed instruction, teacher feedback, perception of competitiveness at school, and exposure to bullying.

Table

The results of a regression analysis for PISA reading literacy score

	Standardized coefficients (β)		
	Model 1 (N=6659)	Model 2 (N=5746)	Model 3 (N=5461)
Gender (0 — F, 1 — M)	-0.13***	-0.08***	-0.01
The language used at home most of the time (1 — Russian, 2 — other)	-0.15***	-0.13***	-0.11***
Immigrant background	0.01	0.01	0.00
Index of economic, social and cultural status	0.25***	0.22***	0.19***
Skipping classes or days of school	-0.06***	-0.04	-0.03
Arriving late for school	-0.06***	-0.04**	-0.04**
School and parent variables			
Teacher’s stimulation of reading engagement		0.14***	0.12***
Adaptive instruction		0.11***	0.09***
Teacher enthusiasm		0.02	0.02
Disciplinary climate		0.03	0.02
Teacher-directed instruction		-0.19***	-0.17***
Teacher feedback		-0.10***	-0.08***
Teacher support		-0.01	-0.01
Exposure to bullying		-0.07***	-0.06***
Perception of competitiveness at school		-0.09***	-0.07***

	Standardized coefficients (β)		
	Model 1 (N=6659)	Model 2 (N=5746)	Model 3 (N=5461)
Perception of cooperation at school		0.05***	0.06***
Parents' emotional support		0.08***	0.07***
Motivation variables			
Enjoyment of reading			0.23***
Fixed mindset			-0.14***
General self-efficacy			-0.02
Mastery goal orientation			-0.13***
Fear of failure			0.04**
Achievement motivation			-0.02
Value of school			-0.02
Competitiveness			0.08***
R^2	0.12	0.18	0.26
ΔR^2	0.12	0.06	0.08

Note. * — $p \leq 0.05$; ** — $p \leq 0.01$; *** — $p \leq 0.001$.

In the third model, the regression coefficient of gender becomes insignificant, which may indicate that the relationship between scores and gender is mediated by some motivational factors. Other predictors remain significant, although the strength of the relationship decreases: this is especially pronounced in relation to SES. The largest positive relationship with reading literacy demonstrates enjoyment of reading. A smaller positive association was found for SES, teacher's stimulation of reading engagement, adaptive instruction, parents' emotional support, perception of cooperation at school, and of the motivational variables — competitiveness and fear of failure. Reading literacy scores were negatively related to the language used at home most of the time, arriving late for school, teacher-directed instruction, teacher feedback, exposure to bullying, perception of competitiveness at school, and among the motivational variables — fixed mindset and mastery goal orientation.

A comparison of the explained variance proportion in each of the models demonstrates a more important role of motivational factors and family characteristics, while

the impact of the perceived school environment and teacher is somewhat weaker. The final model explains 26% of the variance in scores, which is approximately the same as the proportion of between-student reading score variance explained by similar factors in the PISA 2009 study using Russian sample, albeit with a smaller set of variables [2].

To analyze the mediating effects of motivational factors we compiled a structural model, including as the main predictors the variables with the largest regression coefficients: enjoyment of reading and SES. Of the characteristics of the school environment, teacher's stimulation of reading engagement and teacher-directed instruction were included in the model with covariation between them. We also included in the model gender which showed a varied impact on the reading literacy scores across RA models, suggesting the possibility of an indirect effect. Enjoyment of reading was hypothesized to partially mediate the effect of other variables on reading literacy scores. Evaluation of this model (see figure) demonstrated an excellent fit to the data: $\chi^2=114.07$; $df=9$; CFI=0.953; RM-

SEA=0.040 ($N=7139$). This model explains 19% of the variance in reading literacy scores.

Among the mediated effects, the following are statistically significant: gender (-0.06; $p \leq 0.001$), socio-economic status (0.03; $p \leq 0.001$), teacher's stimulation of reading engagement (0.04; $p \leq 0.001$) and fixed mindset (-0.02; $p \leq 0.001$).

Discussion

Students' academic achievement is the main educational outcome that modern school systems around the world strive for. Educational achievement in reading is important not only in itself, but also because it is a strong predictor of student achievement in mathematics and science. The results of the analysis confirmed the role of SES, which was previously shown among the important predictors of schoolchildren's academic achievements [2], even though in Russia the contribution of SES is relatively small, and SES itself is quite high.

Of particular interest is a group of educational factors that can be influenced by

adjusting teacher training and orienting them towards more effective strategies and teaching styles. In relation to educational variables, the role of teacher support for reading engagement was shown both for adolescents' own interest in reading and in their reading literacy. The negative impact of teacher directed instruction on reading literacy has also been demonstrated. These data correspond to international ones [12] and can be meaningfully interpreted from the framework of self-determination theory, currently the most well-known approach to understanding the sources of intrinsic motivation. Thus, teacher-directed instruction perceived by students is an attempt by the teacher to control the entire course of learning, independently regulating the actions of children in a rather directive, non-negotiable manner, which frustrates the students' need for autonomy. The consequences of such frustration typically include decreased autonomous motivation, persistence, and engagement in the learning process, which likely explains the negative effect of directive instruction on reading

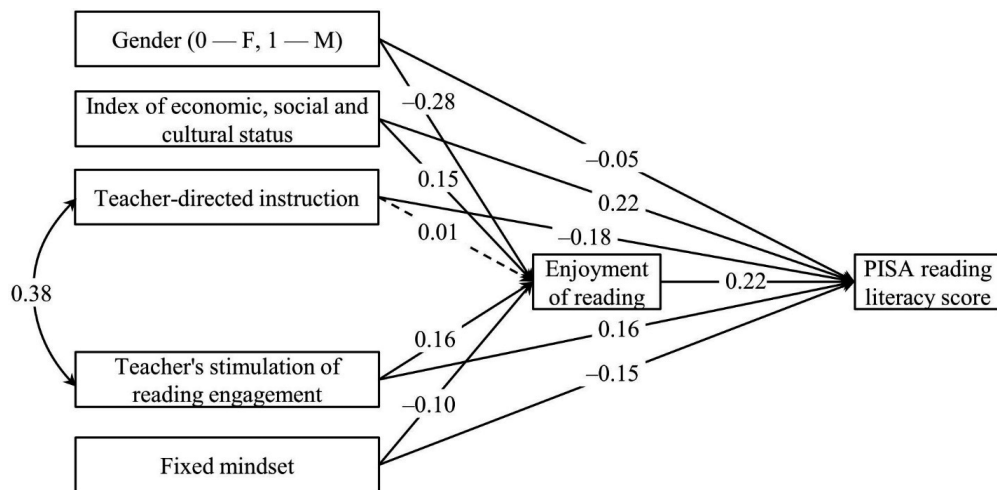


Fig. A structural model of the relations between reading literacy scores and main motivational, educational and family predictors (all coefficients are standardized and statistically significant at $p < 0.001$, with the exception of the coefficient from teacher-directed instruction to enjoyment of reading)

achievement. However, the results indicate that teacher directed instruction does not have a direct effect on reading enjoyment), reflecting a distinction between learning motivation and the more specific reading motivation that depends on factors other than the teacher's. Even the teacher's use of special reading stimulation techniques, as can be seen from the presented model, has only a very limited effect on reading enjoyment, comparable in magnitude to the SES effect and noticeably smaller than the gender effect. The relatively weak dependence of enjoyment of reading, the most important motivational predictor of PISA achievements in reading literacy, on the educational environment convinces of the need for further analysis of the factors that determine it, which constitutes the prospect of this study.

The strategy for stimulating reading engagement involves teacher support for the students' intellectual activity, their involvement in the process of studying literary texts, directing them to search for connections between the material being studied and their own lives, and discussions about the material under discussion. This kind of activity can support another basic psychological need — the need for competence, which has a positive effect on interest and motivation for reading. The resulting model demonstrates that reading stimulation does support reading engagement, but the indirect effect on reading achievement is only partial to the direct effect. In other words, reading stimulation techniques support students' activity, leading to positive results even in cases where it is not accompanied by an increase in reading enthusiasm. At the same time, the use of reading stimulation to increase the activity of students may not lead to an increase in engagement if stimulation techniques are used in a controlling manner, when, despite inclusion in the appropriate activity, conditions for satisfying the needs for competence and

autonomy do not arise. The possibility of such a controlled use of reading stimulation techniques is also evidenced by the fairly close direct connection between reading stimulation and directive teaching, which is typical not only for the Russian education system, but also for schools in OECD countries [16]. The frequent use of reading stimulation techniques in a controlling style can also explain the rather moderate magnitude of their effect on reading enjoyment.

The fundamental role of motivational variables and, in particular, joy for reading in reading literacy was discovered, which confirms earlier data obtained on a Russian sample [2]. A new and important result discovered using PISA 2018 data shows the role of the fixed mindset (entity theory of intelligence) as a negative predictor of academic achievements of Russian schoolchildren and the mediation of this contribution by enjoyment of reading. This result is of particular interest considering the recent debate about the predictive value of entity and incremental implicit theories of intelligence (see meta-analysis [20]) and their possible cultural specificity [6].

The results obtained are of interest both from a theoretical and practical points of view, largely consistent with the data of other analyzes conducted within the framework of the PISA project [2; 12], as well as psychological and pedagogical research aimed at searching for educational and psychological sources of academic achievement [1; 10; 18]. At the same time, several data reveal cultural specificity: thus, in contrast to the data obtained on schoolchildren in Turkey, China and Mexico [12], the disciplinary climate turned out to be an insignificant predictor of reading achievements in Russian adolescents.

Conclusions

1. The analyses of the results of the role of educational and motivational factors (controlling for gender and family

environment) in the academic achievements in reading literacy of Russian adolescents are presented; they are based on the PISA 2018 data which emphasized reading literacy. The contribution of SES and gender to reading achievement and their relationship with reading motivation is shown: the higher achievements of girls and students from families with higher SES are largely due to their greater motivation for reading (enjoyment of reading).

2. Regarding the contribution of educational factors to reading literacy, the

positive role of teacher stimulation of students' active involvement in reading and the negative role of teachers' directed instruction (which most likely frustrates students' autonomy and competence needs) are shown.

3. A significant contribution of motivational variables to PISA reading literacy has been shown: namely, adolescents' enjoyment of reading contributes to the achievement of higher results, while fixed mindset (or entity theory of intelligence according to C. Dweck) is associated with lower achievements.

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The Mediation of Arithmetic Problem-solving by Third-graders: The Procedure of “Assembling Sets”

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The purpose of our study was to reveal students' typical difficulties when performing trivial transformations of several quantities, which are to be coordinated. We have designed two tasks that required to build up the “sets”, and to keep their ratio. 97 third-graders from three secondary Moscow schools were recruited for this study. The participants solved the first task individually in the written form, and afterwards there were 25 couples randomly selected to solve the similar task jointly in an oral interview with the experimenter. The analysis of the results revealed the weakness and confusion of most of the surveyed students in solving such problems. The in-depth consideration of the written works and interviews allowed us to characterize the model means, used by students, as formal or meaningful. Among them, only the “portion-by-portion” measurement of two independent quantities, performed through drawing or using the counting material, provided by the experimenter, turned out to be effective. The study showed that the source of difficulties in solving problems related to “assembling sets” is the lack of adequate model mediation, and confirmed the relevance of considering the “assembling sets problem” in the general line of development of the number concept in primary mathematics education within the framework of V.V. Davydov's theory of learning activity.

Keywords: teaching mathematics; primary math; model mediation; assembling sets; qualities of different kind.

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Возможности опосредствования решения арифметических задач третьеклассниками: процедура «комплектования»

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Представлены материалы исследования, направленного на объективацию типичных затруднений, испытываемых учащимися при выполнении даже простейших расчетов, связанных с согласованными преобразованиями величин. Разработанные нами задачи, решение которых требовало учета «комплектности» величин из условий, предлагались 97 третьеклассникам трех общеобразовательных школ Москвы в форме индивидуальной письменной работы. Из их числа случайным образом были составлены 25 пар, совместно решавших аналогичную задачу в устном собеседовании с экспериментатором. Анализ результатов выявил беспомощность большей части обследованных учащихся в решении подобных задач. Подробное рассмотрение письменных решений и протоколов собеседования позволило охарактеризовать модельные средства, используемые учащимися, как формальные или конструктивные (порционное отмеривание разнородных величин). Показано, что источником трудностей в решении задач, связанных с комплектованием, является отсутствие у большинства детей способов их адекватного модельного опосредствования. В целом подтвердилась актуальность рассматриваемой «задачи комплектования» в общей линии развития понятия числа в начальном обучении математике в рамках концепции учебной деятельности В.В. Давыдова.

Ключевые слова: обучение математике; математика в начальной школе; модельное опосредствование; комплектование; разнокачественные величины.

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Introduction

“...And so I sat and looked at them: the boy has two pockets, the girl has one pocket, and some insights began to appear in my head...”
N. Nosov. “Vitya Maleev at school and at home”

The development of an approach to teaching math to primary school students is an urgent challenge. The tasks, which require coordination of changes, performed simultaneously with magnitudes of different kinds, demand special attention. The theoretical analyses of the related intellectual structures and their emergence in child’s development was begun by Piaget [14], and continued by recent research [8; 13; 15; 17; 20; 23] that pointed out specific difficulties, which students commonly experience as they try to solve such problems. We assume that these findings emphasize the complexity of the educational design, required to build up the learning situations based on the necessity to coordinate actions related to magnitude transformations.

Some feasible progress in this regard was made in the area of psychology of mathematics education in the studies [1; 5; 12; 19; 21], which followed Davydov’s view on the psychological mechanisms of number concept formation [2; 11]. The “assembling sets” task stands out among the first tasks of the primary math curriculum. It was defined as a way of comparing quantities that diverged from the direct counting of the objects they consisted of. V.V. Davydov considered the adoption of the complex procedures of counting objects by “portions” and counting portions themselves, which stem from the practical tasks of assembling sets, as the special learning task, providing for the proper number concept formation further on [3, p. 180—188; 2, p. 58—66]. The task, which demanded “mediated” comparison necessary to assess the sufficiency of the number of components for “sets”, revealed the quality of students’ orientation: either “productive” (the comparison between saliently presented quantities was mediated by the set template) or “formal” (the comparison was limited to

counting separate objects) [11, p. 145—147]. The contradiction between “visual” and “conceptual”, which was embedded in the tasks’ design, exposed specific deficits in the calculation skills, acquired by first-graders.

We believe [16; 22], that it is crucial to continue the research on the potential of the assembling sets task as an initial step within the general line of number concept formation in primary school.

Organization, procedure and methods

The goal of our current study was to reveal typical difficulties in problem-solving, which students experience in arithmetic tasks, related (directly or indirectly) to assembling sets procedure and to the ratio of quantities set by these procedures. Primary school students are faced with such tasks in their third and fourth grades [7]. To assess the abilities of third graders in carrying out coordinated transformations of quantities, two tasks “about puppets and buttons” were created. They required students (along with other simple calculations) to measure components for an explicitly or implicitly set number of portions. The first part of the survey consisted of an individual written task — an answer to two basic “direct” questions from the first task:

Task 1. Mary makes puppets and sews on blue buttons as their eyes. For each dress, she will sew 3 green buttons on.

(Question 1) How many blue buttons would she need if she had already taken 12 green ones for the puppets’ dresses?

(Question 2a and 2b) If Mary has 10 blue buttons, how many puppets can she make and how many green buttons does she need?

For the second part of the survey, which was an oral interview with each pair of students, the task was designed in such a way that the answers to the questions could not simply be obtained by repeating a set of buttons. It introduced the “lack” of both quantities, which were to be assembled by sets:

Task 2. Mary planned to sew puppets. Their eyes would be made of blue buttons, and they would have three green buttons sewn on each dress. Mary decided to sew 8 similar puppets and prepared the necessary number of buttons for each one. But when Mary arrived at school, she found only 14 green and 13 blue buttons in her pocket.

(Question 1) How many puppets can Mary make now?

(Question 2) How many buttons did Mary lose on her way to school?

It was necessary to group students in pairs in order to expose the process of joint problem-solving and the ways in which the provided counting materials were used, as students partially discussed them between each other.

97 third graders of three Moscow schools (43 boys and 54 girls, 9–10 years old) participated in the first part of the survey (individual written solution of the problem). 50 of these students were selected at random to solve a similar problem in the second part of the survey (oral solving, a total of 25 student interviews).

When completing individual tasks in the first part, students could write down their reasoning in any convenient form. There was no time limit for completing the tasks. It took our participants about 10 minutes to solve individual tasks. For the second task, each pair of students were given a leaflet with the text of the task and counting materials (blue and green tokens) for common use. The interview lasted until the students felt that they had completed the task, and that usually took between 7 and 17 minutes.

