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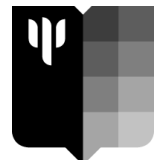
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THEORY AND METHODOLOGY
ТЕОРИЯ И МЕТОДОЛОГИЯ

The Development of Consciousness in the Context of the Problem of Sign and Symbolic Mediation

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The problem of the development of individual consciousness as a process of acquisition of cultural forms and the formation of relations between its structural components is considered. The hypothesis is proposed that the various types of cultural forms which a person acquires build systemic links between components of the structure of consciousness. Acquisition of the corresponding types of cultural forms has a certain ontogenetic sequence. The typology of cultural forms is proposed. It is based on a functional criterion and correlates with the structure of consciousness. The cultural forms are divided into two groups — sign and symbolic. The sign forms represent the agent-to-object links and relations. The symbolic forms represent the agent-to-agent ones. The sign forms include objects-substituents (objective actions), spatial patterns, models, word-concepts, social gestures. Symbolic ones include bodily practices, artistic images, expressive gestures, myths (narratives) and symbols. Semantic codes occupy an intermediate position. Differentiation of ideas about the functions and ontogeny of assimilation of various cultural forms can be used to create a uniform practice of psychological assistance to children and adolescents based on a cultural-historical approach.

Keywords: consciousness, development, mediation, cultural form, sign, symbol.

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Развитие сознания в контексте проблемы знакового и символического опосредствования

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Рассматривается проблема развития сознания индивида как процесса овладения формами культуры и формирования связей между его структурными компонентами. Предлагается гипотеза о том, что различные типы культурных форм, которыми овладевает человек, выполняют функцию построения системных связей между компонентами структуры сознания. Овладение соответствующими типами культурных форм имеет определенную онтогенетическую последовательность. На основе функционального критерия и в соответствии со структурой сознания предлагается типология культурных форм, которые разделены на две группы — знаковые и символические. Знаковые формы представляют субъект-объектные связи и отношения, а символические — субъект-субъектные. К знаковым формам отнесены предметы-заместители (предметные действия), пространственные схемы, модели, слова-понятия, социальные жесты; к символическим — телесные практики, художественные образы, экспрессивные жесты, мифы (нарративы), символы. Промежуточное положение занимают

семантические коды. Дифференциация представлений о функциях и онтогенезе освоения различных культурных форм может использоваться для создания единой практики психологической помощи детям и подросткам, основанной на культурно-историческом подходе.

Ключевые слова: сознание, развитие, опосредствование, культурная форма, знак, символ.

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Research Problem

The development of human consciousness in cultural-historical psychology is directly connected with the mastery of cultural forms as psychological tools. This process is the essence of the individual's socialization, since it ensures the appropriation of one's cultural-historical experience. In this regard, the problem of developing mediation becomes particularly acute in the context of creating a variety of developmental (i.e., educational, correctional) psychological and pedagogical practices [4–9; 11; 16; 18; 21; 23–25].

The creation thereof involves deep insight into the development and functioning of cultural forms in the mind of the individual. V. P. Zinchenko and E. B. Morgunov write: "The objective, final side of social abilities that determine the real individual's activity is expressed in the forms of culture; activity, as you know, dies out in its object. Therefore, psychologists need to reconstruct the content of the principle of activity in culture as an object of appropriation, with which the logic of the development of the individual's consciousness should be internally coherent" [11, p. 176].

The variety of cultural forms creates the need to form a typology thereof in accordance with the specifics of their functions in the development and operation of consciousness. The same circumstance allows us to present consciousness as a complexly organized functional organ which simultaneously solves many problems [10; 11].

The complexity of the functional organization of consciousness motivated V.P. Zinchenko to develop upon the ideas of L.S. Vygotsky and A.N. Leontiev about its structure [10; 11]. He emphasized that his model of the structure of consciousness is intended to reflect its content and functioning in a concise form: "The most important functions and properties of consciousness must be derived from the structure" [11, p. 188]. If we proceed from this, we are faced with the task of linking its functions and structure.

A solution to this problem would avoid the reduction of consciousness to its separate functions (which

has been done many times in psychology before), since the structure of consciousness is designed to model its functioning as a whole. In addition, the structural model of consciousness will help to understand the systemic relationships between its individual components [1].

To establish functional and structural links, it is necessary to develop a typology of cultural forms based on ideas about the structure of consciousness. This method of defining types of cultural forms and their corresponding functions (tasks) enables us to create a holistic picture of the operation and development of the individual's consciousness, as well as a more differentiated approach to the practices of its development and psychological correction.

The Structure of Consciousness and Mediation

Ideas about the structure of consciousness have been developed in various areas and schools of psychology [1; 10; 11; 14; 17]. However, considering consciousness through the prism of the agent's cultural development, the most adequate and fully developed concept of the structure of consciousness is described in the works of the Russian psychologists A.N. Leontiev and V.P. Zinchenko [10; 11; 14]. Leontiev singled out three constituents of consciousness: the sensory tissue responsible for image, meaning and sense [14]. The first refers to the ontological layer of consciousness, the last two — to the reflexive. Zinchenko suggested supplementing the ontologic layer of consciousness with a biodynamic tissue — an organ for building living movement (a concept proposed by N. A. Bernshtein) [10].

Zinchenko also developed ideas about the spiritual layer of consciousness, with human I (and the other I, i.e., You) as its core, based on the work of such famous thinkers as S.L. Frank, M. Scheler, M. Buber, M.M. Bakhtin, and G.G. Shpet [10]. He believes that ideas about the I, or more precisely, about the I-You relationship are logically built into the Vygotsky's ideas about inter- and intra-individuality, D.B. Elkonin ideas on joint activi-

ties, and A.A. Ukhomsky ideas on the "dominant on the face of another".

Despite the fact that the functions of cultural forms are traditionally associated with executive functions, reflection of human experience, generalization and communication, in our opinion, the function of "internal maintenance" of consciousness should also be singled out. That is, the function of building systemic links between the components of consciousness and mediating their interaction and mutual transitions. In this regard, it can be assumed that *the most important characteristic of the development of consciousness from the view of cultural-historical psychology is the construction of internal systemic links between its constituent components, due to their mediation by various cultural forms.*

The development of the idea of mediation in this context requires the differentiation of cultural forms in accordance with the types of connections they serve, as well as the logic of the ontogenetic development of consciousness. The effectiveness of the differentiation of cultural forms according to this criterion is seen in the possibility of its application in the creation of a holistic concept of the developmental practices that contribute to the socialization and mental development of the child. In addition, this idea may be helpful in understanding the psychological mechanisms of dissociation or disorders in consciousness development which remain practically unexplored and are represented only by clinical descriptions of their altered states.

Functions of Cultural Forms as a Basis for their Typology

Thus, we consider the functions of cultural forms as a basis for constructing the typology thereof. Cultural forms can be divided into two types. The first type represents the functions of organization and regulation of the agent's conscious activity, i.e., mediation of interaction with subjective and objective reality, that is, cooperation with other agents and the transformation of objective reality. According to this criterion, cultural forms should be divided into symbols and signs. The former mediate the awareness of subjective reality and agent-to-agent relations, the latter mediate awareness of objective reality and objective activity¹.

The second type of function includes those for establishing systematic connections between the components of consciousness. *Thanks to them, the artificial influence (due to training, correctional work, etc.) of cultural forms on the development of consciousness is revealed.* Our hy-

pothesis is that in order to build a certain type of connection between the corresponding components of consciousness, a specific type of signs and symbolic forms is used. At the same time, the varieties of these sign forms are used mainly to build objectively significant connections, varieties of symbolic forms — to create subjectively significant (sense-making) ones.

The structure of consciousness, the connections between its components and the localization of cultural forms are shown in Figure (Fig. 1). Connections that radiate out from the meanings (meaning to biodynamic tissue, meaning to sensory tissue, meaning to I, etc.) are represented mainly by the sign forms, and those that radiate out from sense (sense to You, sense to sensory tissue, sense to I, etc.) are the symbolic ones. The exception is the link "meaning of sense", which simultaneously refers to both the sign and symbolic forms.

Thus, the function of building systemic links allows us to more accurately differentiate cultural forms and determine their role in the development of consciousness. Consider the typology of the cultural forms in accordance with the specified criteria.

The Sign Forms

The Sign forms are organized around components such as meaning and direct a person mainly towards the objective constituents of consciousness — biodynamic tissue, meaning and another I (You).

The simplest and ontogenetically earliest form of a sign is an *object action and an object-substituent*. An object action or movement, subordinated to the logic of using the object, allows it to be represented in the mind of the child, pointing to it and reproducing its properties, even in the absence of direct contact with it [5; 9; 14; 18; 21–23; 25]. So, for example, in infancy, a child, reproducing the grasping movement that he made with an object in its absence recreates its image [5]. According to D.P. Ausubel, senso-motor acts in the theory of J. Piaget are signs of the objects to which they are directed [22]. A.N. Leontiev understood object actions as a prototype of verbal meanings [14]. Also, object-substituents (a stick — as a spoon, a handkerchief — as a blanket), which a child begins to use in the second year of life, perform the function of a sign, since they point to another, albeit similar, object. It is important that the child singles out the functions and purpose (meaning) of the substituted objects through object actions (movements) and object-substituents [9; 21].

The second sign form, which begins to be acquired in early childhood, is the *spatial scheme* [18; 24]. In the

¹ A more detailed justification for the distinction between symbols and signs is presented in our other works [16].

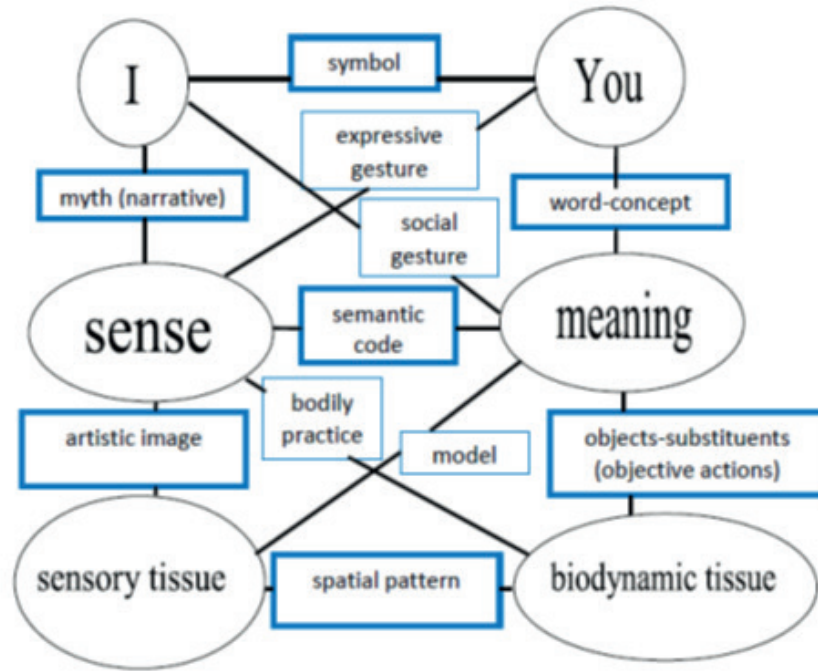


Fig. 1. Cultural forms in the structure of consciousness

literature, it can be found under the names of 'graphic symbol' or 'model' [24]. It is important to note that this is a spatial object visually similar to the replaced object. For example, a child may fold their hands into a triangle, showing a house. An image of an object can act as a spatial scheme. Graphic symbols are mastered only by the age of 3–4 due to the fact that the child perceives them for a long time as self-sufficient objects, not as signs of other objects [24]. More complex versions of spatial schemes generally mastered at primary school age, are quasi-spatial objects (clocks, calendars, plans/schedules). The main function of spatial schemes is the transformation of movements and actions into the space of images and their reverse transformation, which ensure the interaction of the sensory and biodynamic tissue of consciousness [10].

Regarding the provision of assistance to children at the early and preschool ages, the actualization of the object-substituent, object actions (movements) and spatial schemes is deeply and thoroughly covered in studies by A.V. Zaporozhets and L.A. Wenger on sensory education and the development of visually-shaped thinking, in the "Tools of the mind" approach (E. Bodrova, D. Leong), and in child neuropsychology as a whole [9; 23].

The next cultural form that mediates the interaction of meanings and You (the Other) is the word-concept, which generalizes the human experience in its essential characteristics for it to be shared with other people. The word connects us to universal human experience and places our consciousness into a cultural context [5; 6; 10; 11]. This form and the ontogeny of its acquisition

have been best studied in psychology. Suffice it to recall such researchers in this field as Vygotsky, Luria, Bruner, Piaget, and Davydov [5; 6; 11; 18; 23]. The ultimate goal of mastering a word-concept is the development of its generalized and reflective cultural meaning, fixing the properties of an object that are essential in any respect. However, not only the cognitive function of the word is important, but also the fact that it becomes the point where different minds meet each other, creating a "shared" field of meanings.

The *model* should be referred to in the sign forms. It occupies an intermediate position between a word-concept and a spatial scheme, since, on the one hand, it is a visually represented object that represents something in the space-time continuum, and, on the other hand, it reflects only the properties of the object that are essential for solving a specific problem. An example of a model is a set of colored rectangles laid out in a certain sequence and displaying the morphological structure of a word. Normally, children begin to master modeling at primary school age. Studies of modeling in the educational activities of schoolchildren are prominently presented within the theory of developmental education by D.B. Elkonin and V.V. Davydov [8; 21].

The last of the sign forms that connect meaning with one's own I is the *social gesture*. We categorize it as a sign form due to a certain and unambiguous understanding of its content by a large number of people, in contrast to the poly-semantic and unique sense of the symbol. It is impersonal, addressed not to specific individuals, but to a group formed on formal grounds. If, for example, a man wears a suit and tie,

he demonstrates his social position and belonging to a formal group (deputy, leader, etc.), and does not address a personal message to one or several specific people (in the latter case, clothing turns into a symbolic message, as, for example, a dress of sparkling silver brocade and a large scarf of crimson chiffon of the main character of S. Maugham's novel "The Theater", Julia Lambert, in one of the final scenes). A social gesture allows you to demonstrate to others your position and status among others, for example, the role of a winner or victim, an intellectual or a "simple guy". We interpret such a gesture in the spirit of R. Barthes, who focuses on its deliberateness, the intentional strengthening by the agent of the characteristic behaviors, statements, clothing, etc., their redundancy in relation to the situation and practical meaning [3]. R. Barthes analyzes gestures that appear in various social situations — in a sketching competition, in advertising, in the press, in the behavior of politicians. Anything can be a social gesture — a word, an action, an object, clothing, a photograph. The manner and context of the use of a gesture is important. R. Barthes gives the example of a writer working during his summer vacation as an expression (gesture) of his special prestigious status, elevating him "above the prosaic social position, which is due to our, alas, too materialistic era", a representative of the "best mind" of society [3, p. 85]. R. Barthes connects the use of gestures with the development of modern mythology, which always has some hidden sense and subtext, which allows it to be classified as a symbol. In his interpretation, signs (words, gestures) serve as the basic elements for constructing a myth.

Symbolic Forms

One of the most accessible and forms to be mastered early on is *bodily practice*. By this, we refer to any cultural methods (movements and actions) for meeting needs and expressing personal sense. These methods determine how we eat, keep warm, bathe, move around, communicate with other people, and reveal the needs and senses behind them.

Body practices include instrumental gestures as one of the methods of non-verbal communication. Their initial form is understood as the failed object action (movement) of a child, which an adult "reads" as a request for some help (for example, an unsuccessful attempt to reach an object turns into a pointing gesture) [9; 11; 21; 25]. The child begins to master them from the end of the first year of life. Instrumental gestures are similar to object actions, but, unlike the latter, they serve not as a means of object substitution, but as a form of communication with another.

Some authors see in such gestures the communicative intentions of a child, and the gestures themselves are understood as polysemantic [25]. For example, a gesture of giving (a child holds out an object to an adult) can have

different meanings — an offer to play, a protest reaction, etc. Not only is the polysemantic nature of such a gesture important, but also the fact that it serves as a form of communication with the Other, which can reflect not only the intention of a child, but also the intention of an adult.

As a rule, bodily practices are associated with the use of cultural tools (cutlery, clothes, etc.). Mastering them requires the restructuring of movements according to the logic of their use [9; 21]. Mastering bodily practices should be correlated with the formation of self-service skills. However, in reality, this is a broader task, which includes the mastery of various movements — locomotion, articulation (think of B. Shaw's *Pygmalion*), eye movements, etc.

Despite the outwardly apparent certainty of various bodily practices, they contain a rich content of sense, which allows them eventually to turn into social gestures or symbolic acts. For example, certain ways of eating become gestures expressing belonging to a certain class, social group, or turn into a family ritual that symbolically maintains a connection between relatives.

The second variety of symbolic forms is *artistic images* that connect the sensual tissue of consciousness with its component of sense. The artistic image, being a sensually presented image, is similar to a spatial scheme and model. However, it differs fundamentally from them in its emphasis on subjectively significant elements of experience. If models and spatial schemes seek to convey an objectively important and general content, abstracting from everything individual and "random", then the artistic image, on the contrary, relies on an expressive, visual, living sensibility in order to emphasize the individuality and uniqueness of the image and to alienate (V.B. Shklovsky), that is, to detach the viewer (reader, listener) from everyday reality, to turn his or her consciousness toward the inner reality, the reality of sense [7; 15; 20].

So, G.G. Shpet considers art as a special kind of knowledge that highlights the value-semantic reality of a person and is presented in the form of sensory-emotional experience [20]. He, like Vygotsky, emphasizes the uniqueness of the artistic image, which, unlike the sign, is not included in the actual connections of things, but, on the contrary, renounces these connections, taking our consciousness beyond the framework of everyday reality [7; 20].

In this regard, an important task in interacting with an art form is its "decomposition", isolation from its object content and the direct meaning of the image, in order to reveal the hidden semantic content [15; 20]. According to A.F. Losev, art is allegorical in relation to life, metaphorical, "...because the actor depicts on stage what he really is not" [15, p. 429]. When referring to an artistic image, it is important to understand that it is not really about what it literally depicts (for example, the images of animals and plants in a fairy tale or fable do not signify them as such,

but people's relationships and mental states). To do this, it is necessary to actively relate to the artistic image, to carry out the work of living through it aesthetically. However, at the simplest and ontogenetically early levels of comprehending an art form, only its emotional expressiveness comes to the fore. It sets the cultural norms of objectifying emotional states and their sense in expressive movements, sounds and images. This feature allows us to suppose that the earliest kind of art form is an *expressive gesture* used in personal communication to express one's own mental states. An expressive gesture towards the Other in a situation of communication makes it possible to attribute to it a variety of symbolic forms. In addition, an expressive gesture is inextricably merged with the mental state and relations of a person, which are expressed in it bodily. The artistic image, in this respect, remote from its inner content, only hints at it.

In its function, the artistic image is similar to the *semantic code*, the artistic form of which, however, is simpler, lacking the same unique specificity and richness of the sensual fullness, while also conveying an evaluative attitude to something in a conventional form [2]. The semantic code is the simplest sign-symbolic form, on the one hand, expressing the emotionally-evaluative attitude of a person to something or someone, and on the other hand, objectifying the cultural significance of the object being evaluated. In this regard, it is difficult to attribute to it purely symbolic or purely sign forms. In its "symbolism" it is closest to instrumental and expressive gestures, in its "signism" to words and social gestures. Semantic codes can be represented using words ("good", "hard", "cool", "trash", "sucks", etc.), colors, shapes, sounds, as well as various rating scales that are widely used in psychological tests, etc. This form has been actively studied in psychosemantics and the psychology of subjective semantics [2].

Myth (narrative) is of particular importance to the construction of identity, the I of a person [4; 12; 15]. In this regard, several essential characteristics of myth and narrative should be highlighted.

First, myth is understood as a symbolic form [3; 15; 19]. This means that, on the one hand, myth is material, based on specific facts ("not ideal", "based on specific facts", according to A.F. Losev) [15]. On the other hand, it expresses the agent, his I, his partiality. R. Barthes writes about the value essence of myth [3]. A.F. Losev notes its affective nature, its "vitality" [15]. Myth is a message not about things, but about personalities: "A myth always speaks not about mechanisms, but about organisms, and even more so, about persons, about living beings" [15, p. 424].

At the same time, a myth (narrative) should be distinguished from a symbol in the narrow meaning of the word. A symbol as such is always addressed to the Other, it serves as a form of existence of one personality for another. This is its connecting, communicative function.

A myth is, as it were, self-sufficient, addressed to one agent, and the symbol is "divided into two ones".

Secondly, a myth (narrative) is historical, and it is a personal narrative or the history of a person [4; 15]. A.F. Losev writes: "Myth is a personal being... The image of a personal being, a personal form, the face of a personality" [15, p. 459]. Further, he directly states: "Every living person is one way or another a myth" [15, p. 461]. "A myth is a personal history given in words" [15, p. 535].

R. Barthes emphasizes the idea that a myth is a word, but a special word, which is chosen by history, and its meaning cannot be derived from the "nature of things" [3].

J. Bruner considers the creation of a narrative (which is based on a myth) as the creation of a personal story and the construction of a person's own life [4].

Thus, it can be argued that a myth (narrative) is a special form of a word — the word-narrative, the word-story, the instrumental logic of which differs from the word-concept. Otherwise, a myth (narrative) is a story in which a person is gradually revealed in words that acquire sense only in relation to the story as a whole. We should agree with R. Barthes that a myth is secondary in relation to a single word, the content of which *becomes a form for constructing* a myth [3].

Obviously, one of the most important functions of myth (narrative) is the function of identity construction, self-formation and self-determination [4; 12].

Thirdly, defining myth as a special cultural form requires comparing it with an artistic image. A.F. Losev draws attention to the fact that the similarity between them lies in the detachment from everyday reality, the orientation to the supersensible semantic content [15, p. 422]. R. Barthes writes about alienation and deformation in the myth of one's own objective meaning of things [3].

Differences between an artistic image and a myth, according to A.F. Losev, are seen in the great importance of the external form for the former (a myth can be represented artistically, but not necessarily) and in its metaphorical, allegorical nature [15, p. 429]. A myth is characterized by directness of expression: a myth is "not metaphorical, not allegorical, but a completely independent, authentic reality" [15, p. 426]. Through such an intrinsic synthesis of the form of a myth and its sense, an internal personal dimension and sensual images form, words seem true to us, we believe them. The passion in the myth, its saturation with affectation is connected with the same feature [15].

Fourth, speaking about the relationship between myth and narrative, it should be noted that the former underlies the latter, meaning these two forms are close [4]. However, there are differences between them.

A myth is an intuitive, pre-reflexive cultural form that implies direct perception by the agent of the reality presented in it and belief in its truthfulness [15]. This feature makes it total, universal, manifested in ev-

ery thing and their properties (the mythology of color, sounds, names, etc.). Any thing, action, image, in which the expression of personality is seen, becomes a myth. Similarly, in the body, especially in the face, we see a person's mental states, intentions, and attitudes.

Narrative, unlike myth, is reflexive [4; 12]. According to J. Bruner, it contains an appeal to the consciousness of the character [4]. The appearance in the narrative of an additional dimension of the character's consciousness is not accidental and is associated with the strengthening of the role of the individual in building his story, which is inseparable from his life. This provision can be associated with A. N. Leontiev's idea about the transformation of personality from an object of development into the agent thereof [14]. In this context, the question of the formation of personality appears to be the question of creating a life story [4].

A *symbol*, on the one hand, combines the properties of the above symbolic forms and, in certain cases, may coincide with them. It paradoxically combines inextricably linked spiritual-ideal content with object-sensory content [10; 13; 15; 16; 19]. For example, K.A. Svasyan writes: "A symbol... we can call it an idea visible in a fact" [19, p. 159]. N.V. Kulagina considers the symbol as a mediator of human relations with the world, as a universal means of regulating spiritual-practical experience [13]. Through to the symbol, the agent can discover the sense of a whole being, inexpressible in rational sign forms. The author believes that symbolic formations are charged with unconscious attitudes, a deep-seated personal sense and motives.

On the other hand, the specificity of the symbol per se lies in its "being shared between two" persons. It is not only addressed to the Other as an expressive gesture, but must also be accepted by the Other. A gesture expressing the subjective state of a person remains as such, even if no attention is paid to it. A symbol immediately loses its symbolism if it turns out to be significant only for a single agent. Symbols are always forms of joint awareness. This understanding, by the way, also corresponds to the etymology of the word "symbol", which among the ancient Greeks meant fragments of a plate, shards matching each other, things which, when put together helped people identify each other, finding themselves bound by a union of friendship or any other moral obli-

gations. A symbol is something that connects particular people, forming a single whole, and it connects uniquely. The external form of the symbol is not random or arbitrary, it cannot be mechanically or logically composed of any other parts.

Thus, the symbol per se is the culmination of the development of various symbolic forms, integrating all the diversity of their characteristics². At the same time, it cannot be completely reduced to any of them. A *symbol* can be defined as a form of an agent's personal appeal to the consciousness of the Other, expressing their personal relationship with each other. If the sign expresses the logic and relations of objective reality, then the symbol, due to its antinomy and personification, undermines it and brings the human consciousness into another dimension of reality — the dimension of agent-to-agent links and relations, the dimension of personal being. Through the appeal to the consciousness of the Other, one goes beyond one's own limited vision of the world. We see the main function of the symbol in the self-transcendence of consciousness, in the sequential overcoming of one's own always limited position.

Conclusion

Thus, we propose that the development of consciousness be considered to be the formation of systemic links between its structural components based on the agent's acquisition of the relevant cultural forms and their functions in cooperation with other people. Cultural forms are divided into two types — sign and symbolic. The first reflects and allows a person to realize the agent-to-object relations to the world, and the second — the agent-to-agent relationships. Sign forms include objects-substituents (objective actions), spatial schemes, models, words-concepts, and social gestures. Symbolic forms include bodily practices, expressive gestures, artistic images, myths (narratives), and symbols. There is an ontogenetic sequence in the assimilation of various types of cultural forms, which, however, is difficult to tie closely to specific age periods of development. The typology of cultural forms we have developed can be used to create a holistic concept aiding the practical development of the individual's consciousness within the framework of the cultural-historical psychology.

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² This explains the rather late mastery of this form and its inclusion in communication with other people, which, according to our research, occurs only in late adolescence [16].

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Embodied Cognition in Education: Possibilities and Limitations of Hybrid Representations

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The main purpose of this review is to systematize theoretical and experimental research in one of the areas of the field "Embodied Cognition", aimed at solving applied problems in the field of education, as well as identifying the main opportunities and limitations in using the results obtained. The numerous experimental evidence and new explanatory models that have emerged within the framework of this approach open up a wide range of opportunities for new practices in education. This field offers a whole set of tools that can be used in the pedagogical process in order to increase its purposefulness and effectiveness. We will consider one of the most developed topics – the correlation of abstract concepts in mathematics or disciplines of the natural science spectrum with the specific content of perceptual representations of the student. The approach of embodied cognition allows us to identify the patterns that determine the effectiveness of using various types of visualizations (diagrams, drawings, maps, graphs, diagrams, etc.) in the process of mastering a specific field of knowledge. As a result, the prospects of using the concept of hybrid representations, combining modal perceptual and amodal components, to explain the internal mechanics of the mediation of conceptual thinking are discussed.

Keywords: embodied cognition, learning, cognitive psychology, hybrid representations, grounded cognition, visualization, education.

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Воплощенное познание в образовании: возможности и ограничения гибридных репрезентаций

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Целью данного обзора является систематизация теоретико-экспериментальных исследований в одном из доменов области, именуемой «Воплощенное познание». Все они связаны с решением прикладных задач в области образования, но также направлены и на выявление возможностей и ограничений в использовании предлагаемых методов и полученных результатов. Психологические исследования, обсуждаемые в обзоре, предлагают целый набор инструментов, которые могут быть использованы в учебном процессе с целью повышения его прицельности и эффективности. Мы рассмотрим одну из наиболее разработанных тем — соотнесение абстрактных понятий в математике или дисциплинах естественнонаучного цикла с конкретным содержанием перцептивных репрезентаций обучающегося. Подход «Воплощенное познание» позволяет выявить закономерности, обуславливающие эффективность использования различных типов визуализаций (схем, чертежей, карт, графиков, диаграмм и т. д.), в процессе освоения конкретной области знаний. В качестве итога обсуждаются перспективы использования понятия гибридных репрезентаций, сочетающих в себе модальные (перцептивные) и амодальные компоненты, для объяснения внутренней механики опосредствования понятийного мышления.

Ключевые слова: воплощенное познание, научение, когнитивная психология, гибридные репрезентации, укорененное познание, визуализация, образование.

Финансирование. Статья подготовлена в рамках выполнения научно-исследовательской работы по государственному заданию РАНХиГС.

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Introduction

Currently, there is a large number of theoretical models and empirical facts indicating the important role of the body's sensorimotor activity in the functioning of cognitive processes (for more details, see: [1; 2; 3]). The approach most commonly known as Embodied Cognition has taken its rightful place in the field of fundamental research. Now, its proponents are trying to answer the legitimate question of how to practically apply the results obtained. One of the intriguing areas of application would be education, where problems often arise when students to to master abstract material. This problem is especially common in STEM (Science, technology, engineering, and mathematics) education. It seems likely that the resources provided by the embodied cognition framework are the most efficient and effective for overcoming such difficulties.

Among research in the field of embodied cognition, the most developed framework is “Grounded Cognition”. On the one hand, this is due to the large number of heuristic experimental methods proposed (e.g., the switching cost or feature verification paradigms). On the other hand, it is theoretically the least radical among all the varieties of embodied cognition frameworks, and is much easier to compare with theories and facts derived from more mainstream cognitive research. That is why we will be focusing

mostly on grounded cognition paradigms in this review. The main purpose of this review is to systematize the theoretical and experimental studies in the applied field of STEM-education carried out within this framework, as well as to identify the main limitations and opportunities presented by the results obtained.

One of the most heuristically valuable ideas in the grounded cognition framework regards the fundamental feature of mental representations, that they do not have to be symbolic and amodal. The metaphor of the computer suggests that we receive information through our perceptual system in a modal-specific way (visual, auditory, tactile, etc.) and then translate it into an abstract symbolic amodal format arranged like machine code. One of the founders of the grounded cognition approach, Lawrence Barsalou, pointed out the scarceness of empirical evidence for such a translation. He proposed the alternative scenario that people do not translate one representation into another, but can use modal-specific representations, enacting both perceptual and motor systems, in the process of processing information of any depth and complexity [4]. The computer metaphor does not allow for such a move, considering it meaningless, because the notion that the input and output systems (e.g., keyboard, computer display, etc.) are functionally involved in the operation of the central processor would be absurd. The embodied approach, on the other hand,

attempts to combine these two seemingly irreconcilable positions. Its proponents propose the idea that mental representations are associated with both sensorimotor processes and amodal ones. Thus, such representations are hybrid, that is, they contain both multimodal and abstract symbolic components. This position is based on the following arguments:

1) The classical theories of amodal representationalism assume a rather narrow view of the very nature of mental representations. The research based on such a notion often substitutes “knowing something” as simple verbal “name giving” [5], which is clearly not sufficient.

2) Conceptual representations are limited by context [6; 7; 8], which does not at all correspond to the amodal point of view.

3) The neuronal recycling hypothesis [9] argues that if abstract conceptual representations grounded in perceptual and motor systems, then the answer to the question of how such complex high-level abstract processes (e.g., natural language, mathematics, etc.) could arise and develop in a very short time, relative to an evolutionary timescale.

Hybrid representations offer diverse opportunities for improving the efficiency of the learning process, but they are also associated with significant limitations. We will try to demonstrate these in the material of two rapidly developing areas of research — the understanding of symbolic expressions and of graphs and diagrams.

In both cases, we can find modern research with certain echoes of the cultural-historical theory of Lev Vygotsky. It seems to us that the cited works can be interpreted as quite convincing conceptualizations of the principle of mediation, i.e., the use of diverse cultural means to enhance structurally simpler, and genetically earlier, mental functions [10].

Understanding Symbolic Expressions

The groundedness of abstract mental representations in the perceptual system could be most easily demonstrated within the field of mathematics, the field of knowledge with the most abstract content. As an example, consider how people read and understand symbolic expressions such as algebraic equations. An algebraic equation can describe a huge class of specific situations, so its abstractness is undeniable. Moreover, the meaning of an algebraic equation, of course, does not depend on what color or what font it is printed in. However, the perceptual system makes a significant functional contribution to the understanding of this class of symbolic expressions.

An algebraic equation contains abstract and hierarchically ordered relationships between variables, but the form of the equation is closely related to perceptual

characteristics which can also be represented and affect the way the equation will be understood. For example, the spatial proximity between variables may be related to the order in which arithmetic operations are performed. The order in which arithmetic operations are performed determines their hierarchy (high-level operators are executed before low-level ones). Addition requires the variables and operator to be written in full ($p + q$), while multiplication accepts the shortened version (pq). Both of these examples of mathematical notations do not seem to invoke perceptual elements in the mental representation of an equation, but rather concern certain mathematical conventions. However, this impression is deceptive.

An experiment was conducted on material of spatial proximity, in which the participants were required to evaluate the correctness of the equations presented to them. It turned out that they coped with the task worse if the parameter of spatial proximity between variables was not associated with the order of arithmetic operations [11; 12]. For example, if there is less distance between the numbers to be multiplied than between the numbers to be added, then this makes it easier to assess the correctness of the equation and if the distances are arranged vice versa, it is more difficult. In addition, it was found that if adult participants who have a school-level grasp of algebra were asked to write an equation by hand, they would write variables closer to each other if they were considered a higher operation in terms of the hierarchy or order of operations (for example, multiplication) than variables associated with the operation of a lower hierarchy level (for example, addition) [13]. The researchers assumed that symbols and mathematical operators would automatically activate spatial relationships. As it turned out, the distance to the first character left or right of the equal sign was the maximum [13].

Judging by the available data, the influence of irrelevant visuospatial information only increases with the growth of expertise [14]. In this study, the authors used an online platform to collect data from about 50,000 Dutch schoolchildren who had to evaluate the correctness of the equations. It was found that high school students have a more pronounced relationship between spatial proximity and the order of arithmetic operations: closely spaced variables were interpreted as having priority in terms of the order of operations. This effect is paradoxical, since many researchers of cognitive development have for decades assumed that development proceeds from concrete forms of thinking to more abstract forms. However, the results cited indicate that with increasing expertise, people become more sensitive to the spatial organization of algebraic expressions.

One possible explanation is the mechanism of perceptual learning: the perceptual system can be trained so that the distribution of attention represents a math-

emathical problem in accordance with the decision-making rules. As an example of one of the studies on the role of attention in solving mathematical equations, one can cite a work where the feature verification paradigm was modified on the basis of algebra [15]. Previously, it was found that checking visual features (for example, color) is easier within one visual grouping than when comparing several features [16]. In a study by Margetis et al., equations like “ $a * x + b * y$ ” were presented but the color of two neighboring elements changed from black to blue or red (see Fig. 1)

The participants had to state whether the color of these neighboring variables is the same or different. The elements could refer to one arithmetic operation (it might be worth noting that, according to the rules of arithmetic, multiplication is performed before addition), or the elements could belong to different arithmetic operations. It was assumed that the hierarchical organization of the order of operations in the equation will affect the response time about what color the variables are. In particular, if the variables were connected by a multiplication sign, the reaction time for correct answers should have been faster than for variables connected by addition. And so it happened, but only for the participants with a high level of knowledge in the field of algebra. The results led the authors to the conclusion that the perceptual system plays a functional role in determining the correctness of actions for solving equations, and is not just a channel for obtaining information. In another study, using the method of eye movement registration, it was found that when determining the correctness of an equation, eye movement patterns correspond to the syntactic structure of the equation [17].

Based on the results, the authors proposed a hypothesis of reassembly of perceptual-motor systems known as Rigged Up Perception-Action Systems (RUPAS), designed to explain how people manage to successfully operate complex sign systems without the evolutionarily

developed cognitive structures and mechanisms for this [18]. The general idea here is that initially, operating with sign systems requires a full set of resource-intensive arbitrarily controlled processes, but as learning progresses, they are automated and replaced by more concise perceptual-motor routines.

Based on this hypothesis and the experimental results obtained, the scientific group of Robert Goldstone developed an interactive system, “Graspable Math”, designed for teaching algebra, in which students can actively manipulate mathematical operators in real time [19]. Such an approach fundamentally avoids linking abstract equations with concrete elements like coins, matches, apples, pies, etc. It is assumed that such a system allows us to understand an important thesis: the variables and operators themselves are, in a sense, concrete objects that can be manipulated. Various types of equation transformations are performed by physical actions to change the spatial arrangement of mathematical objects. At the moment, evidence has already been obtained of the effectiveness of teaching algebra using this system [19; 20]. But it is necessary to evaluate the effectiveness of the proposed approach in comparison with the traditional one.

Understanding Graphs and Charts

Another area of application of the ideas of grounded cognition is data visualization. In the natural sciences, quite often, one has to deal with a visual representation of non-obvious abstract patterns. Therefore, in order to be able to optimize graphs and diagrams, to make them as understandable as possible, it is necessary to study which cognitive processes are involved in this task.

One of the research directions in this area is the study of visual routines [21; 22] that are used in the process of reading graphs and which may affect the final interpretation of a particular image. The very fact that these

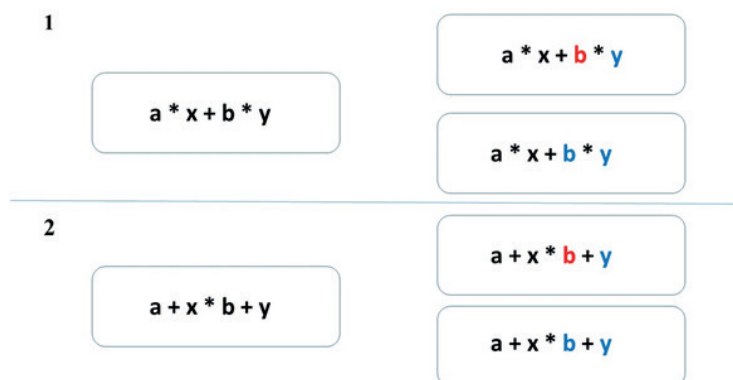


Fig. 1. The example of stimuli for the study of color verification based on the understanding of symbolic expressions (adapted from [17]). (1) Color verification in the condition of the high-level multiplication operator. (2) Color verification in the condition of the low-level addition operator

routines influence the interpretation of a graph already suggests that such representations should be grounded in the perceptual system. In one of the works the authors used the eye-tracking method to determine what exactly happens in the process of understanding histograms [23]. The subjects had to compare the bars of histograms by color or by size. As it was found that when reading this type of graph, people first choose a kind of reference point (in the case of histograms, a specific column in it), with which they compare the rest. It turned out that for histograms of the same color, but different height, such a reference point is most often the highest bar. And if the columns differ in color, but are the same in size, then it is the darkest. However, if the columns differ both in color and size, then the subjects are guided by the attribute that is relevant to the task (that is, how exactly it is worth comparing the columns – by color or by size). Thus, perceptual templates turn out to be task-specific, and if the presented histograms present several options upon which to establish understanding, then the templates contribute to the interpretation by determining the initial reference point. This result is consistent with others obtained in the course of estimating the number of objects on histograms, where the final interpretation of the graph also depended on the selected reference point [24].

A whole series of studies has been devoted to how, when reading color graphs, people match different colors and concepts that define the semantics of the graph [25]. Evidence has been obtained in favor of the fact that histograms reflecting a different number of objects (fruits) are better understood if the color of the bars matches their color [26]. That is, the perceptual characteristics of the graph affect the accuracy of its interpretation. However, as the authors of this study point out, such an effect occurs only if there is a strong association between the color and the semantics of the category displayed on the graph.

Thus, we can conclude that data visualization is more effective the more it follows the principle of isomorphism: the perceptual characteristics of graphs should somehow correspond to the semantics of the displayed categories.

Another direction of research into the groundedness of mental representations in a perceptual system in the field of visualization regards how students generate schemas that visualize the operation of complex systems. In general, it has already been established that if students independently generate some explanations, examples or analogies for the material being studied, then this increases the effectiveness of learning [27; 28]. But how important is the visual format of these explanations and analogies?

There is already evidence that the explanation of educational material accompanied by relevant schemes and

diagrams, is more effective than without [29]. In particular, it has been found that, when reading a text about tectonic plates and asking students to draw a diagram to accompany the text, they perform better on a follow-up test of similar content than students who were asked to write a short summary of the text they have read [30]. Similar results were obtained for a text on the law of conservation of energy, the understanding of which was better when students were asked to draw a diagram rather than write their own text [31].

One possible explanation for the advantage of visualizations over verbal descriptions is the need to translate from one representational format to another. Such a translation can help to find gaps and contradictions in the original ideas, and aid in their subsequent development and refinement [32]. In general, this kind of translation might be helpful due to a deeper processing of information. However, another explanation is also possible, that perceptual and verbal representations correspond with each other and, due to such integration, provide an advantage in learning [33].

However, there is also evidence against the use of visualizations in teaching. In particular, it was found that the very drawing of diagrams to understand a text in physics can lead to specific comprehension errors, when an incorrect spatial arrangement of the components on a diagram leads to additional difficulties in understanding the material being mastered [34]. Yet, the author points out that such errors occur only among beginners who have no experience in using diagrams. Thus, the benefits of visualization in learning are mediated by the amount of experience with using diagrams.

At the same time, a number of studies suggest that spatial abilities can play a role as well. In particular, it was found that people with low levels of such abilities spend more resources on building a visual representation, and people with high levels of spatial abilities willingly spend these resources on matching visual and verbal representations [35]. In addition, people with low spatial abilities demonstrate difficulties in the animation of mechanical systems (they can neither imagine exactly how a particular device works nor answer the corresponding questions) [36]. Besides, it has been found that people with low levels of spatial ability tend to perceive visualizations as static pictures [37], while people with higher levels of spatial ability embed visualizations into more complex mental representations and manipulate them effectively.

Finally, one of the best-known studies has shown that if subjects are asked to explain or draw how a device (a bicycle pump) works, information about the structural components of the pump is more accurately learned and presented in the visualization than in the verbal explanation. No differences were found in responses on the func-

tion and mechanics of this pump [38]. Furthermore, the authors indicated that, according to the results of their study, visualization still helps people with low spatial abilities in learning, which is generally consistent with the empirical evidence already accumulated in this area. Thus, we can conclude that it is worth suggesting a student draw a diagram in the process of mastering abstract material if he or she has sufficiently low spatial abilities, and also if we are talking about the structure, and not about the functions of the phenomenon being studied.

Summing up, we can point to the potential application of using hybrid representations, combining both perceptual components and abstract amodal ones, in an educational context. The very concept of hybrid representations can be a clue to researchers seeking to uncover the mechanisms that underlie the mediation of

conceptual thinking, as well as a point of convergence between modern cognitive research and the cultural-historical approach. In particular, the studies described above can be interpreted as illustrations of how various cultural tools in the form of visualizations (graphs or diagrams), and in the form of a system of mathematical symbols, affect learning processes.