Written papers, protocols, and video recordings of interviews were used as material for analysis.

The quantitative analysis involved calculating the proportion of correct answers and analyzing the relationship between the success in solving the questions in the written assignment using conjugacy tables.

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culating the proportion of correct answers and analyzing the relationship between the success in solving the questions in the written assignment using conjugacy tables. The chi-square test (χ^2) was calculated using the jamovi statistical package version 2.3.28.

Results and discussion

The overall success rate of solving the first task is 54%. The percentages of students who answered each question correctly are shown in Table 1.

Table 1

The success of the individual written solution to the first problem by third-graders

Task 1. Questions	The % of students who gave the correct answer
Question 1: How many blue buttons would Mary need if she had already taken 12 green ones for the puppets' dresses?	39
Question 2a: How many puppets can Mary make with 10 blue buttons?	67
Question 2b: How many green buttons will Mary need for 10 blue buttons?	56

The significance of the differences in the success rates of solving question 1 compared to questions 2a and 2b were calculated using conjugacy tables. Based on the analysis, we see that:

- 1) There is a significant direct correlation between the accuracy of answers to questions 2a and 2b ($\chi^2 = 47.3$, $p < 0.0001$)
- 2) There is a significant direct connection between the accuracy of the answers in questions 1 and 2a ($\chi^2 = 10.8$, $p = 0.001$)
- 3) There is no link between the accuracy in answers to question 1 and question 2b ($\chi^2 = 1.26$, $p > 0.05$).

It is remarkable that among the 13 children who correctly answered the second question about puppets (2a) and could not count the

green buttons (question 2b), not a single student had answered question 1 correctly.

The range of successful answers allowed us to identify five groups of participants based on their solutions:

1. Did not solve anything: 21 students
2. Answered all the questions correctly: 28 students
3. Answered correctly only to question 2 about puppets: 13 students
4. Answered questions 2 and 3 correctly, but not question 1: 24 students
5. Answered only question 1 correctly: 8 students

Other possible combinations of right and wrong answers made up only 3 of 97 papers.

We paid special attention to the content of students' records that accompanied their arithmetic calculations, as there was a significant number of solutions, which contained both: correct and

wrong answers. In 68 cases among 194 notes that we acquired, there were traces of some data analysis by students: extracts of task conditions, tables with numbers of buttons and puppets, lines of buttons or drawings of puppets with buttons. The relationship between students' success and their use of specific means is presented in Table 2. We found that the success of solving problems was significantly related to the type of notes used by students ($\chi^2 = 22$; $p < 0.001$).

Extracts from the task were found in the works of six students: four solutions turned out to be correct (Fig. 1a), and five were incorrect (Fig. 1b, c).

Only 13 students of one of the classes that were surveyed used tables to solve the task.. It is clear that they were trained to write down tasks in this form. Figure 2 shows examples of both successful (Fig. 2a) and unsuccessful use of these "means" (Fig. 2b).

Table 2

The success in solving the first problem for the variety of "additional" notes used by third graders

Students' notes	The number of correct results	The number of incorrect results	The «efficiency» of using notes of the kind (% of correct results)
Extracts from the task (9 cases)	4	5	44
Tables (16 cases)	6	10	38
Buttons drawn by portions (29 cases)	23	6	79
Buttons drawn in lines without splitting by portions (14 cases)	1	13	7
No notes (126)	56	70	44

Вопрос - ? м.п.
Пуппосе - ? по 3 зм. п.
Сн. - ?
Зн. - 12 п.
 $12 : 3 = 4(к.)$
 ~~$4 \cdot 2 = 8$~~
 $4 \cdot 2 = 8$

Ответ: 8 сунух пуппосе

a)

Зелитосе - по 3^{ма} п.
Сунух - ? п.
 $1) 12 : 3 = 4(п.)$

Ответ: 4 пуппосе

b)

Вопрос - ? пуп. сун.
Пуппосе - по 3 пуп. зм.
Пуппосе - 12 зм.
Вопрос - ? пуп. сун.
 $(12 : 3 = 4) (1) 3 + 3 = 6 (пуп.) - на пуппосе$
 $2) 12 : 6 = 2 (пуп.) - сунух$

Ответ: 2 сунух пуппосе понарадитица

c)

Fig. 1. Examples of brief notes from the task, preceding right (a) and wrong (b and c) answers

Купили м.	Кат-во	Всего
Куклы	1 шт.	2 син. пуговицы
Платки	1 шт.	3 жёл. пуговицы
Платки	?	12 жёл. пуговиц

1) $12 : 3 = 4$ (шт.) 4 платка
 2) $4 \cdot 2 = 8$ (син. пуговицы)

Ответ: нужно 8 синих пуговиц для платка

a)

Fig. 2. Examples of solutions using the table: a) correct; b) incorrect

Куклы	Кат-во	Всего
2 шт.	1 к.	12 шт.
3 шт.	1 шт.	?

1) $12 : 2 = 6$ (шт.) синих пуговиц

Ответ: 6 синих пуговиц

b)

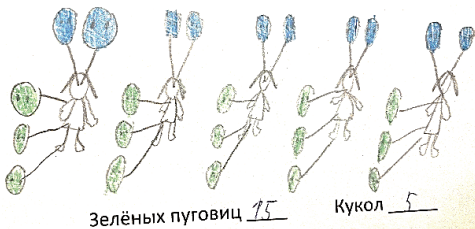
All drawings of puppets and buttons that we encountered could be divided into two categories: those in which the buttons were clearly arranged in “sets” (pictures of puppets with the buttons grouped together, the buttons circled in groups of two and three), and those with no traces of “portion by portion” calculation (rows of buttons according to their number from the task, pictures of puppets without any buttons).

The drawing of buttons by portions was most often followed by correct arithmetic op-

erations and answers (Fig. 3a): 23 out of the 29 cases.

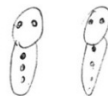
The image of buttons in rows or piles (Fig. 4), was rare (14 cases). Among the solutions illustrated in this way, there was only one correct (for example: Fig. 4a).

In the second part of the survey, more than one third of the students (36%) who worked in pairs failed to answer any questions of the second task. At the same time, 60% of students answered the first question (how many puppets will Mary make?) correctly, and only



a)

Fig. 3. Examples of buttons drawings accompanying correct (a) and incorrect (b) solutions



Ответ: Зелёных пуговиц 6 Кукол 2

b)



a)



Зелёных пуговиц 9 Кукол 10

b)

Fig. 4. Examples of button drawings without grouping them by portions accompanying the correct (a) and incorrect (b) answers

28% answered the second question (how many buttons were missing).

The analysis of the oral interview records allowed us to identify three groups of students who differed in the “strategies” of solution design and in the successful performance accordingly.

First group (9 records, 18 students) incorporates students, who could not answer any questions (did not determine the number of puppets to be made with the buttons left, or the number of buttons missing). All their solutions were reduced to random manipulations with numbers taken from the conditions or obtained during calculations. Here are some examples of these solutions:

Student A: 9 plus 8... is 17...she sewed 8 more dresses — that’s 8. And 14 plus 13, that’s 27. 27 divided by 3 equals 9.

Students’ M and L discussion:

M (divides 8 by 4): lost 2 buttons...

L: She couldn’t possibly have lost 2 buttons. Then she wouldn’t have had enough for 8 puppets. So, why would she lose 2 buttons?

M: Maybe we should multiply 4 by...

L: By 8? 32 buttons?

M: She couldn’t possibly have had that much in her pocket...

L: Funny... Probably, we still need to divide 8 by 4.

M: But she couldn’t possibly have lost 2 buttons. It doesn’t make any sense for her to have taken them if she is still unable to sew a puppet with them...

Student B explains why she first wanted to subtract eight from three: I thought that “minus” would be the first step, because... she had three green buttons, she decided to sew... And when they sew on... they lessen! They go to the puppet. Well, they write here... “would have three green buttons sewn on each dress!” .. Ah!.. Sewing on... is a “division”...

It is significant that, at the same time, students of the first group did not turn willingly to the counting materials prepared on the tables. Even if they were asked to solve a problem with its help, they responded that “it just con-

fuses us”. Only one pair of students were able to consistently construct the correct solution to the second question without resorting to working with the counting materials, but they failed to handle the first, easier question.

The second group consisted of 9 pairs of students, who answered the first question correctly, but were unable to solve the second task about how many buttons had been lost. When referring to counting material, students in this group correctly spread “buttons” in portions and answered the first question. However, then they began to count the “wrong” buttons, such as extra buttons that were not actually lost, or those for four puppets that were impossible to make, etc.: laying down and recounting tokens lead them to incorrect answers. Here are some examples of such work:

Student W lays eight blue tokens in front of him: “We take eight puppets, — he circles the eight tokens with his hand, — and for each puppet there are two eyes... (separates the tokens into pairs). There will be four puppets!”

Student U and R collect four sets from 14 green “buttons” and 13 blue “buttons”, and count the remaining buttons. Student U: “That’s it. She lost two green buttons and another 1-2-3-4-5 (counting them with his/her fingers) — five blue ones”.

The correct calculation of the number of “missing” buttons (6 records) was mostly accompanied by laying out “portions” of tokens (Figure 5). Among students that started with the formal sorting through well-learned arithmetic operations, only those who resorted to laying out the tokens, obtained the correct answer and were able to justify it to each other and to the experimenter.

Students’ M and F discussion:

M points at the leaflet and reads it aloud: Well... She [Mary] decided to sew 8 similar puppets... that is... 8 by 3 and by 2 (points at the laid out “buttons”). We got 24 buttons and now, as she arrived at school, she found only 14, which means... 10. And three she lost... oh... I am a little lost here... I’ve never

dealt with anything like this...

F: She had... (counts) ... 16 blue and she lost 3...

M: She lost 10. There are 14 left.

M: 12...15... minus one... 14 (five triples of green “buttons” are laid out, and one “button” is put aside from the last three). And she had 16 blue eyes. She lost 3. (Students move each pair of blue buttons closer to each trio of green buttons — that makes 4 sets. Then they move another pair from the remaining blue buttons to two green buttons from the incomplete trio.)

M: That is 1-2-3-4-5 (counts “puppets” again)...

F (reads the question again): This one is not going to work! (Points at the incomplete set.) Because it is as the text goes: three! Not two, not one. That is 1-2-3-4... puppets.

M: It was simply necessary to get into it!



Fig. 5. The process of problem-solving with laying down tokens by portions (two blue “buttons” for the “eyes” and three green — for the puppets’ dresses)

The results of the survey demonstrate a number of features of third graders’ use of typical techniques for solving tasks. The number and nature of mistakes made indicates, in our opinion, that some of the third graders are unable to select and perform well learnt operations with whole numbers within the first four tens’ limits.

Summarizing the results, we can say that there should be an obvious differences between the success rate in answering the first and second questions of the written part

(39% vs. 56%), and in answering the first and second questions during an oral interview (60% vs. 28%). The values necessary for the solutions were implied in the tasks’ questions either directly or indirectly. For example, 24 students failed to answer the first question of the written task, in which the “supplementary” value (the number of puppets) was not mentioned, but they succeeded in the second question, which directly required finding this very value. It’s remarkable though that the number of puppets found correctly in question 2a did not necessarily lead to correct calculation of the number of buttons (13 participants). Apparently, these students were not able to handle “the third value” (the number of puppets) appropriately: though they found it, they could not implement it into calculations directly.

The divergence in the number of correct answers to the oral interview questions indicates the actual complexity of the situation created by the task. The first question (about puppets) required measuring given quantities of blue and green buttons “directly” in the correct proportions, whereas the second question (counting missing buttons) implied preliminary measurement by “portions” to build up an exact number of buttons for eight “would-be” puppets as a solution mediator.

The drawing of buttons grouped into portions for each puppet has proven to be the most effective means (79% of correct answers) among the typical additional records used by students. The success rate for solving problems using brief and tabular summaries of task conditions did not significantly differ from that of students who provided no explanations for the solutions they compiled and the answers they derived (44% and 38% compared to 44%, respectively, $\chi^2 = 0.28$, $p > 0.05$). The presence of puppets-drawings without buttons or rows of buttons with no portions made visible is significantly associated with incorrect solutions ($\chi^2 = 7.26$ $p < 0.01$), suggesting that the pictorial representation of

combined portions is more productive than a formal recording of quantities.

The oral interview in the second part of the survey allowed us to clarify the specific content of a student's action as related to drawing schemes of puppets, which provided significant advantages in solving problems individually in the first part. The counting material offered to students did not in itself guarantee that its model functions in relation to the analysis of the task situation will be performed automatically. However, they were quite suitable for this purpose, allowing one to "materialize" an implicit "third" value (the number of button portions), on which the decision depended directly. Thus, students that were solving the task had the opportunity to perform an adequate orientation action, which would mediate necessary calculations, while considering both explicit and implicit conditions (combining different buttons into portions according to the required number of toys).

Those third graders (6 pairs out of 25) who successfully solved the entire problem by dividing the counting materials into portions, apparently imparted the tokens with the required model functions. The incorrect solutions were often associated with attempts to extract a ready-made solution "directly" from counting "buttons", which they had placed on the table randomly. Only those students, who started placing the "buttons" in portions, were able to find and correct the mistakes they had made at the beginning and therefore, they managed to succeed at least with the first question. The participants' appeal to the coordinated counting "by portions" required here, revealed the implicit ratio of calculated values, and obviously allowed them to overcome the difficulties of "common counting".

Conclusion

The results confirm our assumption that the modeling actions, relying on assembling sets procedure, are crucial for solving the tasks we designed. It is the lack of mastery of mediative functions of these actions that

leads students to go around even in the basic arithmetic tasks. They rely on a random selection of numbers and operate with them.

The tasks we designed required precise calculation and coordination of independent changes of quantities of different kinds interrelated by the script. To coordinate these changes they had to measure each amount by appropriate portions and estimate the number of these portions based on the required number of objects (in our case, dolls with two types of buttons). The identification of this "third" value, which is either explicitly or implicitly provided in the task conditions, plays a significant orientating function in determining the order of actions and applying arithmetic operations.

The ways in which some students were using both their own and given supplementary means (diagrams, drawings, counting materials) revealed their helplessness in solving "critical" tasks where numbers could not be used directly to obtain an answer. The calculations they performed could be characterized as "formal". The "meaningful" method would imply modeling materials and actions, but for third graders, the need for such a method was not obvious. Familiar formal techniques for defining "necessary" operations directly based on task data (e.g., tables) did not assist in finding the correct answer. Apparently previous training was not focused on appropriate model reconstruction of the matter, which would have enabled students to design their own solutions with regard to implicitly set conditions.

It is remarkable that consideration of students' typical mistakes in arithmetic problems solving gradually leads researchers to the analysis of the "deficits" in using "model supports" and the prerequisites for their assimilation by primary school students [9; 10; 11; 19]. Treating model objects only as salient illustrative material has been subject to significant criticism [3; 4], but unfortunately, it is still present in the methodological support for primary education.

In general, the results of the current research, as well as those of many others in this field [6; 19; 20], confirm the importance of the psychological and pedagogical study of the ways to include the modeling content under consideration to the elementary course of mathematics. This special content is relevant within co-measurement of quantities required in “assembling sets” task. The organization of the corresponding actions with the appropriate material is

meaningful for primary math learning while students are introduced to working with magnitudes. Significant prospects here are granted by the logical-genetic analysis of the learning actions’ structure and content, related to students’ acquisition of the learning material. The identification and description of the essential model mediation’s functions is an urgent challenge for psychological research on the number-concept formation in primary school.

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ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ

Segregation or Inclusion: An Experimental Study of the Psychological Support in the Professional Training for Persons with Disabilities

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The article reveals the degree of effectiveness of segregated and inclusive forms of psychological and pedagogical support for students with special educational needs. In the psychological experiment took part 68 students with disabilities, its purpose was to identify the dynamics of the psychological well-being of the students depending on the inclusive or segregated forms of psychological trainings they took part in. As a result of the study, carried out with the help of the Scale of psychological well-being K. Riffe (adaptation of T.D. Shevelenkova, T.P. Fesenko), questionnaire Life Style Index (Plutchik, Kellerman, & Conte, 1979) and the methodology of SUN (V.A. Doskin, N.A. Lavrentieva, V.B. Sharay), we found out the differences between the groups of students according to their mood ($t=7,55$; $p<0,001$), well-being ($t=4,89$; $p<0,001$), activity ($t=4,78$; $p<0,001$), psychological well-being ($t=4,65$; $p<0,001$), tension of psychological defenses ($t=2,27$; $p<0,05$). These factors indicate the negative dynamics of psychological well-being of students with disabilities who studied in segregated groups with no conditionally healthy students. Based on the results of the psychological experiment, we made a conclusion, that the segregation of students with disabilities from other students is inexpedient, even if the purpose was providing them with psychological assistance in higher education.