Regarding practical application, the results testify to the perceptual groundedness of abstract representations and can be used in a wide range of educational contexts, ranging from the creation of special software that can suggest to our perceptual system the best ways to assimilate educational material, to local recommendations for working with visualizations and verbal descriptions of complex systems in order to make them more understandable to students.

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Structural Analysis of the Neuropsychological Data for 6–9-year-old Children

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Objective. A system of integral indices was developed for the qualitative and quantitative analysis of the neuropsychological data. These indices comprised the executive functions, the information processing, the functions of activation that regulate tone, waking, and mental states. We aimed to check whether the assignment of the neuropsychological measures to different integral indices was valid with structural equation modeling. **Method.** A total of 471 children aged 6-9 years (older preschoolers and elementary schoolchildren without developmental disorders) participated in the study. All children underwent the neuropsychological examination including both traditional and computerized tests. **Results.** Two factorial models were constructed, wherein the measures of performance in both traditional and computerized tests were the observed variables, and the cognitive functions were the latent factors. Confirmatory factor analysis has shown that the models fit the empirical data well. **Conclusions.** The obtained results indicate that the developed integral indices of various groups of cognitive functions are valid and that the results of traditional and computerized neuropsychological examinations are compatible.

Keywords: neuropsychological examination, elementary schoolchildren, preschoolers, executive functions, auditory information processing, visuospatial information processing.

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Структурный анализ результатов нейропсихологического обследования детей 6—9 лет

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Для реализации качественного и количественного подхода к оценке нейропсихологических данных разработана система интегральных индексов, направленных на оценку функций программирования и контроля, функций переработки информации и регуляции активности. Целью данного исследования является проверка адекватности отнесения показателей выполнения проб нейропсихологического обследования к интегральным индексам с помощью методов структурного моделирования. В исследовании принял участие 471 ребенок 6—9 лет (старшие дошкольники и младшие школьники, без нарушений в развитии). Все дети проходили нейропсихологическое обследование, включающее как традиционные пробы, так и компьютеризированные методики. В результате были построены две факторные модели, в которых экзогенными переменными были показатели выполнения проб — как только традиционных, так и традиционных и компьютерных одновременно; а эндогенными переменными были изучаемые функции. Проведенный конфирматорный факторный анализ показал хорошее соответствие модели эмпирическим данным. Полученные результаты позволяют говорить, во-первых, о правомочности использования созданных нами интегральных показателей для оценки отдельных компонентов высших психических функций, а во-вторых, о совместности результатов традиционного и компьютеризированного нейропсихологического обследования.

Ключевые слова: нейропсихологическое обследование, младшие школьники, дошкольники, управляющие функции, функции переработки слуховой информации, функции переработки зрительно-пространственной информации.

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Introduction

One of the main principles of the Lurian neuropsychology, a part of the cultural-historical psychology [11; 33], is a systemic organization of higher mental functions (HMF). According to this principle, the qualitative analysis of symptoms is essential to distinct between the primary and secondary (systemic) deficits [4, p. 274 and further]. The qualitative analysis has been successfully applied in the studies of adult patients [6; 24]. It is combined with a simple ordinal three-point rating assessment of the symptoms' severity, where 0 indicates the correct performance. However, the examination of cognitive functions in children requires a more detailed quantitative assessment to reflect the dynamics of HMF development. Therefore, a combination of qualitative and quantitative analyses is in demand.

In the modern world literature on neuropsychology, after the dominance of the psychometric, quantitative, approach, there is an increasingly clear trend towards convergence of quantitative and qualitative approaches in recent decades. [19]. The quantitative approach has its pros and cons which are discussed for the neuropsychological examination of both adults [9] and children [2; 12]. The qualitative approach, apart from its obvious advantages, has some limitations. Specifically, it provides a more comprehensive picture of the patient's HMF but complicates the formalization of the results; they are rather a unique expert judgement that is sometimes difficult to compare with others. The understanding of the strengths and weaknesses of these approaches leads researchers to attempts to combine them; such a convergence of methods is seen in child neuropsychology [13; 36]. For instance, different schemes for the quantitative assessment of qualitative neuropsychological examination of adults [3] and children [7; 5; 8] were suggested in Russian neuropsychology. Such work requires the estimates of the qualitative neuropsychological examination to be more strictly formalized, to be converted into scales, and normative data to be accumulated (see the discussion of these issues in [12]).

In this study, we use the results of an extensive neuropsychological examination of preschoolers and elementary schoolchildren. The examination was developed within the framework of the qualitative approach, but the task performance was assessed quantitatively. For example, a number of mistakes at a particular task were calculated or a representation of some special phenomena was accessed. Based on the previous works, we attempt to check whether the integral quantitative indices of diverse cognitive functions are composed correctly using structural equation modelling.

During the development of such indices, it is useful to take into account the experience of the neuropsychological assessment which shows that the precise evaluation of a participant requires not only the general productivity

scores (i.e., a ratio of correct answers to errors) but also the specific errors. A system of the qualitative discrimination between such errors was developed for the neuropsychological examination of 6–9-year-old children [7].

Noteworthy, the way to construct the integral indices which include performance characteristics of different tests is also important. The indices of this type were developed in the latent process analysis [25] within the quantitative approach. Addressing the component composition of executive functions, Miyake and his colleagues noted the task impurity problem. As human activity is complex, there are no tasks that load only a single function. Therefore, to assess a particular cognitive component with more sensitivity it is necessary to sum up some unidirectional measures from several tasks.

An equivalent technique, an addition of performance measures from different tasks to compose the indices, is also applied in the child neuropsychology based on Vygotsky-Luria theory [7]. A system of qualitative and quantitative neuropsychological assessment with the application of indices has been successfully tested in diagnostics and correction of learning disabilities in children [10]. However, the sets of measures that the indices are comprised of having to be also refined statistically. We make such an attempt in this study.

The abovementioned neuropsychological battery for the 6–9-year-old children was applied in our work to assess the HMF. Performance in the battery's tests is assessed in numerous characteristics which are considered by a neuropsychologist in assessing one's cognitive functions and completing of qualitative conclusion. The indices in turn are useful when it is necessary to compare the results of neuropsychological examinations in different samples of children (i.e. groups with different types of disabilities). Akhutina et al. [7] presented the set of integral indices which assessed the components of HMF associated with the three functional brain units, according to Luria. In our study we address the most important ones: (1) executive functions (i.e., programming and control of voluntary activity), related to the third brain unit; (2) two indices for the information processing (auditory verbal and visuospatial information), related to the second brain unit; (3) two indices for the functions of activation (i.e. regulation of tone, waking, and mental states), related to the first brain unit, namely (3a) hyperactivity/impulsivity and (3b) fatigue/slowness of mental activity. From the perspective of cognitive assessment of preschoolers and elementary schoolchildren, such a set of indices seems fairly complete to evaluate the most important components of cognitive functions that are actively developing at this age and are important for effective learning [31; 35].

In addition to the traditionally applied neuropsychological tasks, computerized neuropsychological batteries are being increasingly developed nowadays. The CANTAB is the

most popular among them [21], however, there are a lot of others, for instance, ANAM, ImPACT, CogState, CNS-VS, etc. (see the review [28]). We have designed and used the battery of tests aimed to assess the abovementioned functions [20]. For a more precise and informed application of the computerized assessment it should be compared to the traditional examination, so we attempt to implement this below.

The indices listed above were constructed based on the theoretical analysis and experience of the neuropsychological examination, however, their composition remain to be empirically and statistically verified. Confirmatory factor analysis (CFA) is widely used to test the structure of the neuropsychological batteries [27; 22; 34].

Using the CFA, we are going to test the validity of the indices that characterize different cognitive functions in children and include various measures of performance in the traditional and computerized neuropsychological tasks. We aim to address the following research questions:

Is it possible to verify the indices' composition that was earlier developed based on the theory and practice of the child neuropsychology using the CFA on a large sample of 6–9-year-old children?

Does the combined application of the traditional and computerized neuropsychological tasks increase the accuracy and reliability of the cognitive assessment?

Participants

The study comprised a total of 471 children. Parents of all the children gave informed consent to their participation in the study. The participants had diverse levels of academic performance but no diagnosed disorders of mental development or neurological disorders. Participant distribution by grade, sex, and age was as follows: (1) 139 preschoolers (mean age 6.53 ± 0.61) of whom 63 were female children; (2) 90 first-graders (mean age 7.66 ± 0.42), 56 female children; (3) 145 second-graders (mean age 8.66 ± 0.42), 62 female children; (4) 97 third-graders (mean age 9.64 ± 0.43), 45 female children.

Method

Two groups of tasks were used, namely the traditional tasks for neuropsychological examination adapted for 6–9-year-old children [7] and the computerized diagnostic tests included in the battery for computerized neuropsychological examination [20].

Neuropsychological examination with quantitative assessment

1. *The Go/No-go task* aims to automatize the stereotypical motor reaction to stimuli and then change this

stereotype. The analyzed measures included understanding of the instruction for the second subtest (a novel, conflict program), the total number of errors, and the performance rate.

2. *The Counting task*. In this task we assessed the child's ability to count in the direct order (from 1 to 10), to count back (from 10 to 1), to count selectively (e.g., from 3 to 7 or from 8 to 4), and the total number of errors.

3. *The Verbal Fluency task*. A child was asked to generate as many words as possible (any words, action names, and plant names for the first, second, and third subtests respectively) in one minute. The measures included in our analysis were the productivity (i.e., the number of correct answers) for the first and the third subtests, the number of exact plant names in the second subtest (e.g., a birch, a maple, but not a tree or a flower), and the number of set-loss errors in the second subtest.

4. *The Odd one out task*. Five series of five words each were presented aurally, and a child had to find the odd one and explain his or her choice. We assessed the productivity, the total score accounting for categorical and concrete answers, and the number of inadequate answers.

5. *The Three Positions Test, or "Fist-Edge-Palm"*. A child had to understand and automatize the motor program. A measure of program understanding was included in our analysis.

6. *The Auditory verbal memory task*. The two groups of three words each were presented aurally three times. After presentation of each group, a child had to repeat the words; after the repetition of both groups, the child had to recall them. We assessed the productivity of the first repetition and of the third recall, the number of distortions (changes of two sounds), and extra-list intrusion errors.

7. *The Visual perception task*. A child was asked to recognize items depicted on the superimposed, crossed out, and unfinished images. The total number of verbal errors was analyzed.

8. *The Visuospatial memory task*. Geometric shapes that are hard to describe verbally were presented three times; after each time a child had to draw them by memory. The productivity of the first and the third recall, the number of the right-hemisphere and left-hemisphere errors, and the number of shape transformations to a sign were assessed.

9. *The Finger Position test* included imitation of visually presented finger positions and reproduction of finger poses by proprioceptive memory without visual control. The sum of spatial errors was analyzed.

10. *The Copying of a three-dimensional picture of a house*. Indications of the right-hemisphere (holistic) and the left-hemisphere (analytic) strategies were assessed.

11. Five characteristics related to the functions of activation (as functions of the first brain unit, according to Luria) were evaluated based on the observation during

the entire examination: fatigue, slow cognitive tempo, tendency to perseveration, hyperactivity, and impulsivity (for details see [7, p. 143–147]).

Computerized tests

1. *The “Dots” test* [20]. In this test, a child had to respond to the stimuli of two types, the images of hearts and flowers. They were presented on the left or on the right side of a computer screen. When a child saw the heart, he or she had to press the button on the same side where the stimulus appeared; whereas the flower was presented, the child had to press the button on the opposite side. The task comprised three subtests: (1) a congruent one (only hearts were presented); (2) an incongruent one (only flowers were presented); and (3) a mixed one (hearts and flowers were mixed).

2. *The “Understanding of Similar Sounding Words” test*. A child was presented with a set of ten pictures of distinct objects; each object had a pair whose name differed in one sound (e.g., *koza* and *kosa* — a goat and a scythe). Then sequences of objects’ names were presented aurally, one sequence at a time, with gradual increase in their length. The child had to choose the corresponding pictures on the screen in the same order as heard.

3. *The Corsi Tapping Block test*. Nine cubes presented on the screen, and some of them were highlighted one by one with an increasing sequence length (started from length of 2 elements). A child was asked to reproduce each sequence in the correct order. We analyzed the maximal length of a correctly reproduced sequence and the average time between responses within a sequence.

4. *The computerized version of the “Schulte Tables” in Gorbov’s modification* [20] comprised five tables, each containing black and red numbers from 1 to 10. A child had to search for and indicate the numbers in a particular order. The first two subtests required pointing to the numbers from 1 to 10 colored either in black (the subtest 1) or red (the subtest 2). The instructions in the subtests 3 and 5 were equal except for the descending order of numbers (from 10 to 1). In the most complex subtest 4, a child had to alternate between black and red numbers in the ascending order (i.e., 1 black, 1 red, 2 black, 2 red, etc.).

The number of correct answers and errors as well as the reaction time were registered for each computerized test.

Data Processing

The statistical analysis was carried out in the RStudio environment (version 2021.09.0+351; language version R 4.1.1) with lavaan package, version 0.6–9 [29]. Due to the presence of ordinal measures, we used the method of weighted least squares mean-variance adjust-

ed (WLSMV). As the model comprised measures from the same task, the correlations between them were also included into it. The quality of models was estimated with root mean square error of approximation (RMSEA; the model quality was considered high if RMSEA was less than 0.080), comparative fit index (CFI), and Tucker-Lewis index (TLI; CFI and TLI must be more than 0.900 for a good model [30]).

Results

We constructed two models that clarify whether it is possible to assign particular neuropsychological measures to different groups of cognitive functions. Model 1 comprised only the results of the traditional neuropsychological examination, whereas the measures from the computerized tests were added to Model 2. Five factors corresponding to the following groups of functions were identified in the models: executive functions (EF); functions of auditory verbal information processing (AV); functions of visuospatial information processing (VS); fatigue and slowness of mental activity (FS) related to the concept of sluggish cognitive tempo [15]; and phenomena of hyperactivity/impulsivity (HI) reflecting symptoms of the attention deficit hyperactivity disorder (ADHD).

Model 1 was based on the model described previously in the study by Akhutina and co-authors [7, p. 171–179]. Differences of Model 1 from the original one were as follows: first, characteristics of the functions of activation were divided into two abovementioned symptom groups (i.e., FS and HI), and second, some measures were removed from the integral indices according to the results of a preliminary analysis. Furthermore, the correlations of residuals not explained by the factors for the measures from the same task were added to the model (the same procedure was applied, for instance, in [27]). Table 1 provides the list of measures included into the model.

The model’s quality was fairly high; therefore, it can be considered to fit the empirical data well: $\chi^2(293) = 589.412$, CFI=0.925, TLI=0.910, RMSEA=0.046. Coefficients for each measure included in the model are presented in Table 1. Most latent factors were closely associated with one another; their correlations are given in Table 2.

Then we included measures from the “Dots” test, the “Schulte tables”, the Corsi Tapping Block test, and the “Understanding of Similar Sounding Words” test into the model and constructed Model 2. The complete list of measures is provided in the corresponding column of Table 1. Notably, FS and HI comprised equal set of timing measures, which were included in these factors with different signs as shown in Model 2.

Table 1

**The coefficients of Model 1 (comprising measures of traditional examination only)
and Model 2 (comprising measures of computerized tasks additionally)**

Factor	Measure	Factor loadings (standard errors), significance	
		Model 1	Model 2
EF	Go/No-go: understanding of the instruction for the second subtest	0.578 (0.060)*	0.553 (0.058)*
	Go/No-go: the total number of errors	0.573 (0.027)*	0.576 (0.016)*
	Counting: ability to perform	0.556 (0.032)*	0.530 (0.021)*
	Verbal Fluency: productivity in the third subtest (any words)	-0.489 (0.041)*	-0.544 (0.030)*
	Verbal Fluency: productivity in the first subtest (actions)	0.182 (0.047)*	-0.559 (0.029)*
	Verbal Fluency: the number of set-loss errors in the second subtest (plants)	-0.510 (0.036)*	0.164 (0.047)*
	Odd one out: productivity	-0.443 (0.040)*	-0.532 (0.032)*
	Odd one out: the total score	0.348 (0.040)*	-0.486 (0.035)*
	Odd one out: the number of inadequate answers	0.448 (0.036)*	0.357 (0.027)*
	Three Positions Test ("Fist-Edge-Palm"): program understanding	0.184 (0.043)*	0.399 (0.031)*
	Auditory verbal memory (recall): the number of extra-list intrusion errors	0.118 (0.056), <i>p</i> = 0.037	0.133 (0.041), <i>p</i> = 0.001
	"Dots": productivity (the number of correct responses) in the third (mixed) subtest	-	-0.422 (0.041)*
	Shulte tables: the number of errors in the fourth subtest	-	0.254 (0.042)*
AV	Visual perception: the total number of verbal errors	-0.604 (0.050)*	0.118 (0.054), <i>p</i> = 0.030
	Verbal Fluency: the number of exact plant names in the second subtest	-0.438 (0.051)*	-0.522 (0.041)*
	Auditory verbal memory (repetition): productivity of the first repetition	-0.440 (0.049)*	-0.402 (0.043)*
	Auditory verbal memory (recall): productivity of the third recall	-0.611 (0.047)*	-0.616 (0.041)*
	Auditory verbal memory (recall): the number of distortions	0.212 (0.045)*	0.199 (0.049)*
	"Understanding of Similar Sounding Words": the number of correct answers	-	-0.591 (0.045)*
	"Understanding of Similar Sounding Words": proportion of substitutions by similar sounding words	-	0.345 (0.048)*
VS	Visuospatial memory: the number of right-hemisphere errors	0.354 (0.048)*	0.287 (0.036)*
	Visuospatial memory: productivity of the first recall	-0.459 (0.047)*	-0.400 (0.033)*
	Visuospatial memory: productivity of the third recall	-0.557 (0.041)*	-0.500 (0.034)*
	Copying of a three-dimensional picture of a house: indications of the left-hemisphere (analytic) strategy	0.674 (0.037)*	0.630 (0.034)*
	Copying of a three-dimensional picture of a house: indications of the right-hemisphere (holistic) strategy	0.741 (0.035)*	0.633 (0.017)*
	Corsi Tapping Block test: the maximal length of a correctly reproduced sequence	-	-0.505 (0.034)*
	Shulte tables: the average response time in the fourth subtest	-	0.746 (0.018)*
	FS	Fatigue	0.799 (0.043)*
Cognitive tempo		0.554 (0.039)*	0.473 (0.034)*
Inertia		0.764 (0.044)*	0.604 (0.039)*
Go/No-go: performance rate		0.570 (0.069)*	0.487 (0.053)*
Shulte tables: the average response time in the first subtest		-	1.070 (0.095)*
"Dots": the average time of correct response in the first subtest (hearts)		-	0.601 (0.073)*
Corsi Tapping Block test: the average time between responses within a sequence		-	0.495 (0.063)*
HI	Impulsivity	0.798 (0.065)*	0.719 (0.049)*
	Hyperactivity	0.928 (0.072)*	0.890 (0.060)*
	Shulte tables: the average response time in the first subtest	-	-0.938 (0.095)*
	"Dots": the average time of correct response in the first subtest (hearts)	-	-0.599 (0.078)*
	Corsi Tapping Block test: the average time between responses within a sequence	-	-0.426 (0.067)*

**p*<0.001

The quality of Model 2 (wherein the measures of computerized tests were additionally included), compared to Model 1, remained sufficient: $2(560) = 1183.845$, CFI=0.917, TLI=0.907, RMSEA=0.049. The associations between measures from the same task remained almost unchanged. The most pronounced change in the correlations between the latent factors was between FS and HI (0.693; $p < 0.001$). The correlation between VS and HI became non-significant. The rest of the correlations remained significant and did not change substantially (see Table 2).

Table 2
**Correlation coefficients between the factors
 in Models 1 and 2**

Factor	Factor	Model 1	Model 2
EF	AV	0.800*	0.800*
	VS	0.842*	0.930*
	FS	0.660*	0.793*
	HI	0.318*	0.232*
AV	VS	0.707*	0.749*
	FS	0.536*	0.470*
	HI	-0.043 ($p=0.584$)	0.099 ($p=0.172$)
VS	FS	0.534*	0.599*
	HI	0.212 ($p=0.002$)	0.002 ($p=0.969$)
FS	HI	0.299*	0.693*

* $p < 0.001$

Discussion

The obtained results allowed us to verify and optimize the set of integral indices and their composition which had been previously developed based on the neuropsychological theory and practice. The construction of initial model with the traditional composition of indices [7, p. 171–187] allows to identify the uninformative measures reflecting productivity with the ceiling effect or infrequent specific errors. Their removal from Model 1 improved its quality. In this model, the measures related to the functions of activation were divided into two separate indices, while the timing measures were included in both of them with different signs. This finding confirmed the validity of separation between these indices. Notably, the presence of two indices for the functions of the first brain unit further improved the model's quality. The measures from the computerized tests were added to Model 2. We suggest that its sufficient quality reflects the possibility and feasibility to combine the traditional and computerized data. In general, these results demonstrate that the CFA is useful to evaluate the validity of sets of such indices and their composite measures.

Our results seem prominent from several perspectives. First, they indicate that the chosen sets of cog-

nitive measures can be consolidated into the integral indices related to essential cognitive functions in older preschoolers and elementary schoolchildren. The proposed structure of these indices is consistent with the empirical data obtained from the neuropsychological examination. Second, the sufficient model quality after the addition of measures from the computerized tests means that the results of traditional and computerized neuropsychological assessments are complementary and can be used in combination.

It should be noted that the measures traditionally associated with the neurodynamic aspect of cognition were divided into two factors, namely fatigue and slowness of mental activity (FS) and hyperactivity/impulsivity (HI). Importantly, the same timing measures included in both factors had factor loadings with opposite signs which point to the relevance of these factors to behavior phenomena of sluggish cognitive tempo and impulsivity. The groups of children with predominance of one of these symptoms were previously described on the basis of neuropsychological assessment which also illustrates the necessity of their separation [1]. Beyond ADHD, the concept of sluggish cognitive tempo is considered in literature [15]. These symptom complexes have the intersection points which are explained by deficits in both neurodynamic and executive aspects of cognition in the Russian neuropsychology. There is evidence on the associations between the sluggish cognitive tempo and ADHD, especially regarding the phenomena of poor attention in ADHD [14; 18]. Furthermore, there are reports on higher associations of other cognitive functions with the sluggish cognitive tempo than with ADHD [16; 18; 23; 32] which is consistent with the results of our study.

The associations between the factors within the models should be also discussed. The smallest correlations were found between all factors and HI. The rest of the correlation coefficients in Model 1 were more than 0.5. When measures from the computerized tests were added, the correlations between the factors, except for HI, mainly increased (except for the decrease of correlation between AV and FS in 0.6). The correlation between HI and all other factors, except for FS, decreased or remained close to zero. At the same time, the correlation between HI and FS increased substantially which might be related to the technical reasons as three equal variables were added to both factors. Associations between the factors identified on the basis of psychological assessment are frequently reported to be high, varying between 0.4 and 0.9 [17; 25; 26]. The CFA differentiates between factors and also accounts for the correlations between them. The correlations between the latent factors revealed in our study were expectable as the underlying cognitive functions are not independent in the real activity, which is in

line with the idea of the systemic structure of HMF in the Vygotsky-Luria neuropsychology.

Conclusions

We have constructed the structural models of relations between the neuropsychological measures and factors corresponding to the different groups of cognitive functions (i.e., HMF components). The CFA carried out on the sample of 6-9-year-old children demonstrated that the suggested structural models fit the empirical data well. Therefore, we can conclude that the structural validity of the proposed set of integral indices (EF; VS; AV; and two indices for the regulation of tone, waking, and

mental states, namely FS and HI) is fairly high. According to our results, the structural model involving measures of the traditional face-to-face neuropsychological examination of children may be complemented with the data derived from computerized tests. This finding indicates the consistency of the data obtained with these different methods and the possibility of their combined application to improve the reliability of cognitive assessment in older preschoolers and elementary schoolchildren.

In conclusion, it is important to emphasize that the qualitative approach to the neuropsychological examination may be integrated with statistically verifiable quantitative assessment, highlighting the high explanatory power of the Lurian neuropsychology based on the principles of cultural-historical psychology.

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Neuropsychological and Electrophysiological Profiles in Adolescents with ADHD: a Qualitative Approach

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Previous studies report the absence of a single pattern of attention-deficit, as isolated clinical picture, according to neuropsychological and electrophysiological characteristics during ontogeny. The aim of this study was to use qualitative approach of cultural historical neuropsychology introduced by A.R. Luria to detect the neuropsychological functional factors which underline the cases of attention deficit and hyperactivity disorder in adolescence. The study included 20 adolescents, 10 with ADHD, and 10 control subjects. The method of analysis of neuropsychological syndrome was used to identify the functional state of neuropsychological brain factors according to the results of neuropsychological qualitative assessment. The electroencephalogram method was also applied, using a visual qualitative study to evaluate the functional level of cortical and subcortical brain structures. The results obtained using qualitative analysis of the data confirm the presence of different clinical pictures in adolescents with ADHD from neuropsychological and electrophysiological level of analysis. There is no any kind of unique isolated patterns, but rather, diffuse and more global participation of subcortical regulation of different levels. The results show that ADHD is not a single clinical picture as several neuropsychological profiles were detected. Qualitative analysis of syndromes, according to cultural historical approach, suggest the necessity of an individual approach for the precision of brain functional mechanisms (or neuropsychological factors) in each concrete case.

Keywords: ADHD, clinical neuropsychological assessment, EEG analysis, neuropsychological profile, Luria's approach.

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Нейропсихологические и электрофизиологические профили у подростков с СДВГ: качественный подход

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Последние исследования нейропсихологических и электрофизиологических характеристик в онтогенезе показывают, что, по всей видимости, не существует одного-единственного паттерна дефицита внимания в изолированном виде. В настоящей работе мы применили качественный подход культурно-исторической нейропсихологии, разработанный А.Р. Лурия, чтобы определить функциональные факторы, лежащие в основе синдрома дефицита внимания и гиперактивности в подростковом возрасте. В исследовании приняли участие 20 подростков: 10 испытуемых с СДВГ и 10 испытуемых в контрольной группе. Мы использовали метод анализа нейропсихологического синдрома для определения функционального состояния нейропсихологических факторов мозга в соответствии с результатами нейропсихологической и электрофизиологической качественной диагностики. Мы также использовали метод электроэнцефалографии в сочетании с визуальными методами, чтобы оценить функциональное состояние кортикальных и субкортикальных мозговых структур. Результаты проведенного качественного анализа данных подтверждают существование очень разных клинических картин у подростков с СДВГ с точки зрения нейропсихологических и электрофизиологических характеристик. Похоже, имеет место не какой-то уникальный, отдельно взятый паттерн, а скорее диффузное участие субкортикальной регуляции на разных уровнях. Таким образом, СДВГ представляет собой не единую клиническую картину, а целый ряд нейропсихологических профилей. Качественный анализ синдромов с точки зрения культурно-исторического подхода подсказывает, что необходима разработка индивидуального подхода к определению функциональных механизмов мозга в каждом конкретном случае.

Ключевые слова: СДВГ, клиническое нейропсихологическое диагностика, ЭЭГ, нейропсихологический профиль, Лурия.

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Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most common behavioral disorders that are diagnosed at different stages of human ontogenesis. The estimated worldwide prevalence of ADHD is 7.2% [38]. The interest in understanding the causes and mechanisms of this clinical entity is increasing due to its important relationship with school academic performance [28]. Clinical reports and descriptions of ADHD cases have focused on the child population [5]. Some authors claim that the disorder also might depend on psychological and social factors, such as family situation, the child, and the school's teaching methods [8].

In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [1] the biomedical paradigm is strengthened by a change of emphasis on preventive psychiatry. The current aim of psychiatric nosology is the early identification of the psychopathology, in order to prescribe adequate interventions before the establishment of possible mental health problems, by introducing new diagnoses and lowering existing thresholds [12]. Some authors found that ADHD is a psychiatric diagnostic entity, as a historical, cultural, and political category that fulfills certain functions [12] as opposed to a simple neurobiological category. Nevertheless, in the clinical practice of most countries, the diagnosis of ADHD is used as an independent nosological entity, which causes ambiguity in terms of understanding its causes and the possibility of treatment.

However, there are no measurable biomarkers or objective tests to establish the presence or absence of ADHD as a natural disorder from the early stages of an individual's development [39]. This position is supported by a meta-analysis, which found that ADHD lacks a specific etiology and there are no unique characteristics or laboratory indices to support its diagnosis. In addition, this category is based on the history of the syndrome itself, as well as observing and describing specific behaviors and symptoms [40].

The specific medical treatment for ADHD and its effects on children is another point of discussion in the literature. The most common treatment consists of administering psychostimulants. The effect of such treatment, considering the diversity of possible causes and absence of homogeneity, are debatable. In a recent study a group of adolescents with ADHD demonstrated poor therapeutic adherence and an indifferent attitude towards medication. However, the authors report that drugs can be useful in optimizing treatment and reducing external symptoms [11].

The previous research indicates that children and adolescents with different clinical characteristics can fall under a single diagnosis and receive the same pharmacological treatment without sufficient justification. The same behavioral symptoms might be caused by a wide range of cerebral, physiological, and social reasons. For this reason, equating children from a neuropsychological and neurophysiological standpoint according to the data from the interviews based on the DSM-5 diagnostic checklist does not seem to be ideal for establishing diagnoses and treatments [37].

This position is supported by electroencephalographic studies demonstrating that abnormal brain electrical activity in subjects with ADHD may be associated with deficit of functioning of different subcortical brain systems that support information processing and executive control processes [23]. Different disciplines and approaches may propose their own strategies for analysis of brain mechanisms, which underline the symptoms described in cases of attention deficit.

One of such approaches is cognitive-quantitative neuropsychology. From this perspective, the authors consider that ADHD occurs due to developmental failure of the brain circuits responsible for inhibition of attention and behavioral and emotional self-regulation [3;4], as well as due to impaired executive functions and working memory [9].

Quantitative neuropsychology focuses primarily on psychometric techniques applied to diagnostic problems, to the detriment of systematic attempts to construct a working theory of the functional organization of the brain in relation to the psychological processes [19]. In this case, ADHD might be associated with deficits in different cognitive domains based on mistakes during the performance of subjects in psychometric tests.

Another approach is qualitative neuropsychology, proposed by Vigotsky, Luria and cultural-historical approach [15; 16; 17]. This approach considers the possibility of generalizing clinical pictures not by behavioral traits, but by the type of brain functional mechanisms (or neuropsychological factors) that underline different cognitive tasks [38]. This provides a new understanding of the neuropsychological syndrome, which means the identification of common features in mistakes and the process of performance in different tasks. Such a procedure is called the psychological qualification of the deficit and allows one to find a common factor, which underlines disturbances in different functions [18; 24].

The neuropsychological factor is a specific term used only within the cultural-historical approach might be understood as a brain functional mechanism of the brain functional system. Such an approach makes it possible

to establish different levels of analysis during the neuropsychological assessment. These levels are (i) brain level, related to the functioning of specific brain mechanisms, and (ii) psychological level, related to the psychological phenomena produced by the functioning of this mechanism [24]. Functional brain mechanisms are organized into complex functional blocks of complex cortical-subcortical relationships [2; 16; 17]. These relations are flexible, dynamic, and changeable during different periods of ontogenetic development according to types of cultural activity [36].

According to Luria's approach, the neuropsychological investigation is based on the assumption that each psychological action is represented in the brain as a complex flexible functional system that reflects the joint functioning of groups and levels of brain zones. Each brain area has its own highly specific work, which plays the necessary role in effectively performing complex psychological activities. In case of disturbances in any brain area, the whole functional system would suffer; this suffering would be different according to each precise level of involved neuropsychological factors [18].

Syndromic or dynamic neuropsychological analysis has three main advantages: 1) it contributes to a greater diagnostic accuracy in terms of brain functionality, 2) allows differentiating between conditions that may be externally similar, but internally different, and 3) provides the methodological bases to create corrective methods and work pathways [15].

Brain functional mechanisms, detected during qualitative assessment of school children with diagnosis of attention deficit disorder in Mexico, were studied in previous studies. Qualitative neuropsychological assessment was applied to pupils between 7 and 9 years ($n=20$) and 9 to 12 years ($n=14$). Qualitative syndromic analysis of younger pupils of primary school established four neuropsychological profiles according to specific types of functional deficits, which were: 1) deficit of voluntary regulation and control, 2) low level of nonspecific brain activation, 3) deficit of spatial analysis and synthesis and 4) deficit of sequential organization of movements and actions. In older pupils, combined profiles of deficits in regulation and control and spatial analysis and synthesis were also observed, as a combination of profiles 1 and 3. Visual qualitative analysis of EEG, in each particular type of neuropsychological profile, was related to specific EEG abnormal patterns. These patterns reflected immaturity and/or suboptimal functioning of cortico-subcortical regulatory systems of the brain [32; 35]. These data underscore the absence of a single neuropsychological profile and electrophysiological pattern that underlie the attention deficit syndrome throughout the school-age years.

Adolescence is a period with less systematization of ADHD clinical data (deficit of brain functional mechanism) and treatment recommendations; however, this population also attracts the interest of investigators [6; 13; 22]. The aim of this study was to describe the neuropsychological profiles and electrophysiological patterns that underline ADHD in early adolescence, according to methodology of qualitative neuropsychological assessment, proposed by the cultural-historical approach.

Research program

Participants

The sample consisted of 20 Mexican teenagers, enrolled in a public secondary school, divided into two groups: 10 control and 10 experimental subjects (diagnosed with ADHD). Both groups exhibited similar sociodemographic characteristics, in terms of sex, age and educational level.

The inclusion criteria for the experimental group were the following: 1) the age between 12 and 15 years, 2) being a student enrolled in a public urban secondary school, 3) being previously diagnosed with attention deficit disorder with or without hyperactivity (ADD or ADHD), determined independently by a neuropediatrician, child and adolescent psychiatrist, neurologist or school psychologist, according to DMS-IV or DMS-5 criteria, and 4) exhibiting symptoms 6 months before assessment that manifested themselves in at least two environments (school, family, etc.).

The main reasons for medical and/or psychological consultation were learning problems and poor academic performance. Moreover, at the initial interview, the parents of adolescents with ADHD reported that professional care was not entirely efficient, including the pedagogical and medical strategies they had previously experienced.

As for the control group, the inclusion criteria were the following: 1) the age between 12 and 15 years, 2) being a student enrolled in the same public urban secondary school as experimental subjects, 3) absence of diagnoses of attention deficit disorder or any other neurological or psychiatric diagnosis.

All adolescents of both groups participated in the study according to the Declaration of Helsinki. Their participation was voluntary; written informed consent was obtained from the families and teachers for neuropsychological and EEG assessments. The study was approved by the local research ethics committee.

Instruments

During the study, all participants were submitted to the following procedures: a semi-structured clinical interview, qualitative neuropsychological assessment, and EEG recording. For the semi-structured interview, a flexible format was used to obtain information on the perinatal and postnatal ontogenetic development of each participant, in order to rule out alternative medical conditions other than attention deficit.

Qualitative neuropsychological assessment

Clinical neuropsychological assessment was conducted by evaluating the neuropsychological factors using tests designed for this purpose. The Brief Neuropsychological Assessment of Adults [29] represents a sensitive exploration of neuropsychological factors described in Table 1. This assessment involves different task modalities: tactile-motor, visual, verbal, and graphic (guided and independent drawing). Additionally, oral word association and oral conflict tests were used as a part of the Brief-Puebla Neuropsychological Assessment

of Children protocol / ENIB-Puebla [33]. The aim of this test is to assess regulation and control in completing a motor program with verbal instructions. Table 1 represents the relation between the tasks of the protocol of neuropsychological assessment and neuropsychological factors with its specific function in psychological tasks.

Syndromic analysis

After the neuropsychological assessment, all executions were submitted to syndromic analysis, which means analysis of different mistakes and behavior of participants during the performance in the proposed tasks. A large number of symptoms should be reduced to a common reason of deficit of a specific brain mechanism or factor. This method can only be used in its entirety for qualitative analysis of the symptoms of each particular subject in order to find the factor underlying the difficulties and relate it to specific brain level [18]. In each adolescent, the answers obtained in the entire neuropsychological assessment protocol were analyzed in order to identify the neuropsychological profile underlying each clinical picture.

Electroencephalogram (EEG)

The NicView System (Nicolet Biomedical Inc.) was used for EEG recording, with sampling frequencies of 250 Hz and 19 electrodes placed according to the international 10-20 system: O1, O2; P3, P4; C3, C4; T3, T4; T5, T6; F1, F2; F3, F4; F7, F8; Pz; Cz and Fz. The recording was made in a waking state and the following maneuvers performed: a) opening and closing the eyes, b) Rhythmic photo stimulation at frequencies from 8 to 12 Hz in 1-Hz steps. The duration of the period of light stimulation and the interval between stimuli were equal and amounted to 10 s c) hyperventilation (90 seconds).

Monopolar and bipolar montages were used for each recording. Monopolar montage makes it possible to assess the bilaterally synchronous EEG patterns, which reflect the suboptimal functioning of different deep brain regulatory structures. On the contrary, bipolar montage evaluates the functional states of different brain cortical areas [20;35]. EEG recording was applied to 10 adolescents from experimental and 5 from the control group.

Table 1

Structure of the qualitative neuropsychological assessment protocol

Neuropsychological factor or brain functional mechanisms	Function	Tasks for assessment
Brain non-specific activation	Level of general brain tonus needed for the normal working of the cerebral cortex and stability of task execution	– Level of stability observed throughout the subject's execution of the assessment protocol
Phonematic integration	Differentiation of verbal sounds according to phonemic contrast in words with different meaning in each concrete language	– Repetition of phonologically opposite pairs of words and syllables – Identification of specific phonemes – Identification of sounds (first and second) in words
Kinesthetic-tactile analysis and synthesis	Fine tactile sensitivity as well as proprioceptive precision of postures and poses; articulation of oral speech by differentiation of verbal sounds according to the mode and location of motor production	– Reproduction and retention of finger positions with closed and opened eyes. – Reproduction of phonoarticulatory poses (inflating cheeks, blowing, tongue movements) – Repetition of syllables and sounds with articulatory close sounds
Audio-verbal retention	Ensures the stability of memory traces (volume of perception) in the audio-verbal modality	– Reproduction, simple recall and recall after heterogeneous interference of series of words
Visual retention	Ensures the stability of memory traces (volume of perception) in the visual modality	– Reproduction, simple recall and recall after heterogeneous interference of series of meaningless figures
Spatial integration	Guarantees the perception and adequate production of essential features and their location, metric aspects, and the spatial relationships between the elements of the situation.	– Understanding of instructions related to orientation in the body scheme – Understanding of complex logical-grammatical sentences – Perception of numbers and letters – Copy of a complex model (house with perspective) – Free drawing of animals
Sequential organization of movements and actions	Guarantees fluent transition from one movement to another, inhibits the anterior motor link for flexible passage to the posterior motor link	– Sequence of hand movements (execution with / without language) – Copy of a graphic sequence with changing graphic patterns
Regulation, programming and control of voluntary actions	Ensures task execution according to the objective (the instruction or the rule), the established program and its final verification	– Observation of subject's performance – Oral word association test – Oral conflict test

Visual qualitative analysis of EEG

The adolescents' brain electrical activity was analyzed using visual qualitative analysis of different abnormal EEG pattern identified in clinical EEG studies [10]. The original scheme was applied for qualitative analysis of EEG, assessing the EEG parameters grouped into four blocks in relation to the systemic organization of the brain [20]. Table 2 shows EEG parameters for each functional block, variables, which might be detected on EEG for each parameter and the function of variables.

Source: Adapted from [31] and [22].

These parameters make it possible to assess the functional state of the cerebral cortex and its relationship with age, diffuse brain electrical activity changes, functional state of the different cortical areas of each hemisphere, and subcortical regulatory systems [31].

Procedures

The initial interview was administered to the participants' caregivers in an individual session lasting approximately 1 hour. The same neuropsychological assessment was applied to all adolescents at the Neuropsychology Service of the University Hospital of Puebla, Mexico. The sessions were held individually and lasted 90 minutes. Later, adolescents with ADHD and 5 participants of the control group were submitted to EEG recording at the Neuropsychology and Psychopedagogy Institute of Puebla, Mexico.

Data analysis

The qualitative analysis consisted of identifying the conserved and altered neuropsychological factor in each adolescent based on typical errors. In addition, the visual qualitative EEG parameters were analyzed in each recording (Table 2), forming the electroencephalographic results of the study. Next, certain group trends were established based on neuropsychological performance and EEG profiles.

Results

The results of neuropsychological assessment and syndromic analysis method made it possible to identify types of errors for the 10 adolescents from the ADHD group in order to organize neuropsychological profiles. Table 3 shows three profiles found in the study according to the analysis of errors: 1) errors related to brain non-specific activation or arousal level; 2) errors related to kinesthetic analysis and synthesis; 3) error related to regulation, programming, and control of voluntary activity.

The results of the study show differences in tasks performance among adolescents with ADHD. The mistakes were related to the functional state of different brain mechanisms. The incidence of these types of errors in each case allowed to establish clinical neuropsychological profiles. Each profile corresponded to the typical difficulties and errors found during the neuropsychological assessment.

Thus, the following profiles of adolescents with ADHD were formed: 1) with the deficit of regulation and control of activity [n=5], 2) with the deficit of regulation and control and with reduced brain arousal level [n=3], 3) with the deficit of regulation and control and with deficit of kinesthetic analysis and synthesis [n=1], 4) absence of neuropsychological profile [n=1]. One adolescent from the ADHD group did not demonstrate any cognitive or regulatory difficulties during neuropsychological examination [absence of neuropsychological profile, n=1].

According to the results of the assessment of adolescents of both experimental and control groups, optimal performance was found for the following neuropsychological factors: phonematic integration, audio-verbal retention, visual retention, spatial integration, and sequential organization of movements and actions.

As expected, the control group exhibited no systematic errors related to the functioning of neuropsychological

Table 2

Parameters for visual qualitative analysis of the EEG

Parameters	Variables	Functions
(1) Functional state of the cortical rhythmogenic mechanisms	<ul style="list-style-type: none"> – Characteristics of the alpha rhythm: regularity, topography, frequency range, amplitude, alpha rhythm asymmetries. – Reaction to the functional probes (opening and closing of eyes, rhythmic photo stimulation and hyperventilation) 	<ul style="list-style-type: none"> – Level of cortex excitability. – Manifestation correspondence with the relevant age norm
(2) General and diffuse changes of the brain functional state	<ul style="list-style-type: none"> – Diffuse sharp waves of different frequency ranges (alpha, theta, delta, beta) without particular location 	<ul style="list-style-type: none"> – Manifestation of diffuse changes of the brain activity (Slight/ pronounced changes)
(3) Local changes of the brain cortex activity	Type, topography, asymmetries of local deviated electrical activity (LDEA), its reactions to functional probes	<ul style="list-style-type: none"> – LDEA location – LDEA origin (cortical or subcortical) – LDEA character (functional, paroxysmal, pathological) – LDEA manifestation.
(4) The condition of the deep brainstem and subcortical structures.	<ul style="list-style-type: none"> – Type, topography, asymmetries of generalized or bilateral synchronized deviated electrical activity (BSDEA). – BSDEA reactions to functional probes 	<ul style="list-style-type: none"> – Deep structure level that produces changes in the EEG: caudal brain stem, mesencephalic, limbic, diencephalic (hypothalamic), frontal-thalamic, fronto-basal. – Character of EEG changes (functional, paroxysmal, pathological)

Table 3

Types of errors in adolescents with ADHD observed in the neuropsychological assessment tasks and their relationship with a specific neuropsychological factor

Errors related to reduced arousal level	Errors related to the deficit of kinesthetic analysis and synthesis	Errors related to the deficit of regulation and control of activity
<ul style="list-style-type: none"> – Slow execution of motor and verbal tasks – Latency in verbal tasks – Micrography in graphic tasks – Fluctuations in the graphic task trace – Loss of horizontality in graphic tasks 	<ul style="list-style-type: none"> – Incorrect articulatory movements (especially in precise tongue movements) – Inability to reproduce positions with the fingers – Sound distortion and substitution (dentoalveolar: /d/, /t/, /r/, /l/) in verbal tasks – Phonetic/phonological substitution of sounds in all verbal tasks 	<ul style="list-style-type: none"> – Simplifications (graphic / motor) – Disorganization of execution in graphic, verbal and motor tasks – Loss of objective in graphic and motor tasks – Impulsiveness and anticipation of graphic and motor task activities – Loss of information (without losing the objective) in verbal memory tasks – Problems in controlling/verifying graphic and verbal tasks – Semantic substitutions (determined by the phonological context) in verbal tasks – Partial loss of baseline in graphic tasks – Intrusion of elements in graphic and verbal tasks

logical factors, that is, optimal performance in the proposed tasks during the assessment. The errors observed had no systemic effect, since they were sporadic and not repeated in the tasks of different verbal, graphic, and motor tasks.

Physiological study results (EEG)

According to the scheme of EEG structural analysis (Table 2), various electroencephalographic phenomenon, such as rhythmic oscillations of a certain frequency or individual deviating patterns, depending on their regularity, shape and topography belong to four functional classes that characterize the condition of the cerebral cortex and deep regulatory structures of the brain. Considering the objectives of the present study, we describe the EEG patterns of the experimental group compared to the control group together with the relation of these patterns to the results of neuropsychological assessment.

Analysis of EEG data of 5 adolescents of the control group found out a modulated alpha rhythm of approximately 11Hz, mean amplitude of 60-110µV, and occipito-parietal topography with right posterior temporal extension, which corresponded to the age norm. The EEG showed absence of functional changes of local, diffuse, bilateral, and/or generalized character.

The EEG data of adolescents of the experimental group showed a background rhythm compatible with the age (compared with EEG data of the control group), that is, all participants of both groups exhibited an optimal cortical rhythmogenesis and excitability level, according to the first parameter of qualitative analysis. No difference according to the second parameter (general and diffuse changes) was found between the subjects from the control and experimental group.

The differences between the participants of experimental groups and the control group were found for to the third type of EEG patterns related to local changes of the brain cortex activity and also for the fourth type related to the functional state of the deep brain regulatory structures.

Most of the deviated EEG patterns, observed in our study were related to suboptimal functioning of the brain subcortical or cortico-subcortical regulatory system (the fourth type of EEG changes according the structural EEG analysis). The EEG changes of different frequency, waveform and topography were attributed to the suboptimal condition of the different brain deep structures. The characters of these patterns and their associations with the brain structures are shown in Table 4 (for more information see [23]).

Table 4

EEG patterns reflecting suboptimal functioning of the deep brain structures

Brain structures	EEG pattern
Basal ganglia	Bilateral synchronous bursts of the spindle-like β-activity (20–30 Hz) in the frontal, central, and/or anterior temporal leads
Hypothalamus	Generalized bilaterally synchronous oscillations of different frequencies, sometimes including sharp monophasic and/or biphasic spikes, alpha or beta-spindles
Limbic	Bilaterally synchronous spindle-like oscillations of 6–10 Hz (low alpha range) in the frontal and/or fronto-temporal leads
Fronto-thalamic	Bilaterally synchronous groups of theta waves (4–6 Hz) in the only frontal or in the frontal and central leads
Mesencephalic	Bilaterally synchronous groups of theta waves in the posterior and central leads
Brainstem	Generalized bilaterally synchronous groups of theta waves
Reticular formation of caudal brainstem	Hypersynchronous alpha or theta oscillation in the occipital and parietal leads

Some examples of bilaterally synchronous patterns of various origins are shown in Figures 1 and 2.

The table 5 shows the results of neuropsychological assessment resumed in profiles and their relation to individual's EEG features.

It is important to underscore that the adolescents from the experimental group exhibited some similar and some different characteristics in both neuropsychological assessment and EEG analysis, that is, no single EEG pattern could be identified in adolescents from the ADHD group. With respect to the neuropsychological clinical profiles, it was also impossible to find a single

correlation, however, certain regularities were observed. The majority of adolescents have shown difficulties with regulation, programming and control as unique characters or together with reduced level of general brain activation or difficulties of kinesthetic analysis and synthesis. Nearly all adolescents from experimental group have shown EEG patterns of suboptimal condition of hypothalamic structures, but always in combination with other deviated EEG patterns. Changes of hypothalamic genesis are rather frequently seen at adolescents' EEG [22] and associated with the activation of hypothalamopituitary system of hormonal regulation during puberty.

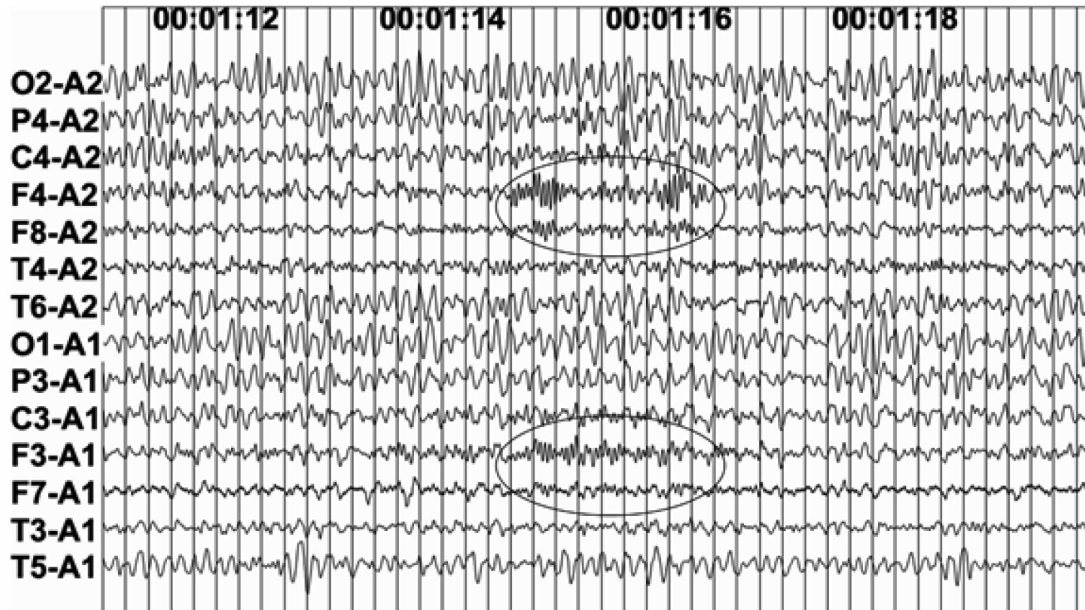


Fig. 1. An EEG segment shows bilaterally synchronous beta – spindles (β) in frontal (F3, F4) and inferior frontal (F7, F8) leads. The EEG pattern of suboptimal functioning of fronto-basal structures shown for the case 3 with ADHD (neuropsychological profile # 1: deficit of regulation and control)

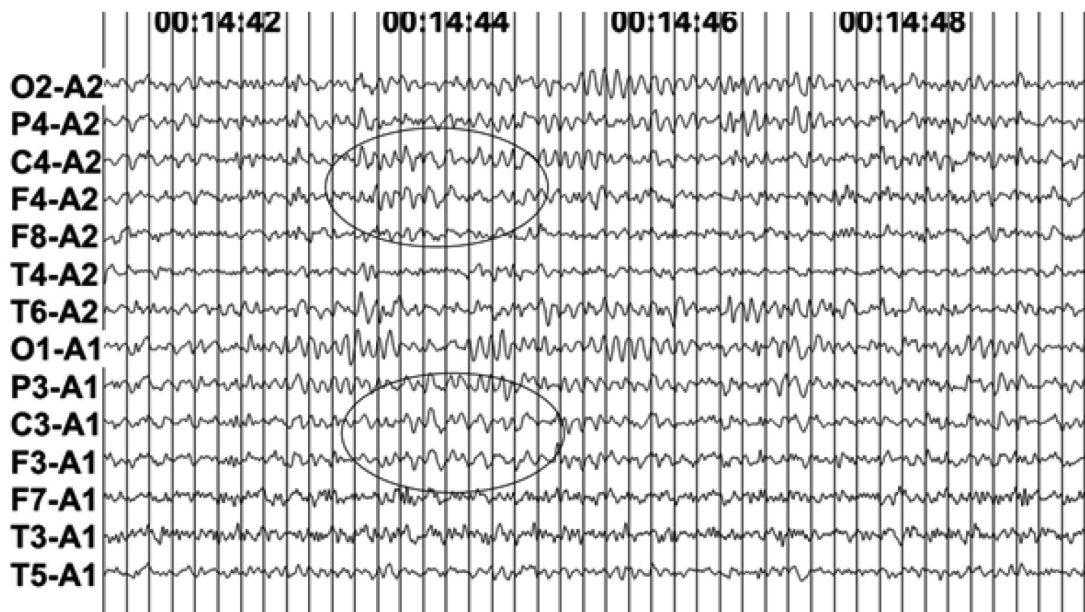


Fig. 2. An EEG segment shows groups of bilaterally synchronous theta (θ) waves in frontal (F4, F3) and central (C3, C4) leads. The EEG pattern of suboptimal functioning of fronto-thalamic system shown for the case 7 with ADHD (neuropsychological profile # 2: deficit of regulation, control and reduced arousal)

Variants of neuropsychological and EEG profiles established after qualitative analysis of the data of adolescents with diagnosis of ADHD

Adolescents with diagnosis of ADHD	Neuropsychological profile	EEG profile
Case 1	Deficit of regulation and control of activity	1. Functional changes of hypothalamic genesis 2. Functional changes of basal ganglia genesis
Case 2	Deficit of regulation and control of activity	1. Functional changes of hypothalamic genesis 2. Functional changes of fronto-thalamic genesis
Case 3	Deficit of regulation and control of activity	1. Functional changes of hypothalamic genesis 2. Functional changes of basal ganglia genesis
Case 4	Deficit of regulation and control of activity	1. Slight functional changes of brainstem genesis 2. Slight functional changes of hypothalamic genesis
Case 5	Deficit of regulation and control of activity	1. Pronounced bilateral functional changes of fronto-thalamic genesis 2. Functional changes of hypothalamic genesis
Case 6	Deficit of regulation and control and reduced arousal level	1. Functional changes of hypothalamic genesis 2. Slight local changes (presumably of cortical genesis) in the left fronto-temporal area
Case 7	Deficit of regulation and control and reduced arousal level	1. Local slow wave changes in the left central and inferior frontal regions 2. Changes of limbic genesis 3. Functional changes of fronto-thalamic genesis 4. Functional changes of hypothalamic genesis
Case 8	Deficit of regulation and control and reduced arousal level	1. Functional changes of hypothalamic genesis 2. Functional changes of limbic genesis
Case 9	Deficit of regulation and control and deficit of kinesthetic analysis and synthesis	1. Functional changes of caudal brainstem genesis 2. Functional changes of hypothalamic genesis
Case 10	Absence of neuropsychological profile	1. Functional changes of mesencephalic genesis

Analysis of results

Individual qualitative EEG analysis showed that the same behavioral (ADHD symptoms) and neuropsychological (deficit of voluntary regulation and control) manifestation could be associated with the suboptimal conditions of different cortico-subcortical regulatory systems. In analyzed cases, we found suboptimal functioning of fronto-thalamic system (cases 2, 5, 7), fronto-basal system (cases 1, 3), left fronto-temporal or left fronto-central regions (cases 6, 7). According to the clinical and neurophysiological data, all these functional systems participate in realization of voluntary control of goal-directed activity -executive functions- [16; 25; 26].

Clinical neuropsychological profile 1 (deficit of regulation and control) was related to deviated EEG patterns of different origin: fronto-thalamic, limbic and basal-ganglia. All these patterns appeared together with hypothalamic patterns (5 cases). Clinical profile 2 (deficit of regulation and control and with lowering of the brain arousal level) was related to local EEG changes in anterior zones or EEG changes of caudal brainstem genesis (3 cases). Clinical profile 3 (deficit of regulation and control and kinesthetic integration) was related to abnormal EEG patterns of caudal brainstem genesis. In the case with clinical profile 4 (absence of neuropsychological syndrome), EEG traces showed functional changes of mesencephalic genesis.

In other words, it's possible to say that the neuropsychological profile of difficulties of programming, regulation, and control might be recognized as a diagnosis of attention deficit disorder. Next in the order, the profiles of insufficient brain activation (low arousal level) might also be related to the diagnostic of attention deficit disorder. Both, the deficit of regulation and control and the deficit of general brain activation, are different neuropsychological profile in the qualitative approach [14; 27]. At the same time, possible combinations of difficulties of programming and control together with difficulties of general brain activation or kinesthetic integration would be not taken into account without the application of qualitative analysis of errors during the neuropsychological assessment.

The study shows that adolescents diagnosed with ADHD exhibit heterogeneous clinical characteristics and certain similar regulatory traits. The external behavioral symptoms exhibited by these subjects are homogeneous in appearance alone since different brain functional mechanisms can be identified. These mechanisms can be assessed from at least two levels of analysis: clinical neuropsychological evaluation and EEG visual qualitative analysis.

According to our data, adolescents with ADHD can show different cognitive and behavioral problems. According to the conception or functional units of the brain [2; 15; 16; 17], these difficulties may be related to three

systems or syndromic variants: 1) deficit of programming and control of voluntary activity (third functional block), 2) deficit of analysis and synthesis of somatosensory information (second functional block) and 3) low functioning of the brain activation systems (first functional block).

According to the qualitative approach, ADHD in preschool and school-age children is not a single clinical picture with unique neuropsychological and neurophysiological levels in all studied cases [31; 32]. Neuropsychological difficulties such as functional impairment have been reported in different brain functional mechanisms such as mechanisms that regulate and control activity, integration of spatial information and insufficient activation of brainstem systems [32].

Different manifestations of ADHD are related to different conditions of subcortical brain levels that can manifest themselves heterogeneously at distinct periods of development. According to this assumption, multiple characteristics have been reported in brain regulation systems at different ages in preschoolers, primary students, and adolescents [7; 21; 23].

Moreover, EEG visual qualitative analysis made it possible to characterize the essential patterns of immaturity in the frontal-thalamic regulation system and deficit of non-specific regulation related to reticular formation at the brainstem level [23]. These patterns are frequently observed in children diagnosed with ADHD at preschool age and older [31]. However, there are also cases in which other patterns of brain electrical activity have been observed [32].

Different electroencephalographic patterns were also detected in our study. With respect to the profile of deficit in regulation and control, variants in EEG functional changes were found at the basal ganglia, fronto-thalamic in different combinations and in constant combination with hypothalamic level. For the profile of deficit of regulation and control and the deficit of lowering of the brain arousal level, the changes were related to the limbic, frontal-thalamic, and hypothalamic system. In the case of this neuropsychological profile, we also found local changes in the left fronto-temporal area and in the left central and inferior frontal regions, according to EEG. As for the kinesthetic difficulties, regulation and control profile, the brainstem, and hypothalamus were found.

It is important to stress that combination of deviated EEG patterns of different origin with the pattern of hypothalamic genesis is typical for adolescence, as it wasn't present so frequently in other ontogenetic periods [22; 32]. The physiological pattern of mesencephalic origin was observed in the adolescent with ADHD, where no neuropsychological patterns were detected. This underscores that the presence of electroencephalographic patterns does not necessarily determine a clinical picture. As such, EEG data cannot be used as a direct predictor of clinical difficulties, independently of neuropsychological assessment.

Recent studies show that the symptoms observed in ADHD did not show typical focal cortical changes, but rather diffuse and more global participation of subcortical regulation levels [9; 23; 31; 32]. These findings

support Xomskaya's [41] hypothesis that the large areas of cerebral hemispheres with a complex organization of neural levels, cortico-cortical and cortico-subcortical relationships might participate as a morphological substrate of neuropsychological factors. However, one of the participants of our study has presented local changes of cortical genesis and another one local changes of subcortical genesis of frontal and fronto-central regions, both of them presented difficulties with programming, regulation and control and deficit of brain non-specific activation or arousal level. In both cases, additional patterns of brainstem level were also present.

Similar cases of suboptimal functioning of various parts of the brain regulatory systems (limbic, fronto-thalamic, fronto-basal, hypothalamic, etc.) according to the visual analysis of EEG traces, have been reported in adolescent with signs of behavioral and emotional problems at home and school [23].

These findings support the idea that ADHD is not a single clinical picture since several neuropsychological profiles related to different brain systems were detected. Qualitative data suggest the necessity of an individual approach for the precision of brain mechanisms or neuropsychological factors in each concrete case [34].

The mentioned data question the importance of focusing on external behavior as the only level of analysis in clinical psychiatry, where the diagnosis is established based on the caregiver's answers in the interview [40]. This type of diagnosis, which is used predominantly by specialists in most countries, should be subjected to reflective criticism.

Thus, it can be concluded that the behavioral approach of DSM-5 [1] does not completely explain the possible causal mechanisms of ADHD. This agrees with some authors, who indicate that diagnosis based on interview data does not identify the etiology of the disorder or propose a justifiable intervention [39; 40]. Our new data allow noticing that diagnosis of attention deficit disorder might include adolescents with the deficit of regulation and control and the deficit of general brain activation, the combination of these both deficits and also other possibilities of deficits, for example, the deficit of kinesthetic integration. Even adolescents with the absence of any kind of neuropsychological profile might receive a diagnosis with attention deficit disorder [37].

It is important to underscore that the supposition about the unique behavior of ADHD has been disseminated by DSM-5 [1] and widely reproduced by health professionals, schools and families. Some authors such as [12] report that understanding ADHD is influenced by the social, and cultural ideas about "normal development" and the "idealized child", in which the emphasis on management of this entity is the responsibility of schools and education.

At the same time, there is a new tendency to move the DSM's diagnostic criteria towards a dimensional approach. The World Psychiatric Association created a Research Domain Criteria (RDoC) initiative for research purposes, with the aim to develop new ways of classifying mental disorders based on a matrix of dimen-

sions -neurobiological, and cognitive mechanisms, social processes, arousal and regulatory systems-, because advances in integrative neuroscience were not being applied in patient care [30].

In our study, the qualitative analysis shows a set of clinical variables that have predictive value for detecting a neuropsychological profile in ADHD, such as deficit in regulation and control and low level of general brain activation. At the same time, some specific variants (deficit in kinesthetic integration or combinations of deficits) might be lost in case of the absence of qualitative neuropsychological analysis. Additionally, the analysis of EEG shows the predominant role of subcortical origin (functioning pattern most prominent) of the difficulties traditionally associated with the diagnosis of ADHD. That finding indicates the value of applying qualitative diagnostic methods in two levels, such as neuropsychological assessment and EEG in the analysis of brain functional mechanism of difficulties in adolescents.

It can therefore be hypothesized that what is occurring with the diagnosis of ADHD is that children and adolescents with different qualitative characteristics are being included in the same clinical group for no clear reason. Such a fact might be related to exclusive consideration of quantitative criteria and the interview method as a unique method for assessment.

It could be said that the traditional approach in psychology, medicine and neuropsychology has taken ADHD as a “thing” and has not examined the process or the precise functional characteristics in the subjects [42]. Studies, from cognitive quantitative approach, have been interested in establishing external descriptive signs of external behavior, rather than precise neuropsychological mechanisms and their dynamic manifestations at different ontogenetic stages. Furthermore, the study of the influence of the academic-educational environment on adolescents with ADHD, as well as the reflexive analysis of diagnostic systems, cannot be conceived outside the scope of the clinical perspective of cultural historical neuropsychology [16; 34; 42].

The limitations of the study might be related to the necessity of special professional preparation of researchers. In order to reproduce the procedures of this investigation, professionals and researchers must be trained in the theoretical and clinical principles of qualitative neuropsychology. Future research dedicated to adolescents with ADHD within qualitative neuropsychology should be focused on the relation between clinical profiles reported in this study and academic performance in math, reading, and writing tasks. It's also necessary, to provide

studies in this population on the design and approval of programs of neuropsychological intervention with the validation of their effectiveness.

Conclusions

In studied adolescents, the diagnosis of ADHD did not indicate the existence of a homogeneous group in terms of neuropsychological and neurophysiological analyses. The behavioral reports obtained in the caregivers' answers to the initial interview questions are only the starting point for the syndromic study of ADHD. The contribution of this study lies in the establishment of accurate neuropsychological criteria for ADHD, using the qualitative approach, as the basis for guiding measures and designing specific intervention programs for these cases.

The search for usage of different levels of analysis such as electrophysiological and neuropsychological assessment might therefore become an interdisciplinary heuristic model for the accuracy of underlying brain functional mechanisms in students with similar and different symptoms due to distinct causes.

Thus, the psychological development in these cases, in particular of the regulation and control systems, must be formed in adolescents with the participation of the adult, teacher or health professional, based on the design of appropriate pedagogical and treatment strategies. At the family level it might also be decisive to foment parenting models aimed at activity of planning and organization of communicative and intellectual activities. The progressive formation of psychological processes in accordance with the gradual internalization of external social interactions is one of the essential postulates of the cultural-historical approach in psychology and is also essential for the field of clinical neuropsychology.

The paper recognizes the value of the qualitative procedure developed by L.S. Vygotsky and A.R. Luria as an alternative approach for the analysis of the difficulties shown by adolescents with ADHD in determining their psychophysiological mechanisms. Such an approach can help to establish guidelines and strategies for neuropsychological, psychological and pedagogical treatment in each particular case. The authors assume the cultural-historical approach for the design of the research, the development of a qualitative evaluation at different levels of analysis: neuropsychological and electroencephalographic, as well as to position some criticisms to the current problematic of ADHD studies.

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Manifestations of Social Cognition Deficit in Children with Mental Retardation

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The article presents a study of the mental model deficit in preschoolers with mental retardation. The aim of this study using eye tracking is to identify markers that can predict the difficulties of social cognition associated with a deficit in the mental model in children with mental retardation. A comparative study of 64 typically developing preschoolers and preschoolers with mental retardation was carried out. To study the formation of a mental model, the paradigm of understanding false beliefs and experimental situations were used, which actualize in children the idea of the possible success of using and recognizing deception. Additionally, in the experimental situation, the method of registration of eye movement was applied to identify the level of the mental model. It is shown that with a deficiency of the mental model (from the point of view of understanding and applying false beliefs), there is a concreteness of perception, difficulties in using sign-symbolic means of social interaction, inability to suppress impulsive action and act from the position of a social partner. Children with mental retardation often turn not to sign-symbolic means, but to specific external signs of the situation: behavioral manifestations, actions, experience difficulties in distancing themselves from their own beliefs in order to rely in behavior on ideas about the knowledge of an adult. According to the results of an eye tracking study on heat maps of preschoolers with mental retardation, there is a deficiency of a gaze direction detector, which is necessary for understanding the intentions and predicting the actions of an adult. Eye movement analysis confirms that children with mental retardation often do not track the behavior of an adult and his reactions in situations of recognition and application of false actions.

Keywords: mental model, social cognition, joint attention, preschool age, mental retardation, eye tracker.

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Проявления дефицита социального познания у детей с задержкой психического развития

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В статье представлено исследование дефицита модели психического у дошкольников с задержкой психического развития. Цель исследования методом слежения за движением глаз выявить маркеры, которые могут предсказать трудности социального познания, связанные с дефицитом модели психического у детей с задержкой психического развития. Проведено сравнительное исследование 64 типично развивающихся дошкольников и дошкольников с задержкой психического развития. Для исследования становления модели психического были использованы парадигма понимания ложных убеждений и экспериментальные ситуации, актуализирующие у детей представления о возможной успешности применения и распознавания обмана. Дополнительно в экспериментальной ситуации на выявление уровня модели психического был применен метод регистрации движения глаз. Показано, что при дефиците модели психического (с точки зрения понимания и применения ложных убеждений) наблюдаются конкретность восприятия, трудности применения знаково-символических средств социального взаимодействия, неспособность подавить импульсивное действие и действовать из позиции социального партнера. Дети с задержкой психического развития чаще обращаются не к знаково-символическим средствам, а к конкретным внешним признакам ситуации: поведенческим проявлениям действия, испытывают трудности дистанцирования от собственных убеждений, чтобы опираться в поведении на представления о знаниях взрослого. По результатам айтрекинг-исследования на тепловых картах дошкольников с задержкой психического развития наблюдается дефицит детектора направления взгляда, необходимого для понимания намерений и прогнозирования действий взрослого. Анализ движения глаз подтверждает, что дети с задержкой психического развития часто не отслеживают поведение взрослого и его реакции и в ситуации распознавания и применения ложных действий.

Ключевые слова: модель психического, социальное познание, совместное внимание, дошкольный возраст, задержка психического развития, айтрекер.

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Introduction

Today, in science, special attention in the study of child development is paid to the ability with which the child is able to interpret and predict the behavior of other people, based on their own beliefs and intentions [5; 12; 25].

In this regard, the approach of the “mental model” (the theory of mind, ToM) is actively developing in the study of the processes of social cognition [2; 7; eleven; 24]. The mental model is understood as a system of conceptualization of knowledge from one’s own mentality and the mentality of other people, which allows one to explain and predict their behavior, a certain phenomenon of “reading” the mental state (mindreading) of other people [1; 2]. With the help of the mental model, we are able to infer mental states (opinions, desires, intentions, ideas, emotions, etc.) that cause the actions of other people. The mental model allows revealing the cognitive mechanisms of understanding in interpersonal interaction, since the communication process is based on constant monitoring and comparison of understanding of mental states and events [3, p. 120].

Such coordination is possible only at the level of symbolic communication; therefore, the deficiency of the mental model can be associated with impaired thinking and

perception, the complexity of contextual representations, and the distortion of cognitive schemes. Without a certain critical level of symbolic thinking (with a symbolic deficit), the ability to decode social signals is reduced, therefore, to understand and adequately respond to them. Cognitive mechanisms are not being formed that make it possible to define hidden variables in a fundamentally different way (for example, intentions, mental states), which makes it difficult to fill gaps in direct perception [8; 9; 13; 23].

Important in the development of the child is the ability to use “signs” as pointers and social signals in relation to other people, the formation of a system of collective signs that generate a symbolic function as a means of expressing thinking [1].

The question of the origin of disorders of the mental model remains relevant, whether they arise as a result of a cognitive deficit or are an independent disorder. In the study of the mental model, no matter how scientists try to control their influence on verbal learning, memory [13] and thinking [11; 12; 19; 21] and language [13] contribute to group differences in the performance of tasks on the mental model.

At the same time, the limitations of previous results are related to the fact that most studies involved children with autism who were mentally retarded, and some

of their symptoms are due to this lag [22]. Therefore, it is impossible to fully explain the difficulties that were recorded in social interaction due to the combined diagnosis [3].

We can talk about the threshold value of the level of intelligence necessary for the formation of a mental model, however, the question remains whether it can be considered that the level of development of psychometric intelligence, assessed on the basis of tests, indicates the necessary role of cognitive development for the formation of a mental model [5, p. 7; 14]. To resolve this issue, it is necessary to test the specificity of the manifestation of joint attention deficit in a sample of children with cognitive impairments.

From the point of view of experimental design, the main methodological procedure in the “model of the mental” direction is tasks for incorrect opinions or understanding of false beliefs [5; 6; 12].

The ability to understand deception testifies to the cognitive development of the child and reflects the formation of a “mental model” as a system of representations of one’s own mental phenomena and the mentality of other people, since it involves ideas about the knowledge of another person and ways to change it [3; 10]. To recognize deception, children need to understand not only the manifested mental phenomena, but also carefully hidden ones, i.e. perform double decoding (recognize deception), based on additional knowledge and ideas. When an individual knows what the other wants (desires) and what he thinks (beliefs) about how to achieve this, the individual can predict his behavior (intention) [11]. Differences in the ability to apply and recognize deceptive actions will fix the level of development of the mental model.

However, some studies have shown that autistic people do well on tests of false expectations, when in fact they do not have the ability to represent internal representations. For example, D.M. Bowler, C.D. Frith, F. Happ believe that, most likely, these subjects find some kind of solution strategy that is justified specifically for these tasks, which gives them the opportunity to “hack” these imperfect tests, but cannot be used in real life (unlike true representation of internal representations) [17]. In this regard, the topical issue is the application of the situation of real interaction between a child and an adult [18]. Therefore, in our opinion, it is necessary to use the natural conditions of interaction between an adult and a child, where one can trace the response to a naturalistic flow of events that a child can easily encounter in real life, and we strive to characterize the natural variability of gaze movement patterns in episodes of joint attention [18; 20; 27].

From the point of view of research opportunities, the use of eye tracking in children as a potential diagnostic tool in the study of the mental model is currently gaining popularity [7; 12; 15; 16; 23; 24; 26; 27].

The task is a comparative analysis of the model of the mental as a cognitive ability to understand mental states and ways of their changes in the form of a deceptive action in typically developing preschoolers and preschoolers with mental retardation.

The main goal is to use eye tracking to identify patterns that can reflect learning difficulties associated with a deficit in the mental model in children with mental retardation.

Method

Empirical study sample

The empirical sample of the study was formed in a randomized way on the basis of preschool institutions in Barnaul (Russia): 64 preschool children aged 5 to 6 years (mean age 6 years 4 months). Of them:

- 32 preschool children with mental retardation (class F80–F89 according to ICD-10).
- The contrast sample consisted of 32 typically developing preschoolers.

When the diagnosis was made the level of intelligence development was assessed by the Wechsler Preschool and Primary Scale of Intelligence (WPPSI). Children with mental retardation are below average (<85 points). According to the results of diagnostics by a kindergarten psychologist, children with normative age development had an average level of intelligence development (>100 points).

Research methods

To study used experimental situations that make it possible to trace not only the detection of deceit, but also the ability and strategies to change the mental state of the communicative partner.

Methodology for direct opposition and deception (Sadian and Frith 1992)

This task consisted of two series. In the first series, the child was given instructions to directly counter the deception: “There is a thief coming, what are you going to do?” – the child needed to close the box, thereby hiding the toy from an imaginary thief, and in the second, “a friend is approaching, what will be your actions?” – on the contrary, the child needed to open the box, which indicated that the preschooler was ready to share the item. The task of the preschooler was to apply false beliefs to the adult experimenter, recognizing his intentions depending on the signal of the thief or friend now in front of him.

The task of applying false beliefs in the situation of the game “Find the toy in the box”

The child was asked to hide the toy in one of three small boxes so that the experimenter did not know exactly where it was. It was allowed to hide the item in any

box and rearrange them in the chosen order. The experimenter was asked what kind of box the toy was in. The children had to “deceive” the experimenter by pointing to an empty box, while using false beliefs.

**Game on the use of false beliefs
 “Guess which hand the coin is in”**

The child was asked to hide the toy in one of three small boxes so that the experimenter did not know exactly where it was. It was allowed to hide an item in any box and rearrange them randomly. The children had to “deceive” the experimenter by pointing to an empty box, while using false beliefs.

Game on the use of false beliefs “Guess which hand the coin is in”.

The child had to hide the object in the fist of the left or right hand, while not showing the experimenter in which hand he was hiding the coin. When the experimenter asked the question: “In which fist is your coin?”, the children had to falsely point to the hand where nothing was.

All series of experiments were repeated 5 times. Successfully completed attempts were recorded from 0 to 5.

Eye Movement Recording Method

In the experimental situation of the game on the application of false beliefs “Guess which hand the coin is in”, the method of registering eye movement was used.

The main method is the method of eye movement registration using a portable tracker Pupil Headset-PLabs – an eye tracker in the form factor of glasses, binocular version. Camera delay 4.5 ms. Processing latency depending on the CPU > 3 ms.

Heatmaps were built – a graphical display of areas of interest in which the respondent most often looked, where the focus of attention was and what elements were ignored in visual attention. To analyze the data, the results in the form of color spots are superimposed on the eye movement graph. The color corresponds to the duration of viewing different zones: blue – no fixation of the gaze, red – predominant fixations. The following areas of interest were

marked with special markers for fixing data: the face of an adult experimenter, the target object (toys), and the non-target object. Data processing was carried out using the SPSS V.23.0 statistical information processing program.

Results

To find the differences between the contrast groups in the mental model in all series of the experiment, analysis of variance was applied (Lvin’s criterion ≥ 0.05) (table 1).

Comparisons were made between two game series of the experiment, where the child needed to recognize and counter deceit in the first case, and in the second, on the contrary, apply false beliefs. In both situations, the child had to refrain from cheating or hindering the friend’s actions. It was revealed that children with mental retardation either cannot understand and accept deceit, or do it much less often in a game in a series of tasks for direct opposition to deception and the use of false beliefs (Fig. 1).

The difference between the compared situations was that deceit (lying or incorrectly pointing to an empty box) affects the expectations of the "competitor", while direct opposition (locking the box in which the candy was located) only affected his behavior.

Preschoolers with mental retardation could not cope with direct opposition and could hardly deceive at all.

The conditions and rules of the game were presented in the form of symbolic symbols ("a thief is coming" and "a friend is approaching" as symbolic signs – signals for a certain symbolic action). It is significant for us that in a game with a deceptive action, the child was required to use signs to anticipate events that made it known about the nascent action of an adult, or the child himself had to use signs to change the behavior of an adult. The difficulties of children with mental retardation can be viewed as a low level of formation of symbolic-modeling means of social interaction in general, based on the mental model.

Next, a series of experiments was compared, where the preschooler had to hide the toy in one of three small

Table 1

**Descriptive statistics in tasks on direct opposition to deception and the use of false beliefs
 [Please, align the figures accordingly: put a dot, not a comma – 11.34, not 11,34]**

		M	Standard error	F	Significance
Task for direct counteraction to deception	typically developing preschoolers	5	0	1705	0,0001
	preschoolers with mental retardation	0,416	0,148		
False Belief Challenge	typically developing preschoolers	5	0	6242,7	0,0001
	preschoolers with mental retardation	0,083	0,0833		
Hidden Toy in a Box Challenge	typically developing preschoolers	4,6	0,40	131,89	0,000
	preschoolers with mental retardation	0,523	0,145		
Hidden Toy in a Box Challenge	typically developing preschoolers	1	0	11,34	0,001

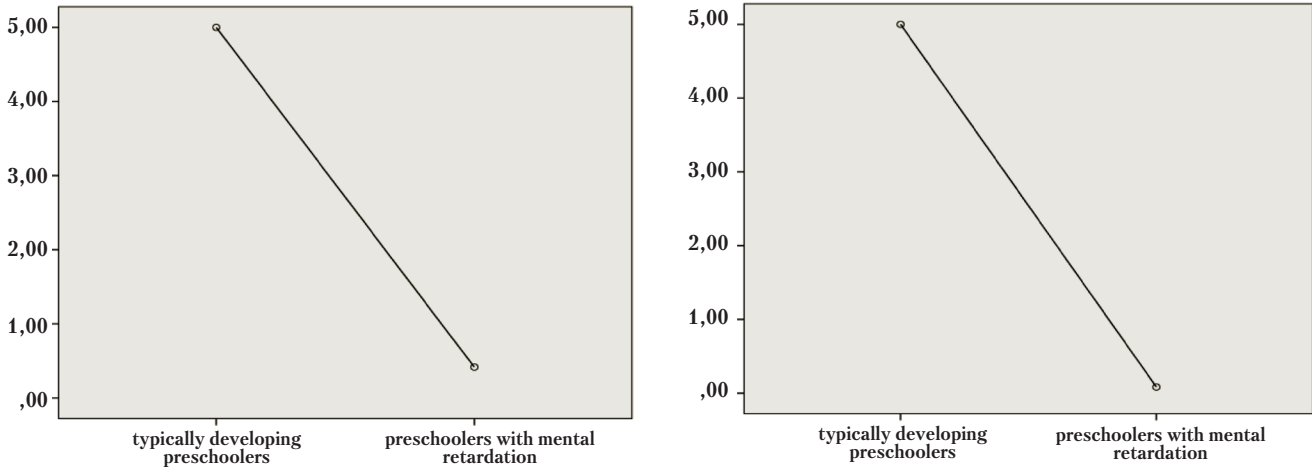


Fig. 1. The difference between contrasting groups in the task of directly counteracting deception and the use of false beliefs

boxes so that the experimenter did not know where exactly it was and confuse the experimenter by pointing to an empty box, while using false beliefs. Children with mental retardation, as well as in the previous series of the experiment, were less likely to use the game condition for the use of false beliefs (Fig. 2).

Next, a series of experiments was compared, where the preschooler had to hide the toy in one of three small boxes and confuse the experimenter by pointing to an empty box, while using false beliefs (Table 1). Children with mental retardation, as well as in the previous series of the experiment, were less likely to use the game condition for the use of false beliefs (Fig. 2).

Children with mental retardation had difficulty understanding the principle "to know is to see": instead of moving the toy into another box, they rearranged the boxes or hid the box with the toy under other boxes or under the table. The principle of actions of children with mental retardation can be described as: "if the box where the toy is hidden is not visible, then the experimenter will not know that the toy is in it." This also confirms the

specificity of perception and the difficulties of the sign-modeling use of social signals.

A comparison was made of contrasting groups for the use of false beliefs "Guess which hand the coin is in", where the child had to hide the coin in his fist and falsely point to the hand where nothing was (Fig. 3).

A child with a mental retardation could not commit a "fraudulent act", they did not accept the rules of the game and each time they pointed to the hand where the hidden object lay. Compliance with the game rules is considered as one of the criteria for the development of arbitrary control of the child. Therefore, the difficulties are associated not with the inability to represent internal ideas, but with the child's inability to suppress his own action directed at the object, based on the position of the social partner.

In the experimental situation of the game "Guess which hand the coin is in", the eye movement registration method was used and the results of the eye tracker study were analyzed. For visualization, heat maps were built (Fig. 4).

Children with mental retardation are characterized by: incorrect correction of the gaze movement route with ini-

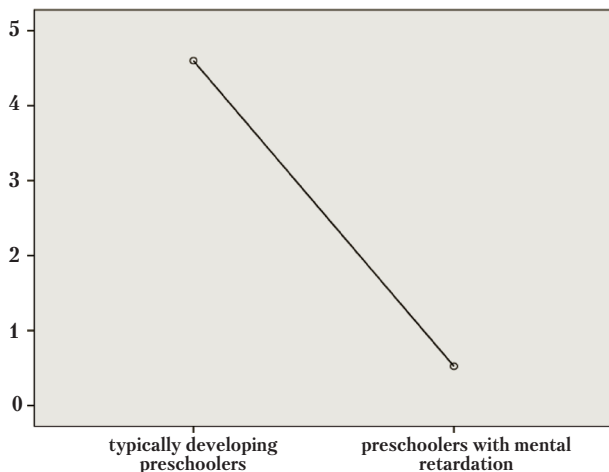


Fig. 2. Differences in contrasting groups in the task with a hidden toy in a box

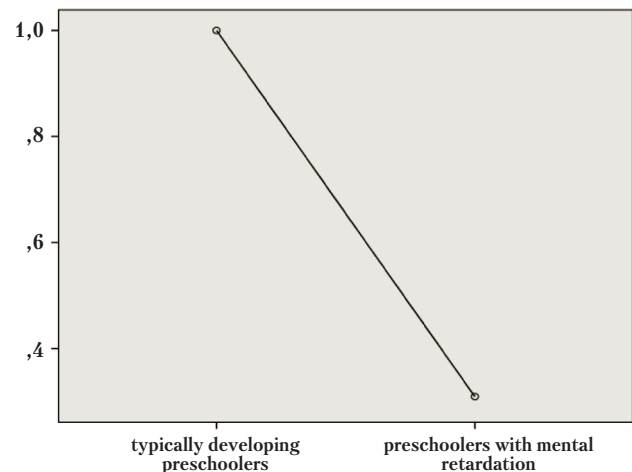


Fig. 3. Differences of contrasting groups in the task with a hidden coin in hand

tially correct tracking of the adult's gaze movement trajectory as a target prompt, difficulties in cross-eyed, synchronous gaze, dispersal of the child's areas of interest, preference for non-social signals, neutral or non-target objects.

These symptoms indicate a violation of the mechanism of joint attention necessary to establish a triadic relationship between an adult-child-object, understanding the intentions and predicting the actions of an adult, a high mental load, and the cognitive complexity of recognizing social signals. An analysis of eye movement confirms that children with mental retardation have a reduced motivation for social participation: they do not track whether an adult sees a hidden coin, which hand he looks at, how he chooses, which hand the adult showed.

Eye tracker study data were subjected to quantitative analysis by Student's T-test for independent groups.

Comparison data of contrast groups confirm the features of establishing joint attention in children with mental retardation:

- The time of fixations to social cues decreases (for example, in the eyes and face of an adult) and the time of fixations to non-target or neutral stimuli increases. It is these features that can lead to the difficulty of identifying relevant features for the formation of a target representation of social signals.

- The time of the total duration of fixations increases, which is necessary for the stabilization of visual attention and the selection of information features.

- The total number of fixations is increasing. It is difficult for children with mental retardation to predict where the adult's gaze will be in the next moment; in order to have time to synchronize, the child needs to follow the actions of the adult more often, so more fixations are needed.

It can be assumed that it is the change in the duration of fixations that is decisive for the emergence of a synchronous gaze, which is necessary for monitoring the focus of attention and combining the focus of attention of a child with an adult.

Discussion

These studies reflect the relationship between the cognitive level of development and the level of the mental model in the process of forming the basis of social cognition. It can be assumed that the formation and development of the mental model proceeds in parallel with the development of the child's symbolic thinking.