Keywords: psychological experiment; segregation; inclusion; students with disabilities; psychological well-being; psycho-emotional state; psychological defense mechanisms.

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Сегрегация или инклюзия: опыт экспериментального исследования условий психологического сопровождения профессиональной подготовки лиц с ограниченными возможностями здоровья

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Представленные в статье материалы посвящены проблеме выявления степени эффективности сегрегированных и инклюзивных форм психолого-педагогического сопровождения студентов с особыми образовательными потребностями. Целью психологического эксперимента, в котором приняли участие 68 обучающихся с ограниченными возможностями

здоровья, стало выявление динамики их психологического благополучия в зависимости от выбора инклюзивной или сегрегированной форм проведения психологических тренингов. В результате исследования, выполненного с помощью Шкалы психологического благополучия К. Рифф (адаптация Т.Д. Шевеленковой, Т.П. Фесенко), опросника «Индекс жизненного стиля» Плутчика-Келлермана-Конте и Методики САН (В.А. Доскин, Н.А. Лаврентьева, В.Б. Шарай), установлены различия между группами в показателях настроения ($t=7,55$; $p<0,001$), самочувствия ($t=4,89$; $p<0,001$), активности ($t=4,78$; $p<0,001$), психологического благополучия ($t=4,65$; $p<0,001$), напряженности психологических защит ($t=2,27$; $p<0,05$), свидетельствующие о негативной динамике психологического благополучия студентов с ограниченными возможностями здоровья, проходивших тренинги в сегрегированных группах, исключающих присутствие в них условно здоровых студентов. На основании результатов психологического эксперимента делается вывод о нецелесообразности обособления и выделения студентов с ограниченными возможностями здоровья из общего числа студенческой молодежи даже в целях оказания им психологической помощи в вузе. Материалы статьи вносят существенный вклад в осмысление принципов организации в инклюзивном вузе психолого-педагогического сопровождения студентов с ограниченными возможностями здоровья.

Ключевые слова: психологический эксперимент; сегрегация; инклюзия; студенты с инвалидностью и ОВЗ; психологическое благополучие; психоэмоциональное состояние; механизмы психологической защиты.

Финансирование. Исследование имело финансовую поддержку РФФИ и Министерства образования, науки и молодежной политики Краснодарского края в рамках научного проекта № 19-413-230017 «Активизирующая модель профессиональной подготовки лиц с инвалидностью и ограниченными возможностями здоровья как конкурентоспособных специалистов».

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Introduction

In modern conditions, in the context of the formation of a society of equal opportunities, the problems of developing a holistic theory of inclusive education remain relevant and have not yet been solved, which could become the basis for the implementation in practice of the ideas of accessibility of high-quality education, including higher educa-

tion, for all citizens of the country, regardless of the presence or absence of certain health problems health [3].

Numerous normative legal acts regulating the activities of educational organizations to ensure accessibility of higher education for persons with disabilities and HIA emphasize the need to create special conditions to improve the quality of inclusive edu-

cation, develop special measures to achieve the expected effect [2].

As a solution, adapted educational programs are offered separately for students with disabilities [4; 8], and recommended the use of special correctional and rehabilitation technologies in the educational process of the university [5; 9], the organization of psychological support, including psychodiagnostic, preventive and correctional procedures [7], medical and wellness support, social support [6; 12], the use of special teaching methods in the educational process of the university [15], conducting psychological trainings [18].

In many universities of Russia have been established special educational and methodological centers for inclusive education and supporting students with disabilities in their professional development [17]. Numerous scientific publications made the analysis of the activities of such Centers and declared the idea of separating students with disabilities from the general group of students in order to provide them with psychological and pedagogical assistance and support. Thus, some publications say that the main purpose of the activities of such Centers is to create a unified educational space where, according to the authors, all structural units of the university for the education of people with disabilities will interact [13; 16]; other studies emphasize that inclusive education cannot be effective without the organization of

special support for students with disabilities. At the same time, it is proposed to consider classes specially organized for them to correct their personal characteristics as such support [10; 11].

A theoretical analysis of numerous publications devoted to the problem of improving higher inclusive education has shown an almost unanimous opinion of researchers and practitioners on the need to organize a special service at the university dealing with the problems of students with disabilities and therefore working only with them through their segregation and separation from the general group of students. At the same time, it is already traditional and generally accepted that inclusive education is nothing more than a condition for preventing segregation of persons with disabilities [1; 4; 12; 14].

Thus, in modern scientific and methodological literature, an objectively valid contradiction has formed between, on the one hand, declaring the inadmissibility of segregation of persons with disabilities through the development of an inclusive education system, and, on the other hand, the proposal of specialists to segregate (isolate) them already inside the inclusive university itself in order to provide them with specialized psychological and pedagogical assistance.

The results of a theoretical understanding of the problem of organizing psychological support for students

with disabilities in conditions of inclusive higher education indicate the need for a psychological experiment in order to identify the level of effectiveness of the same psychological support program, but implemented in inclusive and segregated groups of students.

Methods

The study was conducted in the period from March 2022 to June 2022 in a face-to-face format. A psychological experiment was conducted, which consists in organizing two forms of psychological support for students with disabilities: within the framework of the developed programs, classes were held in the first case in inclusive groups, and in the second — in groups uniting only students with disabilities. In all groups of subjects, the same program of psychological assistance was implemented in a situation of low psychological well-being of the individual. The program involved conducting group training sessions for four months with a frequency of 1 time per week for 2,5 hours. A total of 16 training sessions were held. During the experiment, the dynamics of students' psychological well-being, their current psycho-emotional states, as well as the peculiarities of the relationship between psychological well-being and psychological defenses in two groups of subjects were studied.

The psychological experiment was conducted on the basis of 12 uni-

versities in Russia, where inclusive practices are implemented. All universities were partners of Resource Educational and Methodological Centers (RMC) operating in Moscow and St. Petersburg. At the time of the organization and conduct of the experimental study, from 6 to 39 students with disabilities studied in each of the “sponsored” or “partner” universities; in the universities where the RMC was established, from 124 to 625 people were students with disabilities of full—time and part-time education. 68 visually impaired students took part in the psychological experiment ($n = 20$; of these: 2 are blind with light perception; 11 are blind with objective vision; 7 are students with functional visual impairments), hearing ($n = 24$; of these: 16 are hard of hearing students and 8 are inaudible), musculoskeletal functions ($n = 24$; all students in this group have preserved intelligence in the aftermath of spinal cord injuries and cerebral palsy). The overall research sample was formed based on the results of a preliminary study of the level of their psychological well-being (out of 186 surveyed students with disabilities, only those students who were characterized by an insufficient level of psychological well-being were selected). To organize the experiment, the entire research sample was divided into two experimental groups: 34 students made up the first experimental group, where psychological support was provided

in an inclusive environment — a total of 10 training groups were formed, in which students with disabilities made up from 10% to 22% of the total number of training participants) and 34 — the second experimental group (3 segregated training groups of 10 to 12 students with disabilities).

The study was carried out using the following psychodiagnostic techniques:

1) “Scale of psychological well-being” by K. Riff (adaptation by Shevlenkova T.D., Fesenko T.P.);

2) The Plutchik—Kellerman—Conte Lifestyle Index questionnaire;

3) The SAN method (Doskin V.A., Lavrentieva N.A., Sharai V.B.).

The study used to compare and contrast the indicators identified in two experimental groups — the -2 criterion, the Student’s t criterion (checking for the normality of the distribution was carried out using the Liliefors and Shapiro-Wilk criteria), the Mann-Whitney U criterion (when identifying gender differences), to assess the longitudinal change of the studied variables were used Wilcoxon’s T -criterion, as well as Spearman’s correlation coefficient for searching for relationships. The SPSS 22.0 program was used for data processing.

At the end of the experiment, positive changes occurred in the indicators of psychological well-being of students with disabilities in the first experimental group (the intensity of the positive shift was fixed at the

level: $T = 162$, $p = 0,02$, which proves the positive effect of the program). In the control group, based on the calculation of $T_{nabl.}$, the hypothesis about the effectiveness of the same program implemented by the same trainer was not confirmed, since $T_{nabl} < 0$).

In all groups of subjects, it was implemented by the same coach who has the appropriate qualifications and experience working with people with disabilities for more than five years.

Results

At the beginning of the experiment, there were no statistically significant differences in the indicators of psychological well-being in the two experimental groups ($p > 0,05$) on all scales of the corresponding questionnaire. The experimental groups were made up of students with disabilities who were characterized by a low level of satisfaction with the self-realization of their personality, inability to build positive relationships with other people, unwillingness to change something in themselves and their lives, lack of interest in life, faith in themselves and their strengths, and an unformed desire for a realistic perception of life and goals in it.

At the end of the experiment, positive changes occurred in the indicators of psychological well-being of students with disabilities in the first experimental group.

Figure 1 clearly shows the percentage distributions of students with

disabilities from two research groups characterized by a decrease or increase in indicators of psychological well-being that occurred at the end of the experiment.

The majority of students who completed the training in an inclusive group with students without disabilities, had slightly increased indicators of psychological well-being. 32,35% of the training participants with disabilities during the experiment gained confidence in the ability to build positive relationships with other people, learned to accept themselves with all their advantages and disadvantages, formulate real goals in life, not to be offended by it, not to complain about their special position in society, not to blame themselves and others for failures and failure, to perceive oneself as a growing and striving for self-realization, open to new experiences. In 26,47% of students with disabilities of the first experimental group, the overall indicators of psychological well-being increased by 40-50 points, which indicates that the expected effect of the training was achieved.

In the second experimental group, where psychological training took place in conditions of segregation of students with disabilities, such an effect was not observed: in about half of the participants in the training over the past four months there was a slight, but decrease in indicators of psychological well-being.

It should be clarified that by the end of the experiment, less than half

of the participants remained in the second experimental group, which may explain the low effectiveness of the developed psychological training program aimed at improving the level of psychological well-being of students with disabilities, as part of the psychological and pedagogical support of their professional training at the university.

A comparative analysis of the average group indicators of psychological well-being of students of the two experimental groups showed that if at the beginning of the experiment they did not differ from each other at a statistically significant level, then at the end of the experiment all the indicators provided by the methodology became significantly higher in the first experimental group.

During the training sessions, the participants were helped to realize their individuality and uniqueness, personal resources and potential abilities, they accumulated emotionally positive experiences, skills of adequate perception of other people, their feelings and emotions, the ability to manage emotional states, regulate behavior and activities. Participation in group discussions, exercises, and games in the training program was supposed to be a stimulating factor in the development of students with disabilities in the need for self-change, self-knowledge, and self-improvement. However, the achievement of the training goals, as shown by the psychological experiment, largely

depends on the conditions of its implementation and the characteristics of the participants of the training groups. The fact that the training has a neutral or even negative impact on the personality of students with disabilities may be related to their psycho-emotional states caused by their life events and related experiences.

The study of the current psycho-emotional state of students with disabilities in two experimental groups showed the presence of certain problems in the second experimental group.

Thus, it was revealed that between the two experimental groups there are statistically significant differences in the average group indicators of the mood of students with disabilities ($t = 7,55$; $p < 0,001$), their well-being ($t = 4,89$; $p < 0,001$) and activity ($t = 4,78$; $p < 0,001$).

The decrease in mood among students with disabilities of the second experimental group could be caused by their negative emotional reactions to events that are significant to them and were considered as an obstacle to achieving the goal, as something that did not meet their expectations and hopes. In the second experimental group, activity indicators were also reduced, due to the limited interaction of students with disabilities with the outside world, their possible forecasts of further development of life events. Despite the fact that only the well-being, according to the estimates of students with disabilities, is

on average in the range of positive values, its indicators are also lower than in the first experimental group.

Due to the reduced emotional background recorded in students with disabilities of the second experimental group at the end of the experiment, we decided to analyze the level of tension of psychological defenses of their personality.

First of all, it is necessary to focus on the fact that, according to an empirical study performed at the end of the psychological experiment, the overall level of tension of psychological defenses is significantly higher in the second experimental group than in the first ($t = 2,27$; $p < 0,05$).

Secondly, the indicators of the lifestyle index are not only interrelated with the level of psychological well-being, but also have gender characteristics.

Thus, a comparative analysis of the average group indicators obtained using the "Lifestyle Index" methodology in two experimental groups allows us to identify the gender characteristics of their relationship with indicators of psychological well-being of the individual.

In a subsample of young men, significant differences between the two experimental groups were revealed on the scales of "Regression" ($p = 0,000$) and "Denial" ($p = 0,000$).

These differences may indicate that young men with disabilities of the second experimental group, who mainly have a low level of psycholog-

ical well-being, are prone to returning to earlier and infantile personality reactions. It can also be said that the boys of the second experimental group are more characterized by ignoring potentially disturbing information and avoiding it than the boys of the first experimental group.

In the female subsample, statistically significant differences were found between the two research groups on the “Substitution” and “Projection” scales.

The empirical data obtained suggest that girls with disabilities of the second experimental group who underwent psychological counseling in separate groups and have a low level of psychological well-being are more likely to transfer reactions from an “inaccessible” object to another object that is considered “accessible”, as well as to unconscious transfers of their own unacceptable feelings, aspirations and desires for others.

The results of the correlation analysis of experimental data are of interest.

The revealed significant relationships between indicators of psychological well-being and mechanisms of psychological protection in the second experimental group are several times higher than in the first, moreover, the connections in the second group are stronger than in the first.

Correlation analysis showed that the indicators of autonomy in the first experimental group are interrelated with the indicators of regression

($r = -0,391$ at $p = 0,030$), projection ($r = -0,362$ at $p = 0,045$), compensation ($r = -0,374$ at $p = 0,038$); in the second experimental group — with negation ($r = -0,805$ at $p = 0,000$) and the total protection strength (ONZ) ($r = -0,457$ at $p = 0,010$). The indicator of personal growth in the first experimental group is positively correlated with rationalization ($r = 0,356$ at $p = 0,049$) and negatively with ONZ ($r = -0,369$ at $p = 0,041$); in the second group — with hypercompensation ($r = -0,874$ at $p = 0,000$). The indicator of the goal in life in the first group correlates with rationalization ($r = 0,359$ at $p = 0,047$), and in the second — with displacement ($r = -0,917$ at $p = 0,000$) and ONZ ($r = -0,796$ at $p = 0,000$).

In addition, the direction of correlation in the first experimental group is almost always the opposite, that is, with a higher level of psychological well-being among students with disabilities who underwent psychological training in compliance with the basic principle of inclusion — participation in events without their separation into separate groups — the intensity of such defenses as regression, projection, and the general level of tension of the protective mechanisms. The connections with denial, hypercompensation, displacement and the general level of tension of protective mechanisms are revealed. The higher the indicators of psychological well-being, the lower the intensity of correlating defense mechanisms.

Discussion of the results

The results of the study confirm the idea that psychological support for the professional training of students with disabilities studying in an inclusive education environment cannot be effective if it is organized only for such students and involves their isolated participation in psychological activities. During the psychological experiment, it was revealed that the effectiveness of the same psychological support program decreases sharply if its implementation was carried out in isolated groups formed only from students with disabilities.

It should be clarified that in modern psychology and pedagogy of inclusive education there are partial studies that indirectly confirm the legality of considering the inadmissibility of segregation of students with disabilities in educational organizations.

Thus, according to, for example, K. Bollard, excessive attention on the part of teaching staff to the problems of students with disabilities leads to the fact that many of them are in a state of constant stress [19]. Bailey J., Banton B. It is indicated that students with disabilities experience frustration and excessive mental stress in the situation of providing them with special assistance in the inclusive education system [20].

Our psychological experiment has shown that when trying to isolate students with disabilities inside an inclusive university, even in order to

provide them with the necessary psychological assistance, it can make such students to experience negative psycho-emotional states that prevent them from achieving the expected goals. The most humane goals here can not only be unrealized, but also have a completely opposite effect, turning into goals of segregation. This is especially true for the universities with a small number of students with disabilities — less than 1—2%.

It should also be noted that the development and implementation of special programs for psychological support of vocational training of students with disabilities, involving special preventive, developmental and corrective measures in separate groups, undermines the very foundations of inclusive education, its main, fundamental principles and priorities. It, first of all, refers to the independent free choice of educational programs and learning conditions by each student, regardless of whether or not he has health problems. Inclusive education provides an opportunity for students with disabilities not only to gain access to quality education, but also to become competitive, on a par with students without disabilities.

Conclusion

During the psychological experiment, it was found that the dynamics of the psychological well-being of students with disabilities in the context of the implementation of a

specially developed program of one of the directions of psychological support for their professional training in isolated (segregated) groups is characterized by a negative orientation, whereas in inclusive groups it is positive. The interrelation of psychological well-being, we revealed current psycho-emotional states and psychological defenses of students with disabilities.