In all our the series of experiments, the tasks were involved in the application and recognition of false beliefs. Recognition and false beliefs are closely related to the general "mentalization", understanding the mental state (mind reading), the ability to participate in the perception of other people's intentions. Both skills involve social cues that indicate interest in objects or events, but the first emphasizes processing information about other people's behavioral cues, while the second emphasizes

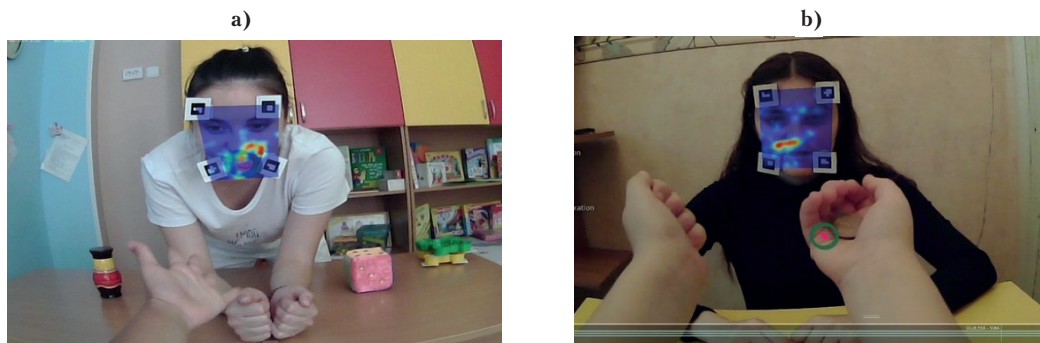


Fig. 4. Heat map of a preschooler, typically developing preschoolers (a) and mental retardation (b), in an experimental situation of recognizing and applying false beliefs

Table 2

Group statistics based on the results of eye movement fixation
[Please, align the figures accordingly: put a dot, not a comma – 11.34, not 11,34]

		M ± standard erro	Significance	Levine's test for equality of variances	
				F	Significance
Duration of fixations to non-target stimuli	typically developing preschoolers	0,59 ±0,04	0,003	3,86	0,150
	preschool children with mental retardation	0,69±0,06			
Total duration of fixations	typically developing preschoolers	36,35±1,58	0,0001	3,90	0,632
	preschoolers with mental retardation	47,99±2,94			
Ttotal number of commits	typically developing preschoolers	51,11±1,86	0,0001	9,82	0,203
	preschoolers with mental retardation	75,52±4,19			

own modeling these cues for other people to change their state of awareness. The results of our study reflect the difficulties of children with mental retardation in both skills.

The deficit of the mental model is associated with “realism”, the concreteness of perception and thinking in a game with a deceptive action. This concreteness of thinking will be observed in the recognition of social signals, which is manifested in the fact that the child confuses the symbolic rules of the game with real physical rules. It can be assumed that this is due to the low level of the mental model in children with mental retardation and a deficit of symbolic thinking.

Based on the results of the eye tracking study, it can be assumed that children with mental retardation are insensitive to social signals, do not perceive the direction of the gaze of the interlocutor as informative, significant clues for combining joint attention. A huge role is played by the lack of joint attention necessary for the formation of cognitive components responsible for understanding social signals. These results complement the data of S. Baron-Cohen that the violation of the representation of internal representations can be a secondary manifestation of an earlier violation of the construction of the “triadic representation”.

With a delay in mental development, disorders are primarily expressed in the difficulties of comprehending

and restructuring one’s own mental interpretations that are inadequate to the communicative context, and the weakness of the reflective component.

Conclusion

A comparative analysis of contrasting samples allows us to conclude that the state of delayed or incomplete mental development, which is characterized primarily by a decrease in skills that determine the general level of intelligence, is directly related to the functioning of the mental model.

As a result of the study on contrasting samples, the specificity of the lack of means of social interaction based on the model of mental development is shown: a group of preschoolers with mental retardation has difficulty in using the direction of an adult’s gaze as a social signal for detecting intentions, that is, they recognize it as an information sign, but not always can use. It is analyzed that in a game with a deceptive action, the child is required to use signs to anticipate events that let you know about the nascent action of another person. At the same time, children with mental retardation in the game with deceptive action showed a situational mode of action without taking into account the model of the mental partner in interaction.

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Development of Social and Psychological Readiness for Professional and Working Life in Students with Intellectual Disabilities

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The research revealed and explained the main contradictions in the impact of learning environment on the formation of interpsychological supports that allow a graduate with intellectual disabilities (ID) to make an independent professional choice and successfully find a job in the future. The study involved graduates of general education schools and special boarding schools with ID (N=742) living in Russia, Ukraine and Poland. The study consistently proved that the psychological mechanisms that determine the ability of a student with ID to perform actions according to a known algorithm, to manifest independence, to accept workplace discipline, formed by the learning environment of a correctional school, do not work in case of any change in conditions, methods of activity and multitasking present in the open labour market. The level of development of logical operations in a homogeneous environment does not lead the student to the search for a new solution to the problem; quite the reverse, it leads to the wrong solution or to the refusal of activity. The experiment indicated that the learning environment that develops the social competence in students with ID, triggers the mechanisms of group interaction in a heterogeneous environment to expand the boundaries of their social experience and transfer skills to new conditions of activity is the key leverage that activates the thinking and search activity.

Keywords: inclusive learning environment, correctional school, intellectual disabilities, social and behavioural component, joint activities, identifying future profession, employment.

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Подготовка к профессионально-трудовой деятельности учащихся с интеллектуальными нарушениями

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Исследование направлено на выявление основных противоречий влияния образовательной среды на формирование интерпсихических опор, позволяющих сделать выпускнику с интеллектуальными нарушениями (ИН) самостоятельный профессиональный выбор и в дальнейшем успешно трудоустроиться. В исследовании участвовали выпускники с ИН общеобразовательных школ и специальных школ-интернатов (N=742), проживающих на территории России, Украины и Польши. Экспериментальная методика разработана на основе кейс-метода с использованием проективных стимулирующих ситуаций. Достоверно доказано, что психологические механизмы, определяющие способность учащегося с ИН выполнять действия по известному алгоритму, проявлять самостоятельность, соблюдать

трудовую дисциплину, сформированные образовательной средой коррекционной школы, не работают при изменении условий, способов деятельности и многозадачности на открытом рынке труда. Уровень развития логического мышления в однородной среде приводит учащегося не к поиску нового решения задачи, а к неправильному решению или отказу от деятельности. Эксперимент показал, что тем рычагом воздействия, который активизирует мышление и поисковую деятельность учащихся с ИН, являются условия обучения, развивающие их коммуникативно-организационную компетентность, запускающие механизмы группового взаимодействия в разнородной среде для расширения границ их социального опыта и переноса навыков в новые условия деятельности.

Ключевые слова: инклюзивная образовательная среда, коррекционная школа, интеллектуальные нарушения, социально-поведенческий компонент, совместная деятельность, профессиональное определение, трудоустройство.

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Introduction

The primary task of modern Russian and international education is the socialization of students and their independent selection of a life path, primarily a professional one. This is especially much concern about the vulnerable groups of students with disabilities, in particular, those with intellectual disabilities (ID). The idea of integrating such graduates into society as fully-fledged citizens capable of mastering a profession and working on their own, takes its roots from the scientific works of domestic psychologists and speech pathologists which were dedicated to the role of labor in the development of a personality with intellectual disabilities (I.D. Bekh, V.I. Bondar, G.M. Dulnev, B.I. Pinsky, K.M. Turchinskaya). [3; 5; 11; 13; 16]. According to the valid educational plans of correctional schools of the 1960s, vocational training and practice took from 8 to 14 hours a week [11, p. 10].

Modern psychology and defectology generally examine the readiness of an individual for professional and labor activity from the point of view of a positive attitude of the person to work, his or her desire to work, their focus on the engaging into a certain professional activity [1; 2; 4; 6; 7]. It is worth noting that the educational environment of correctional schools quite successfully helps to develop these qualities in pupils. The main emphasis is placed on the development of independence, discipline and practical skills as a result of direct involvement in the process of performing labor operations in the real-world context [1; 2; 3; 5; 11; 13; 18; 19].

However, school graduates and graduates of vocational schools with ID have always been the outsiders in the labor market since they were not fit for work. As of today the situation has remained almost un-

changed – a long-term study of former graduates of correctional schools and colleges aged 18 to 35 showed that most of them, having learned the rules of conduct and algorithms of common labor and even professional operations during training, act in accordance with them, however as long as the requirements and situations are accessible to their understanding and do not contradict their immediate needs (I.V. Ananiev, Yu.A. Bystrova) [1].

The modern labor market is characterized by multitasking, a rapid change in conditions and algorithms of activity, and requires the employee to be a good team player and work well under supervision [1]. This situation aggravates the problem that psychologists are facing nowadays when trying to developing in students with ID those personal strengths that will allow them to independently learn the realities of a full value existence in a working team. From this point of view socio-psychological readiness for professional and labor activity should be considered as an integrative quality of a person that contributes to the successful completion of work tasks. Labor efficiency depends not only on professional knowledge and competencies, but also on flexible skills regulating interpersonal relations, organizing joint activities, group communication, etc. [1; 2; 4].

The task of the educational environment is to create and launch mechanisms of the development of the personality of a student with ID, which will subsequently allow him to actively change his activities in a way that he might not only be able to find a job with support, a follow-up or independently, but also work in a team and under guidance, take responsibility for his actions. The key principle of the cultural-historical theory of L.S. Vygotsky, according to which the psychological mechanisms of personality development are interaction

and dialogue in external-objective activity, appear to be the most appropriate from the point of view of methodology of approaching this problem [8; 9]. The maturity of the communicative and organizational basis of activity allows the individual to solve the issues of joint completion of tasks, i.e. how to achieve a common goal, in what way, agree on the distribution of funds and resources, control the accuracy and effectiveness of the task, intermediate operations and the final product, prevent conflict situations. The communicative and organizational foundation of labor activity is laid at all stages of development of the personality – first in the game, then in school, therefore, the individual's socio-psychological readiness for work is formed by the environment in which he or she found themselves at the earlier stages of development [5; 14; 15].

The hypothesis of the study about social situation of development (homogeneous educational environment of a correctional school) presents an obstacle to the formation of such communicative and organizational foundations of activity that allow a person with ID, having mastered a profession, to work in a heterogeneous environment of the open labor market. The mechanisms launched in one socio-cultural environment give impetus to the development of certain qualities and competencies of an individual with ID, which, unfortunately, are not sufficient for him to be integrated into another socio-cultural environment and successfully function in it.

The tasks were formulated based on the hypothesis of the study, i. e. to identify and clarify the main contradictions in the influence of the educational environment on the development of interpsychic foundations that allow a student with ID to master the communicative and organizational basis of professional and labor activity and subsequently work successfully in a team.

Methodology

The methodological basis of the study has been represented by the ideas of L.S. Vygotsky about the social situation of development, which states that the mechanisms responsible for psychological development of a child with ID are launched by the social environment with its specific system of signs, values, interactions, and dialogics [9]. As well as the thesis on the development of higher mental functions in collective activity and the appropriate change of this activity influenced by the improvement of mental functions, independent choice of means and methods for achieving the goals [6; 12; 13; 14; 15; 17].

The study is based on the method of comparative analysis, which makes it possible to trace the influence of the educational environment (inclusive educational environment; educational environment of correctional schools) on the development of the communicative and organizational foundation of activity as a socio-psychological willingness to work.

Selection.

The study involved regular school graduates with ID (inclusive educational environment (IG) – 240 students) and speciality schools (educational environment of a correctional school (CG) – 252 students), 250 students without intellectual disability residing in Russia, Ukraine and Poland (Moscow, Leningrad, Luhansk, Donetsk, and Kherson regions and Lodz province).

All graduates selected for the study can boast certain basic concepts of communicative and organizational activity and personal qualities acquired during training, which will subsequently allow them to make a professional choice and work or on the contrary may not be sufficient for employment in the open labor market [4; 7; 18].

This study is based on the communicative-organizational component of readiness for professional and labor activity. We have defined the levels of its development – sufficient, average and minimum according to the following indicators [1; 6; 7]:

- 1) ability to analyze social situations;
- 2) ability to evaluate and control one's own activities and behavior;
- 3) ability to work productively in a team.

Students with ID are unable to fully comprehend the content of the forms and questionnaires, therefore we have selected for this study projective techniques or real-life cases, that can be understood easily, suitable for studying the communicative-organizational component of their willingness to work and involving qualitative assessment of the studied phenomenon.

Techniques.

1. The proprietary technology for studying the level of representations, comprehension and analysis of social situations, which has passed evaluation test during the defense of a PhD thesis [6]. The methodology consists of a set of projective stimulating situations that best of all reflect the general professional scenario and success rate of the graduate among others: choice of a profession; communication within a team; separate housing; well-being; acquisition of a source of income [4]. Materials for the implementation of the study were provided to students in the form of photographs and videos, role play games. The study was carried out individually. The algorithm for evaluating the results is defined in the study guidelines [4]. The processing of the results was carried out according to qualitative indicators that help to identify assessment trends and patterns, comparison and explanation of the situation by students themselves.

2. A special technique based on the case method – simulation of real-life situations resembling professional activities in the open labor market [1]. The case was based on techniques that help to launch psychological mechanisms of a person with ID: the problematization technique (the choice of real-life situations of three types – based on an undefined course of action; undefined means of action; with undefined conditions of ac-

tion); dialogue technique, group interaction technique (joint planning and execution of actions). The study has been carried out with reliance on the zone of proximal development of students under specially organized supervision [8; 9]. We have made sure that all actions of the respondents and the speech report were recorded in the protocols. The participants in the experiment were offered to perform a problem-solving task, which required finding a solution. The task was to assemble a certain construction based on a finished sample and consisting of several parts. Joint activity is an important new formation for school aged children and forms the basis of the team interaction as a flexible skill necessary for the future professional activity [15]. It is known that development of the team work of students with ID goes with significant complications [6; 16; 18]. Therefore, special attention has been paid to observation of the team interaction. The technique included 4 series of tasks:

Block 1 – the goal, means, conditions (individually) are known, the way to complete the task is unknown; block 2 – the goal, conditions are known (individually), but the means and methods of implementation have been changed; block 3 – the goal is known, the methods are known, but the conditions for implementation have been changed to a team of four people with ID; block 4 – the goal is known, the methods, the conditions for implementation are changed – students with ID are asked to work in a group with peers without mental disability. The group consisted of 4 people – 2 and 2.

Results

When analyzing comparative data, a low level of understanding of social situations has been noted among respondents from the CG in comparison with the IG; students from the CG can be characterized by fragmented achievement, poverty of assessment and misunderstanding of crisis situations, situations of frustration or conflict. CG respondents find it easier to evaluate situations of the individual's success (a new job, renovations in their own apartment, physical and emotional well-being). All this proves that educational work in a correctional school is aimed to create positive lifestyle of a student as well as a standardized image of a positive personality.

As a result of the study 55.16% of students in the CG and 15.87% in the ID demonstrated distortion of the social ideal, that is, a minimum level of understanding of situations, especially negative ones. Thus, while watching a video clip about the life of jobless and beggars they were unable to understand what is wrong with it, they found such a life appealing, comfortable and attractive. Students are unable to differentiate certain intricacies of the situation. At the same time 84.13% of ID students demonstrated ability to appreciate the positive, and 47.61% both positive and negative aspects of various situations. Thus, a sufficient level of

assessment of various situations has been identified within 47.61% of the IGs and only in 6.75% of the CGs.

An analysis of the judgments of CG students showed that practically not a single student in this group was able to specificate the image of their own desired future, to name the deadlines for achieving their goals. For example, when answering the question: "Think of the important events that have already taken place in your life, and which should definitely take place in the future?" students mentioned their desire "to live well", "to earn a lot of money", "for that no one gets drunk", "to have a cool car", etc. instead of naming events as such. The following were mentioned among their plans for life following the graduation from the school "to watch all the episodes of one's favorite monster movie", "to meet relatives from another city", etc. At the same time, 47.61% of IG students have demonstrated a sufficient level of temporal orientation and that of the interaction modality. This, in our opinion, is due to their experience of communication with peers without intellectual disability and the assimilation of samples of the logic of their judgments.

Hereby we present the results of the special methodology based on the case technique:

Block 1. While performing individual construction tasks the students were asked to assemble a mechanical ballpoint pen from its parts (components) based on a sample. Almost all students of the CG still at the stage when the instruction was announced, declared that they would be able to cope with the task. They have referred a simple and familiar object as a result of activity to a simple task of performing an activity. Students began to act, often incorrectly, but decisively and confidently, using familiar algorithms. Only 6.75% of students have put their skills under doubt and asked for help. When performing tasks according to the developed algorithm, some difficulties have emerged with the quality of the final product; following the third or fourth assembly, 69.84% of the students in the CG lost control over the results of the task and produced a faulty product, often refusing to adjust it. This suggests that individuals with ID perceive the performance of a task as a process, and not as a result of their activity. A different picture emerged among IG students. These were respondents studying in an inclusive educational environment starting from the start of the school. While performing individual tasks the students demonstrated no significant differences in the achievement and application of the algorithm. At the same time, 87.08% of IG students required clarifications before starting the task, in the process they turned to the observer for help, and when pointed out their errors made an effort to amend them.

Block 2. The observer removed one component from the general cycle – a cap on which the hook is fixed. Due to the fact that the algorithm was constantly changing, the students failed to memorize it completely, therefore, having started work, 80.15% of the subjects in the CG could not understand why they have failed to complete

the task. They simply quit their job abruptly giving reasons: "it didn't work out." The majority of IS students (84.12%) turned for help and during conversation tried to find out why they failed.

Block 3. Teamwork. The observer announced that the team would have a common goal to assemble a certain number of construction sets, but did not offer an algorithm for the team work. The students of the CG continued to work each with their own batch of components without trying to rationalize the process, even after the observer's suggestions to separate the types of work. They worked side by side, but not together. At the same time, each of them carried out the function of control over the members of the group similar to that of the teacher performs in the classroom. Being unaided, they failed to find any other means of interaction, the students practically did not communicate with each other, did not share details, and in case of difficulties stopped working. The results of the experiment showed that only 6.75% of students in the CG were capable of carrying out a constructive dialogue during group interaction.

When forced to work in a group, the students of the IG at the beginning completed the task each on their own but following communication with each other and the observer's prompts, streamlined their work, distributed the full cycle of the task to assemble and pack the construction sets between their peers.

Block 4. Students with ID were offered a possibility to work in a group of peers without mental disability. The group consisted of 4 people – 2 and 2. At the final stage a new task of concurrence and competition between the teams was added to the test. The results of the research have shown that 55.16% of students with CG turned out to be incapable of evaluation and management of their own behavior during group interaction, demonstrated emotionally unstable behavior, dropped their work over strict requirements, quarreled with each other.

47.61% of students with IG during the team work in a group of peers without mental disorder chose not to act as team leaders but demonstrated readiness for group interaction, expressed their own opinion, listened to that of the team leader. Another 36.51% of students with IG completed their task with an average score.

During the comparative study of the results of the observance over students with KG and IG, we have defined general levels of communicative and organization

component of readiness for professional band labour activity (Table 1).

The minimum level was found in 55.16% (CG) and 15.87% (IG) – students failed to demonstrate ability to joint activity or work in a team, instead demonstrated estrangement, lack of desire to communicate to peers, did not follow common norms and rules of social behavior, were prone to conflict, aggression, resentment, and often acted impulsively (Table 1).

The average level was found among 38.09% (CG) and 36.51% (IG) – the students periodically demonstrated the ability to team interaction, the ability to work under supervision, sometimes if desired they even demonstrated leadership qualities, albeit fragmented, they failed to get actively involved into interpersonal relations, did not always comply with the general norms and rules of social behavior. Their group work did not help to solve the situation, and demonstrated instead their ability to communicate in a group.

A sufficient level – 6.75% (CG) and 47.61% (IG) – of students actively worked in a team, immediately joined in joint activities, observed general norms and rules of social behavior.

Discussion

The conducted study confirmed our hypothesis that the homogeneous educational environment of a correctional school can become an obstacle to the development of such basic activities that allow a person with ID, having mastered a profession, to work in a heterogeneous environment of the open labor market. We have identified communication and organizational problems identified in 55.16% of graduates of the correctional school:

- weak analysis of methods to complete the task with a known final result, adaptation of the solution to already known algorithms;
- the intricacies of applying already generated algorithms of labor actions in amended conditions;
- the intricacies of assessing the modality of the social situation;
- the intricacies of adapting to new social relations, inability to regulate one's behavior in accordance with the requirements of the environment;
- inability to use the dialogue for problem solving;

Table 1

Levels of development of the communicative-organizational component of readiness for professional and labor activity of students with ID (%)

Indicators	Levels	КГ (N=252)	ИГ (N=240)	φ/p
1	2	3	4	5
Capability to analyze social situations. Ability to evaluate and manage one's own activity and behavior. Ability to work in a team.	Sufficient	6,75	47,61	2,40/0,001
	Average	38,09	36,51	0,6/0,05
	Minimum	55,16	15,87	4,39/0,001

– overestimation of one's capabilities;
– mild reflection, regulatory and control function during various activities.

Another 38.09% experience such problems periodically, most often in unfamiliar or competitive environment.

It is worth noting that such problems are observed only in 15.87% of graduates studying in the inclusive educational environment. Separately, we will highlight the reasons that impede readiness of graduates of an inclusive school for professional labor activity:

– lack of confidence and desire to get help or support from an adult should the slightest difficulties arise;

– inability to independently assess the level of complexity of the tasks they are facing;

– shifting responsibility for performance of the task.

In the absence of a positive example in the work and a clear leader in a homogeneous environment, the students of the IG group, capable of social interaction (36.51%), begin to demonstrate the same passivity in work as the students of the CG group. This indicates that, due to the peculiarities of the development of the volitional sphere and impaired thinking, individuals with ID are unable to communicate effectively and require constant mentoring in their work. Therefore, we can see that the mechanisms of social interaction, which took shape in an inclusive environment are only partially preserved in a homogeneous one, which may also indicate their superficiality.

Thus, the educational environment of correctional schools may hinder the process of development of the communicative-organizational component of readiness for professional activity among students, because its homogeneity, to which L.S. Vygotsky referred [8; 9; 17], does not provide an opportunity for the development of collective cooperation and joint activities that would allow students with ID to launch collective logical thinking, find new ways of activity and thereby control their behavior in the group. That said, the low level of problematization of learning, the lack of a productive dialogue with the teacher and peers without mental disability, lack of positive examples of the causal explanation of substantive activity make students overestimate their strengths, make mistakes and quit activities.

An inclusive educational environment aimed at providing psychological guidance to the student, as demonstrated by the study, helps develop a personality ready for a constant dialogue in problem solving. However, it should be noted that the dialogue is often counterproductive, but turns into a request for help in the absence of independence in the decision-making process,

anticipation of prompting from a teacher, tutor or peers. Nevertheless, the doubts and indecision in the activities of IG students generated at the stage of new tasks make them search for the right solution and course of action. While independently found solution to the problem when interacting with team members already represents a step forward in the problem of the readiness of people with ID to integrate into society.

Conclusion

Young people with ID following graduation from educational institutions are not ready for full integration into society employment and work in a team. Given the significance of the defined problem for the Russian society, a comparative study was organized and conducted related to the impact of the educational environment of a correctional school and an inclusive environment on the development of the communicative and organizational foundations of the activities of students with ID based on the case method.

The study makes and proves the hypothesis that the emergence of this problem is due to the influence of a homogeneous educational environment of correctional schools, which despite the attention it gives to the development of a positive attitude to work, discipline and independence in labor activity, does not form the ability to communicate, work together and regulate behavior in accordance with it.

The leverage that activates the thinking and search activity of students with ID is the learning environment that helps develop their social competence, triggers the mechanisms of group interaction in a heterogeneous environment to expand the boundaries of their social experience and transfer skills to new conditions of activity. Such learning conditions can be created by an ideal model inclusive educational environment. The study also highlighted a number of problems characteristic of an inclusive educational environment, such as lack of independence in the activities of students with ID, the instability of their skills for effective group interaction.

The results of the study can form the basis for the creation of special programs that would help to develop a communicative and organizational component of the readiness of students with ID for professional and labor activities in an inclusive educational environment, taking into account the best practices of correctional education in the formation of a positive attitude towards work and independence in labor activity.

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ЭМПИРИЧЕСКИЕ ИССЛЕДОВАНИЯ

The Role of Verbal Representation in Assessment of Category Judgments

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The study examines the role of inner speech measured by verbal representation scale in assessment of category judgments and in transfer from the category example to the whole category. We used the conventionality effect of the category label, meaning that people perceive judgments containing commonly used category labels as more convincing even when the category itself is new, and its label is artificial [11]. We proposed that this effect can be enhanced if to use a metaphorical label for the category that emphasizes its feature. We also tested whether the metaphorical label could enhance the transfer of the feature from the category example to the whole category. We hypothesized that the conventionality effect and transfer of the trait will be different in participants depending on their level of verbal representation. In the first part of the study, we adapted the Internal Representation Questionnaire [16] and used verbal representation scale from it to divide participants into groups by their level of inner speech. The results show that participants with higher level of verbal representation were less influenced by the conventionality effect of the label. We also found that participants with lower level of verbal representation were more prone to transfer information of the metaphorical labels. Otherwise, participants with higher level of verbal representation were more inclined to transfer category information of non-metaphorical labels. The findings indicate the relationship between individual differences in verbal representation level and evaluation of category judgments.

Keywords: inner speech, verbal representation, concept, category, conventionality, metaphor, category judgement.

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Роль вербальной репрезентации в оценке категориальных суждений

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В исследовании изучается роль внутренней речи, измеренная по шкале вербальной репрезентации, в оценке категориальных объяснений и переносе информации с нового примера на целую категорию. Мы использовали эффект конвенциональности названия категории, который заключается в том, что объяснения с использованием общеупотребимого названия кажутся более убедительными — даже в том случае, когда категория является новой, а название искусственным [1]. Мы предположили, что данный эффект может быть усилен при использовании для категории метафорического названия, подчеркивающего ее перцептивный признак. Также мы проверили, способно ли метафорическое название категории усилить перенос признака из нового примера категории на целую категорию. Гипотеза заключалась в том, что и эффект конвенциональности, и перенос признака будут по-разному проявляться у испытуемых в зависимости от того, насколько развита их внутренняя вербализация. В первой части исследования мы адаптировали на русском языке опросник внутренних репрезентаций [2], используя для второй части исследования из него одну шкалу — уровня вербальной репрезентации для разделения испытуемых на группы по степени выраженности внутренней речи. Оказалось, что испытуемые с более выраженной вербальной репрезентацией меньше подвержены эффекту конвенциональности названия категории. Также выяснилось, что при низком уровне вербальной репрезентации перенос категориальной информации был более выражен с использованием метафорических названий категорий. При высоком уровне вербальной репрезентации, наоборот, перенос категориальной информации был более выражен, когда использовались неметафорические названия категорий. В совокупности результаты исследования показывают связь индивидуальных различий в уровне вербальной репрезентации с вынесением и оценкой категориальных суждений.

Ключевые слова: внутренняя речь, вербальная репрезентация, понятие, категория, конвенциональность, метафора, категориальное суждение.

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Introduction

Language helps in learning concepts [1; 12] and remembering relevant information when solving problems [2]. It also helps humans represent their own thought processes. When solving a problem, we often rely on speech to tell ourselves what needs to be done. Several theories suggest that in addition to its regulatory func-

tion, which supports learning mechanisms, speech provides humans with the form and content of representation. For example, when we encounter something new to us (a new food, a new smell), we can describe the characteristics of this phenomenon in some words.

The format of representation may not necessarily be in the form of inner speech. A. Paivio's prominent theory of double coding [14] assumes the existence of

at least two formats — verbal and analog. According to this theory, the choice of representation format can be conditioned by the requirements of the task, as well as determined by individual differences — by the way of representation that initially dominates in a person.

One of the directions of development of this theory is to measure different types of representations and individual differences in the level of their development [3; 4; 6; 17]. The Internal Representations Questionnaire, published recently [16], is the closest one of representation type measurement to the goals of our study. In contrast to the above-mentioned measurement options, this questionnaire aims to assess speech participation in various situations that do not require communication. In the present study, we used this questionnaire to assess the relationship between the internal speech and the construction of category judgments: the role in explaining and transferring new categorical information of such basic characteristics of a categorical name such as conventionality and the presence of metaphorical descriptions.

We asked subjects to evaluate simple examples of judgments and explanations about categories: “Why are leaves green?” — “Because they contain chlorophyll.” In this example, the greenness of the leaves is explained using the word “chlorophyll.” But if the meaning of “chlorophyll” is unknown, will the explanation be taken as convincing? We hypothesized that the level of verbal representation may be related to categorical explanations: the higher the level, the more persuasive the explanation will seem to a person (hypothesis 1).

Research confirms that categorical names or category names make explanations more plausible for respondents [9], especially if the label has conventionalism — the notion that other people also know the name [11]. We also hypothesize that the higher the level of verbal representation a subject has, the more significant will be the conventionality factor (hypothesis 2).

Previously, however, this effect was only studied on labels representing invented abstract categories (e.g., “agularia”). If the category name was metaphorical, would it also affect the persuasiveness of the explanation? A metaphorical name emphasizes a feature in a category that serves as the basis for the metaphor, and can potentially enhance the effect of conventionality by implicitly “explaining” why the category has that name. Research shows that metaphors influence perceptions and judgments about various phenomena [19], but their effect on the evaluation of explanations in relation to conventionality has not yet been studied.

According to D. Gentner’s theory [8], metaphor acts as a transitional form between concrete and abstract concepts. Therefore, in some cases, such as more abstract and relative concepts, metaphorical names will not so much serve to generalize as to draw attention to the incidental parts of the category [10].

Since it is known that one important function of categories is to provide inductive transfer of information from a new example of a category to the whole category or its individual examples [5; 7], we hypothesized that metaphorical names can affect both inductive transfer and interact with the level of verbal representation: they will enhance the transfer of categorical information in people with low verbalization and weaken it in people with high levels (hypothesis 3).

We tested how categorical explanations would be evaluated and how information from the new example would be transferred to the target category if the category labels differed in conventionality and ‘metaphorality’. Our goal was to test the relationship of individual differences in internal verbalization ability to judgment persuasiveness and categorical information transfer. We used the Internal Representations Questionnaire [16] primarily to measure the level of verbal representation. The authors of the original questionnaire assessed convergent validity by correlating the results of the questionnaire with existing internal verbalization assessment instruments, and also assessed the predictive validity of the questionnaire by relating the results of the questionnaire, in particular the level of verbal representation expression, to performance on simple categorical tasks: assessing the relationship between an image and its names. They saw the mechanism of the influence of the level of verbal representation on the performance of such simple tasks in the fact that internal speech may cause additional phonological coding of information, which activates relevant categorical information in the long-term semantic memory. In our study, we wanted to show the dependence on the level of verbal representation of higher-level processes. To do this, we translated the original questionnaire into Russian and evaluated it to highlight the verbal representation scale, and then used the translated version in the experiment.

Study 1. Adaptation of the Internal Representations Questionnaire

Method

The Internal Representations Questionnaire [16] consists of 35 statements measuring four types of representations: Visual Imagery, Internal Verbalization, Orthographic Imagery, and Representational Manipulation. These representations are represented in four scales of the questionnaire. The Visual Imagery scale includes 10 statements in which the preference to use visual images in thinking is described (e.g., *I can close my eyes and easily picture a scene that I have experienced*) The Internal Verbalization scale consists of 11 statements which reflect the process of thinking in the form of inner voice, that is, the

ability to speak the ideas and hear the words "in your head" (e.g., *I think about problems in my mind in the form of a conversation with myself*). The Representational Manipulation scale has 8 statements which describe the ability to manipulate mental representations in visual-spatial, auditory, and tactile modes (e.g., *I can easily choose to imagine this sentence in my mind pronounced unnaturally slowly*). The Orthographic Imagery scale consists of 6 statements which reflect the ability to visualize language as it is written (e.g., *I see words in my "mind's eye" when I think*). Two statements from the Internal Verbalization and the Representational Manipulation scales are reversed.

The original questionnaire was published online and was accessible for use [16]. The statements were translated from English to Russian with the participation of two professional translators (<https://osf.io/tsdrp/>).

Participants. One hundred and seventy-three students (116 – females, $M = 17.92$, $SD = 0.767$), participated in the study.

Procedure. The study was conducted online via 1KA platform (www.1ka.si). Participants were asked to complete the questionnaire and rate each statement using 5-point Likert scale (1 – completely disagree, 2 – disagree, 3 – do not know, 4 – agree, 5 – completely agree). The statements were presented on a screen in a randomized order. To make sure that participants take the task seriously and do not give answers randomly, we added a control question in the questionnaire. We excluded 15 participants who gave wrong answer to this question. The data from the current study is published in an online repository (<https://osf.io/tsdrp/>).

Results and Discussion

Exploratory factor analysis (EFA) was used to analyse the factor structure of the questionnaire. Four factors were set to extract from the data. Factors were extracted using principal component analysis (PCA), Varimax rotation was applied to rotate factors. The results of the EFA showed that four factors explain 36.9% of data variance, which is a somewhat weak result. However, the scree plot with Eigenvalues demonstrates a four-factors solution. (Fig. 1).

The results of applying Varimax rotation method, and in particular, factor loadings of the variables are presented in Table 1. We considered and included only those variables which had a factor loading of more than 0.3.

The first factor consists of 12 variables, including 8 statements from the Representational Manipulation scale, and 4 statements from the Visual Imagery scale. The second factor includes 9 variables which represent statements from the Internal Verbalization scale. This factor also includes one variable from the Orthographic Imagery scale.

The third factor consists of the statements from three scales – the Internal Verbalization scale (4 statements), the Orthographic Imagery scale (1 statement) and the Visual Imagery scale (7 statements). Finally, the last factor includes statements from the Orthographic Imagery scale (3 statements) and the Visual Imagery scale (2 statements).

The results show that 3 out 4 factors are found to be heterogeneous and consisting of variables from different scales. It means that to confirm a four-factor structure of

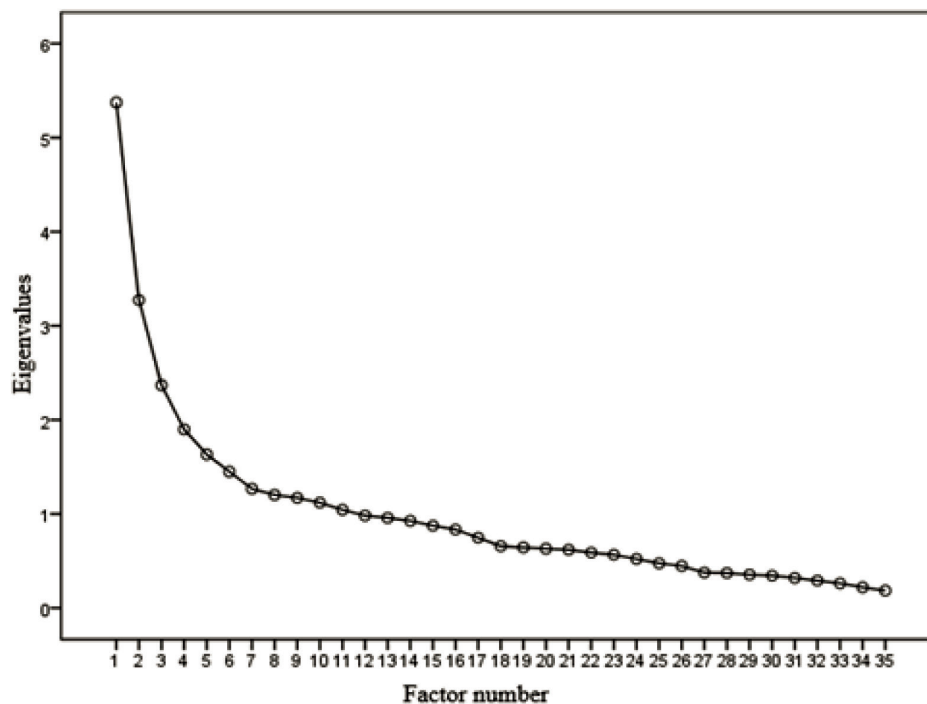


Fig. 1. Scree plot

Table 1

Factor loadings of the variables (statements) after applying the Varimax rotation method

Variable	Factor			
	1	2	3	4
manip1	.764	-	-	-
manip5	.729	-	-	-
manip8	.643	-	-	-
manip6	.586	-	-	-
manip4	.577	-	-	-
vis3	.487	-	.434	-
manip2	.454	-	-	-
vis2	.396	-	.320	-
vis7	.319	-	-	-
vis8	.311	-	-	-
ver1	-	.650	-	-
ver6	-	.647	-	-
ver8	-	.617	-	-
ver4	-	.588	-	-
ver7	-	.583	.429	-
orth5	-	.580	-	-
ver2	-	.559	.483	-
ver9	-	.495	-	-
ver10	-	.495	-	-
ver5	-	.324	-	-
ver3	-	-	.563	-
manip3	.364	-	-.553	-
ver11	-	-	.545	-
vis6	-	-	.520	-
vis1	.324	-	.520	-
orth6	-	-	.518	-
vis4	-	-	.433	-
vis5	-	-	.342	-
orth4	-	-	-	-
manip7	-	-	-	-
orth2	-	-	-	.762
orth1	-	-	-	.694
orth3	-	-	-	.684
vis9	-	-	.337	.340
vis10	-	-	-.320	.325

Note: manip — Representational Manipulation scale, vis — Visual Imagery scale, ver — Internal Verbalization scale, orth — Orthographic Imagery scale. Statements that formed the Verbal Representation scale are marked in bold.

the questionnaire, one need to conduct one more adaptation study and reconsider the translation or the wording of the statements.

Almost all statements from the Internal Verbalization scale were included in the factor. One statement from another scale was also found in this factor: *I hear a running summary of everything I am doing in my head.* Based on the idea of this statement, we might say, however, that it corresponds to the description of the Internal Verbalization scale and can be included in this factor.

We took statements from Internal Verbalization which were included in the factor in EFA, named the created scale the Verbal Representation scale and used

it to assess the verbal representation found in the questionnaire adaptation study and compared the evaluation of category explanations in participants with different internal verbalisation levels.

Study 2. Experiment: the Relationship between the Verbal Representation Scale and Perceiving Judgments

Method

Participants. Two hundred and six students aged from 17–24 years participated in the experiment. They

received extra points for a course as a reward for participation.

Materials and procedure. We used text descriptions of four types of categories (<https://osf.io/tsdrp/>): plants (flowers), inanimate nature (stones), social categories (ethnos) and health condition (disease). Each text contained the information that some person discovered a new phenomenon. In the *conventional label* condition, it was reported that this phenomenon had a certain name (e.g., *Anna learns that the accepted name for plants with those attributes is "agularia"*). In the *without conventional label* condition, it was reported that a person decided to name this phenomenon on his or her own (e.g., *she decides by herself to name plants with such attributes as "agularia"*). Also, each category varied depending on the presence or the absence of the metaphor in its name. For instance, instead of an artificial name "agularia" the name "flamy flower" could be used. As the result, there were four condition variants for every type of category: with or without conventional label and with or without the metaphor. The experiment had a within-subject design, and texts were randomly distributed. Texts were interchanged with the text-fillers with well-known categories which served as a control condition.

An example of one text description of a new category is presented below:

Maria is watching a broadcast about several people suffering from a rare disease which causes the tears to drop often and spontaneously. She doesn't know about the existence of such disease and decided to name it somehow. She decides by herself to name the disease with such attributes as "parsotaphia" / "Piero's syndrome" // She doesn't know about the existence of such disease. She learns that the accepted name for the disease with those attributes is "parsotaphi" / "Piero's syndrome". Later, Maria and her friend are watching a broadcast about another person suffering from this disease. The person has his tears to drop often and spontaneously. Her friend asks: "Why does it happening to him?" "Maria answers: "Because he has parsotaphia / "Piero's syndrome".

After reading the text, participants answered the question "To what extent do you find the given answer to be satisfying?" using 7-point Likert scale. According to the hypothesis, the scores for this question (*persuasiveness of explanation*) should be, on average, higher in conventional label condition, as in the [11]. In addition, metaphor labels can enhance this effect because the metaphor contains the main attribute which constitutes the category. We also compared the scores for answers in familiar categories and in new categories and analysed the interaction of text factor with other factors. According to the data from the original study [11], the score for *persuasiveness of explanation* should be lower in texts with new categories.

Then, participants were presented with the text in which a new example of a category was described, and a new attribute of this example was reported:

New category: *Later, Maria learns that there is another disease which is also characterised by spontaneous and frequent tear dropping. In addition, it is characterized by a constant feeling of grief and melancholy.*

Participants were asked to rate the probability that the phenomenon described in the previous text also had the attribute described in the latter text using 7-point Likert scale (e.g., *To what extent is it probable that the disease, which Maria watched in the broadcast earlier, is also characterized by the constant feeling of grief and melancholy?*).

According to the hypothesis, in the case of metaphor labels, the scores for this question (*the probability to transfer category information*) should be, on average, higher than in the group without metaphor labels because the metaphor implicitly contained the attribute which should be transferred from the new category example.

In the end of the study, participants were asked to complete the Internal Representations Questionnaire. However, we only used statements which formed the Verbal Representation scale in data analysis.

Results and Discussion

Participants were divided into three groups (group factor) based on the level of verbal representation defined by the Verbal Representation scale from the modified version of the Internal Representations Questionnaire [16]. Mean score amongst participants was 3.521, SD = 0.643. The division by groups was organised using quartiles: low level of verbal representation group included participants with the score lower than $Q_{25} = 3.00$, middle level – higher than $Q_{25} = 3.00$ and lower than $Q_{75} = 4.00$, and high level – higher than $Q_{75} = 4.00$.

We used ANOVA to define the influence of metaphor category label, conventionality of category label and individual differences in the level of verbal representation on the persuasiveness of explanation and the probability to transfer category information.

Familiar and new categories comparison. We compared participants' answers in relation with the presence of a new or a familiar (control condition) category and evaluated the interaction of text and group factors. ANOVA revealed a significant influence of the text factor on both questions: participants perceived judgements with familiar categories as more persuasive ($M=4.09$, $SD=2.04$), than with new categories ($M=3.21$, $SD=2.05$), and were more prone to transfer information in the case of familiar categories ($M=4.20$, $SD=1.92$), than in new categories ($M=3.61$, $SD=1.61$), $F(1.986)=45.630$, $p<.001$ and $F(1.986)=21.21$, $p<.001$ respectively (Fig. 2).

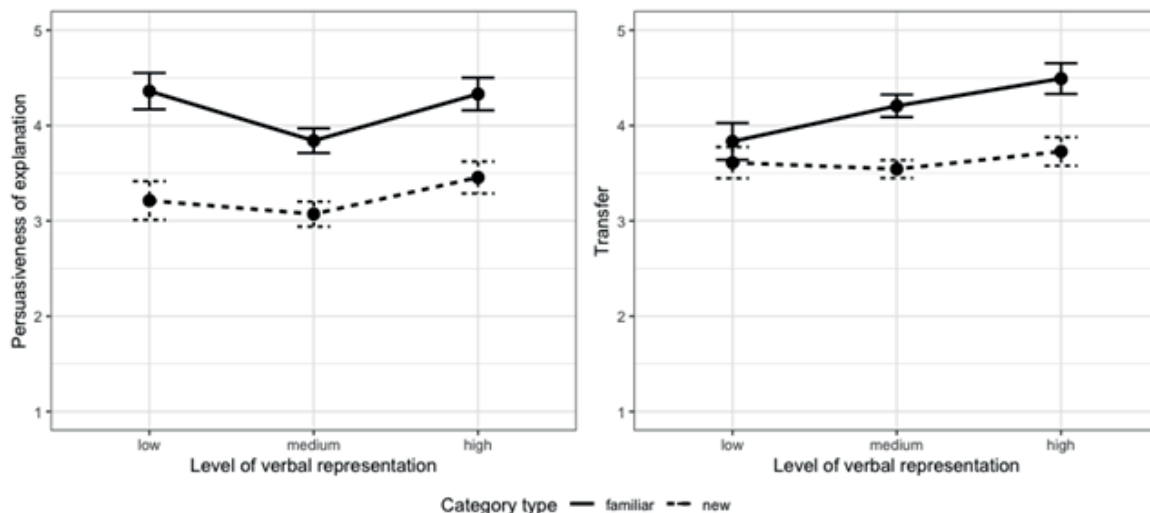


Fig. 2. The comparison of experimental conditions based on the level of verbal representation and category type

Our hypothesis about the group factor was confirmed: this factor was significant for both questions. Speaking about the persuasiveness of explanation, participants with high level of verbal representation demonstrated on average higher scores than participants with medium level of verbal representation. As for the probability to transfer category information, the higher the level of verbal representation, the higher the scores and, therefore, the agreement with the information transfer.