The psychological experiment showed the inexpediency of isolating and separating students with disabilities from the total number of students, even in order to provide them with psychological assistance at the uni-

versity. In this regard, it is necessary to develop fundamentally new forms and methods of organizing psychological support for the professional training of students with disabilities as competitive specialists. The solution of the problem of psychological (adaptive, personal, professional, etc.) support for the professional training of students with disabilities cannot be carried out without solving the general problems of organizing psychological support for the professional and personal development of all students at the university, regardless of the presence or absence of health problems.

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Functional Psychological Literacy of Parents and Teachers as a Condition of Effective Communication with a Child

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The article provides a transcript of the speeches of the speakers of the Round Table “Functional psychological literacy of parents and teachers as a condition for building effective communication with a child”, held at the Moscow State University of Psychological and Education on April 25, 2023. The Round Table addressed the problems of modern “psychology for life”: the formation of functional psychological literacy of school teachers and parents in the sphere of communication and interaction with children. The speeches of the speakers of the Round Table were devoted to modern ideas about psychological literacy in psychology; approaches and researches in the field of formation of psycho-

logical literacy within the systems “teacher-pupil”, “parent-child”; formation of functional psychological literacy of school teachers in communication with pupils; knowledge, skills, abilities of parents in interaction with a child; risk factors in the development of functional psychological literacy in communication and interaction with a child of parents and teachers in the sphere of communication and interaction with a child. Video recording of the speeches is given on the official video channel of PsyJournals.ru.

Keywords: functional psychological literacy; parent; adult; “parent-child” relationship; “teacher-student” relationship.

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Функциональная психологическая грамотность родителей и педагогов как условие построения эффективного общения с ребенком

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В статье приводится стенограмма выступлений спикеров круглого стола «Функциональная психологическая грамотность родителей и педагогов как условие построения эффективного общения с ребенком», состоявшегося в Московском государственном психолого-педагогическом университете 25 апреля 2023 года. На круглом столе были рассмотрены проблемы современной «психологии для жизни»: формирование функциональной психологической грамотности школьных педагогов и родителей в сфере общения и взаимодействия с детьми. Выступления спикеров круглого стола были посвящены современным представлениям о психологической грамотности в психологии; подходам и исследованиям в области формирования психологической грамотности в рамках систем «учитель-ученик», «родитель-ребенок»; формированию функциональной психологической грамотности школьных педагогов в общении с учениками; знаниям, навыкам, умениям родителей во взаимодействии с ребенком; факторам риска в развитии функциональной психологической грамотности в общении и взаимодействии с ребенком родителей и педагогов в семье и школе. Видеозапись выступлений приведена на официальном видеоканале портала психологических изданий PsyJournals.ru.

Ключевые слова: функциональная психологическая грамотность; родитель; взрослый; отношения «родитель—ребенок»; отношения «учитель—ученик».

Дополнительные материалы. Функциональная психологическая грамотность родителей и педагогов как условие построения эффективного общения с ребенком [Электронный ресурс]: круглый стол журнала «Психологическая наука и образование»: [плейлист] // YouTube. 2023. 25 апреля. URL: https://www.youtube.com/playlist?list=PLY__a3HONsDRbWRozOdUzbjQwrXdRgGdY (дата обращения: 14.11.2023).

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Introduction

At present, there is a public demand for improving the quality of the education and upbringing of future generations of Russian society. On the pages of the journal "Psychological Science and Education" we have already raised a question how to answer to this demand by developing a critical scientific literacy in the flow of information containing contradictory scientific data and expert opinions. It's one of the aspects of improving the quality of education and upbringing, another one is the strengthening correlation between different types of learning motivation and developing the level of scientific literacy [23; 40]. Another important condition for the realization of the demand is the formation of functional psychological literacy of the participants of educational and upbringing processes. On the 25th of April 2023, there was a round table Functional Psychological Literacy of Parents and Teachers as a Condition for Building Effective Communication with a Child, its purpose was to discuss modern ideas about psychological literacy, approaches and technologies for the formation of psychological literacy within the "teacher-child", "parent-child" systems. The round table was organized by the Moscow State University of Psychology and Education and the editorial board of the journal Psychological Science and Education. The speakers of the round table were specialists from different universities and research centers, such as MSU, MSUPE, PI RAE, MHRC(N.N. Avdeeva, A.D. Andreeva, V.K. Zaretskii, S.N. Enikolopov, I.A. Burlakova, E.I. Zakharova, T.A. Poskakalova, Y.A. Kochetova). We present the results of the discussion in the format of a transcript of the participants' speeches. The video recording of the speeches is available on the official

YouTube channel of the portal of psychological publications PsyJournals.ru.

The Concept of Functional Literacy: Stages of Study¹

Functional literacy is "a person's ability to use knowledge acquired during life to solve a wide range of life tasks in various spheres of human activity, communication and social relations" [43, p. 35]. Such a definition is consonant with the one used in the PISA Program of International Comparative Study.

Currently, the following types of functional literacy are being developed: reading, mathematical, scientific, financial literacy; global competencies and creative thinking. It should be noted that psychological literacy itself is not singled out as a component of functional literacy.

Summarizing various researches on types of functional literacy, we found that the components of functional literacy are quite diverse. They include: a knowledge of information, rules, principles; the assimilation of general concepts and skills that form the cognitive basis for solving standard tasks in various spheres of life; the ability to adapt to a changing world, to solve conflicts, to work with information, to conduct business correspondence; the ability to apply the rules of personal safety in life. It draws attention to the fact that all these heterogeneous components are oriented towards the improvement of human functioning in the society.

The concept of the Functional Literacy of Schoolchildren according to the Russian Federal State Educational Standard is more defined and is more about the ability to apply knowledge and skills in practical life situations. The Russian Federal State Standard currently includes functional literacy as read-

¹ Transcript of the report: Natalia Nikolaevna Avdeeva, PhD in Psychology, Professor of the Department of Developmental Psychology named after Professor Obukhova, Moscow State University of Psychology & Education (MSUPE).

ing, mathematical, scientific and financial literacy, creative thinking. In Russian pedagogy, the problems of functional literacy are developed at the conceptual, research and practical levels. At the same time, there is a sphere of psychological and pedagogical problems, research and methods, which has projections both in psychology and pedagogy, for example, in the field of creative thinking.

In Russian psychology, the problem of psychological literacy has been considered since the 90s of the XX century. For the first time the concept of psychological literacy was introduced by E.A. Klimov. He stressed that "psychological literacy is not reduced to the elements of the awareness of facts and dependencies characterizing the subjective world of a person, but assumes a specific educatedness of the personality and a certain mindset, orientation of the mind". Psychological literacy includes: the "soul-searching orientation" of thinking; an interest in the other; the possession of psychodiagnostic techniques, probing in the process of conversation [36; 61, p. 163].

In this period, psychological literacy is considered as an interpersonal space and a space of social relations, the perception of a person by a person within these interpersonal social relations.

At the next stage, psychological literacy is considered as a *part of psychological culture*. In turn, psychological culture acts as an integral part of the basic culture of personality, a systemic characteristic of a person, which allows him/her to effectively self-determine in society and self-realize in life, contributing to self-development and a successful social adaptation, a satisfaction with his/her own life. It includes literacy and competence in the psychological aspect of understanding the human essence, the inner world of a person and himself, personal relations and behavior.

It should be noted that such an understanding of psychological culture has traces of the influence of humanistic psychology,

popular in Russian psychology at that time. The new understanding of psychological culture emphasizes the possibility of self-determination in society, self-development, self-realization, life satisfaction. That is, from the zone of interpersonal relations and social context, psychological culture and related psychological literacy are shifted to the personality, self-development, understanding of oneself, one's inner world, human relations and behavior. This second focus came to be seen in terms of the necessity of education for the formation of psychological literacy.

As the next stage in the development of ideas about psychological literacy, it is possible to distinguish the psychological research of the last decades.

A number of works studied the psychological literacy of schoolchildren. A.V. Milekhin's research studied the relationship between psychological literacy and the socialization of senior schoolchildren [42]. In the work "Teaching psychology at school as a condition for the formation of the psychological literacy of students" [5], the operationalization of the concept of psychological literacy is presented, as well as empirical data characterizing the formation of the basics of psychological literacy at all stages of school education. A.M. Prikhozhan's work "Psychological literacy of junior schoolchildren as a condition for mastering universal learning actions" is devoted to the problem of forming empathy and decentration as universal learning actions in junior schoolchildren during psychology lessons in elementary school [47].

A number of studies considered psychological literacy in adult ages. Thus, in the work of O.V. Palchenko "Psychological sciences and psychological education as a resource for increasing the level of the psychological literacy of young people" the problem of the low level of psychological literacy of young people is described, the consequences and psychological causes of this phenomenon are deter-

mined on the basis of observations [45]. A.G. Busygina's work "Psychological competence (literacy) of students of pedagogical universities as the basis of the psychological health of a future teacher" reveals the problem of the meaning and essence of the development of students' psychological competence, which is the basis of professional training in higher education, within the framework of preserving the psychological health of the young generation [14]. So, certain steps have been made to show the significance of the psychological literacy of schoolchildren and university students for their success in learning, their socialization, and psychological health.

In foreign psychology, the development of the problem of psychological literacy in the training of undergraduate psychologists has been actively discussed in recent years in connection with the COVID-19 pandemic. It has been noted that for 50 years, leaders in the field of psychology have been calling for fundamental changes in the conduct of psychological research, psychological education, and engagement with society. The COVID-19 pandemic has demonstrated that psychology should contribute more to the well-being of individuals, both generally and in the case of specific social groups.

Psychological literacy is seen as an integrative concept in psychology and as a pedagogical approach. Thus, current research points out that psychological literacy is a pedagogical approach that promotes the application of knowledge of psychology to social, ethical and cultural problems. It is suggested that it is necessary to seriously restructure the entirety of the psychological training of students, orienting them precisely towards "skills for life". Psychological literacy is considered the primary outcome of a bachelor's degree in

psychology, and scholars are calling for more "psychologically literate" forms of summative assessment to reflect this outcome.

The Problem of Functional Psychological Literacy and the Professional Ethics of School Teachers²

The topic of my speech is "The problem of functional psychological literacy and the professional ethics of school teachers". We have a traditional socially desirable image of a school teacher, which assumes a good command of the subject knowledge, methodological and didactic means, a high level of general culture, pedagogical giftedness and a love for children. But, at the same time, it is always a big problem for me, because a pedagogue, a teacher is a mass profession, and the need for such professionals is very high, and therefore it seems to me that the effectiveness of their labor should not depend on such personal, such individual qualities as pedagogical giftedness and a love for children. Several years ago, in our Laboratory of the Scientific Foundations of Applied Child Psychology of the PI RAE, a series of empirical studies related to the study of attitudes of students and their parents towards various aspects of school life was conducted [6; 7; 8]. For example, high school students were offered a 45-item questionnaire about everyday school life. What do schoolchildren and their parents think a good school teacher should be like? Schoolchildren massively note that it is a teacher who knows his/her subject well and respects his/her students, does not allow himself/herself to humiliate someone who is weaker than him/her [8].

But parents' attitude towards a teacher, or rather, parents' social perception of what

² Transcript of the report: Alla Damirovna Andreeva, PhD in Psychology, Senior Researcher, Head of the Laboratory of the Scientific Foundations of Applied Child Psychology, Psychological Institute of the Russian Academy of Education (PI RAE).

they expect from a teacher, studied using the method of P. Verges, turned out to be somewhat different [6]. The core of their social perception of a good teacher includes such qualities as an excellent knowledge of the subject, authority and high demandingness. That is, these are the qualities that a teacher must possess. It is good, of course, if he/she is patient, wise, kind, fair and attentive, and it is not necessary that he/she loves children. A love for children is on the periphery of parents' social perception of a teacher and is considered, in my opinion, as a stereotypical attribute of a teacher rather than a professionally valuable quality.

In our opinion, this suggests that the professional activity of a teacher today has lost its humanitarian content and is reduced mainly to the transfer of knowledge. And I remembered how, a few years ago, the banner of educating a competitive personality was raised high. Now it is less talked about, but I think it contributed to such a value transformation of ideas about the tasks and place of a teacher in children's life. The most important thing is that he knows the subject perfectly, is authoritative and demanding, and with everything else we, in general, are ready to put up with.

In the above-mentioned research it was shown what exactly schoolchildren dislike in a teacher [8].

They do not like it when the teacher explains badly, when he/she shouts, ridicules, has favorites and inspires fear. I will dwell on this very briefly, but I will dwell nonetheless. Poor explanations — such a dissatisfaction of children with the productivity of a school lesson has good reasons. For example, in one Moscow school it was explained to parents that now the teacher only “gives the topic”, and its further mastering is the task of the pupil and his family. The high level of demand for tutor services is an equally alarming symptom of dysfunction in the school education system. If, earlier, parents of either low-achieving

children or school graduates preparing to enter a higher education institution used to use these services, today, systematic tutoring of well-performing, highly motivated children of various ages has become the norm. Nowadays, it is no secret that a successful passing of current and final certification by students is a criterion of quality educational services provided by the school, but it is also no secret that this high rating of the school, which is calculated on the basis of these attestations and victories in subject olympiads, is largely achieved at by the work of tutors, which is provided for by the child's family. In our opinion, a critical substitution of values for the teaching profession has taken place. For a teacher, it has become important not what he or she has taught a child, what knowledge and skills he or she has given him or her, but what results he or she has shown at various certification events.

We see that no less serious problem is the lack of mastery of the basics of pedagogical ethics by many teachers, or, more precisely, their lack of understanding of which of the methods of pedagogical influence they use can be regarded as forms of psychological violence. We can see that 63% of schoolchildren surveyed are accustomed to teacher's shouting and swearing, 68% are sure that a teacher can always use jokes, threats or mockery to put in their place a pupil who disturbs or dislikes him, and 71% of respondents talk about teacher's favorites. In principle, the professional ethics of a teacher do not forbid him/her to feel sympathy, have a good attitude, to support some students, but it is important that a good attitude does not turn into favoritism. The line here is very thin, very shaky. The largest percentage — 80.1% of pupils say that they are afraid of teachers, these are pupils from Moscow and regions.

How can this situation be changed? In my opinion, there are two possible ways. Firstly, the development of psychological literacy, the

improvement of the psychological culture of teachers and, secondly, the formation of professional pedagogical ethics.

The psychological literacy of a professional does not come about by itself, simply from work experience or professional development courses. Training in a pedagogical university is aimed at students mastering the content of the subject he will teach, the methodology, didactics, a general course of pedagogy and psychology. The knowledge of psychology they receive is practically inapplicable in everyday pedagogical practice, it lives in the textbook in a chemically pure form, and the psychological phenomena described in it are poorly recognized in the individual behavior of schoolchildren and the teachers themselves. There is also a very important point related to the fact that, in schools today, there are quite a lot of people working without basic pedagogical education, people who have received a higher technical, natural science or humanitarian education. They have gone through the teacher retraining system, passed exams, but nevertheless they are non-professional teachers.

It is important to understand that functional psychological literacy implies not only the knowledge of psychological laws, phenomena and terms, but also a conscious and arbitrary ability to apply this knowledge in solving real life problems. Psychological literacy should be considered as a professional competency of a teacher, for the development of which it is necessary to create special conditions.

Apparently, the psychological education of future teachers should be aimed not so much at psychological enlightenment as at the formation of psychological literacy. The development of functional psychological literacy creates prerequisites for the formation of the psychological culture of a personality as a part of general culture. The development of a theoretical and practical course, including age and educational psychology, age social

psychology, personality psychology, and elements of defectology, is not a matter of the near future.

It seems more realistic to form, at least at the first stage, professional pedagogical ethics, because the ignorance of the basics of professional ethics and psychological unculturedness is the weakest link in the training of future teachers. Unfortunately, today, psychological and even sometimes physical violence against children is no longer rare. Teachers insult and humiliate children, intimidate them, threaten them, ridicule their mistakes and blunders, refuse to help them master difficult learning skills, devalue their efforts, and appeal to the socio-cultural and national characteristics of the child and his/her family. But psychological violence is not necessarily expressed in such harsh forms; it can also manifest itself in the form of incorrect, tactless questions, in the form of the disclosure of test results or medical information. I have met teachers in Moscow schools who were terribly proud of how they humiliated a child, how they wittily put them in their place. These teachers knew their subject well and were generally not bad people, but such was their understanding of their pedagogical giftedness.

Parents do not remain in debt and aggravate the conflict with the teacher, fueling it with their passion and irrepressible desire to punish the teacher. They use recording devices, and the meticulous questioning of the child about the details of each school day, the meticulous study of the teacher's grades and remarks. For some parents, this struggle becomes the meaning of life, a form of social activity, and the child becomes a tool of this full-scale war. While "protecting" their child from a demanding teacher, such parents are actually afraid to admit their own educational and parental failure, and this self-protection becomes another reason for an irreconcilable struggle with the teacher.