There were no interactions between category type (new or familiar category) and group factor in both questions (Tab. 2). This way, the influence of the rest of the factors – the presence of the metaphor and conventionality in the category label and the level of verbal representation – will be considered based on the texts with new categories where the scores are lower than in familiar categories condition.

Persuasiveness of explanation. ANOVA did not reveal the interaction of all three factors, i.e., metaphor, conventionality and group, $F(1.484)=0.529$, $p=0.589$. There were also no significant interactions between metaphor and conventionality, as well as

between metaphor and group (Tab. 3). We found a significant interaction between conventionality and group, $F(1.484)=3.920$, $p=0.020$. As for the analysis of separate factors, only conventionality factor was found to be significant: participants found judgments with conventional label to be more persuasive ($M=4.17$, $SD=1.97$), than with non-conventional label ($M=2.25$, $SD=1.66$). This result replicates the result from the previous study [1].

The analysis of the interaction between conventionality and the level of verbal representation showed that participants with high level of verbal representation were less dependent from the conventionality of the label when evaluating the persuasiveness of explanation (Fig. 3). Participants with low and medium level of verbal representation gave higher scores for the persuasiveness of explanation when the label was conventional, and lower scores when it was unconventional. It means that the effect of conventionality [11] was more relevant for participants with low and medium level of verbal representation. This result disproves our hypothesis that the

Table 2

ANOVA results of persuasiveness of explanation and probability to transfer category information in new and familiar categories

Factor	SS	df	MS	F	p	η^2_p
persuasiveness of explanation						
category type	189.52	1	189.52	45.630	<.001	0.044
group	39.07	2	19.53	4.703	0.009	0.009
category type * group	5.41	2	2.71	0.652	0.521	0.001
Residual	4095.23	986	4.15			
probability to transfer category information						
category type	66.1	1	66.11	21.21	<.001	0.021
group	19.1	2	9.57	3.07	0.047	0.006
category type * group	10.0	2	5.02	1.61	0.200	0.003
Residual	3073.4	986	3.12			

Table 3

ANOVA results of persuasiveness of explanation in new categories

Factor	SS	df	MS	F	p	η^2_p
metaphor	0.736	1	0.736	0.224	0.636	0.463
conventionality	371.255	1	371.255	113.089	<.001	0.189
group	13.059	2	6.530	1.989	0.138	0.008
metaphor * conventionality	1.023	1	1.023	0.312	0.577	0.644
metaphor * group	3.228	2	1.614	0.492	0.612	0.002
conventionality * group	25.735	2	12.867	3.920	0.020	0.016
metaphor * conventionality * group	3.476	2	1.738	0.529	0.589	0.002
Residual	1588.897	484	3.283			

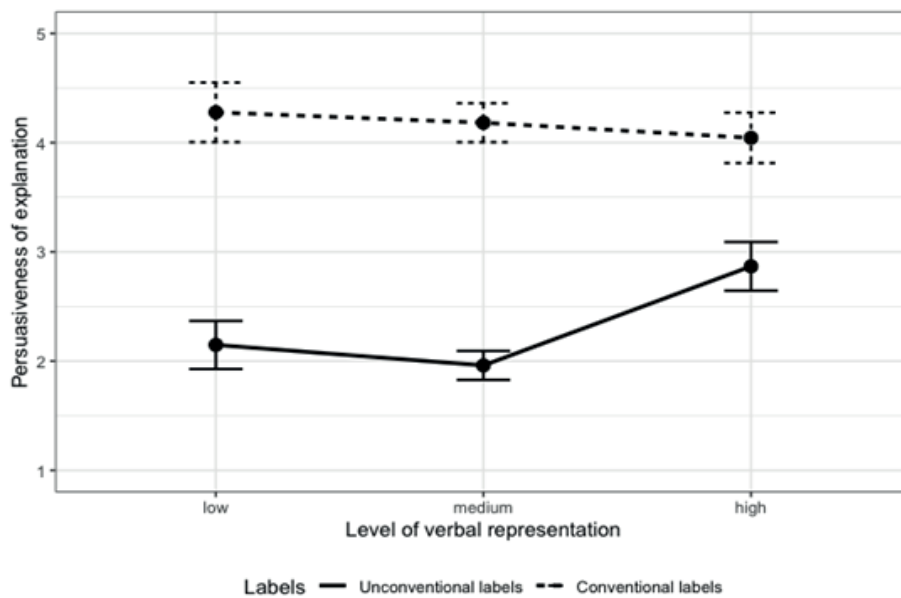


Fig. 3. Persuasiveness of explanation depending on the level of verbal representation and category type

effect of conventionality should manifest more in participants with high level of verbal representation.

Probability to transfer category information. ANOVA found a significant interaction of three factor (metaphor, conventionality, group) and their influence on the agreement to transfer an attribute from the new category example to the previous one, $F(2.484)=4.368$, $p=.013$ (Tab. 4).

Participants with low level of verbal representation were more prone to transfer the information in the case of metaphor labels, than without metaphor. Participants with

high level of verbal representation, otherwise, were more prone to transfer the information in the case of labels without metaphor, than with metaphor. This interaction was found only in the conventional label condition (Fig. 4).

This interaction confirms our hypothesis that metaphor labels should enhance the agreement to transfer the information about category if a person has a low level of verbal representation, whereas labels without the metaphor enhance this agreement when a person has a high level of verbal representation.

Table 4

ANOVA results of the probability to transfer category information

Factor	SS	df	MS	F	p	η^2_p
metaphor	0.448	1	0.448	0.173	0.677	0.358
conventionality	1.514	1	1.514	0.586	0.445	0.001
group	3.001	2	1.500	0.580	0.560	0.002
metaphor * conventionality	2.965	1	2.965	1.147	0.285	0.002
metaphor * group	2.507	2	1.254	0.485	0.616	0.002
conventionality * group	1.538	2	0.769	0.297	0.743	0.001
metaphor * conventionality * group	22.584	2	11.292	4.368	0.013	0.018
Residual	1251.257	484	2.585			

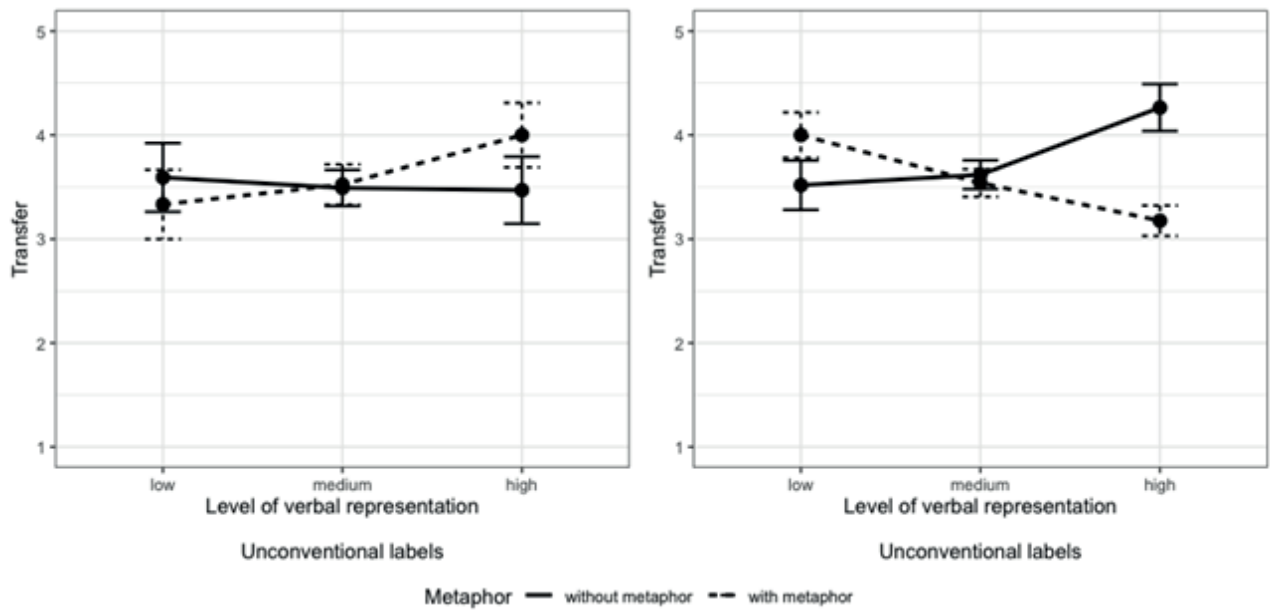


Fig. 4. The comparison of the probability to transfer category information in dependence from the level of verbal representation and category type

General Discussion

Language allows us to work with the information internally: retrieving information from the long-term memory and translating it to the level of awareness [17; 18; 19]. The influence of speech on cognitive processes increases with age [1]. Our study shows that the influence of the inner speech also extends to the understanding of categorical explanations. We found that high levels of verbal representation were associated with the evaluation of the persuasiveness of categorical explanations and transfer of categorical information. This ability was related to the presence of the 'metaphorical names' factor. At a low level of verbal representation, the transfer of categorical information was more significant with the use of metaphorical names. In contrast, when the level of verbal representation was high, the transfer of categorical information was more significant when conventional categorical names were used. Further research is needed in order to account for these differences.

In our study, we did not compare the assessment of categorical judgments with individual differences in other types of representation. Adapting the questionnaire did not allow the use of other scales, but the verbal representation scale has shown that it can be used for a wide range of cognitive processes, from simple ones that require image identification [16] to more complex ones that include the understanding of explanations. The next stage in the application of the measure of the inner speech and verbal representation can be to examine the relationship to the level of awareness in the operation of categorical information. It is known that adults and children over the age of 9 are more successful in learning cat-

egorization rules if the attributes included in these rules have good lexical labels [2]. This effect is not observed in children under 9 years of age, even though formation of these types of rules is already available. At the same time, children of this age can hardly verbalize and, consequently, realize the found categorization rule [18]: a fact that was noted by L.S. Vygotsky [1]. It can be assumed that children who have a higher level of development of verbal representation will have more opportunities to comprehend the found categorization rules. However, testing this hypothesis would require adapting the material of this questionnaire.

Conclusions

In our study, we extracted the verbal representation scale from the internal representation questionnaire [16]. The adaptation of the questionnaire to Russian-speaking respondents showed the greatest compliance of the verbal representation scale with its version in the original version. This scale was used to divide the subjects into groups with low, medium, and high levels of this ability with subsequent analysis of its connection to the evaluation of categorical explanations and the transfer of categorical information. We showed the connection between the level of verbal representation and these cognitive processes and the interaction with the relevant factors – the use of different types of categorical names (conventional and metaphorical) and their conventionality. These results significantly expand ideas about the influence of the inner speech on cognitive processes.

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Involuntary Integration of Another Person's Perceptual Activity Outcomes into the Individual's Own Perceptual Activity

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Monitoring of someone's behavior is accompanied by integrating the results of another person's cognitive activity into our own. We assumed that the process of such integration occurs involuntarily and automatically. The subjects watched "silent" video clips, where the character looked beyond the frame and demonstrated a behavior, pointing that he recognized an object of a certain category at the end of the video. Then the subjects observed the scene from the character's perspective, demonstrating what he or she saw. The subjects' task was to find a visually noticeable letter on these frames as quickly as possible. Healthy individuals (N=70) and patients with schizophrenia (N=34) took part in the study. The healthy subjects who observed the character's behavior automatically analyzed the object perceived by the character, and only after that they searched for the target letter, in contrast to healthy participants who did not see the observer's behavior. Patients with schizophrenia who understood the character's behavior, in contrast to patients who did not, first of all analyzed the object perceived by the character and spent more time detecting the target letter. The study showed that integrating cognitions with observed person is a principally automatic process.

Keywords: joint cognitive activity, co-operative actions, schizophrenia, visual perception, visual attention, eye movements.

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Непроизвольная интеграция результатов перцептивной активности другого индивида в собственную перцептивную активность

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Работа направлена на проверку гипотезы о том, что при наблюдении за поведением другого человека люди непроизвольно, автоматически интегрируют результаты его когнитивной активности в собственную когнитивную активность. Разработана процедура: испытуемые просматривали «немые» видеосюжеты; в конце персонаж, смотря за пределы кадра, демонстрировал реакцию, свидетельствующую, что он воспринял объект определенной категории. После фиксационного креста испытуемые наблюдали кадры, с перспективы персонажа показывающие, что он увидел. Задачей испытуемых было как можно быстрее найти на этих кадрах визуально заметную букву. Были обследованы здоровые лица (N=70) и больные шизофренией (N=34). Здоровые лица, наблюдавшие поведение персонажа, в отличие от здоровых лиц, его не наблюдавших, непроизвольно анализировали объект, воспринятый персонажем, и лишь после этого искали целевую букву. Больные, понявшие поведение персонажа, в отличие от больных, его не понявших, в первую очередь также анализировали объект, воспринятый персонажем, вследствие чего дольше искали целевую букву. Исследование показало, что в условиях наблюдения за другим человеком процесс интеграции результатов его когнитивной активности в собственную является преимущественно автоматическим процессом.

Ключевые слова: совместная познавательная деятельность, ко-оперативные действия, зрительное восприятие, зрительное внимание, движения глаз, шизофрения.

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Summary

The joint cognitive activity issue was developed in the works of a large number of Russian and foreign researchers (L.S. Vygotsky, B.F. Lomov, V.V. Rubtsov, A.N. Leontiev, J. Wertsch, etc.). As J. Wertsch points out, the high relevance of this issue can be explained by two reasons: first, by the key importance of joint activity for the development of cognitive functions in ontogenesis; second, by the ecological validity – we perform most cognitive tasks not in isolation but in cooperation with other people [24]. According to L.B. Resnick, outside the laboratory and school, cognition is almost always cooperative [18]. B.F. Lomov in his works stresses the high importance of studying cognitive functions within the framework of joint activity, because these functions are revealed most fully in this activity [7].

Many researchers highlight the fact that human cognitive activity has a fundamentally social nature (L.S. Vygotsky, M. Tomasello, etc.). This thesis is often understood in the way that the higher mental functions are forming at a certain stage of child's development through the cooperation with an adult [2]. However,

some researchers point out that adults' cognition also has a socially mediated (co-operative) character, i.e., it is performed through another person [12; 21; 22].

In the terminology of C. Goodwin's theory of co-operative action, when building some action, an individual provides to the public space semiotic resources or materials organizing this action. Participants of joint activity selectively use these resources for building their own actions, i.e., include structure of other people's actions to the internal organization of their own activity [12].

In other words, in the process of cooperative action individuals almost instantly integrate the results of other person's cognitive activity into their own cognitive activity. This propensity to integrate cognitions with the other person requires certain functions, one of which is the tendency to pick up the results of others' cognitive activity. This picking up concerns (1) the schematic (conceptual) perception of the other person, (2) language constructs, (3) gestures and action structures [13].

Goodwin's syntactic priming is one example of the integration of cognitions with another person [12]. Tony says to Chopper, "Why don't you get out of my yard?" to which Chopper replies: "Why don't you *make* me get

out of the yard?” This conversation demonstrates how Chopper picks up Tony’s lexical construction and integrates it into his own answer. He builds his action not from the scratch, but by performing operations with the material provided by the other person. First, he breaks down into two parts the linguistic structure provided by Tony. Second, he adds his own material (“make me”) to this structure, creating a fundamentally new action.

Another example of integration of cognitions with another person is a gaze following phenomenon. A number of studies have shown that this process is involuntary, automatic [11; 19]. If we see a person looking to the left, we involuntarily orient our attention to the same direction. This fact has been verified in many experiments [10; 11].

However, the phenomenon of “gaze following” is a part of the more complex process — modeling the perceptual activity of another individual [4]. To illustrate, here is an example. If the observer sees a person with both hands suddenly raised up, he/she understands that such person perceives the situation within the “threat of firearms” scenario. The observer looks the same direction as the observed person and tries to find an object that falls into the category “aimed weapon”. In other words, the observer tries to model another person’s perceptual activity. The observer integrates the results of other person’s perceptual activity (the person saw the aimed weapon) into his/her own perceptual activity (identifies the object that falls into the relevant category). This modeling process requires complex operations of top-down categorization (from a general category to a specific object), and gaze following is a part of this complex process [1].

But the question remains whether the observer will integrate the results of the observed individual’s perceptual activity into own perceptual activity if there is no information about the direction of that individual’s gaze, and the observer can only infer what the individual sees from his/her behavior and facial expressions. In this situation, would the observer focus attention on the objects that are relevant to the categorical perception of the observed individual? Whether such integration, provided by top-down categorization, is an automatic, involuntary process, can it be consciously controlled? In order to answer these questions, two experiments have been performed.

Experiment 1

Participants. The study involved 70 healthy participants aged from 19 to 23 years (mean age — 20.1 years), who were randomly divided into the Group A (35 subjects) and the Group B (35 subjects).

Method. As instructed, participants in the Group A watched the videos of “silent” social scenes, lasting from

65 to 124 s. In the final part of each video, a character’s emotional reaction (fear, amazement, etc.) was demonstrated close-up, showing that he/she perceived an object of a certain category (something frightening, etc.). After the demonstration of the character’s emotional reaction the video was suddenly interrupted and the subjects had to shift their gaze to the fixation cross on the gray background (0.5 s) and then perform the task of searching for the target letter. The task consisted of the following. After the fixation cross, a sequence of video frames, not previously seen by the subjects, was shown for 5 s. where the subjects observed the scene from the character’s perspective, demonstrating what he/she saw. These frames included (1) a large and visually noticeable letter “O” or “X” and (2) a relatively small and inconspicuous object that caused the character’s emotional reaction and was in the focus of his/her attention. The instruction stated that the main task of the subjects was to search and identify the target letter (“O” or “X”) as quickly as possible and name it aloud. And only after that they could look at the objects in the video frames, including the object that caused the character’s emotion. At the end of each trial, subjects were asked to describe the content of the viewed videos and to explain the character’s behavioral reaction.

Thus, the experimental procedure described above has modeled a “cognitive conflict” situation. We assumed that the task of searching for the target letter would conflict (interfere) with searching for the objects that caused the character’s emotional reaction.

The Group B subjects performed the same experimental procedure, with the exception that they didn’t watch the video frames. Each trial began with a demonstration of a fixation cross on a gray background (0.5 s). After that the subjects were presented with video frame sequences where they had to search for the target letters (Fig. 1).

Equipment and material. Videos of social scenes were presented on a 19-inch LCD color monitor with a resolution of 1280×1024 pixels. The distance from the screen to subject’s eyes was 60 cm. The angular sizes of the presented video fragments and scene frames were 25°×18°. Eye movements recordings were performed with the Tobii X120 non-contact eye movement recording system (Tobii Technology, Sweden) with a frequency of 120 Hz (spatial resolution of 0.3°). The subject had a calibration procedure before performing each sample. Eye movement recordings with low validity values were excluded from the analysis.

The study was performed on the material of four videos of social situations from the silent black-and-white movies chosen through the expert assessments: “Girl shy” (USA, 1924), “The kid brother” (USA, 1927) and “Speedy” (USA, 1928). We will give a description of two videos for the illustrative example.

The video 1 (the movie “The kid brother”). The sher-

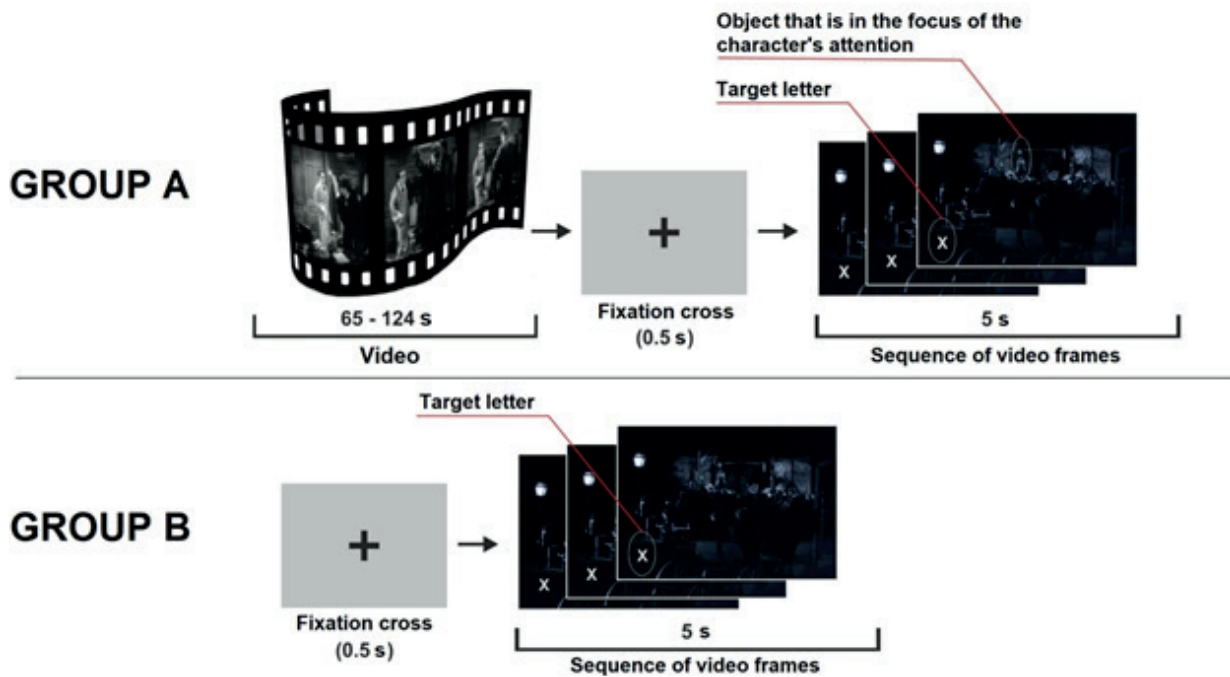


Fig. 1. Experimental procedure

iff's son, by his father's order, tries to shut down a street performance of scam artists. The scammers trick the sheriff's son into handcuffs and hang him over the stage making him look like a laughingstock in public. The sheriff is walking not far from the performance place. A close-up shows him suddenly stopping, looking ahead and frowning his eyebrows. What he sees is hidden from the viewer. A fixation cross follows. Then comes the scenes that show the stage and the sheriff's son hanging over it.

The video 2 (the movie "The Speedy"). The cab driver takes a passenger's suitcases and walks to the cab. He sees his cab suddenly moves off and drives away. He throws the passenger's suitcases on the sidewalk and runs after the cab. A close-up shows the surprised and sorrowful expression on the passenger's face as he looks at the sidewalk. What he sees is hidden from the viewer. A fixation cross follows. Next comes the scenes showing a suitcase lying on the sidewalk and a thin stream of liquid flowing out of it.

The objects that caused characters' emotional reactions were small (up to 3.0°) and had a low "visual saliency" level in all the frames used in the task of searching for the target letter. The target letter also had a small size (2.0°), but a high level of "visual saliency". Visual saliency of the frame areas was assessed using the "Saliency Toolbox". [23].

Registered parameters. The subjects' eye movements were recorded while viewing each video and while performing the following task of searching for the target letter. The visual fixations and saccades were recorded using the "I-VT" algorithm [16]. [16]. The software "Tobii Studio 3.2.1" was used to calculate count and duration of fixations of the subjects' eyes on the so-called dynamic areas of interest (AOIs), i.e., areas that move

in exact accordance with the movement of objects (subjects, characters' faces, etc.) on a video. The data have been analyzed using one-factor and multivariate analysis of variance methods with the SPSS v.23 package.

Results and Discussion

The verbal responses of the subjects have been analyzed for each video. It was found that 100% of healthy subjects successfully explained character's behavior and correctly identified objects in the focus of their attention.

A one-factor analysis of variance (ANOVA) was performed for the letter detection time parameter. It was found that subjects who observed character behavior (the Group A), compared to subjects who did not observe it (the Group B), spent significantly more time detecting the target letter in the frames after *the video 1* ($F(2,12) = 24.7; p < 0.001$), *2* ($F(2,12) = 40.7; p < 0.001$), *3* ($F(2,12) = 10.8, p < 0.05$), and *4* ($F(2,12) = 27.7, p < 0.001$) (Fig. 2).

In order to understand the reasons for these differences, a comparative analysis of the eye-movement parameters while performing the task of searching for the target letter have been performed in the two groups of subjects. A one-factor ANOVA showed that the Group A subjects compared to the Group B required more gaze fixations on the target letter to identify it in the frames after the *video 1* ($F(2,14) = 13.1, p < 0.001$), *2* ($F(2,14) = 3.5, p < 0.05$), *3* ($F(2,14) = 16.5, p < 0.01$), and *4* ($F(2,14) = 3.6, p < 0.05$) (Fig. 3).

It was found that many subjects in the Group A, despite the instruction, first fixed their gaze on the object that caused the character's emotion and only then shifted their gaze to the target letter. The percentage of such

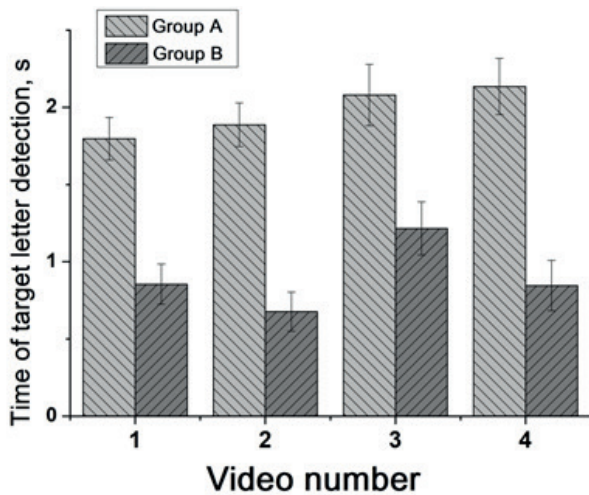


Fig. 2. Mean time of target letter detection in subjects of the Groups A and B for each video

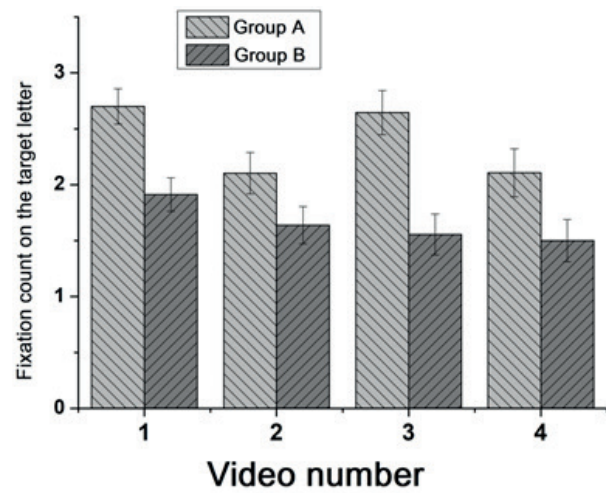


Fig. 3. Mean fixation count on the target letter in subjects of the Groups A and B for each video

subjects was 61% for the *video 1*, 56% for the *video 2*, 64% for the *video 3*, and 53% for the *video 4*.

In addition, subjects in the Group A compared to subjects in the Group B spent significantly more time to visually analyze the object that caused the characters' emotional reactions in the frames after *video 1* ($F(2.14) = 32.2, p < 0.001$), *2* ($F(2.14) = 117.7, p < 0.001$), *3* ($F(2.14) = 102.7, p < 0.001$) and *4* ($F(2.14) = 35.4, p < 0.001$) (Fig. 4).

The results of the study have showed that healthy subjects who observed the character's behavior, unlike healthy subjects who did not observe it, picked up the results of the character's perceptual activity (e.g., "the sheriff noticed his hanging son") and automatically integrated these results into their own perceptual activity even in the absence of information about the direction of the sheriff's gaze. In other words, they involuntarily identified and analyzed the objects/elements of the situation that were perceived by the character and determined his emotional reaction, and only after that they performed the primary task of searching for the target letter.

The process of such integration will be analyzed using the example of the *video 1*. Subjects in the Group A know from the semantic context that the sheriff sent his son to shut down the street performance. They see the scammers hanging the sheriff's son over the stage and continuing the show, then the subjects observe the emotional reaction of the sheriff who is walking nearby (he abruptly stops and frowns his eyebrows). This reaction is the so-called "material anchor" [15], which makes it possible to identify what the character perceives at this particular moment. In C. Goodwin's terms, it represents the material provided by the character to the public space [12]. Observers make the suggestion from the evaluation of the sheriff's reaction that he perceives or "defines" the situation [3] as "outrageous". The Group A subjects, despite repeated instructions from the experimenters to prioritize searching for the letter, involuntarily model the sheriff's perceptual activity by identifying and ana-

lyzing the element of the situation ("the sheriff's hanging son") that is in the focus of his attention and supports the sheriff's perception of the situation as "outrageous". Thus, the Group A subjects, as compared to the Group B subjects, spend more time analyzing the area of this element and searching for the target letter.

In addition, subjects in the Group A require more gaze fixations to identify the target letter than subjects in the Group B. This may be explained by the restructuring of cognitive activity as a result of switching from one type of activity (involuntary modeling of the perception of the observed character) to another type of activity (voluntary identification of the target letter). Thus, the Group A subjects, unlike the Group B subjects, are experiencing an interference effect: the conscious task of searching for the target letter conflicts (interferes) with the automatized process of analyzing the object/element of the situation that is in the focus of the character's attention. The subjects need to inhibit the automatic pro-

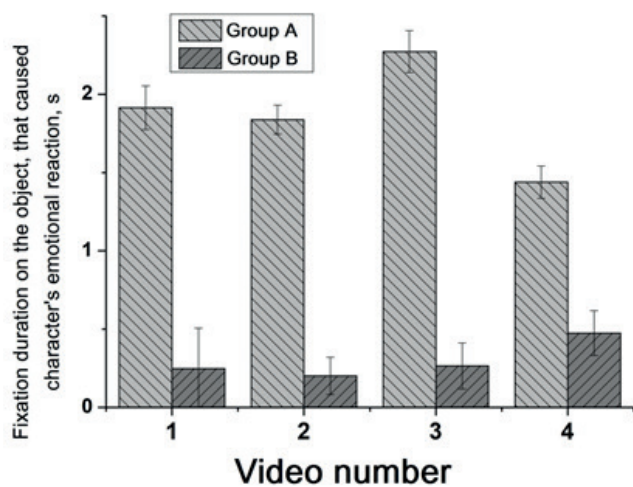


Fig. 4. The total fixation duration on the object, that caused character's emotional reaction, in the subjects of the Groups A and B for each video

cess of selecting this object to perform the task of searching for the target letter [17].

Furthermore, we assumed that the above-described interference effect is only present when the behavioral reactions of the people being observed are successfully understood, and that this effect will be absent when it is misunderstood.

In order to verify this assumption, experiment 2 was performed.

Experiment 2

Participants. The study involved 34 paranoid schizophrenia patients without intellectual disability aged from 19 to 42 years (mean age 30.2 years) being under treatment in the City Psychiatric Hospital №6 (Saint-Petersburg). The disease duration ranged from 1 to 11 years and averaged 4.5 years. All the patients with schizophrenia at the moment of the research were in the state of remission and did not manifest any signs of acute psychotic condition.

Procedure. The experimental procedure and stimulus material were similar to those used in the Experiment 1, when examining subjects of the Group A.

Results and Discussion

The verbal responses analysis had revealed that, unlike healthy individuals, patients with schizophrenia demonstrated considerable difficulties in understanding characters' behavior. The data correspond with the multiple studies [8; 9; 20]. These difficulties manifested themselves in erroneous explanations of the characters' emotional reactions at the end of the videos (e.g., after viewing the *video 1*, the patient said: "the person watched with interest what was being advertised there from the stage", etc.). The percentage of the patients who understood the characters' behavior was: for the *video 1* – 44.1% (15 people), 2 – 67.6% (23 people), 3 – 47.0% (16 people), 4 – 41.2% (14 people).

The patients have been divided into 2 groups by the analysis of the responses for each video: persons who understood and did not understand the characters' behavior.

The one-way analysis of variance was used for the letter detection time parameter. It was shown that patients who did not understand the characters' behavior took significantly less time to identify the target letter than patients who understood it in the frames after the *video 1* ($F(1.89) = 16.1$; $p < 0.001$), 2 ($F(1.89) = 19.5$; $p < 0.05$), 3 ($F(1.89) = 9.1$, $p < 0.01$) and 4 ($F(1.89) = 7.5$, $p < 0.05$) (Fig. 5). A comparison of letter detection time parameters between patients who did not understand the videos and healthy individuals in the Group A (see Exp.1 results) demonstrated that these patients performed significantly faster in searching for the target letter after each video ($F(1.9) = 8.1$; $p < 0.05$), (Fig. 6). As shown

in Fig. 5, patients who understood characters' behavior were slower than healthy subjects in identifying the target letter in all the videos. This fact was associated with the phenomena of psychomotor retardation due to the medications taken, decreased level of activation, etc.

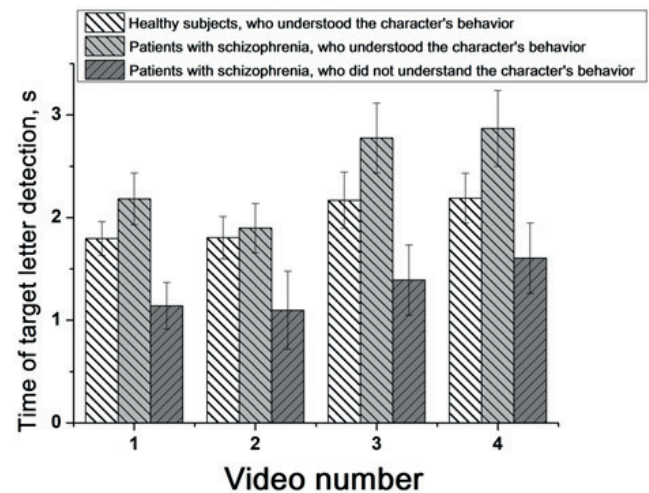


Fig. 5. Mean time for detecting the target letter in patients who understood and did not understand the character's behavior and healthy subjects of the Group A for each video

The parameters of eye-movement activity of patients who understood and did not understand characters' behavior while performing the task of searching for the target letter had been analyzed.

Statistical analysis had revealed that patients who did not understand the characters' behavior significantly less frequently fixed their gaze on the object that caused the character's emotional reaction than patients who did understand it: in the *video 1* ($F(1.82) = 23.8$; $p < 0.001$), 2 ($F(1.82) = 14.5$; $p < 0.001$), 3 ($F(1.82) = 7.1$, $p < 0.001$) and 4 ($F(1.82) = 18.5$, $p < 0.001$). The mean fixation count on the object in patients who did not understand the characters' behavior and in patients who understood it are respectively: for the *video 1* – 1.2 ± 0.54 and 4.43 ± 0.60 ; 2 – 1.45 ± 0.78 and 4.76 ± 0.51 ; 3 – 2.77 ± 0.69 and 5.18 ± 0.74 ; 4 – 2.38 ± 0.65 and 6.4 ± 0.77 . The percentage of patients who understood and did not understand the characters' behavior and made gaze fixations on the object that caused the characters' emotional reaction for each video, is presented in fig. 6. As shown, the fixations on the given object for the frames of the *video 1* were made by 93.3% of the patients who have understood the video, and 60% of the patients who have not understood it; 2 – 96% and 72.7%; 3 – 100% and 70.6%; 4 – 100% and 60%, respectively.

The one-factor ANOVA had showed that patients who did not understand the character's behavior spent significantly less time focally analyzing the object that caused the characters' emotional reactions compared to patients who did understand it: for the *video 1* ($F(1.82) = 17.6$; $p < 0.001$), 2 ($F(1.82) = 19.2$; $p < 0.001$), 3 ($F(1.82) = 3.7$, $p < 0.01$), and 4 ($F(1.82) = 15.8$, $p < 0.001$) (Fig. 7).

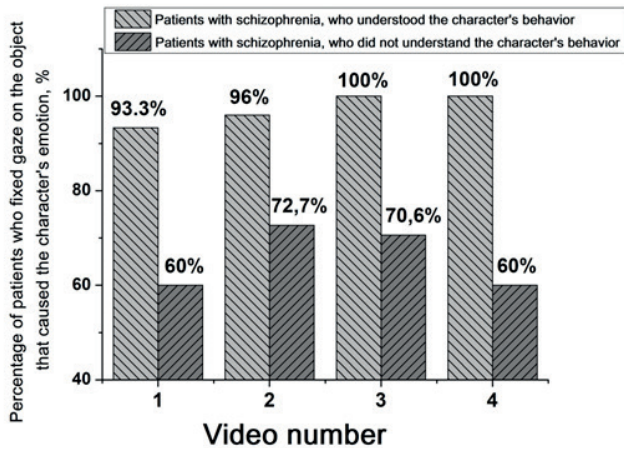


Fig. 6. Percentage of patients who understood and did not understand the character's behavior, who fixed their gaze on the object that caused the characters' emotional reaction for each video

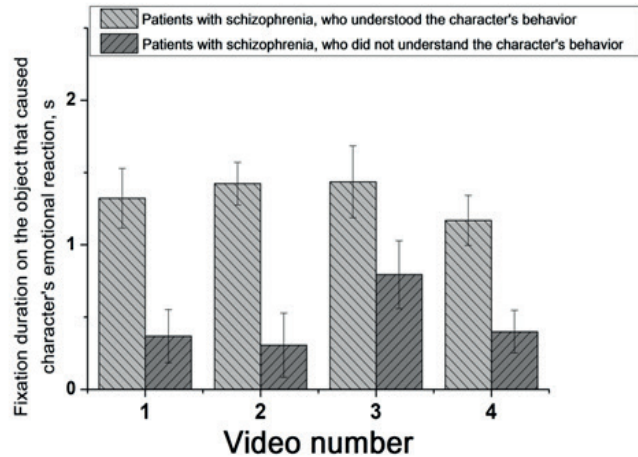


Fig. 7. The total fixation duration on the object, which caused the characters' emotional reaction, in patients who understood and did not understand the character's behavior for each video

The results of the experiment had shown that patients with schizophrenia who understood the character's behavior, as well as healthy individuals, automatically identify and analyze the objects/elements of the situation perceived by the character and reasoning his emotional reaction and only after that perform the task of searching for the target letter. Whereas patients who did not understand the character's behavior did not identify and analyze the aforementioned objects/elements of the situation. As a result, they had no difficulty in performing the task of searching for the target letter and performed that task more successfully than healthy individuals and patients who have understood character's behavior. Thus, these patients had no effect of interference of the task of searching for the target letter with the automated process of analyzing the object that caused the characters' emotional reaction.

General Discussion

The co-operative mode of cognitive activity organization is activated when we observe another person or engage in a joint activity together with him/her. The necessary condition for the activation of this mode is the presence of a "framework for cooperation" — a "joint project" [22], which we temporarily share with the other individual. In our study the formation of such a "project" occurs through the development and concretization of the behavioral conventional scenario of the observed character by the observer: on the one hand, the observer identifies objects and events that are significant for the "project" and, on the other hand, monitors how these objects and events are perceived by the observed character. The integration of the results of the other person's cognitive activity

into their own cognitive activity allows observers to go beyond their perception [27] and contribute to the "joint project": to complete the results of the other person's perceptual activity with the results of their own perceptual activity (for example, to identify objects and events relevant to the "project", but not yet perceived by the other person).

The original experimental procedure was used to show for the first time that the integration described above has an automatic, involuntary character. These findings are corresponding to C. Goodwin's theory of co-operative activity, according to which human actions are co-operative if a person builds them by performing systematic transformative operations with the material provided to the public space by another participant in the situation (linguistic expressions, gaze direction, facial expression, etc.) [12]. In our study, the character's emotional reaction, actualized at the end of the video was such a material. The observers involuntarily picked up the results of the cognitive activity of the observed character and realized their own perceptual activity on its basis.

It has been found that patients with schizophrenia demonstrate a deficit in integrating the results of another person's cognitive activity into their own cognitive activity, which leads to disturbances in understanding situations of social interaction. Patients make hypotheses about how participants in the observed situation perceive objects and events, but do not verify these perceptual hypotheses (do not identify and analyze objects and events perceived by the observed people) and, therefore, do not reveal that these hypotheses are incorrect. The received data can be applied in development of the new diagnostics methods of social cognition disorders in schizophrenia, and can be taken into account in development of new psychological correction programs.

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Temporal Focus as a Mediator between Cultural Values and Subjective Happiness: Evidence from Ecuador and Russia

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Though numerous scholars have studied subjective time, its predictors and effects, the general model considering demographic variables, cultural values and level of wellbeing is not presented. This study seeks to bridge this gap by contributing a comparative study of two very different countries: Ecuador (N=745, aged 19–76, 48.7% male), a Latin American developing country, and Russia (N=428, aged 18–72, 40.2% male), an emerging Eurasian nation. We assumed that temporal focus plays the role of a mediator in the relationship between cultural values and subjective happiness in both countries. To predict the temporal focus (Temporal Focus Scale by Shipp, Edwards, and Lambert, 2009) in both countries, based on the previous literature the study tests the importance of three groups of variables: demographic factors (gender, age, education, income), subjective happiness (Subjective Happiness Scale by Lyubomirsky and Lepper, 1999), and cultural values (Cultural Values Scale by Yoo, Donthu and Lenartowics, 2011). The first stage of analysis involved confirmatory factor analyses and invariance tests for the scales used. Subsequently, multiple regression models made it possible to establish that sociodemographic variables, introduced as covariates, had little influence on the prediction of people's temporal orientation. However, the cultural and psychological variables (long-term orientation, uncertainty avoidance and subjective happiness) introduced as predictors played an important role in the prediction of temporal (current, past and future) focus. Additionally, there are some cultural and psychological predictors of temporal focus specific for each country. Ultimately, structural equation models demonstrated that temporal focus plays the role of the mediator in the relationship between cultural values and subjective happiness in both Ecuador and Russia.

Keywords: temporal focus, demographics, subjective happiness, cultural values.

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Временной фокус как медиатор взаимосвязи между культурными ценностями и субъективным счастьем: на материале Эквадора и России

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Несмотря на многочисленные исследования субъективного времени, его предикторов и последствий, не была предложена общая модель, учитывающая демографические переменные, культурные ценности и уровень субъективного благополучия. В настоящем исследовании мы постарались преодолеть это ограничение, используя сравнение двух очень разных стран: Эквадора (N=745, 19–67 лет, 48,7% — мужчины.), латиноамериканской развивающейся страны, и России (N=428, 18–72 года, 40,2% — мужчины), преобразующегося евразийского государства. Мы предположили, что временной фокус может играть роль медиатора во взаимосвязях культурных ценностей и субъективного счастья в обеих странах. Для того чтобы определить предикторы временного фокуса (Шкала временного фокуса, Shipp, Edwards, Lambert, 2009) в обеих странах, с опорой на существующую литературу, исследуется значимость трех групп переменных: демографические факторы (пол, возраст, уровень образования, уровень дохода), субъективное счастье (Шкала субъективного счастья, Lyubomirsky, Lepper, 1999) и культурные ценности (Шкала культурных ценностей, Yoo, Donthu, Lenartowics, 2011). Первый этап анализа включал конфирматорный факторный анализ и тестирование на инвариантность для используемых шкал. Модели множественной регрессии позволили установить, что социально-демографические переменные, представленные как ковариаты, мало влияют на прогнозирование временной ориентации людей. Однако культурные и психологические переменные (долгосрочная ориентация, избегание неопределенности и субъективное счастье), введенные в качестве предикторов, сыграли важную роль в прогнозировании временного (настоящего, прошлого и будущего) фокуса. Кроме того, существуют некоторые культурные и психологические предикторы временного фокуса, специфичные для каждой страны. В конечном счете, модели структурных уравнений продемонстрировали, что временной фокус играет роль посредника (медиатора) в отношениях между культурными ценностями и субъективным счастьем, как в Эквадоре, так и в России.

Ключевые слова: временной фокус, демография, субъективное счастье, культурные ценности.

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Introduction

Temporal focus is one of the constructs for defining a persons' involvement in their own lifetime, or subjective

time. Along with other terms describing subjective time [6; 20; 3; 23; 25; 38], temporal focus is defined as “the allocation of one s attention to the past, present, and future” [26, p.2]. The generalized profile of orientation to

the past, the present and future affect one's motivation, behavior [6; 25], feelings, emotions [19], subjective well-being [20; 26; 36; 38], and even health [34; 38].

Globalization, accelerating the pace of life, causes a person's priorities regarding time to change [28]. Seeking satisfaction within a rapid stream of events, the individual most often looks for happiness in the present, focusing less on the future or remembering the past [1]. However, for a happy and healthy life, we need to maintain balance in our relationship with time [7; 38], to gather resources from the past, to make plans for the future [36], and to enjoy the present moment [8].

Studies on temporal focus in the period of globalization are limited [28; 30]. Moreover, the interrelation between time perception and cultural values becomes contradictory thanks to the increasing flexibility of our values in the modern world [37]. This study aims to find additional evidence with which to understand the associations between three variables: temporal focus, cultural values, and subjective happiness by using the empirical data from Ecuador and Russia.

Literature Review

Subjective time emerged as a viable research topic several decades ago. Since then, various related constructs have been studied, such as temporal orientation [20], time attitude [25], temporal depth [6], time perspective [7; 23; 38], and temporal focus [26]. In Russian psychology, to define subjective time and its focus, the terms time experience [2], relation to time [3; 5], temporal organization [4] and psychological time [3] are used. In this particular study, in order to explore the features of the subjective time of a person, we focus on the construct of temporal focus [26].

According to Graham, the perception of is "fundamental, and many other perceptions will be biased in one direction or another, depending on a person's perception of time" [13, p. 335], and is associated with one's social and cultural features, primarily through language [9].

There is substantial evidence that subjective time differs considerably among different cultures [13; 22; 31; 33]. The cultural and social environment in which individuals are embedded influence their perception of time, how they value punctuality [19], the extent to which they focus on the past, present, or future [11; 14], their average overall perspective of the future [18; 29], and polychronicity [15; 32].

One of the most renowned theories on cultural values is the concept of cultural dimensions by Hofstede [17]. Differences in cultural definitions (uncertainty avoidance, individualism, long-term orientation) across countries [31] suggest an interrelation between cultural dimensions and temporal focus.

The most important aspect of the question being studied is the association of temporal focus and subjective happiness. The data collected in the existing research confirm the interrelation between subjective time and job and life satisfaction, locus of control, and optimism [36]. In addition, there is evidence of an association between both age and gender (sex) and subjective time [12; 16; 27].

Based on the considerations above, the aim of this study is to explore the role of temporal focus in the shaping of subjective happiness in different cultures.

The Study Scenarios

The current study takes place in two countries with different economic, geographical and cultural characteristics: Ecuador and Russia. Ecuador, located in South America, has a population of over 16 million inhabitants and an average age of 27 years. The national index for *uncertainty avoidance* in Ecuador is rather high (67) [17]. Ecuador is a middle-income developing economy and its Gross Domestic Product (GDP) exceeds USD 100 billion, which corresponds to a per capita GDP of approximately USD 6,000 per year. In contrast, Russia is a Eurasian country, and has a population of approximately 144 million inhabitants, with an average age of 38.9 years. Russia shows high national indices of *uncertainty avoidance* (95) and *long-term orientation* (81) [17]. Russia is classified as an emerging economy, and its GDP is 1,540 billion and its per capita annual GDP is USD 10,743.

For this study, the data came from surveys conducted in one large city each for Ecuador and Russia: Quito for Ecuador, which is also its capital, and Chelyabinsk for Russia, which is one of the 10 most populated cities in the country. The study obtained 745 usable questionnaires in Ecuador (48.7% male) and 428 in Russia (40.2% male).

Methods

The main section of the questionnaire included scales of interest, which were translated from their original English versions, into Spanish and Russian. The Temporal Focus Scale (TFS) of 12 items proposed by Shipp, Edwards, and Lambert [26] was used to measure *temporal focus*, which consists of three subscales: *Past focus*, *present focus* and *future focus*. The TFS items were rated on a 5-point scale describing the frequency with which the respondent thought about the time frame indicated by the item (1 = never; 3 = frequently; 5 = constantly). For each scale, the integral index was calculated. *Past focus* indicates a person's involvement in past memories, *present focus* indicates a concentration on the events of

the present, and *future focus* shows the tendency toward thinking about the future and how he or she is inclined to make plans and develop strategies in life. The Cultural Values Scale by Yoo, Donthu and Lenartowics [35], developed to measure Hofstede's cultural dimensions at an individual level, was used to measure *uncertainty avoidance* (5 items) and *long-term orientation* (6 items) [14]. Respondents were to rate their agreements with the statements on a 5-point scale. (1 – strongly disagree, 2 – neither disagree nor agree, 3 – strongly agree). *Uncertainty avoidance* relates to individuals' reactions to uncertainty and ambiguity; *long-term orientation* refers to the orientation of individuals and societies towards future rewards, when perseverance and thrift are highly valued. These two scales were chosen because they are directly related to the perception of time, and showed high indices of validity and reliability. Finally, the Subjective Happiness Scale was used, which consists of four items proposed by Lyubomirsky and Lepper [24]. The questionnaire suggests that respondents evaluate their feeling of happiness and/or unhappiness, both independently and in comparison with other people.

The questionnaire applied also included a measurement of the sociodemographic variables of the participants, such as age, gender, income, educational level and occupation. Importantly, the income of the respondents was measured as per capita monthly family income.

For all the calculations and estimations made in the current study, the Stata 15 software was used.

Data Analysis

First, the scales were subjected to exploratory factor analysis with varimax rotation. As a result, it was found that in both countries, most of the results were as expected, with factor loadings equal or greater than 0.40. Only in the cases of items lto2, lto3 of the Cultural Values Scale (the long-term orientation subscale) and hap4 of the Subjective Happiness Scale, these requirements were not met in either of the two countries, so the items were removed. Next, Cronbach's alpha values were estimated for all the scales used and for each of the countries, being in all cases a coefficient higher than the cut-off point of 0.60, so the reliability of the scales could be considered acceptable.

The next step of data analysis was to submit the scales to confirmatory factor analysis (CFA). In this way, two CFA analyses [10] were carried out. In the first, the model to be tested specified that the two factors from the Cultural Values Scale used in this study, *uncertainty avoidance* and *long-term orientation*, correlated with each other. The second model to be tested specified that the Temporal Focus Scale consisting of 3 factors, *Past focus*, *present focus* and *future focus*, correlated with each other. The model is

a good fit for both countries for all scales measured. The test of configurational invariance showed an acceptable result [10], and the measurement invariance test supported the configurational invariance for all scales.

Multiple Regression Analysis

As a next step in the data analysis, several multiple regression models were estimated. In these models, the variables to be predicted in each country were three time focuses (*present focus*, *past focus* and *future focus*). The predictor variables were organized around two groups. The first group included the sociodemographic variables (age, gender, income and education) and these variables took on the role of covariates. The second group of variables were cultural and psychological in nature (*uncertainty avoidance*, *long-term orientation* and *subjective happiness*). Due to the non-normality of the data, we estimated robust regressions, which is a more appropriate method in cases like the present one.

In general, it can be observed that sociodemographic variables, introduced as covariates, had little influence on the prediction of people's temporal orientation. Consistently, for both Ecuador and Russia and in line with previous studies [12], the age of the people was negatively related to *future focus*. Additionally, gender (male) was positively associated with *future focus* in Russia and educational level was negatively associated with *past focus* in Ecuador.

On the other hand, the cultural and psychological variables introduced as predictors played an important role in the prediction of temporal focus. In both Ecuador and Russia, the cultural value *long-term orientation* was positively associated with both *present focus* and *future focus*. Additionally, *uncertainty avoidance* was consistently associated (in both Ecuador and Russia) in a positive way with *past focus*. In contrast, *uncertainty avoidance* was positively associated with *present focus* only in Ecuador. Finally, *subjective happiness* was associated in a positive and consistent way (in both Ecuador and Russia) with *present focus*. However, *subjective happiness* was positively associated with *future focus* in Ecuador and negatively with *past focus* in Russia.

Structural equations modeling (SEM) of the relationship between cultural values, temporal focus and happiness

In order to evaluate the possible structural relationship of temporal focus with other constructs, particularly with cultural values and with *subjective happiness*, a structural equations model was drafted. Therein, it was considered that the cultural values of *uncertainty avoidance* (UA) and *long-term orientation* (LTO) were correlated with each other and that they were predictors of *past focus* (PaF), *present focus* (PrF) and *future focus* (FF). In turn, these three temporal orientations were

considered as correlated with each other and as predictors of *subjective happiness* (HAP). This theoretical model is presented in figure 1 and was drafted for Ecuador and Russia.

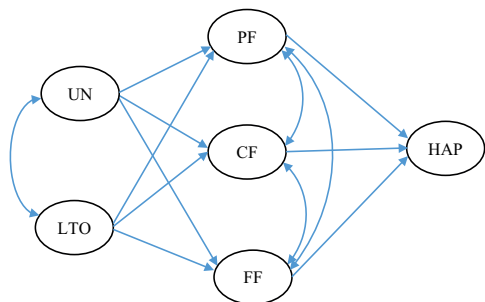


Fig. 1. Theoretical model on the relationship of cultural values, temporal focus and happiness

The fit indexes of the model for the two countries show that the model fits very well in both cases: Ecuador $X^2 = 564.658$, $df = 239$, $S-B X^2 = 434.441$, $RMSEA = 0.043$, $S-B RMSEA = 0.033$, $CFI = 0.952$, $S-B CFI = 0.962$,

Russia $X^2 = 540.388$, $df = 239$, $S-B X^2 = 448.840$, $RMSEA = 0.054$, $S-B RMSEA = 0.045$, $CFI = 0.923$, $S-B CFI = 0.934$. The group of results is very consistent in both countries. *Uncertainty avoidance* positively affects *past focus*, *long-term orientation* positively affects both *present focus* and *future focus* and *present focus* positively affects *subjective happiness*. On the other hand, there are also results that are unique for each country. For instance, in Ecuador, *uncertainty avoidance* has a negative effect on *future focus* and positive effect on *present focus*.

Figure 2 presents the standardized results of the model for Ecuador and figure 3 for Russia. If we consider only the paths that were significant in both of the two countries, it can be seen that in Ecuador and Russia, *long-term orientation* had a strong effect on *present focus* and *future focus*. The effect of *uncertainty avoidance* on *past focus* was moderate in both countries. Finally, the effect of *present focus* on *happiness* was moderate in Ecuador and strong in Russia.

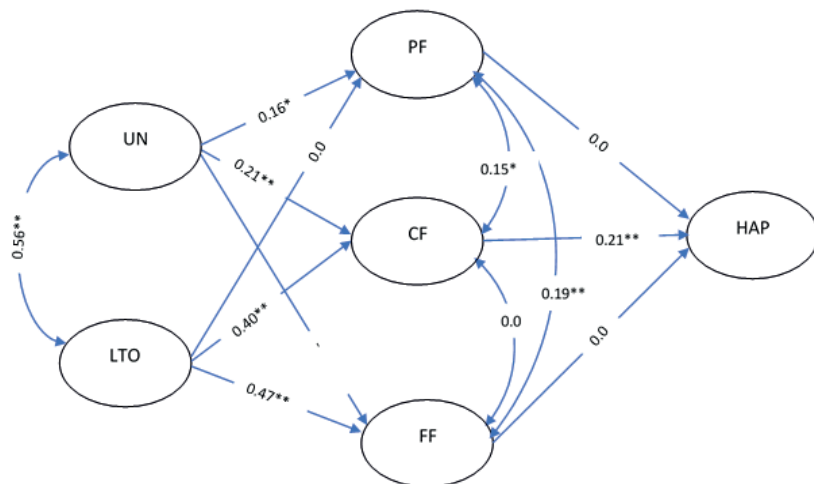


Fig. 2. Standardized results for the structural model in Ecuador

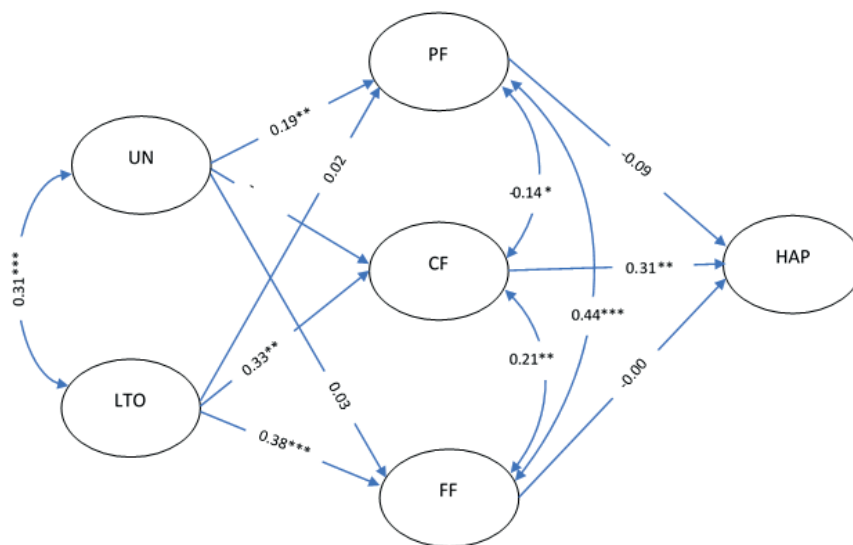


Fig. 3. Standardized results for the structural model in Russia

Discussion, Limitations and Conclusions

In general, the research results can be interpreted in line with studies of subjective time in various cultures [17; 22; 29; 31; 33], however, some of the trends revealed can be explained by a change in people's consciousness caused by globalization. For instance, people seeking to reduce the frustrating uncertainty they face in the modern world [21; 28; 30], particularly look to past events which are invariable, and seek happiness in every single moment of their life [21].

The unique associations of cultural values and temporal focus revealed in Ecuador and Russia confirm data on the impact of culture on perception and the experience of time [7]. For example, the lack of conditions of continuous change in Ecuador prevents a future focus and leads to an unwillingness to make long-term plans. Lower future orientation can serve as a kind of psychological protection against rapid variability and the uncertainty of the world around us.

The influence that temporal focus on the present has on subjective happiness is confirmed [20; 26; 38]. However, the results of the regression analysis show specific interrelations between subjective happiness and future focus in Ecuador (positively) and past focus in Russia (negatively). Perhaps, happiness is supported by optimism and the expectation of "gifts" from the future for residents of Ecuador. On the contrary, an "obsession" with the past, attempts to escape from reality, and nostalgia for old times become an obstacle to happiness for the residents of Russia.

In fact, temporal focus as a representation of subjective time plays the role of a mediator in the relationship between cultural values and subjective happiness in both Ecuador and Russia.

The main research limitation of this study is its focus on only two countries. In future research, the number of countries studied should be broadened in order to confirm the hypothesis of temporal focus's role in personal wellbeing around the world.

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Metamorphoses “At the Ends of the Earth”: Telengit Transitive Society at Solitary Village

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The article focuses on the interdisciplinary analysis of the transformation processes in social situation of development of local people in the territorially detached community (a case study of the Yazula village of Ulagan region of the Altai Republic) through comparison of expeditionary materials of 2003 and 2019 years. The research is conducted within the framework of cultural-historical psychology and based on the methodological principle of metaposition. The analysis demonstrates that increasing of cultural diversity dictates the need for self-determination of locals and their families on behavioral level and complicates the structure of their social identity, including a problem of ethnocultural and religious self-identification. These processes provide the experiencing of insecurity of locals in front of the “outside world” and strengthen preservation of life-important rituals and sacred elements of ethnic culture.

Keywords: transitive society, solitary village, Telengit, Telengit traditional culture, transformation of way of life, social identity transformation.

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Метаморфозы «на краю света»: транзитивное общество теленгитов обособленного селения

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В статье представлен междисциплинарный анализ процессов трансформации социальной ситуации развития жителей территориально обособленного сообщества (на примере селения Язула Улаганского района Республики Алтай) через сопоставление экспедиционных материалов 2003 и 2019 годов. Исследование проведено в русле культурно-исторической психологии с опорой на методологический принцип метапозиции. Показано, как увеличение культурного разнообразия в селекции обуславливает необходимость самоопределения отдельного человека и семей на поведенческом уровне и усложняет структуру социальной идентичности, в том числе создавая проблему этнокультурного и религиозного самоопределения. Это актуализирует переживание незащищенности своей жизни и жизни локального сообщества в целом от внешнего мира и усиливает сохранность жизненно значимых обрядов и сакральных элементов этнической культуры.

Ключевые слова: транзитивное общество, обособленное селение, теленгиты, культура теленгитов, трансформация жизненного уклада, трансформация социальной идентичности.

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Introduction

The world is transforming rapidly. As Toffler wrote, the “death of permanence” has occurred; transience, novelty and diversity have become the norm of life [24]. Meanwhile, a number of communities continue to retain elements of traditional culture, where stability and intergenerational continuity constitute important values. There are virtually no remaining local cultures in the world that are completely autonomous from the global processes. Therefore, the question arises as to how social communities – both entire states and local villages – are transformed. How does the traditional way of life change with the emergence of new technologies (roads, electricity, television, cellular communications, the Internet, etc. [9])? What is the extent of changes in the openness/closedness of isolated communities to the outside world and their involvement in the development of cultural diversity? The focus of the study includes transformation of local community borders, external and internal cultural barriers, and complication of the system of relations in the “us vs. them” model of contacts with the “outside world.” The quality of the border, its openness or closedness to external changes, is dependent on many factors. Communities vary in their attitude toward external influences: the elements of another culture that are introduced can be accepted, alienated, or transformed into something new. However, said [the use of the word *said* is unclear. Please, clarify or remove accordingly] influences can have a non-linear impact on the metamorphosis of the local way of life, cultural traditions, and social identity.

There are many studies that reveal the phenomenon of societal transitivity [19; 26], the specifics of transformation of local communities in the context of globalization [8], which change the socio-cultural context of personal development and identity [6]. Most studies are focused either on global trends or on specific aspects of changes, such as demography [28], way of life [1], rituals

[20], material culture [4], folklore [18], etc. Since different aspects of the life of ethnic groups are studied by different sciences, there are not many works that systematically show how changes in living conditions, an increase in the openness of the village to the “outside world,” transform the system of relations and the way of thought characteristic for its inhabitants.

A.R. Radcliffe-Brown [21] noted: if a researcher can demonstrate variants of structural and functional constructions of social evolution, it represents a great success for science. Transitivity of a local community modified the “social situation of development” for the younger generation, about which L.S. Vygotsky wrote: “... for man the environment is a social environment, because even where it appears to be a natural environment, nevertheless, in relation to man, there are always definite social elements present. In his interaction with the environment, man always makes use of his social experience.” [2, c. 88]. Greater openness to the external information field has changed the content and semantic accents of sign mediation of mental development, transforming not only the way of life, but the consciousness and self-consciousness of the new generations. What is the interconnection? What is modifiable, and what is “encapsulated” and has enhanced “protection” from alteration, thus becoming the “nuclei” of stabilization in the metamorphosis of life?

In line with the discursive approach [5], the research methodology is based on the idea of historical and cultural transformation of the social situation of development as a source of personal development (L.S. Vygotsky) [2] and the theory of a transitive society [7; 24; 26].

In our research we focus on the changes in the social situation of development in a local community by studying the interrelations of changes in the *way of life* (at the level of everyday culture, the ritual component of life and musical traditions) and the *system of social relations* of local residents with increasing “openness” to the outside world. Another focal point is the way these changes are reflected in the image of the world and the image of

self in the world (social identity). Under *way of life* we mean both external and internal factors of a lifestyle in their interrelation, following the logic of understanding the “social situation of development” [not necessary to mention] as a unique combination of objective social relations and subjective priorities in their experience [2].

By *metamorphosis* we understand the transformation of the structure of relations within a community, in the forms and ways of existence of different aspects of culture, as well as in the structure and content of the social identity of the representatives of the community studied. We consider the term “transformation” to be synonymous with metamorphosis.

By *local community* we mean “a particularly constituted set of social relationships based on something which the participants have in common — usually a common sense of identity” [29, p. 72–73]. A community has a clear location (a territorially isolated village with stable social relations between all its inhabitants).

We understand *social identity* as the result of a unified process of differentiation/identification of an individual which derives from their knowledge of their membership of a social group (or groups) “together with the emotional significance attached to such membership” [31, p. 255]. “Social identity is the result of the process of comparing one’s group with other social communities” [22, p. 110]. The question of which group a person identifies with and compares themselves with can be solved at different levels of social stratification, depending on the communicative situation. We considered social identity from the point of view of the following components: regional-territorial, ethnic, religious, professional activities [30].

The *Telengits* are an ancient subethnic group of the Altaians living along the rivers Chulyshman and Chuya in the Ulagan and Kosh-Agach districts and speaking a dialect of the Altaic language. There are different versions as to their ethnogenesis [27]. Recent demographic studies note the stability of the Telengit population in the historical territory of their residence [18, p. 36–43]. During the 2000s a number of ethno-political processes (in Russia in general and the Altai Republic in particular) led to the mixed identity of the Telengits, which is expressed in different variations: Altaians (not distinguishing Telengits as a separate ethnicity), Telengits (as a group separate from the Altai people), Altai-Telengits (as a separate local group within the Altai ethnicity) [25, pp. 4–45].

Research Program

Stages of the research. The first stage — summer 2003 expedition with an archive of audio and video recordings, a series of publications [1212] and summaries of research results [11, p. 161–168; 14]. The second stage — summer 2019 expedition, archive with registers of audio and video recordings. The analysis also used research data produced by other scientists in the region [3].

Sample description. The population of Yazula in both 2003 and 2019 was approximately 250 people (fluctuating between 240 and 260). The research was conducted with most of the families of the village, but in 2003 the communication took place mainly with teenagers and the middle generation (children and the elderly did not speak Russian), and in 2019 — with all generations, from children to the elderly.

Research methods. We employed participant observation; thematic interviews which were recorded through audio, photo and video means; compilation of registries using tagged recordings; qualitative analysis of data on selected parameters: everyday life and the system of social relations in the village, ritual and musical culture as a display of ethnic worldview and self-experience; self-awareness of Yazula inhabitants in the aspect of social identity. The research program is disclosed in the authors’ publications [10; 13; 15].

Purpose of the research is to identify social and psychological changes in the local community as a reaction to the processes of transitivity of the way of life in a territorially isolated village (on the example of the Yazula village in Ulagansky District of the Republic of Altai).

Research implementation procedure was based on the principle of meta-positioning [13], which we consider as a technology for organizing multiprofessional interaction between different specialists in the general research space of a particular ethno-cultural community (at the stages of planning, collecting and analyzing field data). Expedition work was aligned on the basis of general recording of significant aspects of the external parameters of the social situation in the village to the highlighting of research focal points on specific issues that represent the social and psychological transformations in the local community. In 2019, the study of key parameters was organized against the materials of 2003.

Research Findings

For the period between 2003 and 2019 we recorded modifications of cultural transmission (*sensu* M. Mead) from post-figurative type (“where children primarily learn from their predecessors”) to a special combination of co-figurative (“where both children and adults learn from their peers”) and pre-figurative (“where adults also learn from their children” [7, p. 322]. The younger teenagers and children with whom we communicated in 2003 became active participants of the community: school director, head teacher, teachers, head of the rural community. The living conditions associated with openness to the “outside” world and involvement in new information flows have changed dramatically. As A.V. Tolstykh noted, speaking about the change of generations in the post-Soviet era, “... values, norms and behavioral patterns of different... cohorts are now formed and absorbed... in different social contexts and environments... The channels of generalized experience are different.” [233, p. 181]. The

temporal scope of the research covers a relatively stable historical and social period in the country. At the same time, the results obtained allow us to talk about the metamorphosis of generational transmissions: when different generations have different dominant sources of information, dissimilar content and a different format of intergenerational communication. We present the results of the study at the level of analysis and generalization of empirical data, some of which are disclosed in the publications on the transformation of the way of life [16] and musical culture [17] in Yazula over a period of 16 years.

Metamorphoses of the way of life. Laying a road from the district center nonlinearly changes the status of openness/closedness of the isolated village: many borrowings are introduced into the everyday part of life, while a number of spheres (ritual life, sacred places) become more guarded. The increase of accessibility and variability of connections between the local community and the “outside” world amplifies the processes of transformation through openness to novelty in some aspects of life, while in others it yields an effect of “encapsulation” [8], increasing the degree of hiddenness of significant cultural elements from external individuals. Thus, the boundaries between “us” and “others,” between “us” and “them” are actualized.

The transformations that took place led to an increase in mobility and external contacts of the villagers and the complication of the system of social relations, as well as to changes in types of activities and living conditions. The appearance of the road resulted in families acquiring personal vehicles. This increases the availability of a variety of materials that are now easier to buy than to manufacture. The technology of building ails (settlements of nomadic or semi-nomadic type) and setting up household facilities also begins to change, with the appearance of products that substitute a number of traditional industries. People begin to assess what would be easier for them in terms of solving everyday issues: to spend time and effort or to solve said [the use of the word *said* is unclear. Please, clarify or remove accordingly] issues with money. If there are small funds in the form of a pension or salary, people are more likely to choose to buy what is needed. Thus, a wide range of traditional methods of subsistence are lost.

In changing the everyday part of life (housing construction, household appliances, means of transport, etc.) the focus falls on the modern, the urban, which is not always more functional. In these conditions arises a situation of choice (for example, what type of ail is to be built), which occurs not on the scale of “older vs. younger” (“tradition vs. innovation”), but depending on individual priorities (“what is more convenient for me”). What is observed is not only the replacement of old forms with new ones, but also an increase in the diversity of options for organizing living spaces and economic activities. The residents obtain the possibility of choice and the need for conscious self-determination, rather than just following traditions or fashion.

The transformation of rituals and the culture of childhood. Wedding, funeral, and memorial rituals show high stability. A more variable and transforming part of Telengits’ everyday beliefs is associated with the ceremonial accompaniment of childhood and the processes of maturation. For example, *kindyk* (an umbilical cord sewn into a special leather pouch), once a sacred object hidden from the outsiders’ view and serving as a talisman, is transferred into the category of a secular, socially important, and presentable family asset placed on the wall. These processes are associated with the transformation of ideas about the world and the self: control over children is taken into one’s own hands in those spheres of life which were formerly regarded as being “under the supervision” of spirits and forces of nature. This shows a shift in the semantic priorities of the ethnic picture of the world, manifested in ritual practices and everyday beliefs.

Children’s view of adult culture and children’s community culture show maximum variability. For children, adult family culture is replaced by a culture borrowed from television. In the village, children spend less time outside than before, interacting with each other. The culture of childhood is reflected in the community, but its content is replenished by new media content. Traditional mythological characters and storylines are mixed (through addition, displacement, replacement) with characters and motifs from Russian and foreign cartoons. The introduction of new informational content, which is focused on children in the sensitive period of their linguistic development, transforms the linguistic situation in the village. This, in turn, modernizes the overall socio-cultural life of the community as a whole, alters intergenerational communication and the life trajectories of the younger generation.

Changes in linguistic and musical culture. The introduction of external content into the monolingual environment of the Telengit village transforms it into a bilingual one, both linguistically and culturally. In this case, learning the Russian language during the preschool period makes it easier for children to understand those academic subjects that are taught in Russian. This increases the quality of formal education, expanding the social mobility of the younger generation, also creating opportunities for building an educational trajectory and a professional career in the city. In general, the shift in the language situation reshapes the range of “mental tools” that allow for the construction of new systems of social relations and the perception, understanding, and use of new information resources.

The musical folklore of Telengits of Yazula within the studied period is characterized by a “probabilistic” (polyvector, nonlinear changing) nature of development and expansion of musical and cultural diversity (the presence of Telengit, Russian, Tuvian, Kazakh and other ethno-musical codes was documented). The channels of foreign cultural influence on the intonational field of Telengit musical tradition are: radio, Internet

and television; country club; access to transport and travel to the city, international Kurultais of storytellers. While various forms of folklore (Soviet, Russian, Altai) are widely present in the country club, the Telengits' folklore tradition continues to exist exclusively in the ritual context (hidden from outsiders). Mastery of kai, a special type of intonation characteristic for the Turks of the Altai Mountains that marks their ethno-cultural identity and is popular among tourists, regional administration and the public, drives bearers of the tradition to migrate from isolated settlements to central ones. The constant function of kai continues to be the transmission of ethnospecific spiritual values of the Altai people [17].

In terms of *social identity*, we note pronounced changes in the following components: the ethnic component – from more pronounced to more blurred; the religious component – from pagan to syncretic; the professional activities component – from hunting as a significant gender-initiating practice to the loss of its initiating function. Also revealed was the change and concretization of auto- (talking about oneself in the categories of positive and negative traits) and heterostereotypes (the appearance of more pronounced negative characteristics of Saratan residents and positive characteristics of Tuva residents). Ambivalence of experience is observed in the linguistic component: on the one hand, the understanding of the usefulness of the Russian language, on the other hand, the fear of losing the Altaic language as a significant factor of ethnic identity.

The Altai language plays an important role in constructing *the ethnic identity of Telengits*. We have recorded the dynamic process of Telengit identity transformation as a result of the emergence of television and the Internet. All the respondents associate the language with the Altai identity and note that the appropriation of the Russian language by Telengit children through the Carousel children's channel can pose a "threat to nationality" (statement of a Yazul woman born in 1989). Language is seen as the main factor that grants Telengits the experience of being connected to their people, the loss of the language can turn into the loss of ethnic self. This situation generates ambivalent attitudes among the middle and older generations. On the one hand, children appear more equipped for social adaptation when they leave for the city; on the other hand, there is a threat to the preservation of ethnic identity. It is noted that all generations of Yazul residents have improved their knowledge of the Russian language as compared to 2003, which reduces the barriers to communication with newcomers.

The results of the fieldwork in 2019, compared to the data from 2003, found an increase in the level of anxiety among local residents in relation to the external view of them and the village as a whole. It is reflected in their tension when any video or photograph is taken. The fear associated with the possibility of photographs and videos "hitting" the Internet, which is not yet widespread in the village, is due to the emergence

of local mythology about it and its impact on people's anxieties. Tensions about filming are reinforced by a regional television report commenting on the "wild people" and "horrible conditions" of life in Yazul. The "ceremonial portrait" strategy, already observed in 2003, has intensified manifold. The content and essence of a "ceremonial portrait" has not yet been formed by the local residents. The knowledge of the Russian language and frequent communication experience when leaving the village have created ample opportunities for communication with the "outside" people. However, this heightened the anxiety of local residents regarding the consequences of such interaction, especially within their village. The issue of representing oneself and one's culture to the outside world has become more acute. Still, there was no increase in the value of one's "correctness" and identity. Daily comparison of oneself with others (through television or communication with newcomers) does not contribute to self-confidence, and in the minds of the residents, does not work to their advantage. Our interest as outside researchers in the authentic culture of the village commands respect and enables a degree of openness in communication. But the fear that what is recorded will be perceived as "wrong" and evaluated by the outside world creates a powerful isolating and limiting effect when it comes to recording (photographs, video and audio recordings).

General Analysis and Interpretation of the Results

A sharp change in the social situation of development [2] in connection with an increase in the openness of the local community to the outside world and the new information space does not just transform the type of cultural transitivity from post-figurative, to co-figurative, and then to pre-figurative [7]. This change differentiates culture and types of cultural transitivity by spheres of life in a community: in the ethnoconstituent part of culture (especially in its sacred part, in significant rituals) the post-figurative type of transitivity increases; in the household part of culture, everyday way of life and in language communication the prefigurative type begins to dominate; in folklore and music culture the configurative type begins to dominate. The cultural situation in the community becomes a space of greater diversity, which causes multidirectional tendencies: in some aspects – openness to novelty, in others – strengthening of closedness to the outside world. It is supposed that in local communities of this type in the future there will be not a replacement of one type of cultural transmission by another, but an increase in the diversity of cultural transmission and types of intergenerational interaction in different layers of livelihood; the significance of ethnic identity will increase as a response to risks of uncertainty and strengthening of cultural diversity which comes from the external information field.

Findings

Based upon the results of the study of Yazula village under the conditions of transitivity of the social situation of development in a local community, we can draw the following conclusions:

1) increased accessibility and openness of the isolated village to the “outside world” causes multidirectional processes in the life of the community: acceptance of the new and increased cultural variability in the way of life; increased closedness to the outside world of the sacred component of culture, which acts as the core of the ethnocultural worldview;

2) sustainable availability of external information channels, including those targeted at children, drastically changes the linguistic situation from monolingual to bilingual and significantly transforms the social situation of development as well as the content of children’s community culture, also increasing social mobility of young people;

3) transition from the secluded existence of an isolated local community to the relative openness to the “out-

side world” strengthens the “us vs. them” opposition, makes the boundaries between the two notions more pronounced; it actualizes the experience of representation of the image of themselves and their village to other people (especially on the Internet), strengthens the importance of creating a “ceremonial portrait” of oneself and one’s life in photographs and videos;

4) changes in the cultural and informational context transform the musical repertoire of local residents as a way of experiencing reality; the ethno-cultural revival in the region determines the demand for and relocation of bearers of ethno-representative cultural traditions from isolated villages to the central ones;

5) increase in cultural diversity, especially in everyday life, creates the situation of demand for self-determination of individuals and families at the behavioral level and complicates the structure of social identity, in particular creating the problem of ethno-cultural and religious self-determination; all this increases the experience of insecurity of self and life of the local community as a whole for the outside world.

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Russian Version of the Sources of Spirituality Scale

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The article presents the results of development of the Russian version of Sources of Spirituality Scale (SOS-Ru scale) based on the SOS scale by Davis et al. for assessing spiritual experiences connected with different objects: Theistic, Transcendent, Human, Nature, Self. Approbation of the Russian version was realized in the sample comprising 412 participants (70% were women) at the age from 17 till 69 y.o. ($M=26.8$; $SD=9.65$) who completed online or pen-and-pencil survey. During analysis of validity, we used tests which assess religious spirituality, paranormal beliefs, global social identification, connectedness to nature, hedonism and eudemonia, moral foundations and subjective well-being. The results of CFA confirmed theoretical structure of the SOS-Ru scale. The reliability of subscales was high (0.73–0.95). Validity of subscales was confirmed by correlations with relevant indicators: the Theistic subscale showed the highest correlations with religious spirituality, the Human subscale was most related with global social identification, the Nature subscale was highly correlated with connectedness to nature. The subscales of the SOS-Ru scale showed expected correlations with eudemonia, moral foundations, paranormal beliefs and well-being. Using latent profile analysis we elicited groups with high, moderate, low levels of general spirituality and a group with secular spirituality. The data on gender differences and descriptive statistics which may be used as approximate statistical norms are presented.

Keywords: spirituality, spiritual experiences, religiosity, paranormal beliefs, moral foundations, connectedness to nature.

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В статье представлены результаты разработки русскоязычной версии опросника духовных переживаний Д. Дэвиса с коллегами, предназначенного для измерения духовных переживаний, связанных с различными объектами: Бог, трансцендентность, человечество, природа, самость. Для апробации русскоязычной версии был проведен опрос в онлайн- или бланковой форме на выборке, включающей 412 человек (70% женщин) в возрасте от 17 до 69 лет ($M=26,8$; $SD=9,65$). В ходе анализа валидности шкал использовался комплекс методик, измеряющих религиозную духовность, веру в паранормальное, глобальную социальную идентификацию, чувство связи с природой, гедоническую и эвдемоническую ориентации, моральные основания и субъективное благополучие. Результаты КФА показали хорошее соответствие теоретической структуры данным. Все шкалы имеют высокую надежность (0,73–0,95). Валидность шкал подтверждается корреляциями с соответствующими показателями: шкала «Бог» показала наибольшую связь с религиозной духовностью, шкала «Человечество» наиболее тесно связана с глобальной социальной идентификацией, шкала «Природа» сильно коррелирует с чувством связи с природой. Шкалы опросника показали ожидаемые связи с эвдемонической ориентацией, моральными основаниями, верой в сверхъестественное и субъективным благополучием. С помощью анализа латентных профилей были выделены четыре группы: с высокой, средней, низкой общей духовностью и со светской духовностью. Приведены данные о гендерных различиях по шкалам и описательные статистики, которые могут использоваться в качестве ориентировочных норм.

Ключевые слова: духовность, духовные переживания, религиозность, вера в сверхъестественное, моральные основания, связь с природой.

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Introduction

There has been an increase in scientific interest in spirituality in recent decades [1; 2; 5; 8; 15; 23]. The problem of spirituality in publications crowds out the more traditional topic of religiosity, which reflects not only the change in “research fashion”, but also the ongoing socio-cultural changes associated with the spread of various forms of “non-traditional” spirituality. The concept of spirituality is broad enough to cover various forms of religious spirituality (including non-church, individual religiosity) and various manifestations of spiritual life that are not related with religious faith.

Russian psychodiagnosics lacks measures of spirituality. Among the measures used in Russian researches of

spirituality it is necessary to note first of all the “Inspirit” questionnaire, which takes into account only religious spirituality [4; 21] and the recently elaborated Spiritual Personality Inventory [7]. The “Personality’s Hierarchy” questionnaire was elaborated in our country by E.V. Shes-tun et al. for identifying the spiritual level in the personality hierarchy, characterized by the authors through the priority of the realization of one’s destiny, spiritual growth and development [14]. Other measures have not gained popularity due to theoretical or psychometric problems.

Given the abundance of articles devoted to a theoretical analysis of spirituality [5; 8; 15, etc.], we will consider here only the most important theoretical issues for measuring of spirituality. There is one opinion about the complex multi-component, multi-level structure of spirituality [5; 8; 23],

which means that attempts to measure spirituality using single-scale questionnaires are poorly justified. The variety of forms and manifestations of spirituality, the complexity of its structure explain the variety of approaches to measuring spirituality in psychology: in 2010, 24 measures of spirituality were considered in the review [20].

Among the main characteristics of spirituality, many researchers indicate the typical for spiritual people experience of closeness to the sacred, the sublime, which can be presented by various objects: the existence of God, God, the Spirit, the highest truth, humanity, etc. [20]. According to V.V. Znakov, "a person's spiritual aspirations reflect one's attempts to go beyond everyday life and touch other, deeper and at the same time sublime levels of human existence" [5, P. 29-30].

Among other important characteristics of spirituality, there is its association with belief in the supernatural, and some researchers consider such beliefs to be one of the defining features of spirituality [22]. In the five-factor model of spirituality by D.A. MacDonald, belief in the supernatural constitutes a separate factor moderately associated with the factor of spiritual experience [23]. A well-known theoretical concept of the connection between spirituality and morality [5; 8] is confirmed only by rare empirical studies: for example, it has been shown that spiritual experiences mediate the relations between religiosity and moral feelings [18].

Spirituality is considered as a sign of psychological well-being; however, research results show that different components of spirituality are associated with it in different ways: only one component of spirituality, which is referred to as existential well-being, shows a significant correlation [24]. In the context of modern concepts of hedonic and eudaimonic well-being [19; 25], it seems reasonable to assume that spirituality should be associated with eudaimonic well-being, reflecting a person's desire for a meaningful life aimed at realizing one's own potential and purpose.

Since the measurement of spirituality requires an operational definition of this concept, based on the generally recognized characteristics discussed above, *spirituality* can be defined as a feeling of connection or unity with something sacred and the desire for achieving it [16]. Such a definition does not describe all aspects of spirituality, however, it marks one of the most important features that allow not only to distinguish the spiritual from the non-spiritual, but also to systematize the variety of forms of spiritual experience, depending on what exactly the subject considers as sacred.

Based on this understanding of spirituality, E. Worthington [27] in his concept divides spirituality depending on the object that causes a feeling of connection, unity or closeness into four types: theistic (closeness to God), humanistic (closeness to humanity), naturalistic (closeness to nature) and transcendent spirituality (closeness to space, infinity, transcendence). Theistic spirituality includes the experience of closeness, connection, and

unity with God, with a numen. Humanistic spirituality is characterized by the experience of connectedness and unity with other people or humanity as a whole. Naturalistic spirituality is characterized by the experience of closeness and unity with nature. Transcendent spirituality involves the experience of closeness, connectedness, and unity with something supernatural that transcends physical reality and cannot be expressed in words.

Based on this concept, D. Davis and coauthors [16] developed the Sources of Spirituality Scale (SOS scale), which measures the experiences associated with each of the above-mentioned objects. The authors added Self to the objects of spirituality as a source of experiences of the integrity of the Self, but later they excluded this scale due to its debatable justification [26]. In elaborated Russian-language version of the SOS scale we kept Self subscale, leaving the decision on its necessity to the users.

Method

The purpose of this study was to develop a Russian-language version of the Sources of Spirituality Scale (SOS-Ru). Based on the results of the early studies, the following assumptions have been put forward:

1. The Theistic subscale is closely related to religious spirituality.
2. The Human subscale is closely related to global social identification.
3. The Nature subscale correlates with a sense of connection with nature.
4. The Transcendent subscale is closely related to belief in supernatural phenomena.
5. All subscales of the SOS-Ru are related to morality, eudaimonic orientation and subjective well-being.
6. The latent profiles on the subscales allow describing different types of spirituality.

The total *sample* of 412 participants was composed of two groups. The first group, which took part in a paper-pencil survey, included 250 full-time and part-time students of two universities in Biysk (68% women, mean age $M = 24.04$, $SD = 7.93$). This group answered the questions from all of the measures listed below, with the exception of the Balanced Inventory of Desirable Responding (BIDR). The second group of 162 participants (74% women, mean age $M = 31.06$, $SD = 10.51$) completed an online survey that included SOS-Ru and the BIDR.