The professionalism of a teacher is to understand the difference between psychological violence against a child and the pedagogically competent, justified, effective methods of pedagogical influence. Due to the age-related weakness of the child's arbitrary mental processes, volitional behavior and insufficiently motivated learning activities, education and upbringing cannot take place without the use of methods of pedagogical coercion by teachers and educators. School education cannot be based on the child's direct interest in the subject matter alone, as it inevitably contains many routine, uninteresting, but compulsory forms and types of work. The teacher's arsenal includes many professional means and methods of influencing the pupil, including marks, verbal reprimands, discussions with parents, disciplinary penalties, and various forms of individual encouragement, support and approval.

In addition to improving the psychological literacy of teachers and their firm grasp of the code of ethics, there is a need for a system of administrative support for the very measures of pedagogical coercion that can be used by the teacher to regulate relations with the child's family. This system should be based on the provisions of the Family Code of the Russian Federation and the Federal Law "On Education in the Russian Federation" that parents have a priority right to the education and upbringing of their children over all other persons and are obliged to ensure that their children receive a general education.

This disposition has developed only in recent years as a result of a significant redistribution of responsibility between the family and the school. Many generations of Russian parents have been accustomed to a form of a civil contract such as "the family helps the school to teach and educate the children". This existed for many long years, under this form of civil contract parents were in agreement with many harsh forms of influence on

the child, which were traditional for the school. In modern society, at the initiative of the state, this contract has been radically changed, now the responsibility for the education and upbringing of children lies primarily on the parents themselves, and "the school helps the family to teach and bring up children" [7].

What can this look like in practice?

For example, in Danish schools the teacher does not scold the child for having not done his/her homework, but simply notes that the assignments are not completed. Parents know that this is their area of responsibility, and a certain number of such marks in the school logbook is a reason for the school to contact social services: after all, the parent is not fulfilling his/her direct duties well. In schools in Germany or the USA, a pupil who misses several lessons, even for a good reason, may not be certified for a certain academic period. These rules have nothing to do with the personal relations between students and teachers, they do not require special pedagogical talent and insight, they just work and help adults to cultivate in children a sense of personal responsibility for the consequences of their behavior. Our students also know that failing to pass the exam session on time will lead to expulsion from the university, and this helps a little to increase their academic motivation, because even though many believe that they have chosen a profession that they are interested in, nevertheless, studying is studying, it is not always so exciting.

Today, our school teacher has no such tools. Unfortunately, the mechanisms of the practical implementation of the new civil contract have not yet been developed, so the relationship between the two most important social institutions — the family and the school — is transitional, if not conflictual [7].

Summing up my speech, I would like to emphasize that the development of teachers' functional psychological literacy and their mastery of professional ethics are two equal

approaches to solving the problem of productive interaction between the participants of the educational process. Psychological literacy implies a conscious and arbitrary application of psychological knowledge to the solution of a specific problem situation. Pedagogical ethics requires the same conscious and arbitrary observance of the norms of behavior corresponding to the requirements of the profession. In pedagogy, as in any mass sphere of activity, people come with different degrees of professional giftedness, with a different potential of personal development. Interest in psychological knowledge, the desire to competently apply it in their work can be considered as a sign of pedagogical giftedness, the desire for the self-improvement of professional skills. The observance of pedagogical ethics is an indicator of a teacher's conscientious attitude to his/her labor duties, evidence of his/her professional culture. It seems that both "technologies" can be considered as professional competencies of the teacher, the possession of which (or of one of them) is necessary for creating a favorable educational environment, ensuring the psychological well-being of children, preventing the professional burnout of teachers. The formation of these competencies should become a significant direction of professional pedagogical education, since today they are formed spontaneously.

About the Functional Literacy of Parents: How to Help a Child to Overcome Learning Difficulties³

The Department of Individual and Group Psychotherapy of the Faculty of Counselling and Clinical Psychology of the MSUPE has been working for 25 years in the field of the psychological and pedagogical assistance in overcoming learning difficulties, which pro-

motes development. Within the framework of this practice of providing psychological and pedagogical assistance in overcoming learning difficulties, we are developing a direction that we call the reflective activity-based approach to providing such assistance.

Since some time ago, we began to consider it as a direction within the framework of cultural-historical psychology, when we realized how well our practice fits in with the basic ideas formulated by L.S. Vygotsky about the connection between learning and development. Since the adult's help to the child is seen, within the framework of cultural-historical psychology, as a very important moment of their interaction, we would like to propose to consider the *skill or ability to provide effective help as an essential component of the parent's functional literacy*.

I would like to show the significance of the situation of a child's encounter with a learning difficulty for his or her development and to justify this from the perspective of cultural-historical psychology; to justify, accordingly, the significance of the adult's help to the child in overcoming learning difficulties precisely in terms of the role this help plays or can play for the child's development. This is not so unambiguous. Accordingly, we would like to familiarize the participants with the perceptions of the types of teachers' and parental help to the child that have been identified in our empirical studies conducted at the MSUPE. The main types of help were identified in these studies, and I will try to show, based on the work of, first and foremost, Antonina Alexandrovna Ageeva — on her master's thesis, how these types of help, which are identified in empirical research, can be evaluated in terms of effectiveness according to the criterion of developmental assistance [28].

³ Transcript of the report: Victor Kirillovich Zaretskii, PhD in Psychology, Professor of the Department of Individual and Group Psychotherapy, Faculty of Counseling and Clinical Psychology, Moscow State University of Psychology & Education (MSUPE).

In this study, the relationship between learning and development is as follows: there is a learning activity, there are learning difficulties, the child receives some help, and we seek to understand to what extent this help promotes development. *We will consider the ability to provide developmentally appropriate help as an essential component of the functional psychological literacy of both the parent and teacher.* But today we are talking about the functional literacy of parents. Based on the results of our research, we will try to justify the great importance of the problem that relates to the training of teachers and parents in the effective ways of helping children to overcome learning difficulties.

As I have already mentioned, the reflective activity-based approach to helping children overcome learning difficulties is seen as a trend in cultural-historical psychology, as a practice based on its main provisions.

We have chosen 12 positions of L.S. Vygotsky from his cultural-historical psychology of development, which are important for understanding the meaning of the situation of a child's encounter with learning difficulties. It is a certain unit of a developmental step that can be taken when confronted with an error or difficulty. Firstly, L.S. Vygotsky said that learning difficulties are inevitable. Learning activity is organized in such a way that "a child constantly has to punch above their weight", i.e. to do what he does not yet know how to do [18]. It is clear that if a child does what he/she does not know how to do, mistakes and difficulties are inevitable. At the same time, most teachers, parents and pupils treat mistakes and difficulties negatively. How can one have a negative attitude towards something that is inevitable and natural? There is a contradiction here, which also has to do with psychological literacy. Learning leads to development precisely through overcoming learning difficulties. That is, by overcoming difficulties, the child develops. A very interesting phrase

that was also found in Vygotsky's work, but it is in a different context, as he understands the word "overcome". With his inherent sensitivity to language, he writes that to overcome is to lean on, to push back and then one can take a step forward [19], and in this sense, difficulty is a support for a step in development.

Vygotsky says that development takes place in cooperation between a child and an adult. He does not say this immediately, he starts using the word "cooperation" about a year before his death, somewhere from March 1933 [20]. Before that he used other words, but from that time, the last year of his life, he spoke exclusively of co-operation and sometimes of guidance. He talked about the fact that development takes place when co-operation takes place in the zone of proximal development and that the zone of proximal development has boundaries. He said that when a child does what he knows how to do, he is not developing. But obviously there is still some boundary where a child cannot co-operate with an adult, he doesn't directly point to it, but he hints that it exists. And a very important thesis is that the co-operation must be conscious. In his notebooks, he has this phrase: "Awareness=generalization=mastery=communication with oneself=self-consciousness" [21]. That is, he attached great importance to mindfulness.

And he talked about the fact that the concept of ZPD can be extended to the personality as a whole, to consider it very broadly, not only in terms of intellectual development. Finally, in "Thinking and Speech" he writes that learning can be arranged in such a way that "one step in learning can mean 100 steps in development" [19, p. 230], and he, especially when discussing working with children who have developmental peculiarities and abnormalities, says that it is important to build on the child's resource. Because it is impossible to rely on what they do not have. This applies to learning in general, but we are talking

about the situation when a child encounters a learning difficulty. All these 12 positions have a direct relation to what an event is for a child, for his/her life, when he/she encounters a learning difficulty, and how to help him/her.

We have allowed ourselves to make some additions to these theses of Vygotsky within the framework of our practice of helping children overcome learning difficulties by means of the reflective activity-based approach: we will present Vygotsky's positions on the left, and on the right how we interpret them within the framework of our practice of help. Learning leads to development. This means that by helping to overcome learning difficulties, development can be promoted. To overcome means to lean on, to push back, and to take a step forward. So, a mistake or difficulty is the starting point for help. A child cannot do something on his own, so he must be helped to do it. The main questions here are what exactly he cannot do and what kind of help he needs. The answers to these questions are not always obvious.

For us, co-operation became the basis for formulating the thesis about the child's subject position as the most important moment of interaction between a child and an adult. The subject position of the child means that he/she is both the subject of carrying out his/her activity, for example, overcoming learning difficulties, and of its comprehension, i.e., reflection [30]. That is, subjectivity has two meanings; here we rely on the work of Yuri Viktorovich Zaretskii, who identified two necessary components of the subject position: activity and awareness [30].

From the concept of the zone of proximal development follows the requirement to understand and be able to act within the boundaries of this zone. The lower boundary of the zone is clear. Where a child starts to make mistakes and difficulties and cannot cope by himself, this is the lower boundary and the beginning of the zone of proximal development. The question is where it ends. Here,

the thesis about awareness becomes very important. The second boundary of the zone of proximal development is where the child ceases to understand the adult and loses the ability to interact with him or her consciously. From the thesis that cooperation is conscious interaction, an important thesis follows that, in the process of working with learning difficulties and providing assistance, it is necessary to carry out the reflection of joint activity, otherwise it is not certain that the interaction will be conscious: the child may agree with you, do as you say, but whether he or she does it consciously or just copies your actions, or tries to guess what you want is unknown. By asking reflective questions about how the child understands you, how he or she sees difficulty, how he or she sees the way to overcome it, whether he or she understands how you helped him or her, what exactly he or she could not do on his or her own and what he or she needs to learn to overcome this difficulty, we can assess from the child's answers how consciously he or she interacts with you, what exactly he or she does not understand, what kind of help he or she needs.

How is the process of development itself conceived? We know Vygotsky's basic law: what was shared in action becomes personal; interiorization is the process by which development takes place. But things are not so simple here. When we talk about learning, everything is clear: the child could not count in tens by himself, together with an adult he learnt to do it, and then he learnt to do it himself. He has taken a step in learning. It is still unclear where the development is here, but we will show it a little later.

First, let's discuss what thesis follows from the idea of the boundaries of the ZPD, which is directly related to the problem of help. If a child does not act in the zone of proximal development, but does what he or she is able to do, i.e. in the zone of actual development, he or she does not develop. This was

pointed out by L.S. Vygotsky. This is directly related to those children who are successful in school, for them tasks do not cause difficulties and problems. He/she does, solves, but being successful in learning, he/she does not develop. But there is also a zone of actual inaccessibility — where the child is not able to understand the task and act consciously even together with the teacher, with an adult. If a child has to stay in the zone of actual inaccessibility for a long time, we consider it as a risk of psychological trauma. There was one remarkable study by Valeria Yuryevna Andreyuk from Nizhny Novgorod, who showed that truants who do not go to school are not at all mentally unhealthy people, and in some sense, they are even psychologically better off than children who go to school [9]. We explained this fact by obtaining data from the school situation questionnaire [29]. All truants wrote that they have difficulties in this or that subject, which they themselves are unable to overcome — one hundred per cent answered “yes” to this question, and all one hundred per cent answered “no” to the question: “Do you receive help in overcoming your difficulties?”. If a person comes to school and cannot cope with a task, cannot even understand it and does not get help, he has nothing to do there, there is no reason to study in such a school. And, unfortunately, this situation often occurs in middle school, because in primary school children are still somehow led by a teacher, but in middle school the teacher deals more with the subject than with the teenage child, and he discovers gaps in knowledge. But in order for the teacher to eliminate them, you have to go back to primary school, and the teacher has to move through the program. The burden on parents increases, but parents usually can't do anything to help.

Now, for example, one of the pupils I work with is in the seventh grade, but he has errors for the first and second grade, and he has such massive gaps, which are very difficult to

compensate, he is in a very difficult situation psychologically. Thanks to a teacher who understands this and does not lose faith in him — the pupil is gradually catching up. But once again, psychologically it is a very difficult situation and a serious risk of psychological trauma and personality deformation.

We will transform the concept of ZPD into a multi-vector model, which I will show a little later. And this thesis of L.S. Vygotsky: “One step in learning can give a hundred steps in development”, we interpreted as that in the very dynamics of development there is a certain problem epicenter, which has a “magic” property to reveal the blocked vectors of development and immediately open the possibility of movement along several vectors [26]. Christel Manske, a follower of L.S. Vygotsky from Hamburg, has just come to Russia with a lecture; she is very fond of talking about the child's internal intents and that the task of an adult who helps a child is to remove “blockages from the child's internal intents” [39]. We can imagine that a problem epicenter is such a blockage of many vectors at once, and if we manage to help him/her in this problem epicenter, then breaking through it gives the effect of “explosive dynamics” [27].

Finally, looking ahead, I would like to say that in the study of the seven types of assistance that we first identified with Alla Borisovna Kholmogorova and Elizaveta Nikolayevna Klimenkova [58], and then with Antonina Aleksandrovna Ageeva, we identified them in the study of parental assistance, only two of them can be considered as promoting development according to our criteria [28]. The effectiveness of the remaining types of assistance is highly problematic: some of them cause direct harm to the child, and others have risks of negative developmental consequences.

Thus, the problem of aid becomes particularly important in terms of the fact that it is not so obvious. From the point of view of what we have just looked at, an adult can help, in the

sense of facilitating development, or not help, or even harm. Let us look at the mechanisms that can be described on the basis of a multi-vector model of the zone of proximal development, which integrates all these provisions that were mentioned above.

The mechanism of effective assistance is thought of in this way. It turns out to be in the plane of learning activity, and here a step in learning is taken. And all the changes in a person, which accompany this step, occur along other vectors of cognitive, reflective abilities and personal qualities. And development can be likened to an opening flower. By the way, we have started to call the scheme of the multi-vector model "flower". And the main changes, when working with a child as a subject of his/her own development and overcoming his/her own difficulties, occur first of all in the vector of development of the subject position in relation to learning activity, the vector of reflection and the vector of self-efficacy. This is a personal psychological basis of learning. It is clear that when a child is influenced, pressured, humiliated, demanded to do something that is not meaningful, these vectors are blocked, and in this sense, the problem of the functional literacy of the teacher and parent is primarily that, without relying on this resource of the child, without facilitating the movement along these vectors, the teacher or parent unwittingly blocks them and closes the very basic mechanisms that can be included in learning activities, call to life, and first of all — work with learning difficulties, because when faced with a difficulty, the child needs to work with it. If the child does not have a difficulty, he does not need it.

Accordingly, help from the position of the reflective activity-based approach can produce very different effects of developmental assistance and can develop different abilities, different competences.

Now, as for the help itself. Assistance can be seen as helping a child to overcome a

specific difficulty, i.e. to cope with a problem situation. And help can be seen as developmental assistance. What types of help were identified in our research [28]? These are seven types, as I have already said. I start with those that were seen as negative and harmful to development. This is anti-help, which exacerbates the child's problematic situations and experiences, and destroys the child-adult relationship. Formal help. It is milder than anti-help, but it too is experienced by the child as ineffective adult involvement and — the same thing — in milder forms, it aggravates the situation and does not contribute to development. Instrumental help. The adult suggests how to overcome a difficulty, does it for the child, gives advice, a leading question, and this help enables the child to cope with a particular situation. But how it works in terms of development is unknown, here, quite ambiguous interpretations are possible. Empathic help. This is a very important component, especially if the child has strong feelings about difficulties. By itself, it provides an opportunity to stabilize the emotional state, but does not help to overcome the difficulty. Finally, instrumental-empathic help, in combination. Yes, it seems to be effective, but, in reality, its effect on development is unclear and far from unambiguous.

The two types of help that we single out as really contributing towards development are reflexive help, which helps to reflect on the shortcomings of one's own way of acting and to consciously restructure and overcome it with the help of an adult, and reflective empathic help. As I have already said, if this difficulty is experienced by the child as some unpleasant, difficult event, then taking this emotional component into account is very important and strengthens the relationship between the child and the adult, the emotional contact, and also contributes to the work of the very mechanisms that then contribute to development.