Measures. The Sources of Spirituality Scale (SOS scale) by D. Davis et al. [16] consists of 18 items describing various spiritual experiences associated with a different source: Theistic, Transcendent, Human, Nature, and Self. Two psychologists made a translation of the text into Russian (see Appendix), which was then discussed and refined with the participation of three experts involved in various philosophical and psychological studies of spirituality.

During the validation, a set of questionnaires was used to measure various manifestations of spirituality and psychological constructs close to it.

Index of core spiritual experiences (INSPIRIT) by J. Kass et al. [4; 21], which measures religious spirituality.

A Revised Paranormal Belief Scale by J. Tobacyk in the Russian adaptation (D.S. Grigoriev [3]), which includes seven subscales: Traditional religious belief, Psi-abilities, Witchcraft, Superstition, Spiritualism, Extraordinary Life Forms and Precognition.

The Global Social Identification Scale (GSI) by G. Reese in the Russian adaptation (T.A. Nestik [6]) to measure the disposition of a person to identify with humanity.

Connectedness to Nature Subscale by F.S. Mayer and C.M. Frantz in the Russian adaptation by K.A. Chistopolskaya et al. [13].

The Moral Foundations Questionnaire (MFQ) by J. Graham et al. in the Russian adaptation by O.A. Sychev, I.N. Protasova and K.I. Belousov [12]. The questionnaire includes five scales: Care, Fairness, Loyalty, Authority and Purity. The first two scales refer to individualizing moral foundations, and the last three scales constitute binding moral foundations.

Russian version of Orientations to Happiness questionnaire (OH), developed by O.A. Sychev and I.V. Anoshkin [11] based on the Orientations to Happiness measure by C. Peterson et al. [25].

Satisfaction with Life Scale (SWLS) by E. Diener in Russian adaptation by E.N. Osin and D.A. Leontiev [9].

To assess the social-desirability bias the Balanced Inventory of Desirable Responding (BIDR) questionnaire by D. Paulhus in Russian adaptation by E.N. Osin was used [10].

Results

In order to test the five-factor structure of the SOS-Ru scale, a confirmatory factor analysis (CFA) was performed using the robust maximum likelihood (MLR) algorithm. During the CFA each item was considered as an indicator of the latent factor relevant to the subscale, all factors were allowed to correlate with each other. The

results showed a good fit of the five-factor model (Fig. 1) to the data: $\chi^2 = 260.16$; $df = 125$; $p < 0.001$; CFI = 0.962; TLI = 0.953; RMSEA = 0.051; $N = 412$.

Descriptive statistics on the subscales (Table 1) indicates that the mean values are close to the center of the five-point scale, and the standard deviation is close to one. All subscales moderately and significantly correlate with each other.

To analyze the validity of the questionnaire, the correlation coefficients of the SOS-Ru subscales with other measures were calculated (Table 2). Convergent validity of the Theistic subscale is supported by its high correlation with religious spirituality and traditional religious

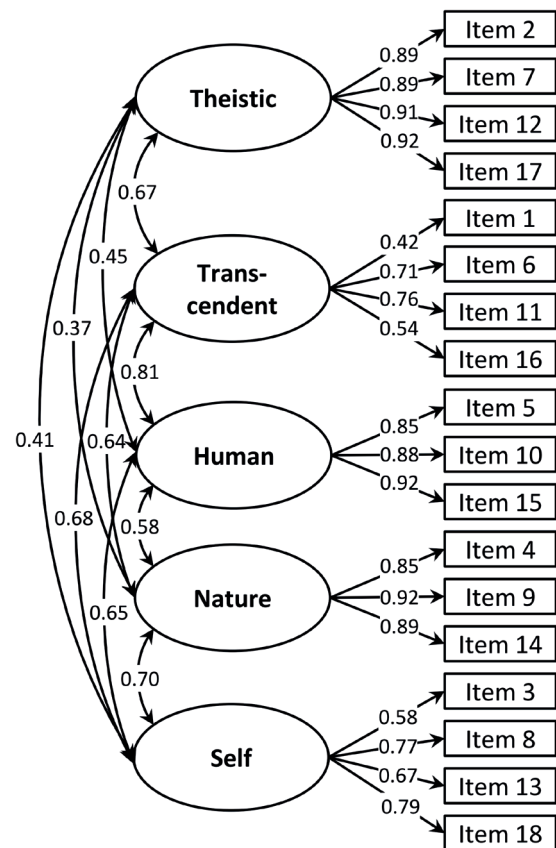


Fig. 1. Factor model of the SOS-Ru scale (all coefficients are significant at $p < 0.01$)

Table 1

Descriptive Statistics, Intercorrelations, and Reliability on SOS-Ru subscales (N = 412)

Subscales	Theistic	Transcendent	Human	Nature	Self
Theistic	—				
Transcendent	0.55*	—			
Human	0.48*	0.35*	—		
Nature	0.52*	0.34*	0.61*	—	
Self	0.62*	0.41*	0.55*	0.53*	—
Means	2.85	2.94	3.44	3.35	2.74
SD	0.90	1.17	0.79	1.05	1.03
Reliability (Cronbach's α)	0.73	0.95	0.79	0.92	0.92

Notes. Significance: * – $p < 0.001$.

belief. The construct validity of this subscale is confirmed by correlations with binding moral foundations measuring adherence to conservative moral values.

The construct validity of the Transcendent subscale is confirmed by correlations with such indicators as religious spirituality and traditional religious belief, global social identification, connectedness to nature, belief in spiritualism, witchcraft and precognition. The convergent validity of the Human subscale is confirmed by the fact that it shows the highest correlation with global social identification. Its construct validity is supported by its association with eudaimonic orientation.

The convergent validity of the Nature subscale is confirmed by the fact that it showed the highest correlation with the connectedness to nature. Correlations of this subscale with global social identification, eudaimonic orientation, moral foundations (care and purity) were also revealed. The construct validity of the Self subscale is supported by correlations with eudaimonic orientation and subjective well-being.

Spiritual experiences (except on the Transcendent subscale) showed a positive correlation with subjective well-being. Relations of spiritual experiences with moral foundations are revealed: the subscales of Nature and Self show the highest correlations with individualizing moral foundations, while the Theistic subscale most closely correlates with binding moral foundations. The Theistic and Transcendent subscales show significant correlations with the traditional religious belief scale

and many other scales of belief in the paranormal. The Human, Nature, and Self subscales show only some moderate correlations with belief in the paranormal, while the correlations with traditional religiosity, although significant, are rather small in magnitude.

Only one of the five SOS-Ru subscales (Self) showed a weak but statistically significant association with a social-desirability bias ($r = 0.17$; $p < 0.05$). Weak and marginally significant ($p < 0.10$) correlations with social-desirability bias were obtained for the Nature and Human subscales ($r = 0.15$ for each).

To test the hypothesis about the possibility of distinguishing different types of spirituality using the subscales of the questionnaire, we implemented Latent Class Analysis with the number of latent classes from two to seven. Based on the entropy value (0.86) and the maximum decrease in the Bayesian information criterion value a solution with four classes was chosen. The results of the analysis (see fig. 2) indicate the presence of one “secular” type of spirituality (class 1) and three “harmonious” types, combining both a religious (mystical) and secular component at a low, moderate or high level (classes 2, 3 and 4).

The analysis of the distribution on the SOS-Ru subscales indicates a significant deviation from normality: the values of the Shapiro-Wilk test are from 0.970 to 0.986 ($p < 0.01$), however, the asymmetry coefficients are small (from -0.35 to 0.16 for different subscales). Spiritual experiences, expressed in a sense of connection

Table 2

Correlations of SOS-Ru Subscales with External Validity Criteria (N = 250)

Measures	Subscales				
	Theistic	Trans-cendent	Human	Nature	Self
INSPIRIT, Religious spirituality	0.80***	0.47***	0.25***	0.23***	0.19**
OH, Eudemonic orientation	0.32***	0.36***	0.46***	0.43***	0.41***
OH, Hedonic orientation	0.00	0.12	0.15*	0.14*	0.24***
GSI, Global social identification	0.32***	0.44***	0.63***	0.40***	0.44***
Connectedness to Nature	0.32***	0.48***	0.47***	0.58***	0.45***
MFQ, Care	0.20**	0.27***	0.25***	0.38***	0.34***
MFQ, Fairness	0.10	0.15*	0.15*	0.30***	0.33***
MFQ, Loyalty	0.38***	0.23***	0.27***	0.32***	0.28***
MFQ, Authority	0.49***	0.28***	0.28***	0.24***	0.25***
MFQ, Purity	0.38***	0.32***	0.30***	0.37***	0.33***
MFQ, Individualizing moral foundations	0.16*	0.22***	0.21***	0.36***	0.35***
MFQ, Binding moral foundations	0.47***	0.31***	0.32***	0.35***	0.32***
PBS, Traditional religious belief	0.70***	0.45***	0.22***	0.21***	0.16*
PBS, Psi-abilities	0.37***	0.33***	0.14*	0.07	0.02
PBS, Witchcraft	0.40***	0.39***	0.16*	0.17**	0.05
PBS, Superstition	0.29***	0.26***	0.13*	0.05	-0.02
PBS, Spiritualism	0.42***	0.44***	0.16**	0.18**	0.05
PBS, Extraordinary Life Forms	0.17**	0.32***	0.10	0.08	0.04
PBS, Precognition	0.42***	0.36***	0.18**	0.22***	0.07
SWLS, Satisfaction with life	0.18**	0.10	0.23***	0.13*	0.31***

Notes. Significance: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

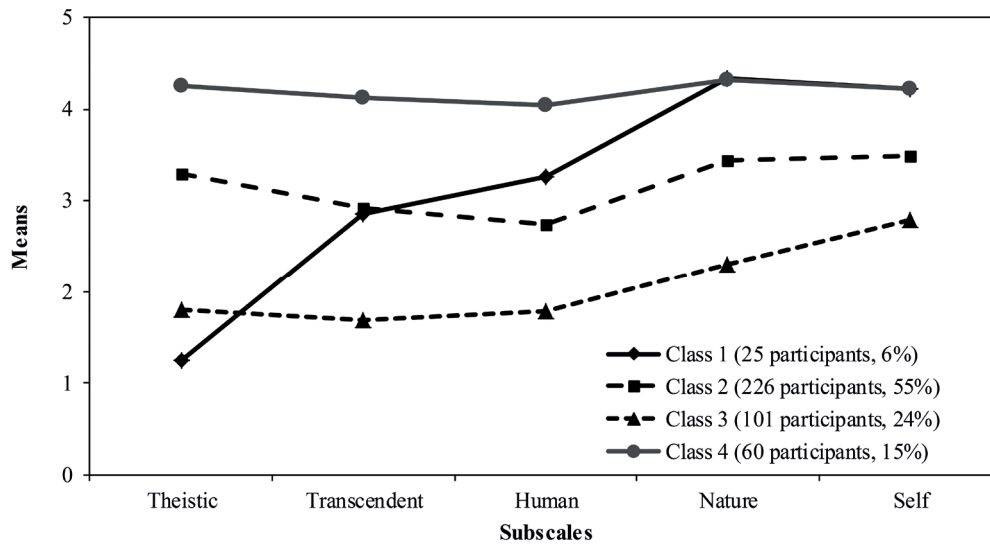


Fig. 2. The results of the analysis of latent profiles on the SOS-Ru subscales

with God and nature, turned out to be more typical for women (Table 3).

To analyze age differences on the SOS-Ru subscales the hypothesis of homogeneity of median values in different age groups was tested using the Kruskal-Wallis test. A statistically significant effect of age was found

on the following subscales: Theistic ($\chi^2(4) = 50.33; p < 0.001$), Transcendent ($\chi^2(4) = 23.02; p < 0.001$), Human ($\chi^2(4) = 18.12; p < 0.01$) and Nature ($\chi^2(4) = 27.69; p < 0.001$).

Presented in fig. 3 means illustrate the trend towards the growth of spiritual experiences in adulthood,

Table 3

Gender Differences on the SOS-Ru Subscales

Subscales	Means		SD		Cohen's d	U	Z	p
	W (290)	M (120)	W	M				
Theistic	3.04	2.70	1.12	1.23	0.29	14473.5	2.57	0.010
Transcendent	2.86	2.64	0.92	1.06	0.22	15217	1.88	0.060
Human	2.77	2.65	0.96	1.15	0.12	16329.5	0.99	0.322
Nature	3.46	3.12	0.98	1.16	0.33	14426.5	2.75	0.006
Self	3.44	3.48	0.77	0.83	-0.05	16795	-0.56	0.578

Note: W = women, M = men, the sample size N is in parentheses, SD = standard deviations, U = Mann-Whitney U-test, Z = Z-statistic for the U-test, p = statistical significance.

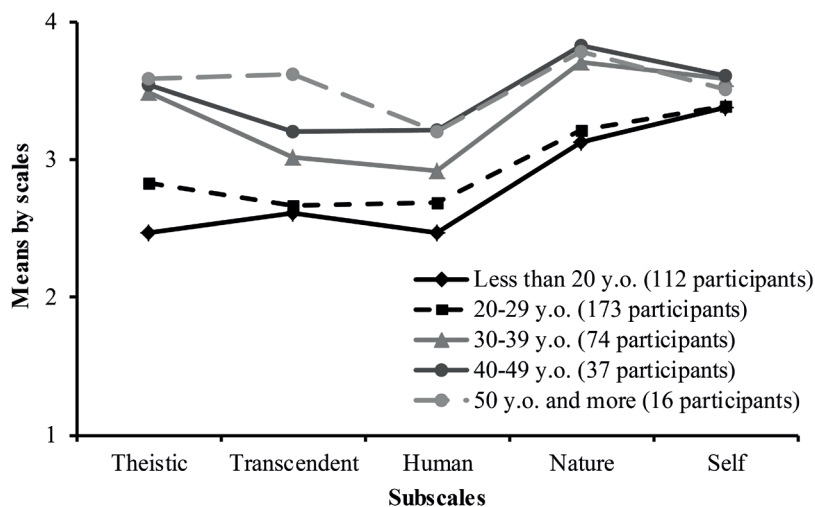


Fig. 3. Means by the SOS-Ru subscales in different age groups

and this trend is most pronounced on the Theistic and Transcendent subscales. Groups with different levels of education also show statistically significant differences across all subscales (Fig. 4) according to the Kruskal-Wallis test (at $p < 0.01$).

The most different groups on the subscales of the questionnaire (undergraduate and people with higher education) differ significantly from each other in age. Covariance analysis with control of age showed that for the Theistic subscale only the impact of age remains statistically significant, for the Self subscale the impact of the level of education is significant, and both age and education are significant factors for the other subscales.

Discussion

The results of the study indicate that the Russian-language version of the SOS scale has high reliability of its subscales, and the five-factor structure fits well to the data. The convergent validity of the Theistic, Human, and Nature subscales is confirmed by high correlations with scales that measure similar psychological constructs. For the Transcendent and Self subscales construct validity was tested and it was confirmed by the expected correlations with other psychological constructs that should be associated with the relevant aspects of spirituality. The Transcendent subscale showed close correlations with belief in supernatural phenomena, which is one of the components of spirituality [23]. The close correlation of the Self subscale with subjective well-being confirms the important contribution of the experience of the unity and integrity of the Self to one's well-being.

During testing of the construct validity of the subscales, the notion of the interrelations between spirituality and morality, widespread in theoretical works, but poorly studied, was confirmed [5; 8]. It should be noted that binding moral foundations showed the greatest correlation with religious spirituality (measured by the Theistic subscale), while individualizing moral foundations are most strongly associated with subscales describing a rather secular type of spirituality (Nature and Self), which fits well with the ideas of the moral foundation's theory [17]. Despite the positive public assessment of spirituality, the impact of the social-desirability bias on the results in an anonymous survey was insignificant for most subscales.

The profiles of spirituality identified in this study were not identical to those found by the authors of the original English-language version [16]; in particular, a profile with an apparent priority of religious spirituality was not revealed in our study. This may be a consequence of either the insufficient representativeness of the sample, which might not include deeply religious people, or the rarity of this form of spirituality in the Russian population.

Conclusion

Measuring of spiritual experiences taking into account their sources allows obtaining a relatively differentiated and valuable description of the person's spiritual sphere regardless of religiosity. The proposed Russian-language version of the SOS scale, which has excellent psychometric characteristics, makes it possible to explore the various manifestations of spirituality, taking into account a variety of spiritual experiences.

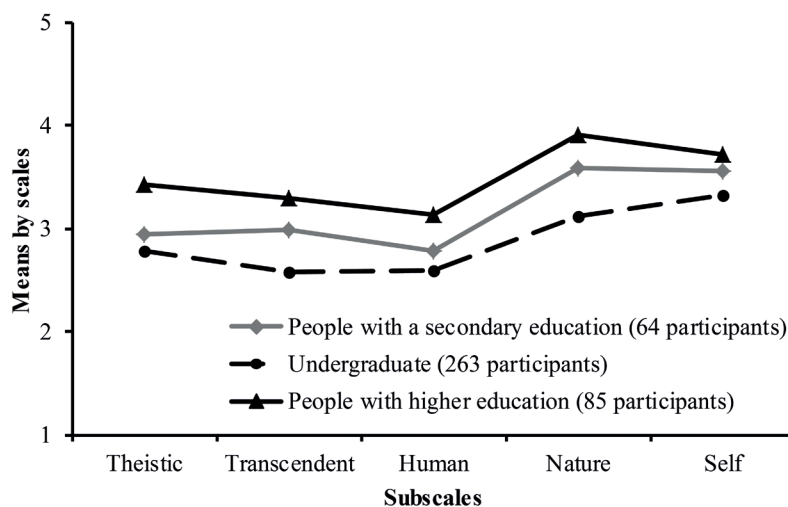


Fig. 4. Means by the SOS-Ru subscales in groups with different levels of education

Russian-language version of Sources of Spirituality Scale

Пожалуйста, укажите степень Вашего согласия с приведенными утверждениями. Варианты ответа: 1 — совершенно не согласен; 2 — не согласен; 3 — ни да, ни нет; 4 — согласен; 5 — полностью согласен.

	1	2	3	4	5
1. У меня было ощущение чего-то бесконечного					
2. Я чувствовал, что Бог рядом					
3. Я чувствовал себя полностью верным себе					
4. Я чувствовал единство с природой					
5. Я чувствовал свою связь со всем человечеством					
6. Я чувствовал свою связь с невыразимой силой бытия					
7. Я чувствовал свою близость к Богу					
8. У меня было ощущение единства своего внутреннего мира					
9. Я ощущал свою связь с природой					
10. Я ощущал свою близость ко всему человечеству					
11. Я чувствовал единство с чем-то, что не могу описать словами					
12. Я знал, что Бог со мной					
13. Я чувствовал себя соответствующим своей сущности					
14. Я ощущал свою близость к природе					
15. Я ощущал единство со всем человечеством					
16. Я чувствовал присутствие чего-то из другого мира или измерения					
17. Я чувствовал присутствие Бога					
18. У меня было чувство своей целостности					

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THE PROBLEM OF DEVELOPMENT
ПРОБЛЕМА РАЗВИТИЯ

The Development of Moral Consciousness in Older Preschool Children Through Problematic Contradictory Situations

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The problem of moral consciousness development in preschool children is of particular importance due to the vagueness of value orientation in modern society. The lack of tools for developing work with children defines the timeliness of the topic. The purpose of the study is to investigate the applicability of problematic contradictory situations in work aimed at the development of moral consciousness in older preschool children. The study involved 40 children aged 6 to 7 years. Methods of T.V. Avdulova were used to study the structure of moral consciousness in children. The ascertaining stage results showed different degree of moral consciousness components formation in surveyed preschoolers: the emotional component as the most formed, the behavioral component as the least formed. Out of 5 moral norms (help, generosity, honesty, obedience, empathy), the most mastered by children were the norms of help and generosity. At the formative stage, the hypothesis was investigated that problematic contradictory situations can be an effective means of moral consciousness development in preschoolers. The control stage results indicate the positive dynamics of all moral consciousness components in children ($U = 35$; $R = 0.67$; $P = 0.00005$). The conditions for application of problematic contradictory situations for the development of moral consciousness in children are as follows: formulation of moral dilemmas, in which the unknown is the aim, conditions or way of action, similar to the child's experience; introduction of problematic contradictory situations in different types of children's activities; structuring a sequence of lessons based on the degree of mastery of moral norms; application of an algorithm that provides reaching a productive solution mediating opposite options during resolving each problematic contradictory situation.

Keywords: moral consciousness, development, preschool children, problematic contradictory situations, dialectical thinking.

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Развитие морального сознания у детей старшего дошкольного возраста посредством проблемно-противоречивых ситуаций

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Проблема развития морального сознания у детей дошкольного возраста приобретает особое значение в связи с неопределенностью ценностных ориентиров в современном обществе. Актуальность темы определяется дефицитом инструментов для развивающей работы с детьми. Цель исследования — изучить возможности использования проблемно-противоречивых ситуаций в работе, направленной на развитие морального сознания у детей старшего дошкольного возраста. В исследовании принимали участие 40 детей 6–7 лет. Для изучения структуры морального сознания у детей использовалась методика Т.В. Авдуловой. Результаты констатирующего этапа показали разную степень сформированности компонентов морального сознания у обследованных дошкольников: наиболее сформирован эмоциональный компонент, наименее сформирован поведенческий компонент. Из 5 моральных норм (помощи, щедрости, честности, послушания, сопереживания) наиболее освоенными детьми оказались нормы помощи и щедрости. На формирующем этапе проверялась гипотеза о том, что продуктивным средством развития морального сознания дошкольников являются проблемно-противоречивые ситуации. Результаты контрольного этапа свидетельствуют о позитивной динамике всех компонентов морального сознания детей ($U = 35$; $R = 0,67$; $P = 0,00005$). Условиями применения проблемно-противоречивых ситуаций с целью развития морального сознания у детей старшего дошкольного возраста являются: разработка моральных дилемм, неизвестным в которых является цель, условия или способ действия, близких к опыту ребенка; включение проблемно-противоречивых ситуаций в разные виды деятельности детей; выстраивание последовательности занятий в соответствии со степенью освоенности моральных норм; использование при разрешении каждой проблемно-противоречивой ситуации алгоритма, позволяющего прийти к продуктивному решению, опосредствующему противоположные варианты.

Ключевые слова: моральное сознание, развитие, дети дошкольного возраста, проблемно-противоречивые ситуации, диалектическое мышление.

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Introduction

Today, value orientations in our society are changing and moral standards are inconsistent, so the problem of children's moral development has become more relevant. The issues of developing and shaping moral consciousness at preschool age are taking on particular importance. The Federal State Educational Standard for preschool education indicates the need for children to learn "the norms and values accepted in society, including ethical and moral values" [17, p. 10].

The issue of moral consciousness development in children has been dealt with by J. Piaget, L. Kohlberg, L.S. Vygotsky, L.I. Bozhovich, D.B. Elkonin, T.V. Avdu-lova, N. Eisenberg, L. M. Padilla-Walker, G. Carlo, B.L. Volling, A. Mahoney and others. They have proposed various approaches to describe the structure of moral consciousness and developed methods for diagnostic assessment and development of children's moral consciousness [1; 2; 7; 8; 9; 13; 15; 26; 27; 29]. However, there is an obvious lack of the means necessary for developmental work with preschoolers. Therefore, the purpose of our study is to explore the applicability of problematic contradictory situations in work aimed at the

development of moral consciousness among preschool children.

Moral psychology has traditionally been developed within the framework of the main psychological schools: behaviorism, psychoanalysis and cognitivism, the methodological contradictions of which have yet to be overcome [9; 11; 13]. Russian researchers understand moral consciousness as an integral structure that includes cognitive, emotional and behavioral components. The development of moral consciousness is associated with a subject's adoption of behavior models. Preschool age has been found to be crucial for the moral development of a person [1; 7; 8; 11; 20].

The conditions for the development of moral consciousness in children is of particular importance. According to J. Piaget and L. Kohlberg, moral development is directly related to the level of cognitive development, and the age from 2 to 7 years — the stage of "moral realism" — corresponds to the pre-operational stage of the child's intellectual development [2; 15]. Vygotsky also emphasizes the importance of intellectual development, but at the same time notes that "it is much more important ... to organize the child's mind in order to help him prevail over all impulses and inclinations" [7, p. 263].

All researchers place the main emphasis on the role of education in the development of moral consciousness among children [1; 2; 7; 8; 14; 27; 29]. However, many questions associated with the methods used in moral education remain open to debate. Vygotsky's criticism of the main approaches to children's moral education is relevant today. Criticizing the authoritarian system based on rewards and punishments, the author pointed out that these methods "serve as a means of rough mechanical influence and at best teach only the virtue of submission, only one moral rule – to avoid the unpleasant" [7, p. 274]. At the same time, Vygotsky criticized free education, he called it "risky" and emphasized that it is "by no means suited for the education of moral behavior" [7, p. 275].

Modern pedagogy offers a wide range of methods for the moral education of children [10]. Both traditional methods (reading general fiction, conversation, observation) and innovative forms, like organizing social events and creative activities, exist [14]. At the same time, it must be noted that literary works or life situations in which "what is good and what is bad" is obvious, remain the primary medium for the children's moral development [18].

Our study is conducted in line with the structural dialectical approach (N.E. Veraksa, A.K. Belolutsкая, I.B. Shiyan, O.A. Shiyan, etc.) [28]. The main scope of studies in this approach focuses on the development of dialectical thinking, but in recent years, increasing attention has been placed on the emotional and social development of the child [4; 6; 16].

Situations involving compliance with moral norms are often contradictory: ideas about moral norms and assessments of actions can not only differ, but also be in mutual opposition. "In the social life of a person, there are often moments when his own interests turn out to be opposite to the interests of others or the existing norm," writes O.A. Shiyan [23, p. 40]. Such situations are attributed to problematic contradictory situations the resolution of which requires dialectical thinking [5]. Research by A.K. Belolutsкая, T.N. Le-van, O.L. Kholodova describes how adults experience difficulties in resolving ethically contradictory situations [3]. In contrast, studies show that preschool children can resolve such situations by demonstrating "dialectical social intelligence" [21; 23]. In such situations, it is possible to overcome the limitations of methods based on the child's awareness of his or her emotional experiences, which are criticized by E. O. Smirnova and V.M. Kholmogorova. They make it possible to "remove fixations on one's own Self through the development of attention to others, a sense of community and belonging thereto" [19, p. 99]. The resolution of problematic contradictory situations involves children identifying their position and the opponent's position, experiencing opposite feelings and making a free choice. This supports the idea that that problematic contradictory situations with ethical content can be used as a means of moral consciousness development in children.

Problematic contradictory situations are viewed in our study as situations that contain contradictory aims,

conditions or ways of action and do not have an unambiguous solution. The resolution of such a situation requires dialectical thinking, as it assumes the identification of opposite circumstances and the search for a qualitatively new solution, including the simultaneous existence of opposites.

The use of problematic contradictory situations in developmental work assumes their introduction in various types of activities that allow children to understand and express their attitude to the objects being studied, and "to realize oneself as a subject of solving various kinds of problems" [24, p. 68]. The leading method for moral consciousness development is ethical conversation, during which "opposite positions can be presented interactively" [23, p. 44]. Favorable conditions can also be created in gameplay, where all the capabilities of children are revealed to the fullest extent possible [25].

Program of the study

The study included three stages: ascertaining, formative and control.

The study involved 40 children aged 6 to 7 years (21 girls, 19 boys) developing within the norm for their age.

At the ascertaining stage, the methods of T.P. Avdulova were used to assess the moral consciousness of preschoolers [1].

To assess the cognitive component of moral consciousness, the "moral dilemmas" method was used. The children were offered eight dilemmas on five moral norms: help, generosity, honesty, empathy, and obedience, and asked questions: What will the character do? Why? How should one act? Why? The levels were determined according to the following criteria: the accuracy and argumentation of answers (orientation to mutual benefit, external evaluation, empathy and respect for the feelings of others).

To assess the emotional component of moral consciousness, a test was used that involved discussing ten pictures: Who is shown in the picture? How do the characters feel? Why? What do you feel? Why? What would you do to change the situation? The level of empathy was determined according to the following criteria: the adequacy and intensity of the emotional reaction and the desire to change the situation.

To assess the moral behavior, the "honest maze" method was used, where the winning child was given stickers to share with other participants. Levels were determined by the number of norms observed independently or by prompting.

The assessments showed the following distribution of children by levels of moral consciousness: 6% of children showed a low level, 67.5% of children showed an average level, and 17.5% of children showed a high level.

The results of the study revealed that the emotional component was formed in children better than in others

(only 7.5% of children showed a low level). The behavioral component was formed worse: 37.5% of children showed a low level. Most of the children showed an average level in all components. Out of five moral norms, those mastered most by the children were the norms of help and generosity.

The methodology of the formative experiment was based on the following hypothesis: we believe that problematic contradictory situations can be an effective means of developing moral consciousness in children under the following conditions:

1) children are provided with problematic contradictory situations that require the resolution of moral dilemmas, in which the aim, conditions or course of action are unknown;

2) problematic contradictory situations in different types of activities are introduced;

3) the system of lessons is structured according to the following principle: each lesson is devoted to one moral norm and the sequence and quantity of lessons are determined by the level of mastery of that norm;

4) an algorithm for the resolution of each problematic contradictory situation is applied which includes: a statement of a problematic issue; formation of a contradictory situation; substantiation of opposing judgments; return to the resolution of the problematic contradictory situation with the help of a scheme; resolution of the situation; symbolic experience of the situation.

To fulfill the first condition of the hypothesis, the problematic contradictory situations were formulated in such a way that they put children in situations of moral choice while not departing far from the child's sphere of experience. The unknown in such situations is the aim, conditions or course of action, as per with the classification of problematic situations by A.M. Matyushkin [12]. The children were presented with problematic contradictory situations in which:

1 – the aim of the action is unknown (for example, the children are asked to resolve a situation in which the adults say that a road must be crossed on a red light, but not on a green light, that is, the advice of adults contradicts the road rules known to the children);

2 – the conditions of the action are unknown (for example, what tasty food to give to a child with allergies, where the aim is obvious and it is necessary to identify all relevant circumstances);

3 – the unknown to be learned is a course of action (for example, how to tell the truth without harming a loved one. Where the conditions and aim are defined, it is necessary to find a new way to solve the problem).

To fulfill the second condition of the hypothesis, the children were involved in different types of activities: 1 – discussion of life situations (“Distribution of food on a hike”, “Give help or catch a train”) and cartoons (“Masha and the Bear”, “Once upon a time there was a dog”); 2 – dramatization game. To ensure that each child had the opportunity to actively participate, the lessons were held in groups of nine children.

To implement the third condition of the hypothesis, lessons were held in a certain sequence. The diagnostic results showed that out of five moral norms the norms of help and generosity were those mastered most often by the children, so the first two lessons were devoted to these norms. Three lessons were devoted to each of the following norms: honesty, obedience and empathy.

Let us give examples of the problematic contradictory situations that we developed:

– The norm of generosity: the children need to distribute a limited set of toys among themselves – there is a contradiction between the norm and one's interests.

– The norm of help: there is a boy in the yard who did not help anyone, but when he lost an important thing, he asked for help – there is a contradiction between the norm and one's attitude.

– The norm of honesty: the child knows that his friend broke someone else's thing and did not confess, and wonders whether he should tell adults – there is a contradiction between the norm and one's attitude.

– The norm of empathy: homeless cats live in the basement of a house and because of them, fleas and an unpleasant smell appeared – there is a contradiction between norms.

– The norm of obedience: the adults ask the children to perform an act that contradicts the rules they have learned – there is a contradiction between norms.

To fulfill the fourth condition, we used the algorithm for the resolution of problematic contradictory situations proposed by O.A. Shiyan in the analysis of fairy tales [22]. We adapted it for the analysis of problematic contradictory situations with ethical content. The algorithm includes the following steps:

1) statement of a problematic issue that arises from the content of a situation and helps to identify mutually exclusive relationships, for example: “imagine a situation where you and your parents are in a hurry to catch a train that is about to leave. An elderly man comes up to you and asks you to lead him to another platform at the station”;

2) formation of a problematic contradictory situation using a provocative question, to which opposite answers can be given: “What to do in this situation? Maybe you don't need to help, because you might be late?”;

3) substantiation of opposing judgments: “We get two groups of opinions. Let us organize ourselves as follows: those who are in favor of helping the man sit on one side, and on the other – those who are not in favor of leaving and helping the man.” When the children have settled, each group provides their arguments;

4) turn to the resolution of a problematic contradictory situation with the help of a diagram: “Now let's present our options in a scheme (a scheme is shown with white and black squares, from which arrows lead to a grey square). In the white square we will write the option – “Help the man”, in the black one – “Do not help the man”. Let's come up with a solution to the situation that will suit everyone, and write it in the grey square”;

5) symbolic experience of the situation: "Let's try to role play this situation." When distributing roles, it is better to offer the role of an elderly person to a child who did not want to help, and offer roles of passengers running late to children who wanted to help.

6) resolution of the problematic contradictory situation— dialectical transformation: "We came to the conclusion that the most appropriate option is to find other adults who are not late for the train and will be able to accompany the man to his platform. That way you will not miss the train but you can still help."

Based on the above, we have prepared a developmental program that consists of 14 lessons with a common structure: greeting, introduction of a problematic contradictory situation, conversation, dramatization game, summing up, and saying goodbye.

The children were selected for the experimental group (EG) based on the assessment of their moral consciousness. The EG included 18 children who showed low and medium levels of moral consciousness development. The remaining children were placed in the control group (CG). A control experiment was conducted to evaluate the effectiveness of the program developed. The significance of the differences was assessed using the Mann–Whitney U test.

Results of the Study and Discussion

Analysis of the data showed that there was no change in the moral consciousness indicators in the CG, while there was a positive trend in the EG. The results are presented in Fig. 1.

For the EG, at the control stage, the number of children with a low level of the cognitive component of moral consciousness decreased to 11.5% and the percentage of children with an average level increased. The children defined the essence of the situation more accurately and gave detailed arguments. One child demonstrated a high level (he was able to formulate generalized norms: "It's unfair that someone has a lot of presents, while someone else doesn't", "The person is in pain, so you need to help

first", and gave arguments for empathy and respect for the feelings of others).

At the control stage, most children from the EG demonstrated an average level of the emotional component (83%). The children did not always name specific emotions, often giving just a general assessment ("Good mood"), did not offer any reasoning, but to the question "What do you feel when you look at the picture?" they expressed empathy: "It's a pity", "I am glad". The children tried to improve the negative situation, but did not offer specific actions, only defining the aim: "To reconcile", "To give treatment". At the control stage, 17% of children in the EG showed a high level of the emotional component. They named specific emotions: "It's a shame", "I am sad", "I am happy", justified their answers and suggested options for changing the situation: "Share toys and play together", "Separate the kids so that they stop fighting", etc.

The number of children with a low level of the behavioral component of moral consciousness has decreased (from 44% to 33%). Most of the children showed compliance with the norm of honesty, but fewer children showed compliance with the norm of generosity.

Statistical processing of data according to the Mann–Whitney U test confirms the positive dynamics of moral consciousness in children from the EG: differences in the indicators of the children's moral consciousness at the ascertaining stage and control stage are significant: $U = 35$; $R = 0.67$; $P = 0.00005$. This proves the effectiveness of the work conducted.

When resolving problematic contradictory situations with ethical content, the children realized the possible existence of not just different, but also opposite points of view in the assessment of social behavior and learned to point out contradictions in the conditions of the situation and in the interests and relationships of its participants. The introduction of problematic contradictory situations in different types of activities contributed to emotional involvement and increased the children's activity. Structuring a sequence of lessons based on the degree of mastery of moral norms made it possible to move from the actual to the potential abilities of the

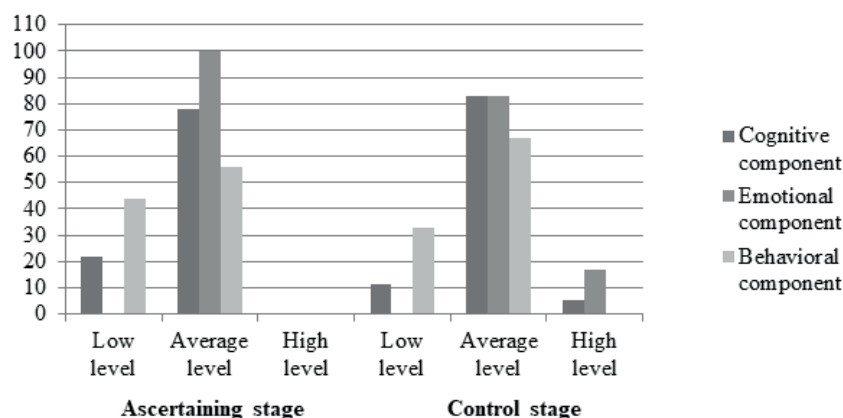


Fig. 1. Distribution of children from the EG according to their levels of development of moral consciousness components at the ascertaining stage and control stage (in %)

children. The use of an algorithm during the resolution of each problematic contradictory situation served as the basis for a dialectical analysis of situations. The visualization of opposite positions in the schema contributed to a deeper understanding, while introduction through gameplay ensured they had a full experience of the situation. It is particularly important that the children gained experience in producing modes of action that allow them to overcome contradictions, find behaviors that mediate extreme positions and, therefore, satisfy all participants.

The short duration of this experimental work must be noted. We believe that more prolonged and systematic work can cause more pronounced and stable positive changes in the structure of the preschool children's moral consciousness.

Conclusion

The development of moral consciousness in children is an important task in modern education. Preschool age

represents the first stage of a person's moral development, which determines prosocial development at later ages. Therefore, the means of moral consciousness development in children are of particular relevance.

In our study, we tested the hypothesis that problematic contradictory situations are a productive means of moral consciousness development in preschoolers. The child encounters such situations on a daily basis, which complicates the development of moral norms and causes ambivalent ethical feelings which are then reflected in the child's behavior. Artificial modeling of situations with moral contradictions makes it possible to form in children a dialectical mechanism for the resolution thereof: the ability to single out contradictions in an ethical situation and find ways to mediate them.

The results of the formative experiment showed that this work based on the use of problematic contradictory situations contributes to the development of all components of moral consciousness of older preschool children: cognitive, emotional and behavioral.

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МЕТОДОЛОГИЧЕСКИЕ ВОПРОСЫ
METHODOLOGICAL ISSUES

Factor Structure of the Russian Version of the “Metacognitive Awareness Inventory”

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Metacognitive processes are important for the success in the wide range of educational activities of youth and young adults. However, the positive correlations between metacognition and academic achievements are not high enough, and the instruments used in these studies might be the reason. We explored the factor structure of the Russian version of the questionnaire “Metacognitive Awareness Inventory” developed by G. Schraw and R. Dennison and adapted by A.V. Karpov and I.M. Skityaeva into Russian. The participants of our study were 527 residents of St. Petersburg, which were studying at the university at the time. Among them there were 366 students getting their first diploma and 161 students getting their second diploma (average age 23.8 ± 8.8). In this article the authors present the results of a confirmatory factor analysis of four models, which are the most frequently used in foreign and Russian literature: unidimensional model; two different two-factor models; eight-factor model. Evaluation of the model fit indices for the four models showed that none of them were a good fit. We reduced the number of items of the questionnaire and re-implemented the factor analysis of these four models. The values of indicators of a good model fit improved. In the short version of the questionnaire “Metacognitive Awareness Inventory” the authors discovered two scales – knowledge of cognition and regulation of cognition, which included 8 subscales: declarative knowledge, procedural knowledge, conditional knowledge, planning, information management strategies, comprehension monitoring, debugging strategies, evaluation.

Keywords: education, metacognition, metacognitive processes, metacognitive awareness, factor structure.

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Факторная структура русскоязычной версии опросника «Метакогнитивная включенность в деятельность»

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Исследования метакогнитивных процессов показывают их важность в успешности учебной деятельности юношества и молодежи. Однако положительные корреляции между общими метакогнитивными навыками и академическими достижениями недостаточно высоки, что может быть обусловлено используемым инструментарием. Нами исследована факторная структура русскоязычной версии опросника «Метакогнитивная включенность в деятельность» Г. Шроу и Р. Деннисона, адаптированная А.В. Карповым и И.М. Скитяевой. В исследовании приняли участие 527 жителей Санкт-Петербурга, включенных в учебную деятельность, в том числе 366 студентов и 161 слушатель отделения профессиональной переподготовки (средний возраст 23.8 ± 8.8). Представлены результаты конфирматорного факторного анализа четырех моделей опросника, наиболее используемых в зарубежных и отечественных научных исследованиях: однофакторная модель, две альтернативные двухфакторные модели и восьмифакторная модель. Оценки индексов четырех моделей показали, что ни одна из них не удовлетворяет критериям соответствия. Мы осуществили сокращение количества утверждений опросника и повторно провели факторный анализ четырех указанных моделей, что значительно улучшило критерии соответствия. Сокращенная версия опросника «Метакогнитивная включенность в деятельность» обнаружила двухфакторную структуру шкал: метакогнитивное знание и метакогнитивное регулирование, а также восемь субшкал: декларируемые знания, процедурные знания, условные знания, планирование, стратегии управления информацией, контроль компонентов, структура исправления ошибок и оценка.

Ключевые слова: учебная деятельность, метапознание, метакогнитивные процессы, метакогнитивная включенность, факторная структура.

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Introduction

The latest studies in psychological and educational research are largely focused on metacognition in learning [7; 34]. J. Flavell was a pioneer in metacognition studies; in the 1980s his followers defined metacognition as a mental activity aimed at investigating the cognitive processes, and actively controlling and managing those processes in order to achieve particular goals [15; 17]. In broad terms, non-Russian metacognition studies are dedicated to two types of mental activity: knowledge of cognition (metacognitive knowledge; awareness of one's own cognitive processes) and regulation of cognition (metacognitive regulation; monitoring and control of one's cognitive processes), which are often studied within the framework of the common phenomenon of metacognitive awareness [25; 27; 33]. This concept is currently being developed by researchers from all over the world.

Within the framework of the structural-dialectical approach, T.E. Chernokova described the detailed structure of metacognition, including metacognitive knowledge (knowledge of general and individual pat-

terns, objective conditions, and instruments of cognition) and metacognitive processes (control, regulation, and management of cognition) [9]. The author defined metacognition as a system of one's knowledge about cognitive activity in general and one's own cognitive processes, as well as the processes that ensure self-regulation of one's cognitive activity [10]. M.A. Kholodnaya proposed the concept of "mental experience", which included involuntary and voluntary intellectual control, an open cognitive position, and metacognitive awareness [8]. Within the framework of the classification of metacognition processes, B.M. Velichkovsky described five groups of metastrategies [3] while A.V. Karpov defined metacognition as the leading form of reflexive regulation skills [4; 5].

Thus, metacognitive awareness appears to be the main regulating mechanism of cognition and the most-studied phenomenon of metacognition in Russian and foreign research [8; 10; 11; 15; 17].