And here is what was obtained in the study of the parents in the work of Antonina Aleksandrovna Ageeva [28]. Reflective and reflective empathic help accounted for 5.5%, and 94.5% were ineffective types of help. At the same time, formal help and anti-help account for 25% of types of help, i.e. in a quarter, in 25% of cases, parents are highly likely to harm their child when trying to help him/her in his/her studies. And instrumental help — 54% — as we said, it is ambiguous in terms of its impact on development and very problematic. We have not conducted such a study on teachers, but it was done by Elizaveta Nikolaevna Klimenkova on the students of pedagogical universities, colleges and the psychologists of our university [35]. Very interesting data. In college students, formal and anti-help dominated, in students of pedagogical universities instrumental help dominated, and only in students of psychological universities reflective and reflective empathic help was found in rather weighty indicators. What was pleasant is that those students who took a course on the reflective empathic approach to helping showed better results in this sense in terms of helping than students of pedagogical universities and other psychology students.

There is a big problem, a huge field of work to somehow help parents to change their ways of helping, to improve their psychological, human literacy, to learn how to provide developmental help, and the same goes for teachers. So, in this sense, if the cause of a child's learning difficulties is an imperfection in the learner's ways of doing things, then the developmental problems that a child has are largely due to an imperfection in the ways in which they receive help from adults. Why and on what grounds do we consider reflective and reflective empathic help to be effective? Because it contributes to supporting

the child's subjective position, triggering the mechanism of self-development, movement in reflection and the development of the ability to reflect and restructure ways, and thus the difficulty faced by the child becomes a resource for development.

Development of Meta-Subject Competencies by Means of Theatrical Activity as a Condition for the Formation of Psychological Literacy of Adolescents in Secondary School⁴

In recent years, psychological literacy is in the focus of psychological and pedagogical research. In Russia, psychological literacy is understood as the acquisition of "psychological knowledge and the tools that allow a person to consciously and reasonably treat himself and others, to know, consider and understand their individual capabilities and characteristics" [42]. This kind of knowledge is acquired in the process of socialization (the assimilation of social norms, cultural appropriation), in the formation of one's own identity and worldview, including the development of communication skills, reflection, critical thinking, etc. [3; 42] (fig. 1).

A.V. Milekhin, among others, developed the issues of the relevance of the development of psychological literacy in schoolchildren. Thus, in 2012, the researcher proposed to introduce the "Psychology" academic subject for study in high school, which would contribute to the development of social and psychological competencies in adolescents, stimulate positive changes in self-concept, the motivational, value and meaning spheres as a result of the meaningful inclusion of psychological knowledge in everyday life and the correction of their own behavior [42]. In addition, the components of psychological literacy are, in many respects, related to and/or are the results of the devel-

⁴ Transcript of the report: Tatiana Anatolyevna Poskagalova, Research Associate of the Center for Interdisciplinary Research on Contemporary Childhood, Moscow State University of Psychology & Education (MSUPE).

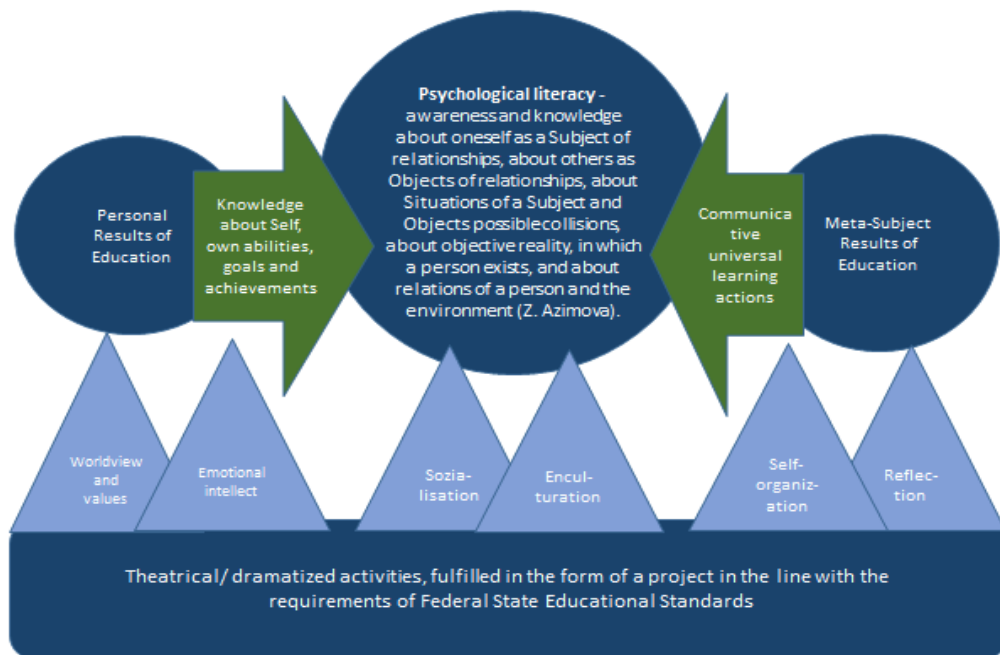


Fig. 1. Development of psychological literacy through the achievement of personal and meta-subject results in the framework of the implementation of theatrical activities in secondary school

development of meta-subject competences, the achievement of personal educational results. For example, the awareness of one's mental capabilities directly affects the mastery of cognitive UEAs, the mastery of self-regulation and self-organization processes. In turn, the development of communicative UEAs is impossible without acquiring knowledge about oneself and others as the subjects and objects of interaction, respectively (Fig. 1).

In foreign literature, psychological literacy appears as the competencies and knowledge possessed by graduates of psychological faculties of universities [64]. Including one of the tools of teaching psychology and a condition for mastering psychological literacy is theater pedagogy [63]. It is worth noting that the use of theatrical activities for learning, developmental, and educational purposes, including the development of metacognitive competen-

cies and, consequently, psychological literacy, is confirmed by a number of studies [46].

One large-scale project in Russia that confirms the effectiveness of theatrical methods in education, is "Multimedia Theater" [49; 50]. This project, among other things, is designed to meet the modern school's demand for the creation of a pedagogical technology capable of solving a number of tasks:

- to ensure interdisciplinarity, to help students establish links between knowledge from separate academic disciplines;
- to ensure the mastery of the UEAs;
- to socialize and integrate different categories of students, including students with disabilities, into the school community;
- to improve discipline and foster responsibility;
- to develop pupils' creative abilities and critical thinking;

— to contribute to the cohesion of school teams.

“Multimedia Theater” is a special communicative and activity environment that allows teenagers to safely and consciously make a “trial” of any action, experiment with roles and positions, relationships. The emphasis is not on the production as such, but on the process of its preparation — on the distribution of the functions and personal responsibility of the participants, on working out a work plan, searching for and selecting material, on writing a script, creating scenery, living through the emotional states of the characters, as well as on discussions both during the work on the performance and after the show.

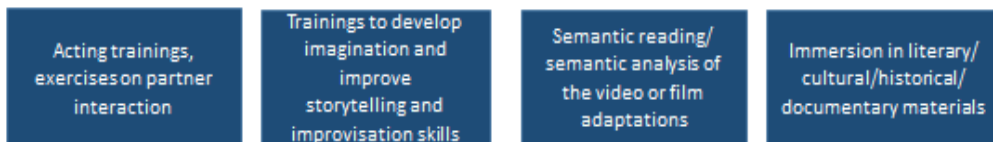
Thus, “Multimedia Theater” is:

— a complex of different activities related to the preparation and realization of a theatrical performance;

- experimentation with social roles;
- an opportunity to build different variants of child-adult communities;
- work with digital technologies.

To date, the project has been running for more than 4 years and has been tested at five schools (Moscow, Stary Gorodok, Stupino and Kashira, Moscow Region). The work within the Multimedia Theatre Project involves not so much the production of a performance as the variety of the preparation: acting tasks, verbal and non-verbal interaction training, discussions, information gathering and searching activities, the creation of creative products, including writing a script, preparing costumes and scenery, and so on. In many ways, the developmental effect is achieved through children’s and children-adult communities, teamwork, the development of not only horizontal ties in the team, but also vertical ones.

The preparatory stage – acquaintance with theatrical/dramatized activities



The creative stage – creation of products and artifacts by students



The final stage – the release of the performance

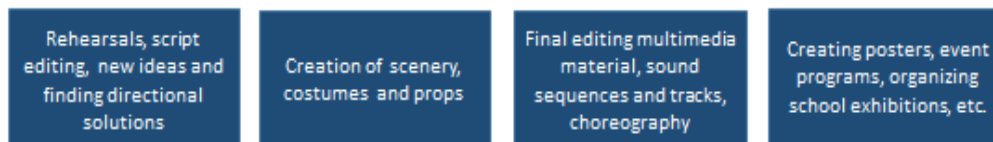


Fig. 2. Stages of work within the framework of the Multimedia Theater project

The activities of the “Multimedia Theater” project include three stages:

- preparatory;
- creative;
- final.

During the preparatory stage, teenagers develop an understanding of the structure of theatrical activity, the interrelation of its components and the importance of teamwork for a successful production. Teenagers perform their first acting tests, learn stage movement and improvisation. Also, if possible, they study literary material for the future production, collect and search for historical, cultural and biographical information to better understand and present the era in the context of which the production will be staged. It is possible to watch and analyze existing screen adaptations of literary material with further discussions, study the correspondence of the author/authors of literary works, reviews and feedback from contemporaries. During theatre classes, much attention is given to the semantic reading, analysis and correlation of different types of text, and the analysis of screen adaptations. Immersion in various cultural and historical materials is achieved through excursions, trips to libraries to collect, among other things, documentary material on the topic under development. The aim of the search and semantic reading tasks is to arouse interest in the project, to teach teenagers how to work with information, and to develop skills in presenting the results of analyses, for example, in tabular form or in the form of an essay or review. Such activities not only develop meta-subject competencies, but teenagers also get to know better about themselves, their own capabilities, the world around them and their place in it.

Often teenagers are so immersed in theater training that they start rehearsing on their own, practicing acting and articulation exercises during breaks. Of special interest to teenagers at the preparatory stage are exer-

cises for developing the imagination, composing stories, improvisation. Making up stories can also fulfil educational goals. For example, in the exercise of making up a story in a circle, adding a new sentence to the statement of the previous participant, the teenagers tried to reveal the meaning of such a phenomenon as friendship. Having invented the beginning: “one day I woke up in the morning and discovered that I had forgotten what friendship is”, they tried not only to define and realize the phenomenon itself, but also the ways how it can be renewed, what actions to take in order to feel it again, to restore some friendship ties and to feel a friendly shoulder.

The second stage of the project is a creative stage, in which teachers try to consolidate the newly acquired knowledge of the participants, including through the detailed analysis of the characters, the creation of cartoons in the cutout technique. Teenagers begin to “try on” roles, “go through” sketches by the etude method, form the cast for the future performance, organize “workshops” for the production of costumes, scenery, products accompanying the performance — wall newspapers, programs, posters. The most difficult and labor-intensive at this stage is writing the script. It should be noted that the goal of the final production is not to reproduce A.P. Chekhov or N.V. Gogol verbatim according to a textbook or a collection of essays, but the goal is to solve some of the pupils’ own problems or conflicts, to reveal a question of interest to them by means of theatre, on the basis of literary materials. Thus, for example, as part of the preparation of the play “Who are you, Mr. Chekhov?”, the idea of which arose among pupils of the Public Secondary School No. 4 in Kashira after visiting the Melikhovo estate, the 7th grade pupils tried to realize the legacy of the great writer. While working on the theatre project, they reflected on Chekhov as a writer, a doctor who stopped a pandemic, a philanthropist and a landowner.

At the end of the project, the teenagers concluded that Chekhov was, above all, a patriot and a great citizen of Russia. Often within the multimedia part of theater projects, teenagers like the activity of creating animations to support ideas; such cartoons help to interpret the statements of the characters, help to convey the intent of the works. For example, in the last project, interesting work was organized around the creation of cartoons illustrating Chekhov's great quotes, including "While you are young, do good" or "Indifference is the paralysis of the soul". Based on these quotes, the teenagers created short stories and then put them into animation. The creative stage of the theater project preparation is completed by discussions, an analysis of the created products, searching for directorial solutions in accordance with the draft script, reworking the texts of the stories into dialogues and shorthand that reveal their content.

The final stage is the most responsible with regards to the quality of the produced performance, its final "assembly". At this stage, video and photo footage shot earlier is edited and integrated into the general framework of the upcoming performance. There is also the selection of soundtracks, the honing of acting, simplification, reduction or, on the contrary, the complication and detailing of the script.

During the 4 years of the Multimedia Theatre project, 5 performances were prepared. Depending on the school's request, they were staged to prevent bullying; to analyze adolescent experiences related to the COVID-19 pandemic; to try new creative genres (writing epigrams and stand-ups based on Nikolai Gogol's "The Government Inspector", writing a fable based on A.P. Chekhov's story "Enemies"); to establish communication between classmates; to teach teamwork skills, etc. In turn, empirical research has been conducted. In turn, empirical research within the framework of the Multimedia Theatre project

demonstrated that adolescents improve their skills of self-organization and the organization of activities in a team, reflection skills and interpersonal communication with peers and adults [49; 50]. The level of learning motivation also increases, conflict situations are resolved, and difficult adolescents are more willing to make contact with psychologists and teachers. Theatre projects at school also contribute to the involvement and adaptation of students with disabilities, children from disadvantaged families or those who are on the internal register at school.

Observing the activities and progress of adolescents, teachers also often not only provide support, but independently continue to introduce theatre activities into the educational process. For example, an open lesson-investigation with theatrical elements dedicated to Sherlock Holmes was held at Kashira Public Secondary School No. 4.

Work with adolescents is often reduced not only to educational and developmental tasks, but also to diagnostic and therapeutic ones. The main difficulties identified during the implementation of the Multimedia Theater project are:

— *Superficial reading* — failure to understand the meaning of what is read, difficulties in interpreting both prose and poetic text, finding the author's point of view in the text, argumentation.

— *Weak digital competences*, including the *inability to use online resources and search engines* to gather information when writing a script. Many adolescents do not have computers at home or access to them, hence difficulties with editing and typing, many do not know how to use a printer and scanner; adolescents' work is centered on smartphones and their apps, which severely limits their ability to work with documents.

— *Lack of planning and prognosis skills* — the inability to plan activities step-by-step, the inability to calculate the steps to

achieve goals and foresee the consequences of their own actions, a lack of vision for the integrity of activities. They are also characterized by the inability to concentrate, to bring a task to completion, to achieve a final result; any project activity leads to misunderstanding and confusion.

— *Lack of independence in actions and initiative* — learned helplessness, an unwillingness to act without adult guidance.

According to the report of the Minister of Education of the Russian Federation S.S. Kravtsov, the application of theatre activities in the educational process and the revival of school theatres is the most important direction in the development of modern schools. Today, there are already 24000 school theatres, and by 2024 it is planned to open a theatre in every school. The relevance of the topic and the growing scientific interest in the theatrical activity of children and teenagers were also noted at the All-Russian conference on the 29th March 2023 “Education — Theater: the personal development of students in a polyartistic space”. To date, the Multimedia Theatre project has the task of covering more and more regions of Russia to spread theatre practices in schools, to study the specifics of theatre activities in schools depending on the age, cultural and social affiliation of the students.

Functional Literacy of Parents as a Factor of the Harmonization of a Family Upbringing⁵

I would like to note that the term “functional literacy of parents” is a debatable concept. When analyzing literature in preparation for the seminar, I more often met such concepts as “parental competence”, “psychological literacy of parents”, “psychological culture

of parents”, which are more traditional and popular. There is not enough information in scientific literature directly about the functional literacy of parents. Nevertheless, I believe that it is extremely important to consider this concept within the framework of developmental psychology and family psychology.

The problem of relationships between parents and children will never lose its relevance, and, in my opinion, this problem is of a particular interest not only for psychologists and teachers, but also for the parents themselves, who are now extremely active, included in the process of education, studying a lot of various literature in order to harmonize child-parent relationships.

Of course, there is no doubt that the family plays an essential role in the development of the child, mediates interaction with the environment and fulfils several important functions. These include meeting the need for emotional support, acceptance, respect, protection, and so on (E.G. Eidemiller, J. Bowlby, L.I. Bozhovich, M.I. Lisina, etc.) [2; 38].

And it should be said that upbringing is a rather complex and multifaceted process, which depends on many factors. Here, it is not only about the knowledge of parents, but also about the specificity of the emotional sphere of the parent themselves, their knowledge, individual characteristics, their own experience of upbringing in the parental family.

If we look at parenthood as an integral concept, I would single out several planes that are worth paying attention to in this respect. This is the plane of individual and personal characteristics of a man and a woman, who make up a family union, because this also has a special influence on the relationship with the child, the relationship in the family, the relationship between the couple, a man

⁵ Transcript of the report: Yulia Andreevna Kochetova, PhD in Psychology, Associate Professor of the Department of Developmental Psychology named after Professor L.F. Obukhova, Faculty of the Psychology of Education, Moscow State University of Psychology & Education (MSUPE).

and woman, husband and wife have their influence on the child as well. A plane that covers both spouses in unity as their value orientations, parental positions, feelings, and a plane that captures the interconnection of generations in their own parental family, and, accordingly, a plane that reveals parenthood in the system of social relations.

According to R.V. Ovcharova, the future of society is the current state of parenthood [44]. So, it is very important to increase the functional literacy of parents, parental competence, the knowledge about approaches in upbringing. To date, the actual problem becomes the “functional literacy of parents” in child upbringing and the definition of this concept. Moreover, the Ministry of Education of the Russian Federation has developed a project: “Monitoring the formation of functional literacy”, which once again emphasizes the relevance of the discussion of the stated topic [17].

Functional literacy is understood as the formation of the ability to use all the knowledge, skills and abilities constantly acquired during life to solve the widest possible range of life tasks in various spheres of human activity.

Accordingly, if we transfer this definition to parenting and child-parent relations, we can reflect on what the “functional literacy of parents” is.

B.S. Gershunsky emphasizes the personal orientation of the “functional literacy” category, showing its place in the process of personality formation. Functional literacy includes components: computer literacy, information literacy, environmental literacy, psychological and pedagogical literacy, medical and hygienic literacy, artistic and aesthetic literacy, etc. Functional literacy has an integrative character, which is manifested in the fact that mastering the content of the mentioned phenomenon as a whole means mastering all its components, this is also worth paying attention to [22].

In pedagogical research the concept of “functional literacy” is considered in the problem field of the competency-based approach [57]. O.E. Lebedev considers functional literacy as one of the indicators of the level of education within the competency-based approach. Actually, as stated earlier, it is the ability to solve various functional problems that a person meets, and if we talk about a parent, then, accordingly, with those tasks that they meet in the field of child-parent relations, as the realization of his parental position. Functional literacy is not just the knowledge, skills and abilities that will be applied by parents during upbringing, but also their conscious and arbitrary application in solving life tasks. The question arises about the need to develop the functional literacy of parents, which contributes to the preparation of children for successful interaction in changing life situations [33].

A competent parent understands that, in order to ensure the comprehensive development of the child, it is necessary to develop oneself, to try, to search, to learn. Thus, there is a complex and debatable question of how to develop the functional literacy of parents. One of such ways can be the psychological education of parents, but it is important to remember that this is not the only solution to the task at hand.

Parental competency acts as a formative personal education, manifested in the form of the preparedness of the personality for the constructive implementation of the parental role [11]. Thus, functional literacy is one of the manifestations of dynamic personal properties that characterize the interests, value system, needs and motives of human behavior. Continuing this idea, it is worth noting that it is impossible to form functional literacy without knowledge and skills in a certain area, moreover — without the independent creative use of this knowledge and skills that form on the basis of existing experience, and an

emotional attitude towards this knowledge, towards oneself, hence the degree of literacy (morality) of parental behavior.

We can conditionally consider functional literacy in the narrow sense of the word — it is knowledge about the styles and types of child-parent relations, the ability to apply basic educational approaches in order to harmonize relationships, knowledge about styles of relationships of the spouses themselves, because it is the style of relationships in the family that directly affects the well-being of the child; the creation of a positive emotional environment for the purpose of the all-round mental development of the child; knowledge about factors of educational influence, knowledge about educational positions.

Functional literacy of parents in the broad sense of the word is a synthesis of knowledge, the abilities and skills that constitute the content of functional literacy of a parent and that call for ensuring the effective functioning of the individual, i.e. the child, in the system of child-parent relations. The following components in this respect are proposed, which are highlighted by A.B. Belinskaya [11]:

1. Psycho-pedagogical functional literacy as mastering and using in practice the concepts of normative personality types, age-related psychological characteristics of the child, as the ability to organize effective interpersonal interaction in the process of family upbringing, as well as mastering and using in practice the concepts of ways to solve the problems of family upbringing;

2. Medical and hygienic functional literacy (the ability to identify a child's psychosomatic condition that requires immediate medical attention; skills in caring for a sick child, providing conditions for the development of a child's health culture and introducing him or her to a healthy lifestyle);

3. Ethnic and intercultural functional literacy, which manifests itself in the formation

of children's appreciation of national culture, the nurturing of the national spirit in a multi-ethnic environment, the interiorization of the elements of intercultural communication, the mastery of foreign languages, the assimilation and transmission of the knowledge of the traditions, history, customs, lifestyle of other peoples, their beliefs, etc.;

4. Legal functional literacy (familiarity with the norms of family law implementation, participation in legal education of children);

5. Functional literacy in the spiritual and moral sphere (perception as a value of norms and meanings that are significant for the given community, maintenance of national traditions, striving to bring up such a worldview in one's children);

6. Activity-based functional literacy (parents' ability to set and change the goals and objectives of educational activity; to organize family socio-pedagogical activity to form social skills, social skills and social intelligence in the child; to improve communicative processes in the course of pedagogical influence on the child).

These are the main components included in the concept of functional literacy of parents.

One of the ways to develop the functional literacy of parents can be qualitatively organized psychological education. The creation of a system of the psychological and pedagogical support of the family and the improvement of parents' pedagogical competency, psychological support of child development in the conditions of the family and educational institution, becomes the most important task of modern society [1].

But, of course, it is important that education is not limited exclusively to knowledge, it is necessary to form in parents the ability to apply it consciously and arbitrarily. It is necessary to form the need for psychological knowledge and its use in the upbringing of a child or in the interests of the development of one's own personality.

One of the main meanings of psychological education can be acquaintance of parents with the basic laws and conditions of the favorable development of the child, and also the popularization of scientifically grounded knowledge, as nowadays there is a big layer of various information on the internet, in social networks, which contains recommendations which do not correspond to scientific data. Many parents are absolutely sure to follow such “recommendations”, which often, unfortunately, do not meet the criteria of scientificity. Therefore, it is important that the information for parents is, on one hand, presented in an accessible and understandable language, and on the other hand, represents scientifically based data that will comply with the ethical principle of “do no harm”.

Work with the emotional burnout of parents is also important. Nowadays it has become a popular topic that deals with emotional burnout not only in the professional field, but also in the field of child rearing. Such a term as the “emotional burnout of parents” has appeared. Especially it concerns mothers who are on maternity leave for a long time.

The main point of psychological education:

— to acquaint parents with the basic laws and conditions of the favorable mental development of the child;

— to popularize and explain the results of the latest psychological research;

— to form the need for psychological knowledge, the desire to use it in the upbringing of a child or in the interests of the development of one’s own personality;

— to achieve an understanding of the need for practical psychology and the work of a psychologist in a children’s institution, and to rely on the recommendations of a psychologist.

Examples of topics for an educational seminar for parents:

— Regularities of development in different age periods.

— Crises in the child’s mental development.

— Child-parent relations and their peculiarities at different stages of ontogenesis, new models of child-parent relations.

— Child development, developmental techniques characteristic of each age period.

— Motivation for learning.

— Difficulties of school learning.

— Anxiety, children’s fears, insecurity, aggressiveness, hyperactivity, shyness and so on.

— Problems of the adolescent period.

— Adaptation to school.

— Age features of a junior schoolboy.

— Readiness for school.

— Unfavorable variants of development in the younger school age.

— Safe use of the internet

These can be quite different topics — the regularities of child development at different ages, sensitive periods for the development of certain psychological processes, functions, etc.

One of the forms of the psychological education of parents can be the development of an “Developmental Psychology for Parents” course. The aim of the course is to educate modern parents in order to reduce the risks of difficulties in child-parent relations, to form a stable need to use psychological knowledge with the help of psychologists.

The educational project reveals the characteristics of the age periodization of child development, includes concentration on the theoretical and practical bases of the long-term research of scientists in coordination with modern research — “portrait of a modern child”. The project will help parents to understand the characteristics of the stages of mental formation and development of children, to overcome difficulties in child-parent relations. The material

can be presented in the form of a course for parents, including lecture material, case studies, training methods and educational brochures with a convenient systematized presentation of information. Mastering the course will lead to increased awareness, the activation of reflection, both personal and social, and the formation of psychologically healthy attitudes. For society as a whole, of course, this is also an important task, as it increases the social significance of psychological knowledge and can make up for the lack of representation of scientific, reliable, psychological knowledge.

In conclusion, I would like to emphasize once again that one of the most modern and convenient forms of building a dialogue between a psychologist and parents are webinars [1]. An example of such activity, which has shown high efficiency, the interest of parents, is the project on rendering services of psychological, pedagogical, methodological and consulting assistance to parents (legal representatives) of children, as well as citizens who want to adopt children without parental care into their families, of the federal “Modern School” project of the “Education” national project, which on the order of the Ministry of Education of the Russian Federation, is being implemented in all regions of Russia, including a number of pedagogical and educational institutions. As part of this project, a nationwide parents’ competence week was organized, an educational platform for parents featuring leading experts in the development and upbringing of children and adolescents. Psychologists, pedagogues, specialists in the development of children with special needs conducted webinars, master-classes and round tables on the most urgent requests of parents [1].

Features of the Interaction Between Teachers and Parents with Preschoolers⁶

Professional activity puts many in education before the need to at least approach the understanding of relatively new terms. The concepts of “functional literacy”, “functional psychological literacy” have quite often become central in the works of colleagues. And although these terms are not new in world science, in order for them to “take root” it is necessary to understand the very essence of these phenomena. It seems that functional psychological literacy is a literacy for life, which helps a person to interact with others. This quality, which is included in human culture, is an element of psychological culture, as N.N. Avdeeva noted.

The essence of this concept can become clearer if we turn to the preschool age. Due to the specifics of children’s development at this age, some causes of difficulties and problems are more clearly presented and are even on the surface. And in order for, in the future, in older ages, fewer tasks to overcome difficulties to arise, it is worth taking a step back. Any interaction of an adult with a child of an early age or a preschooler educates him: teaches, educates, forms his childhood experience. Getting into any situation, first of all the child tries to understand it, to make sense of it. At the same time, a teacher or a parent tries to mediate, to help him or her — he or she tries to comment on the situation or task, to explain it or clarify it, to focus attention on the important points. It is at the first stage of a child’s orientation in a situation or task that problems may already arise, which, if not resolved, will not lead to cooperation, interaction, to some solution of the situation by the child, but will lead to some negative consequences, conflict

⁶ Transcript of the report: Irina Anatolyevna Burlakova, PhD in Psychology, Head of the Department of Preschool Pedagogy and Psychology, Faculty of Psychology of Education, Moscow State University of Psychology & Education (MSUPE).

situations, negative experiences. Such situations are a vivid illustration of the functional psychological illiteracy of an adult.

To confirm this, it is enough to recall various examples, which we happened to observe in educational practice and in the interaction between an adult and a child. For example, at a lesson at the beginning of the second youngest group (fourth year of life) the teacher offered the children the game "Hide the mouse". This didactic game is widely known in preschool education. Each child has to "hide" a mouse from the cat by closing the doors of the houses, i.e. to match the color of the circles (doors) to the houses and "close" the doors of the houses (put the circle in the slot on the rectangle of the corresponding color). This is a task for the development of perception, for mastering the action of identification. The teacher, working with the children, gives the following instruction: "Look, children, there are mice in the houses, they need to hide from the kitty. Please close the red house with the red door, the blue house with the blue door and so on". And, accordingly, not all children fulfilled the task. There were those in the group who have this action at the stage of forming, and do not yet know what color is called orange and purple. Two children in the group could not "hide" two mice from the orange and purple houses. The teacher started trying to help them: first she repeated her task, then she accentuated — the orange door should be put on the orange house. And only after several variants of the used help did the teacher find a verbal instruction that was understandable to these children — find a door of the same color as the house. After that, as it is clear, the children solved the problem. It is obvious that the children's difficulties were caused only by the fact that the educator did not take into account the features of the development of the child's cognitive sphere, the ability to understand the adult's words.

The absence of functional psychological literacy is also illustrated by the story about cold milk. A two-and-a-half-year-old child asked his grandmother for cold milk. He was poured it from a bag that had been taken out of the fridge. But he was not allowed to drink it immediately, he was told that it should warm up a little. This situation caused crying and the justified indignation of the child: in his understanding, the adult offered the impossible, and in the end gave the child warm milk.

There are many examples that illustrate that many problems and negative experiences of young children are caused by the fact that adults do not take into account the obvious age-related, underlying characteristics of children. They do not know, or ignore, the specificity and accuracy of the child's perception of the adult's words.

One educator and artist recommended that teachers should not be afraid to tell children precisely and in detail, specifically what they want to see the child draw, i.e. to formulate the task as clearly as possible. Even if you do preliminary work with the children and consider the patterns that are obtained from the intertwining of branches, and then ask them to draw a tree, the result will be a carrot with sticks. Because they looked at a pattern, but they were asked to draw a tree, and at this age a tree is mostly drawn in this way.

It is extremely important that the adult, when addressing the child, takes into account his age features, in particular, the possibilities of cognitive sphere, the possibilities of thinking, the possibilities of understanding, the possibilities of the perception of speech addressed to him. It seems that functional literacy as literacy for life is a generalized notion, understanding, say, as a minimum, that children have their own peculiarities, different from adults. This is something that is often repeated to students: that a young child is not a miniature adult, it has its own specific characteristics.

The task of the formation and development of functional psychological literacy seems to be extremely important for both parents and teachers.

And the ways for formation are different. Future teachers master, in the process of training, the necessary knowledge and skills, master initial pedagogical experience to use them in various typical educational situations. However, for an effective interaction with children, it is necessary to have a generalized understanding that a child has certain features and the ability to use this understanding in real interaction with a child, i.e. functional psychological literacy.

If, figuratively, it is possible to present the path of teachers towards functional psychological literacy as an ascent from particular to general, parents move on the same road, but in the opposite direction. They should not possess all the knowledge, skills and abilities that a teacher possesses. And the parent should move from understanding that the baby, who appeared in the family, is not like them, it is not an adult, he grows and learns, and he must understand the adult towards specific knowledge and skills that he can use to solve the problems of education, upbringing and development of his child.

And, if the formation or improvement of the functional psychological literacy of teachers is possible in the process of professional training, then for parents there is the main path — education (in the broad sense of the word). It is carried out through various forms of interaction with the family of preschoolers and young children: family clubs, family projects, master classes, lectures, consultations, etc. Educational activities are now one of the trends in Russian education.

But there are unresolved problems on this path.

Firstly, the themes of educational activities. For example, it is known that interested adults, those who have had or are having

some difficulties or problems in interacting with children, their education and upbringing, those who recognize these difficulties and are looking for ways to overcome them, become involved in various forms of education. They become “forcefully literate” (the term proposed by I.V. Abankina “forced literacy”). It is these problems that determine the themes of educational activities. In addition, the choice of the content of educational activities is dictated by the ideas of teachers and psychologists about what is important for children’s development and what is important for parents to know about the child. That is, professionals believe that it is important to tell parents in order for the children to develop more safely and harmoniously.

Secondly, no one has yet determined the effectiveness of educational activities, the criteria and indicators of formed functional psychological literacy. There is a need to develop a tool that will allow us to understand the effectiveness of the educational efforts of professionals. How can the functional literacy of an adult be assessed? What is necessary to look at — that the number of problems in children related to child-parent relations disappears?

Thirdly, a large part of parents who do not realize the difficulties and try to solve educational tasks based on their own pedagogical ideas remains out of the field of educational activities. In this connection, it is interesting to consider the proposal of pedagogue T.V. Krivtsova that it is necessary to form the demand of a large number of parents for certain topics. How are such requests formed? Maybe, existing experience can be used to help? Maybe the technique used in the wonderful long-standing “The Mouth of a Baby” program will be effective? To draw parents’ attention to their child, to the features of his/her perception of the world: the adult world, the world of nature, the world of peers, his/her own self. To form a request to understand

their own children, even if these children do not cause problems for parents. Introduce them to psychological culture through the formation and improvement of functional psychological literacy as a basis.

Functional Psychological Literacy of Parents and Teachers in the Context of Social Interaction and Bullying Prevention⁷

My professional interests are only partially related to the topic under discussion. The first is the problem of the family. In Moscow, for example, there are only 40% of traditional families. And this process tends to reduce the number of whole families. This was not taken into account in today's discussion — the entire time they were talking about some two-parent families, while a huge number of parents are, generally speaking, single parents. Some of them are starting a family for the second or third time. We do not really know the average duration of marriage, how many changing parents a child has, who is actually ready to perceive psychological literacy through clubs, through some other forms of work.

Related to this is the fact that we need to take into account that there is such a phenomenon as family violence, and in our country, according to outdated data, there are 50% of official and unofficial families in which parents either regularly or occasionally beat each other. How many of them hit their children remains unknown. Some of them firmly believe that this too is helping the child's functional literacy. Those examples that V.K. Zaretskii gave, they are just for a good part of parents who somehow participate and respond to the child's requests. And some respond to the child's request simply with violence.

But the more serious problem is of two kinds. One is bullying in school. If you con-

sider that, according to Russian data, the prevalence of bullying in school is 37%, it is a very serious problem. At the same time, the interests of those who research bullying are, of course, primarily related to bullies or bullying victims, and much less attention is paid to observers. Whereas observers fall apart into groups. One part of the observers begins to sympathize with the bully and another part sympathizes with the victim. But the observers have some training going on for them, the child himself may not be involved in all this, but knows very well that violence helps in achieving some goals. But the most interesting thing here is that children note that they have this phenomenon in their class, that there is bullying, they observed it, while a large number of teachers do not see it, they note that it does not exist. It is clear, the simplest explanation is that they just don't want to make a mess out of it, but in reality, many of them are actually (and research shows this) the initiators, they manage the collective with its help. And naturally, they are not anti-bullying. And the saddest thing about all this is that teachers in schools — from what we have researched — are very authoritarian people. Our study of pedagogical university students showed that if you compare what happens to authoritarianism in the first year and in the fifth year, there is much more authoritarianism in the fifth year than in the first year. That is, the teacher training college itself creates such conditions that future teachers become more authoritarian on the way out. Unfortunately, the desire of many teachers to have everyone march in formation is found in quite a large number of studies. We obtained this data in a study of almost all the schools in Sverdlovsk Oblast. That is, this is a very serious problem indeed.

⁷ Transcript of the report: Sergey Nikolayevich Enikolopov, PhD in Psychology, Head of the Department of Clinical Psychology of the Mental Health Research Center of the Russian Academy of Medical Sciences (MNRС).

Related to this is something we have been dealing with for quite a long time: gelatophobia — the fear of being ridiculed. A large number of children are afraid of public speaking, expressing their opinions, participating in active school life, because they are afraid of being ridiculed by their own fellow pupils and teachers. It remained outside of our research, although it is actually very interesting, and how teachers, pedagogues use jokes in a negative, in this case, perspective to teach and transfer their knowledge, their desire for the student to be better. Studies show that among the adult population in the world, on average, it is from 5 to 15%, in our country about 7% of adults suffer from gelatophobia, but in teenagers it is higher than 7%. According to our research, it turns out to be somewhere around 14% in some regions. So, it's the kids who are not active. How many of them become gelatophobic due to their parents' jokes is still a mystery. But all this greatly affects the effectiveness of their influence on children, and teachers have to somehow be informed about the problem of gelatophobia. They don't always realize that it is very dangerous. This is a very strong and good tool — a teachers' sense of humor. But here is the facet of using this very strong and sharp tool remains behind the scenes. And if we say that something needs to be done, then they need to do something in connection with authoritarianism and gelatophobia in teaching teams. In other words, we need to improve the literacy not only of parents to understand some dark spots and places of application of our psychological power.

Psychological Literacy of Parents — in Search of Sources⁸

The problem of the insufficient psychological literacy of parents was raised sev-

eral decades ago, but it is still far from being solved. This is due to the fact that, so far, there is no specialized training for such a difficult and responsible parental activity, and modern parents, adults, have to educate themselves.

Traditionally, the source of parental competence was the parental family, where the child gets acquainted with the practice of child-parent relations and family upbringing. The assimilation of family patterns of behavior, the life scenarios of the parental family leads to their transmission, and, often unconsciously and against one's will, reproduction. It is this practice that becomes the basis for the formation of one's own parental position. However, it has to be stated that an adult is often forced to borrow not always the most successful experience, which limits the boundaries of his competence. Incompetence associated with the ignorance of pedagogical methods, the underestimation of family upbringing, the inability to interact with children, the inability to assess the prospects of child development and create favorable conditions for the possibility of their implementation, according to T.V. Kovalenko, causes the failure of the modern family [15; 24; 37].

The Problem of Finding Sources of Information in the Process of Forming a Parental Position

At the same time, we can state the fact that young people have become more responsible for the decision to become parents, strive to prepare for the realization of parental activity. A natural step of such independent preparation is the search for information about child development and upbringing. The modern level of development of psychology allows us to successfully solve the problem of forming a

⁸ Transcript of the report: Elena Igorevna Zakharova, Doctor of Psychology, Associate Professor, Department of Developmental Psychology, Faculty of Psychology, Lomonosov Moscow State University (MSU).

harmonious parental position. Not only in narrowly scientific, but also in practice-oriented literature much attention is paid to the issues of the content and genesis of its formation [16; 31; 32; 54; 59; 62]. The reliance on scientific ideas allows to successfully acquire competency in taking into account the age specificity of the child (familiarity with the peculiarities of age development, which should be taken into account in the process of upbringing), competency in building interaction between the parent and child (acquiring the ability to organize and implement joint activities, a mastery of verbal and non-verbal communication skills, a correct understanding of the child's condition, the ability to create a positive emotional background in the relationship), competency in caring for the child.

At the same time, we can state the fact that the actively implemented digitalization of society has also affected the sphere of family upbringing. In order to achieve parental competence, young people are increasingly using the internet. The new reality of our time has both positive and negative sides [12]. The development of the internet moves traditional means of mass communication into the cyberspace, making available a large amount of information, increasing the timeliness of its arrival. This allows to expand the audience of the media, which is rapidly growing with independent internet media, personal blogs, which makes it easy to create and disseminate information virtually without restrictions [56]. M.A. Karpova notes the significant influence of the media on the formation of the socio-cultural values of the modern man, as well as on his social life [34]. However, the evidence of negative influence deserves attention, one of which is the "patchwork, unstable polyidentity" of content consumers (due to the high speed of the arrival of information, which changes the worldview) [4]. In addition, the issue of the quality of widely available materials is also acute.

Analyzing the Content of the Information Offered on the Internet Regarding the Patterns of Child Development

Our analysis of the content offered to parents revealed a significant number of distorted ideas about child development and upbringing, which poses a serious risk to child well-being. In order to assess the relevance of freely available information and recommendations on child development, we analyzed the content of websites popular among parents. As units of analyzing the information provided, we used such topics of messages as: mechanism of development, specifics of child ontogenesis in comparison with animal cubs, norms of age development, content of parental role, parental attitude, means of upbringing, content of psychological help.

The results of the analysis of the content offered in the internet allowed us to identify the most common variants of the distortions of the information necessary for the implementation of parental activities:

1. A distorted understanding of developmental mechanisms. In the analyzed content, there is often an appeal to some innate program according to which a child should develop. The reader is suggested to "trust nature and the child, to let him/her develop to the maximum, to give a lot of freedom". The justification for this wait-and-see attitude of the adult is the threat of destroying the emotional bond with the child, who, meeting the restrictions and demands of the parent, tends to perceive the child negatively. Readers are urged not to spoil by attempts to develop and educate the child "the pleasure of emotional communication with him/her". In this case, against the background of recognizing the value of a positive emotional communication with the child, the principle of the adult's anticipatory initiative, which sets the zone of the child's proximal development, is ignored. A deprivation situation is created,

which closes the perspective of the child's cultural development.

2. Calls for forcing the child's cognitive development, which leads to ignoring the internal logic of the development process and its age specificity. No one is surprised by proposals to attend foreign language courses from the age of 3 months, agitation to immediately start learning the alphabet (from the age of 1) and reading from the age of 3. We have to admit that the desire to force cognitive development resonates with modern parents, who see it as an opportunity to create favorable conditions for the child to live in a competitive environment. The available scientific data testifies to the futility of such a strategy, which, against the background of very doubtful advantages in the child's cognitive development, turns into a violation of his/her psycho-emotional state and attitude towards parents [55].

3. An inadequate understanding of the means of upbringing.

Misconceptions about the means of upbringing can be particularly detrimental to a child's development. However, this content is particularly appealing to the reader because there is unity in the pursuit of some of the goals of parenting. For example, most parents aspire for their child to possess a set of personality traits conducive to achieving successful socialization and social acceptance. Most parents would like their child to be initiative, courageous, enduring. We can talk about different strategies for achieving the desired qualities, but urging a child to face the "harsh truth of life" before he or she achieves the necessary prerequisites can have the exact opposite effect. In addition, raising a child requires taking into account the age-related limitations of his or her development. Ignoring a child's age-related capabilities leads to treating his or her behavior as a manifestation of "evil will", which prompts tougher educational influences, including physical ones.

4. The sphere of child-parent relations is also in the focus of attention of bloggers and insufficiently competent practitioners. One can see calls for a critical attitude towards one's feelings towards the child. On the pages of the internet there are warnings about the "excessiveness" of parental love, that a child can be "raped by parental love", that love for a child is secondary to marital love and should not compete with it.

Thus, we can conclude that in the internet the reader may encounter information that distorts the regularities and general logic of child development, which will only complicate the process of forming a parental competence.

This situation leads us to the problem of how the content of the parental competency of today's young generation can be harmonized with the competency of previous generations that did not have the opportunity to use the digital space. The uniqueness of the current situation is that both the representatives of the generation whose competency was formed under the influence of the parental family and a small amount of scientific literature and the generation whose information sources of competence are exclusively in the digital environment are engaged in child upbringing. Researchers note that one of the factors of difference in the level of parental competency among people of different generations is the so-called "digital divide" [41; 52]. In the study by E.A. Sorokoumova, E.B. Mamonov, O.V. Suvorova, and S.N. Sorokoumov, significant differences in the parental attitudes of mothers of different ages were recorded. When studying attitudes towards family roles, more mature parents showed higher values of "parental superauthority" compared to younger parents. And the mothers of the younger generation have significantly higher values of "dissatisfaction with the role of a housewife" and "dependence and non-self-sufficiency of the mother". This study allows us to see

some trends in the transformation of parental attitudes, reflecting the different socio-cultural conditions of mothers' maturation [53]. Taking into account the data obtained at the first stage of the study from the analysis of the content on the basis of which the competency of mothers of different generations was formed, we were also interested in what changes in educational content bring to parental attitudes.

An Empirical Study of the Parental Attitudes of Mothers Whose Competency was Formed in Different Periods of Time

The *aim* of the study was to establish the specificity of parental attitudes taking into account the fact that the internet is becoming a priority source of the young generation.

The study *sample* consisted of 103 people aged from 21 to 63 years old. Such a wide age range met the objectives of our study and allowed us to divide the sample into groups corresponding to the age cohorts, born in 1990—80—70s of the XX century. The respondents' maturation and acquisition of competency took place in a different information space. We considered this division possible, focusing on the position of the sociocultural approach, in the framework of which a generation is defined as a set of people, limited by age, living in a certain historical period, in a certain sociocultural environment and united by similar values [51]. A.I. Afanasyeva defines a generation as "an objectively forming specifically historical set of people close in age and formed in the same historical period" [10].

The research methods used were: 1) the PARI parental attitudes study questionnaire by E.S. Schaeffer and R.Q. Bell; 2) the author's questionnaire to obtain information regarding the most popular sources of information about parenthood. Respondents were asked to provide a detailed description of:

— What sources do you use to get information about being a parent, how to better raise your children?

— Name several sources you use to get information about parenting (websites, forums, books, programs, blogs, lectures, etc.).

— What has been the most difficult for you in raising your children?

Results of the Study

First of all, we identified the preferred sources of information regarding child development and upbringing (Figure 3).

We found that all of the study participants primarily rely on the experience of the older generation when it comes to raising children. Parents continue to be the most reliable source of childcare experience, which is encouraging.

At the same time, we see that Group 1 respondents (generation aged 21—32 born in 19 90s) are more inclined than others to use internet sources and blogs. Group 2 respondents (the 33 to 44 age range group, born in 1980s) are more inclined than other groups to turn to the experiences of friends, perhaps this is due to the emergence of parental experience. Young parents face real problems and the easiest thing for them to do is to seek counselling from peers with relevant experience. It can be assumed that this is not the most effective way of gaining competency as the 'counsellors' may not be significantly superior to them in terms of literacy. Group 3 respondents (age range 46 to 53 years, born in 1970s) have little reliance on educational television programs, the internet and blogs as sources about parenting.

The results of the statistical analysis allowed us to record significant differences in the parenting attitudes of participants of different age groups.

Young mothers demonstrate a greater orientation in the age specifics of the child, and it is possible to speak about a confident

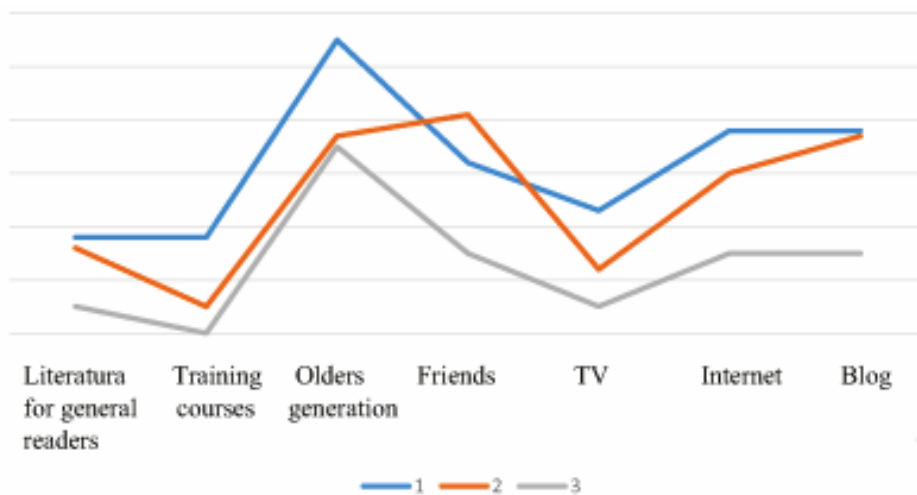


Fig. 3. Frequency of use as a source of information on issues of child development and upbringing

tendency towards more and more literacy on this issue, as the indicators of younger groups are increasing. At the same time, young mothers are less satisfied with the role of the housewife ($U=702.500$; $p<0.001$). Modern women are less oriented towards the family sphere, their self-realization is carried out in a non-family context. At the trend level, we can say that they are characterized by excessive strictness ($U=980.500$; $p=0.077$) and the desire to avoid extra-familial influence on the child's development ($U=977.000$; $p=0.073$).

Mature women are more oriented towards building optimal emotional contact with the child ($U=922.500$; $p=0.031$), the completeness of verbal interaction ($U=954.500$; $p=0.05$). They treat the child with more respect, taking into account his/her interests, tend to build partnership relations ($U=862.000$; $p=0.01$). It is necessary to state a higher literacy of the study participants born in 1970s generation, when the main reference points in acquiring parental literacy were the experience of older generations and the few scientific sources at that time.

Of course, these differences cannot be unequivocally linked to the source of parenting competence. Certainly, one's own experience of parenthood makes necessary adjustments to the parental position. However, the data of the study indicates that the excessive strictness of the young group participants and absolutization of parental authority are associated with the frequency of using modern popular science literature (Pearson's Chi-square=23.14 at $p=0.04$ and 24.21 at $p=0.019$ respectively). While higher communicative competency, which allows for the successful resolution of conflict situations, in the older group is associated with participation in specialized training courses (Pearson's Chi-square=15.31 at $p=0.053$). The middle age group, the generation of the 1980s, is distinguished by the connection of reference to popular science literature with the desire to build partnership relations with the child (Pearson's Chi-square=14.46 at $p=0.043$) and the desire to develop the child's activity (Pearson's Chi-square=18.56 at $p=0.046$).

The obtained results allow us to formulate the following conclusions:

1. The information intended to improve the psychological literacy of parents, placed in the open internet, contains information that distorts the natural logic of the child's mental development, the specifics of child-parent relations and means of upbringing.

2. The modern generation of young parents is increasingly oriented towards internet resources in search of sources to improve their parental competence.

3. The parental position of the generation of young parents against the background of a greater familiarity with the age specifics of the

child reveals a tendency towards a decrease in psychological literacy compared to the generations of the 1970s and 1980s.

The results of the study indicate unfavorable trends regarding the state of the psychological literacy of parents. We can welcome the steps that the professional community is taking in the direction of developing psychological and pedagogical programs to improve psychological literacy, creating educational resources that compete with uncontrolled materials [60]. In addition, the data obtained in the study raises the question of the need to examine the content of recommendations on child upbringing posted in the internet.

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