Research on metacognitive awareness in learning shows its predictive power in relation to the success of learning. In particular, students with a high level of

metacognitive awareness are more successful in problem-based learning [19] and gaining expert knowledge [14], and have better results in terms of academic achievement [2; 6; 26; 27; 28; 31; 32]. However, positive correlations between general metacognitive skills and academic achievement are not as strong as might be expected based on theory. The insufficiently strong correlations can be explained in several ways: first, the distribution of the general population, in which respondents with low levels of metacognitive skills are located on both sides of the achievement scale [31]; second, intermediate variables and/or background factors [16; 13]; third, the specifics of the technics used [18].

Foreign researchers have investigated the advantages and disadvantages of metacognition questionnaires and concluded that the questionnaires are valuable for

practical and large-scale use, but their structure needs improvement [24]. Thus, despite the fact that metacognition has been thoroughly researched, the question of with what instruments to measure it remains controversial.

The most popular questionnaire among many existing instruments for the assessment of metacognitive components is the Metacognitive Awareness Inventory (MAI) created by G. Shrow and R. Dennison to measure knowledge of cognition and the regulation of cognition [15; 17; 25]. The authors proposed three different options for calculating the subscale scores on the questionnaire: (1) an empirical two-dimensional model, (2) a theoretical two-dimensional model, and (3) an eight-dimensional model (Table 1). Later, researchers began to use a unidimensional model to calculate the total score of metacognitive awareness.

Table 1

Metacognitive Awareness Inventory and the distribution of items between scales

Items	Empirical two-dimensional model	Theoretical two-dimensional model	Eight-dimensional model
1. I ask myself periodically if I am meeting my goals.	RK	RK	M
2. I consider several alternatives to a problem before I answer.	RK	RK	M
3. I try to use strategies that have worked in the past.	KG	KG	PK
4. I pace myself while learning in order to have enough time.	RK	RK	P
5. I understand my intellectual strengths and weaknesses.	KG	KG	DK
6. I think about what I really need to learn before I begin a task.	RK	RK	P
7. I know how well I did once I have finished a test.	KG	RK	E
8. I set specific goals before I begin a task.	RK	RK	P
9. I slow down when I encounter important information.	KG	RK	IMS
10. I know what kind of information is the most important to learn.	KG	KG	DK
11. I ask myself if I have considered all options when solving a problem.	RK	RK	M
12. I am good at organizing information.	KG	KG	DK
13. I consciously focus my attention on important information.	KG	RK	IMS
14. I have a specific purpose for each strategy I use.	RK	KG	PK
15. I learn best when I know something about the topic.	KG	KG	CK
16. I know what the teacher expects me to learn.	KG	KG	DK
17. I am good at remembering information.	KG	KG	DK
18. I use different learning strategies depending on the situation.	KG	KG	CK
19. I ask myself if there was an easier way to do things after I finish a task.	RK	RK	E
20. I have control over how well I learn.	KG	KG	DK
21. I periodically review to help me understand important relationships.	RK	RK	M
22. I ask myself questions about the material before I begin.	RK	RK	P
23. I think of several ways to solve a problem and choose the best one.	RK	RK	P
24. I summarize what I've learned after I finish.	RK	RK	E
25. I ask others for help when I don't understand something.	KG	RK	DS
26. I can motivate myself to learn when I need to.	KG	KG	CK
27. I am aware of what strategies I use when I study.	RK	KG	PK

Items	Empirical two-dimensional model	Theoretical two-dimensional model	Eight-dimensional model
28. I find myself analyzing the usefulness of strategies while I study.	RK	RK	M
29. I use my intellectual strengths to compensate for my weaknesses.	KG	KG	CK
30. I focus on the meaning and significance of new information.	KG	RK	IMS
31. I create my own examples to make information more meaningful.	KG	RK	IMS
32. I am a good judge of how well I understand something.	KG	KG	DK
33. I find myself using helpful learning strategies automatically.	KG	KG	PK
34. I find myself pausing regularly to check my comprehension.	RK	RK	M
35. I know when each strategy I use will be the most effective.	RK	KG	CK
36. I ask myself how well I accomplish my goals once I'm finished.	RK	RK	E
37. I draw pictures or diagrams to help me understand while learning.	RK	RK	IMS
38. I ask myself if I have considered all options after I solve a problem.	RK	RK	E
39. I try to translate new information into my own words.	KG	RK	IMS
40. I change strategies when I fail to understand.	RK	RK	DS
41. I use the organizational structure of the text to help me learn.	RK	RK	IMS
42. I read instructions carefully before I begin a task.	KG	RK	P
43. I ask myself if what I'm reading is related to what I already know.	RK	RK	IMS
44. I re-evaluate my assumptions when I get confused.	RK	RK	DS
45. I organize my time to best accomplish my goals.	KG	RK	P
46. I learn more when I am interested in the topic.	KG	KG	DK
47. I try to break studying down into smaller steps.	RK	RK	IMS
48. I focus on overall meaning rather than specifics.	RK	RK	IMS
49. I ask myself questions about how well I am doing while learning something new.	RK	RK	M
50. I ask myself if I learned as much as I could have once I have finished a task.	RK	RK	E
51. I stop and go back over new information that is not clear.	KG	RK	DS
52. I stop and reread when I get confused.	KG	RK	DS

Note: KG = knowledge of cognition; RK = regulation of cognition; DK = declarative knowledge; PK = procedural knowledge; CK = conditional knowledge; P = planning; IMS = information management strategies; M = monitoring; DS = debugging strategies; E = evaluation.

The authors who implement the English-language version of the questionnaire actively (and independently of each other) use four options for processing the questionnaire: the empirical two-dimensional model of the knowledge of cognition (25 items) and regulation of cognition (27 items) [27]; the theoretical two-dimensional model of the knowledge of cognition (17 items) and regulation of cognition (35 items) [33]; the eight-dimensional model [22; 30]; and a unidimensional total model of metacognitive awareness [29].

The Russian-language version of the questionnaire, adapted from English by A.V. Karpov and I.M. Skityaeva, has a unidimensional-factor structure for assessing the total score of metacognitive awareness [5]. However, we identified an eight-factor structure in the questionnaire based on the exploratory factorial analysis of empirical data [1; 2].

The purpose of this study is to clarify the factorial structure of the Russian-language version of the MAI. The following questions guided this research:

1. Which of the four scoring models used with the MAI (the unidimensional model, the empirical two-dimensional model, the theoretical two-dimensional model, or the eight-dimensional model), is the best in terms of explaining the pattern of responses?

2. What are the indices of test discrimination and internal consistency of the MAI?

3. What is an optimal set of items for a short version of the MAI and what fit estimates does it have?

Methodology

In this study, we used the MAI developed by G. Shrow and R. Dennison, adapted by A. V. Karpov and I.M. Skityaeva into Russian. Each of the questionnaire items is assessed by a respondent using a 5-point Likert scale from “strongly disagree” to “strongly agree” [5].

Participants and data collection. The sample consisted of 527 respondents (136 men) aged from 18 to 39 ($M = 23.8 \pm 8.8$); of which 366 were students in a Bachelor program (students getting their first diploma – SGFD) ($M = 19.6 \pm 1.33$) and 161 were students getting their second diploma (SGSD) ($M = 33.4 \pm 5.5$) at the psychology department of St. Petersburg State University.

Data analysis. To assess the explanatory power of different models for the set of empirical data from Russia, we did a confirmatory factor analysis (CFA) using the maximum likelihood restricted [23]. We used the following indicators of a good model fit: Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) [12; 20]. Correlation analysis for the latent variables of the questionnaire was conducted using Person Correlation Coefficient. We applied Item Response Theory (IRT) analysis to the eight-dimensional model of the MAI, which included analyses of both the outfit and infit statistics of Mean-Square Fit Statistics (MNSQ) and items correlating with the score on the scale [21]. The internal consistency of a set of scale items was assessed with Cronbach’s alpha. We used the students’ t-tests for independent groups to evaluate differences between male and female groups and the two groups of students.

Statistical data processing was carried out using STATA.15 and Winsteps software.

Results of the Study

We analysed four models of the factor structure of the MAI (Table 2) on the whole sample.

The CFI and TLI estimates of all four models are below acceptable limits. It should be noted that the latent variables strongly correlated with each other in the models presented: the empirical model ($r = 0.897$; $p < 0.001$) and the theoretical model ($r = 0.922$; $p < 0.001$). The correlation coefficients of the latent variables of the eight-

factor model ranged from 0.666 to 0.818 at a significance level of all $p < 0.001$.

Three items – 42, 43, and 52 – were found to have relatively low factor loadings for all four models (Table 1). These particular items add little information in terms of measuring the construct of metacognitive awareness, so we deleted them from subsequent analysis for reasons of maintaining high internal consistency.

IRT analysis of the Metacognitive Awareness Inventory

The analysis of the dimensionality of each of the eight factors of the questionnaire showed that all subscales had a one-dimensional structure. MNSQ values for all items were between 1.5 and 1.9 (all values are less than 2). IRT analysis results determined the average item difficulty of the questionnaire for the whole sample and identified that 18 out of 49 items were problematic: Nos. 32, 5, 46, 3, 15, 22, 45, 37, 41, 31, 39, 9, 47, 48, 30, 21, 19, and 38 (Table 3). The highlighted items disrupted the consistency of the subscales; therefore, they were excluded from further analysis.

Analysis of the factor structure of the short version of the Metacognitive Awareness Inventory

Based on the results of the IRT analysis, a short version of the questionnaire with 32 statements was comprised. CFA was conducted four times to assess the fit of the four models and clarify the scale structure of the shortened version of the MAI (Table 4).

In the short version of the questionnaire, the multiple model-fitting criteria improved significantly for all four models. The theoretical two-dimensional model and the eight-dimensional model turned out to be the most accurate, as with the full version of the questionnaire. In addition to the RMSE, the values of the output weights the RMSE of our proposed 32-items instrument were inside the normal range, however, CFI and TLI are slightly below the norm.

The values of Cronbach’s alpha for the unidimensional and two-dimensional models are acceptable for

Table 2

Fit estimates of the Metacognitive Awareness Inventory’s scoring models

Models	χ^2 (df)	CFI	TLI	RMSEA	AIC	BIC
Unidimensional model	3646.19(1274)	.563	.545	.071	55765	56191
Empirical two-dimensional model	3634.81(1273)	.565	.547	.067	55556	56185
Theoretical two-dimensional model	3532.94(1273)	.584	.567	.066	55454	56083
Eight-dimensional model	3107.34(1145)	.611	.584	.065	53007	53729

Note: df – the degrees of freedom for chi-square; CFI – Comparative Fit Index; TLI – Tucker-Lewis Index; RMSEA – Root Mean Square Error of Approximation; AIC – Akaike information criteria; BIC – Bayesian information criteria.

Table 3

Fit statistics for the Metacognitive Awareness Inventory (IRT)

Subscale	Items	Item difficulty	Standard error	INFIT MNSQ	OUTFIT MNSQ	The correlation of individual item with the subscale
Declarative knowledge	20	1.08	.21	.78	.74	.57
	16	1.03	.22	.93	.92	.63
	12	.64	.23	.79	.76	.65
	17	.59	.23	.72	.66	.57
	32	-.03	.24	1.31	1.27	.43
	46	-.77	1.2	1.25	1.30	.24
	5	-1.15	.25	1.43	1.21	.46
	10	-1.39	.25	1.21	1.24	.46
Procedural knowledge	14	.94	.24	1.23	1.27	.69
	33	.35	.25	.79	.76	.57
	27	.17	.25	.91	1.00	.67
	3	-1.46	.26	.95	.97	.42
Conditional knowledge	35	.65	.23	.84	.82	.63
	18	.45	.23	.70	.68	.58
	15	-.19	.23	1.36	1.16	.52
	29	1.22	.23	1.22	1.22	.46
	26	-.57	.23	1.08	1.10	.61
Planning	8	.81	.24	.98	.97	.57
	22	-.39	.24	1.39	1.31	.38
	23	.45	.23	.57	.50	.59
	6	-.91	.24	.84	.83	.65
	4	.61	.23	.98	.98	.54
	45	-.39	.24	1.31	1.35	.42
Information management strategies	37	1.19	.17	1.41	1.28	.39
	41	.39	.20	.97	1.05	.31
	31	.22	.21	1.29	1.15	.42
	13	.22	.21	1.27	1.15	.46
	30	.35	.20	.89	.95	.60
	39	.13	.21	.85	.78	.25
	9	-.53	.24	.92	.93	.22
	47	-.76	.67	.67	.67	.41
	48	-1.22	.24	1.06	1.09	.42
Monitoring	34	1.08	.23	.76	.74	.50
	21	.72	.23	1.30	1.25	.47
	28	.61	.23	1.23	1.12	.56
	11	.55	.23	1.11	1.16	.64
	49	-.39	.24	.99	1.00	.52
	1	-1.08	.24	.88	.81	.73
	2	-1.49	.24	1.02	.93	.73
Debugging strategies	40	1.12	.23	.78	.79	.69
	44	.46	.24	.82	.81	.71
	25	.00	.24	1.39	1.44	.51
	51	-1.58	.26	1.00	.99	.47
Evaluation	19	1.13	.20	1.36	1.29	.56
	38	.73	.22	1.33	1.27	.52
	36	.53	.23	.86	.71	.52
	24	.32	.24	1.21	1.10	.47
	7	-.17	.26	1.12	1.15	.50
	50	-1.54	.26	.95	.98	.47

Note: In this table, the items with inadequate fit statistics values are highlighted. MNSQ – Mean-Square Fit Statistic; INFIT – Inlier-Pattern-Sensitive Fit Statistic; OUTFIT – Outlier-Sensitive Fit Statistic.

Table 4

Fit estimates of scoring models of the short version of the Metacognitive Awareness Inventory

Models	χ^2 (df)	CFI	TLI	RMSEA	AIC	BIC
Unidimensional model	21494.46(464)	.810	.799	.054	78148	81002
Empirical two-dimensional model	21467.88(463)	.815	.801	.053	78124	80556
Theoretical two-dimensional model	1442.27(463)	.833	.826	.055	78889	80037
Eight-dimensional model	985.59(329)	.852	.846	.052	78809	79761

Note: df – the degrees of freedom for the chi-square; CFI – Comparative Fit Index; TLI – Tucker–Lewis Index; RMSEA – Root Mean Square Error of Approximation; AIC – Akaike information criteria; BIC – Bayesian information criteria.

psychological questionnaires (Table 5). Cronbach’s alpha values for the eight-dimensional model are below the lower limit of the acceptable range.

Gender and age differences

In the short version of the MAI, the means did not differ significantly in the male and female groups. However, in terms of age, students getting their second degree ($M = 54.6 \pm 8.8$ and $M = 45.2 \pm 8.4$) had significantly higher scores of knowledge of cognition, compared to students in the Bachelor program ($M = 52 \pm 10.3$ and $M = 42.9 \pm 8.9$) in both the empirical two-dimensional model ($t(525) = -2.69$; $p = 0.007$) and the theoretical two-dimensional model ($t(525) = -3.02$; $p = 0.003$). Also, in comparison with students getting their first diploma, students getting their second diploma had significantly higher scores in declarative knowledge ($M = 19.1 \pm 3.6$ – for SGSD; $M = 18 \pm 3.9$ – for SGFD; $t(525) = -3.42$; $p = 0.001$), conditional knowledge ($M = 15.3 \pm 3.1$ – for SGSD; $M = 14.5 \pm 3.2$ – for SGFD; $t(525) = 2.81$; $p = 0.005$) and evaluation ($M = 15.9 \pm 3.1$ for SGSD, $M = 14.9 \pm 3.3$ for SGFD, $t(525) = -3.54$, $p = 0.0004$).

Conclusion

The aim of the study was to clarify the factor structure of the Russian version of the MAI questionnaire adapted from English by A.V. Karpov and I.M. Skityaeva. The CFA and IRT analysis made it possible to exclude some of the items from the questionnaire in order to improve the indices of discrimination test for the MAI. The short version of the questionnaire has improved fit estimates for the scoring models. The resultant 32-item structure of the questionnaire is consistent with the results of our previous research, in which some items (No. 3, 4, 22, 25, 32, 41, 42) were excluded from the questionnaire based on the results of factor analysis [1; 2], and also matches the short English version of the questionnaire by 80% [18].

The results of the internal consistency reliability test of the subscales of the short version of the MAI demonstrate that the theoretical two-dimensional model is the most acceptable for scientific research and practice. The eight-dimensional model can be used with some limitations due to the low reliability of some scales. In conclusion, the Russian version of the MAI can be shortened since it reproduces the original factorial structure and increase internal consistency.

Table 5

The internal consistency of a set of scale items for scoring models of the short version of Metacognitive Awareness Inventory

Models	Subscales	M (SD) (n = 527)	Cronbach’s alpha
Unidimensional model	Total score	120.9±22	.89
Empirical two-dimensional model	Knowledge of cognition	52.8±9.9	.78
	Regulation of cognition	68.1±12.8	.83
Theoretical two-dimensional model	Knowledge of cognition	43.6±8.8	.81
	Regulation of cognition	77.3±13.9	.82
Eight-dimensional model	Declarative knowledge	18.3±3.8	.61
	Procedural knowledge	10.5±2.6	.66
	Conditional knowledge	14.8±3.2	.53
	Planning	15.6±3.2	.51
	Information management strategies	7.7±1.8	.42
	Monitoring	23.0±4.7	.65
	Debugging strategies	15.8±3.2	.53
	Evaluation	15.2±3.3	.56

The short Russian version of the Metacognitive Awareness Inventory

Instructions

Here are several statements about the process of thinking and solving problems. Consider if the statement is true or false as it generally applies to you. Please use the following ratings to answer:

- 1 – strongly disagree
- 2 – disagree
- 3 – don't know
- 4 – agree
- 5 – strongly agree

	1	2	3	4	5
1. I ask myself periodically if I am meeting my goals.					
2. I consider several alternatives to a problem before I answer.					
3. I pace myself while learning in order to have enough time.					
4. I think about what I really need to learn before I begin a task.					
5. I know how well I did once I have finished a test.					
6. I set specific goals before I begin a task.					
7. I know what kind of information is the most important to learn.					
8. I ask myself if I have considered all options when solving a problem.					
9. I am good at organizing information.					
10. I consciously focus my attention on important information.					
11. I have a specific purpose for each strategy I use.					
12. I know what the teacher expects me to learn.					
13. I am good at remembering information.					
14. I use different learning strategies depending on the situation.					
15. I have control over how well I learn.					
16. I think of several ways to solve a problem and choose the best one.					
17. I summarize what I've learned after I finish.					
18. I ask others for help when I don't understand something.					
19. I can motivate myself to learn when I need to.					
20. I am aware of what strategies I use when I study.					
21. I find myself analyzing the usefulness of strategies while I study.					
22. I use my intellectual strengths to compensate for my weaknesses.					
23. I focus on the meaning and significance of new information.					
24. I find myself using helpful learning strategies automatically.					
25. I find myself pausing regularly to check my comprehension.					
26. I know when each strategy I use will be the most effective.					
27. I ask myself how well I accomplish my goals once I'm finished.					
28. I change strategies when I fail to understand.					
29. I re-evaluate my assumptions when I get confused.					
30. I ask myself questions about how well I am doing while learning something new.					
31. I ask myself if I learned as much as I could once I have finished a task.					
32. I stop and go back over new information that is not clear.					

Scoring Guide

Subscales	Items
Knowledge of cognition	7, 9, 11, 12, 13, 14, 15, 19, 20, 22, 24, 26
Regulation of cognition	1, 2, 3, 4, 5, 6, 8, 10, 16, 17, 18, 21, 23, 25, 27, 28, 29, 30, 31, 32
Declarative knowledge	7, 9, 12, 13, 15
Procedural knowledge	11, 20, 24
Conditional knowledge	14, 19, 22, 26
Planning	3, 4, 6, 16
Information management strategies,	10, 23
Monitoring	1, 2, 8, 21, 25, 30
Debugging strategies	18, 28, 29, 32
Evaluation	5, 17, 31, 27

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Perceived Collective Continuity: Scale Adaption for the Russian Context

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This article presents the results of the adaptation of the scale for perceived collective continuity in Russian, the construct of which was initially developed by Sani and colleagues in 2007. The phenomenon of perceived collective continuity reflects the perception of groups as entities that are stable over time and transmit traditions from generation to generation. The perception of collective continuity is based on two main dimensions: perceived cultural continuity (perceived continuity of norms and traditions) and perceived historical continuity (perceived relationship between different historical eras and events). Six hundred thirty-seven Russians took part in testing the methodology. The methodology fit well the empirical data, highlighting the two-factor structure of the construct and validity of its scale. In general, the method of perceived collective continuity demonstrates good psychometric indicators and can be used for research in the field of intergroup relations as a reliable and stable toolkit.

Keywords: perceived collective continuity, historical continuity, cultural continuity.

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Воспринимаемая коллективная преемственность: адаптация шкалы для российского контекста

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В статье представлены результаты адаптации шкалы воспринимаемой коллективной преемственности на русский язык, конструкт которой был изначально разработан Ф. Сани и коллегами в 2007 г. Феномен воспринимаемой коллективной преемственности отражает восприятие групп как сущностей, устойчивых во времени и передающих традиции из поколения в поколение. Восприятие коллективной преемственности основано на двух основных измерениях: воспринимаемой культурной преемственности (воспринимаемой непрерывности норм и традиций) и воспринимаемой исторической преемственности (воспринимаемой взаимосвязи между разными историческими эпохами и событиями). В апробации методики приняли участие 637 жителей России. Методика продемонстрировала хорошее соответствие эмпирическим данным, обозначив двухфакторную структуру конструкта и валидность шкалы. В целом, методика воспринимаемой коллективной преемственности демонстрирует хорошие психометрические показатели и может быть использована для исследований в области межгрупповых отношений как надежный и устойчивый инструментарий.

Ключевые слова: воспринимаемая коллективная преемственность, историческая преемственность, культурная преемственность.

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Introduction

According to social identity theory, a person is aware of his place in the world by referring to those social groups that have emotional significance for him [25]. However, the self-image of the individual is formed not only by the very fact of his identification with a particular social group, but also by the characteristics of this group and the peculiarities of the individual's perception thereof.

Social psychologists have defined the essence of a perceived group, that is, the perception of the group as an object or as a coherent whole, as one of the important features of group perception [8; 23]. S. Reicher and N. Hopkins [21] assumed that such groups are perceived by people as continuous, that is, as entities that move through time. Being a member of such a group, a person perceives himself as a small part of a continuously existing "organism", which is not only spatially larger than him, but also existed before and will exist after him. Based on these studies, F. Sani and colleagues [17] formulated the theory of perceived collective continuity, which implies that the culture and history of a social group can be transmitted and preserved from generation to generation. S. Reicher and N. Hopkins highlighted how much effort and time the members of the group spend exalting and expressing respect for their past group experiences, and protecting their own interpretation of historical events [21]. This sense of collective continuity provides elevation, and also allows an individual to protect the group, its experience, and the events associated with it. For example, although people are aware that they will die, a sense of collective continuity offers existential security [16–18], since this feeling implies that the part of a person that is determined by his or her membership in a group has temporal stability and is transformed into an "eternal we" [14; 26]. Based on this connection with the past, group members are able to gain a deeper understanding of themselves, as well as of intra- and intergroup processes.

F. Sani and colleagues [17] believe that the sense of perceived collective continuity is based on two grounds: cultural and historical. The first view is related to the belief that core values, traditions, and beliefs are transferred within a group from generation to generation. Belief in cultural continuity implies that, in the minds of people, a group has stable and permanent cultural features that characterize it at any time during its existence. The second view, historical, refers to the perceived relatedness of different time periods in the group's history to each other. The authors of the theory describe this as a "continuous flow" — when various eras, times, and events in the history of the group are perceived as sequentially and logically connected to each other, forming a continuous story or narrative. This sense of collective historical con-

tinuity includes not only the past, but also the belief that the group will exist in the future [20].

The authors consider historical and cultural perceived collective continuity to be interrelated, but emphasize the conceptual difference between the perception of the continuity of traditions and the continuity of historical periods. This means that the perception of the group may be dominated by one of these aspects. Moreover, it may also be associated with different characteristics of the group and the consequences for its members. For example, for a group that has radically changed its political regime, high cultural continuity may be undesirable because it would mean the transmission of old beliefs and traditions. However, high historical continuity may, on the contrary, help to emphasize the weight of the historical change that has taken place and explain the transformations [17].

F. Sani and colleagues [17] showed that the perception of a group as an entity existing in time is associated with social identity, the perception of group entitativity, and the collective self-esteem of the group. This construct is actively considered in studies of various socio-psychological phenomena such as social well-being [18], essentialist beliefs [6], fear of death [16], and resistance to a group merger [26]. Also, perceived collective continuity is directly reflected in more global processes, touching on the topics of intergroup relations [15], social identity [19], and group dynamics [24].

Methodology for Assessing Perceived Collective Continuity

The only methodology for assessing perceived collective continuity was presented in 2007 by F. Sani and colleagues. The scale includes 12 statements, 6 for each aspect of continuity. The scale of historical perceived collective continuity contains statements about the connection between time periods in the history of the group (for example, "Italian history is a sequence of interconnected events"). The scale of cultural continuity includes statements about the transmission and preservation of traditions or beliefs across generations (for example, "Italian people have passed on their traditions across the generations"). This scale showed high internal consistency ($\alpha = 0.8$), as were scales of historical and cultural representation ($\alpha = 0.86$ and $\alpha = 0.71$, respectively). Reviewing the structure of the construct confirmed its two-factor nature, highlighting the historical and cultural representations.

The scale is actively used by authors all over the world. Translations have been made into Dutch, Greek and Turkish [19; 11]. All translations show good agreement between the scales, but empirical evidence does

not always support a two-factor structure. In particular, in Turkey, such a structure has not been confirmed, which may indicate the cultural specificity of the perception of judgments (for example, in some countries, culture and history can be considered to be an inseparable single whole).

The growing relevance of group studies in terms of the perception of their temporal characteristics leads to a deeper study of this construct and its connection with psychological phenomena. Thus, for example, perceived collective continuity can explain increased outgroup hostility [15], resistance to a group merger [26], and ingroup defense motives [7]. The methodology of collective continuity can be a useful tool for studying the characteristics of the perception of social groups, the characteristics of its members, and intergroup relations in Russia. In contemporary Russia, there are many groups (civil, ethnic, national), for which the construct of collective continuity can predict and explain not only the perception of their own group, but also important intergroup processes. In addition, collective continuity can explain the perception of historical processes in Russia. The Russian Federation is a young state, the creation of which could “interrupt” the collective continuity of the group. Thus, according to a Levada survey, Russians rate the Soviet government better than the current one, and regret the collapse of the Soviet Union [4].

The purpose of this article is to adapt the scale for assessing the perceived collective continuity of Russia as perceived ethnic group of Russians, since Russians are the largest ethnic group in Russia. It was important not to choose an ethnic group based on citizenship (Russian citizens), but an ethnic group (ethnic Russians), since it is the ethnic group that is perceived as genetically predetermined, which is why the entitativity of such groups is highly valued [2].

Participants

The study involved 637 residents of Russia who identify themselves as ethnic Russians, aged 18 to 79 ($M = 36.71$, $SD = 10.59$, 50.9% men). Most of the respondents have one or more higher educational degree (57.1%), others had yet to complete higher education (9.4%), the rest have completed general secondary (10.5%) or secondary specialized education (22.4%).

Methods

Perceived collective continuity was measured using the methodology of F. Sani and colleagues, translated into Russian by two translators independently from each

other. Further, as a result of comparing the two options and conducted cognitive interviews with respondents, the final version of the scale was compiled, consisting of 12 judgments (see Appendix 1), of which 6 relate to cultural representation (for example, “Throughout history, Russians have retained their mentality”; $M = 5.12$, $SD = 1.09$, $\alpha = 0.87$), and the other 6 – to the historical one (for example, “There is a causal relationship between various events in the history of Russia”; $M = 5.42$, $SD = 0.92$, $\alpha = 0.83$). Each judgment was to be scored from 1 (strongly disagree) to 7 (strongly agree).

F. Sani and colleagues [17] relied on the connection between continuity and constructs related to the phenomena of group identification, since, in group identification, people can tend to fulfill their psychological need for incessancy and continuity (or a sense of symbolic immortality). Therefore, an ingroup that is perceived as culturally and historically contiguous must reinforce its own sense of continuity, which in turn must reinforce group identification, the positive evaluation of the group, and emotional connection with the group. The following methods were used to test the convergent validity of the scale:

Perceived group entitativity was assessed using three judgments: “Russians can be seen as a cohesive group / Russians can be seen as an organized group / Russians can be considered as a single whole” [2]. Each judgment had to be evaluated using a scale from 1 (strongly disagree) to 7 (strongly agree) ($\alpha = 0.89$).

Group identification was measured using a two-factor scale [12] adapted to Russian [1]. The scale includes 14 judgments (for example, “Being a Russian makes me happy”), combined into 5 scales. Each statement must be scored on a Likert scale from 1 (strongly disagree) to 7 (strongly agree) ($\alpha = 0.94$).

Feeling thermometer was assessed through respondents' assessment of how unfavorable/sympathetic and negative/warm feelings they have towards Russians, indicating a number from -5 (unfavorable/negative feelings) to +5 (sympathy/warm feelings) ($\alpha = 0.96$) [15].

To assess the discriminant validity of the scale, methods from *the Big Five* were used, aimed at assessing the scales of *extraversion* ($\alpha = 0.79$) and *neuroticism* ($\alpha = 0.86$) [3]. Each scale includes 9 statements that must be rated from 1 (strongly disagree) to 5 (strongly agree). These traits were chosen to test the discriminant validity, as these are stable personality constructs that are not associated with group phenomena.

Results

Both components of the scale showed high internal consistency ($\alpha > 0.8$) (Table 3). Table 1 shows descrip-

tive statistics of the statements. As can be seen from the data, all statements have a left skewed distribution, that is, the respondents are more likely to agree with them. Most of the statements have positive kurtosis, indicating a distribution where not enough respondents have low or high enough scores to be considered a normal distribution. This means that most of the statements display a low variance.

To assess structural validity of the scale, confirmatory factor analysis was performed using the lavaan package for R 4.0.4 [13]. Values of RMSEA < 0.06 and SRMR ≤ 0.08; TLI ≥ 0.95 [22]; CFI ≥ 0.95 and X²/df < 3 [10] were chosen as indicators of good model quality [9].

The initial model showed poor fit with the data: $\chi^2(53) = 226.04$, RMSEA = 0.071 [90% CI: [0.064; 0.08], CFI = 0.918, TLI = 0.897, SRMR = 0.060. Modification indices showed that there is a high error covariance between the two reversed (negatively-worded) items (6 and 12), which can be explained by the fact that the remaining items in the scale are positively-worded. The model adjusted for the revealed covariance (Fig.) demonstrates a good fit to the empirical data: $\chi^2(52) = 135.89$, RMSEA = 0.05 [90% CI: [0.041; 0.059], CFI = 0.96, TLI = 0.949, SRMR = 0.046.

To test the invariance of the scale across different sociodemographic groups, a multigroup confirma-

tory factor analysis (MCFA) was conducted. Three levels of scale invariance were assessed: structural (assesses whether items in different groups belong to the same factors), metric (assesses whether factor loadings of items in different groups are comparable) and scalar (assesses whether the “complexity” of items is identical in different groups). With the help of multigroup factor analysis, the scores of the scales among men and women were compared. According to the standards, the difference in CFI between the invariance models should not exceed 0.01 [5], therefore, according to the results presented in Table 2, it can be argued that the scale demonstrates complete invariance, that is, the scale works the same across gender groups.

To check the validity of the construct, a correlation analysis was conducted, the results are presented in Table 3. Convergent validity was confirmed by the significant correlations obtained with group entitlement ($r(635) = 0.57, p < 0.001$), group identification ($r(635) = 0.62, p < 0.001$) and feeling thermometer ($r(635) = 0.49, p < 0.001$). A weak positive correlation of collective continuity with extraversion ($r(635) = 0.17, p < 0.001$) and a weak negative correlation with neuroticism ($r(635) = -0.15, p < 0.001$) confirmed the discriminant validity of the adapted scale.

Table 1

Descriptive statistics on methodology items and item-total correlations

№	Formulation of items	M (SD)	Med	Skew	Kurtosis	r (H/C)	r
1 (C)	Russians transfer their traditions from generation to generation.	5.07 (1.31)	5	-0.888	0.57	0.52	0.47
2 (H)	The history of Russia is a sequence of interconnected events.	5.58 (1.22)	6	-1.270	1.856	0.56	0.56
3 (C)	Russian values and beliefs have stood the test of time.	5.11 (1.52)	5	-0.792	-0.107	0.70	0.65
4 (H)	The main periods in the history of Russia are connected with each other.	5.45 (1.2)	6	-1.234	1.823	0.64	0.58
5 (C)	Throughout history, Russians have retained their mentality.	5.28 (1.32)	6	-1	0.668	0.64	0.58
6 (H)	There is no connection between past, present and future events in the history of Russia.	5.61 (1.3)	6	-1.26	1.094	0.61	0.44
7 (C)	Russians will always be distinguished by their traditions and beliefs.	5.34 (1.33)	6	-0.98	0.747	0.68	0.60
8 (H)	There is a causal relationship between various events in the history of Russia.	5.59 (1)	6	-1.292	2.538	0.61	0.49
9 (C)	Russia has preserved traditions and customs throughout its history.	4.96 (1.44)	5	-0.85	0.031	0.78	0.68
10 (H)	The main events in the history of Russia form a continuous chain.	5.14 (1.32)	5	-0.993	0.575	0.66	0.68
11 (C)	Russians have always adhered and adhere to their own values.	4.97 (1.4)	5	-0.806	0.076	0.74	0.64
12 (H)	There is no continuity between different periods in the history of Russia.	5.14 (1.39)	6	-0.83	-0.097	0.52	0.38

Notes. M – mean; SD – standard deviation; Med – median; r (H/C) – correlation with the sum of the remaining items of historical or cultural representation; r – correlation with the sum of the remaining items of the entire scale; H – historical representation; C – cultural representation.

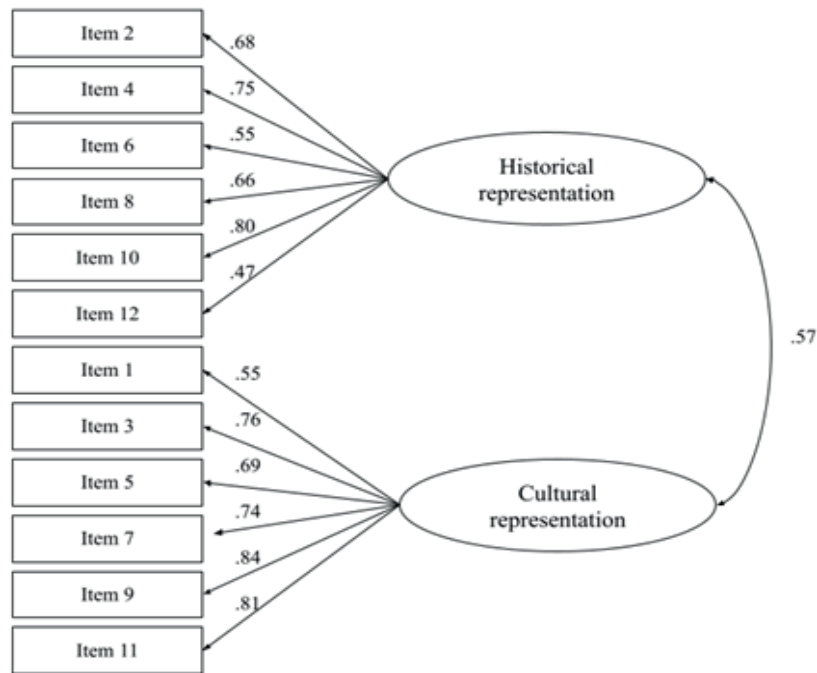


Fig. Perceived Collective Continuity Measurement Model with Factor Loadings

Table 2

Results of multigroup factor analysis

Groups	Model	χ^2	df	RMSEA [90% CI]	SRMR	CFI	TLI	AIC	BIC	$\delta\chi^2$	δdf	δCFI
Gender groups (men, women)	Structural invariance	192.78*	104	0.052 [0.042-0.061]	0.048	0.959	0.948	22973	22635	-	-	-
	Metric invariance	196.65*	114	0.0478 [0.038-0.057]	0.056	0.966	0.956	22914	22620	3.88	10	0.003
	Scalar invariance	210.49*	124	0.047 [0.037-0.056]	0.053	0.96	0.957	22862	22612	13.83	10	-0.002

Notes. χ^2 – chi-square test; df – number of degrees of freedom; RMSEA – mean square error of estimation; SRMR – standardized root mean square residual; CFI – comparative fit index; TLI – incremental fit index; AIC – Akaike information criterion; BIC – Bayes information criterion; $p < 0.001$ ‘*’

Table 3

Descriptive statistics and correlations with other constructs

Scale	M (SD)	α	1.	1.1	1.2	2.	3.	4.	5.
1. Perceived collective continuity	5.27 (0.85)	0.87							
1.1. Historical representation	5.42 (0.92)	0.83							
1.2. Cultural representation	5.12 (1.09)	0.87		0.45*					
2. Perceived group entitativity	4.21 (1.41)	0.89	0.57*	0.33*	0.63*				
3. Group identification	5.09 (1.11)	0.94	0.62*	0.37*	0.65*	0.61*			
4. Feeling thermometer	9.20 (1.89)	0.96	0.49*	0.32*	0.51*	0.46*	0.65*		
5. Extraversion	2.93 (0.73)	0.79	0.17*	0.06	0.21*	0.25*	0.28*	0.24*	
6. Neurotism	3.03 (0.80)	0.86	-0.15*	-0.06	-0.19*	-0.24*	-0.24*	-0.21*	-0.42*

Notes. M – mean; SD – standard deviation; α – Cronbach's alpha; $p < 0.05$ ‘*’.

Discussion

The article presents the adaptation of the perceived collective continuity scale into the Russian language.

Empirical data have shown that the Russified perceived collective continuity scale fits both the original factor structure and psychometric standards of validity and reliability. Therefore, collective continuity can be studied

in the Russian context, using both the whole scale and subscales for various aspects of continuity.

In particular, based on the assumption that a connection between certain aspects of the perceived collective continuity and different characteristics of the group and the consequences for its members exists, the historical context aspect of the theory can be used to explain the differences between ethnic and national groups living on the territory of Russia.

Notably, over the past century, three different states have succeeded one another in what is now the Russian Federation in terms of borders and denomination. Therefore, since members of social groups tend to spend a lot of effort in protecting their own interpretation of historical events and respecting their group experience [21], the construct of perceived collective continuity may allow us to explain relations with groups living

in countries that were reunited with Russia as one state within certain historical periods. Moreover, such states had a different territorial composition and hierarchy of values. High perceived collective continuity can predict outgroup attitudes. The higher the perceived collective continuity, the more extreme the attitudes become both for neutrally or positively assessed outgroups (attitudes towards them become even more positive), and for negatively assessed outgroups (attitudes towards them become even more negative) [15]. This influence can help explain intergroup processes not only within Russia, but also in relation to groups outside of it.

In addition, perceived collective continuity is being actively studied in light of rising existential security and reduced fear of death. This may also be relevant for the Russian context, where an appeal to history and culture can serve a protective function.

Appendix 1

Шкала воспринимаемой коллективной преемственности

1. Русские передают свои традиции из поколения в поколение.
2. История России — это последовательность взаимосвязанных событий.
3. Ценности и убеждения русских выдержали проверку временем.
4. Основные периоды в истории России связаны друг с другом.
5. На протяжении всей истории русские сохраняют свой менталитет.
6. Нет никакой связи между прошлыми, настоящими и будущими событиями в истории России.
7. Русские всегда будут отличаться своими традициями и убеждениями.
8. Существует причинно-следственная связь между различными событиями в истории России.
9. Россия сохраняет традиции и обычаи на протяжении всей своей истории.
10. Основные события в истории России образуют неразрывную цепочку.
11. Русские всегда придерживались и придерживаются собственных ценностей.
12. Нет никакой преемственности между разными периодами в истории России.

Культурное представление: 1, 3, 5, 7, 9, 11.

Историческое представление: 2, 4, 6, 8, 10, 12.

Обратные вопросы: 6 и 12.

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VYGOTSKY STUDIES
ВЫГОТСКОВЕДЕНИЕ

L.S. Vygotsky in the 21st Century: Impact on Psychology of Emotion (based on dissertations in English)

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Despite the popularity of L.S. Vygotsky in the English-speaking world, there is much debate about how exactly his ideas are applied in contemporary research. The article provides a quantitative analysis of dissertations on the psychology of emotions that mention L.S. Vygotsky from 2000 to 2020. It covers 177 dissertations from the ProQuest Dissertations & Thesis database, considering their topics and application of Vygotsky's ideas in the texts. It was discovered dissertations are distributed roughly equally into pedagogical (89) and psychological (88) dissertations. Half of all dissertations refers to Mind & Society, while a quarter relies on English editions of Thinking and Speech. Another 16% of dissertations contain no direct references to L.S. Vygotsky. In the majority of works, L.S. Vygotsky is mentioned either as the author of the sociocultural theory as a whole or as one of the concepts in the field of development. The methodology of the analysis of the semantic structure of consciousness and experiences is little in demand by English-speaking researchers. Only two dissertations have dealt with the concept of "experience". In 13 works, based on L. S. Vygotsky, the authors apply the ideas of mediation, development zones, development of concepts to emotions in childhood, the cultural specificity of emotional language, and consider the emotional side of speech. It is possible to trace both indirect influence of L.S. Vygotsky's legacy on psychology of emotions, testifying to graduate students' familiarity with the cultural-historical approach, and direct, through contemporary advancement of its core ideas.

Keywords: emotions, methodology, "perezhivaniye" (experience), Vygotsky.

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Л.С. Выготский в 21 веке: влияние на психологию эмоций (на основе англоязычных диссертаций)

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Несмотря на известность Л.С. Выготского в англоязычном мире, много дискуссий вызывает то, как именно его идеи используются в современных исследованиях. В статье проведен количественный ана-

лиз диссертаций по психологии эмоций с упоминанием Л.С. Выготского за период 2000—2020 годы. Описаны 177 диссертаций из базы Pro Quest Dissertations & Thesis, их тематика и использование в них идей Л.С. Выготского. Выявлено, что диссертации распределяются примерно поровну — на педагогические (89) и психологические (88). Половина всех диссертаций ссылаются на «Mind & Society», четверть опираются на английские издания «Мышления и речи». Еще в 16% диссертаций нет прямых ссылок на Л.С. Выготского. В преобладающем числе работ Л.С. Выготский упоминается либо как автор социокультурной теории в целом, либо в качестве изобретателя одного из концептов в области развития. Методология анализа смысловой структуры сознания и переживаний мало востребована англоязычными докторантами. Лишь в двух диссертациях проведена работа с концептом «переживание». В 13 работах на основе методологии Л.С. Выготского авторы применяют идеи опосредования, зон развития, развития понятий к эмоциям в детстве, культурному своеобразию эмоционального языка, а также рассматривают эмоциональную сторону речи. Можно проследить как косвенное влияние наследия Л.С. Выготского на психологию эмоций, свидетельствующее о знакомстве аспирантов с культурно-историческим подходом, так и прямое, через разработки релевантных идей.

Ключевые слова: эмоции, методология психологии, переживание, Л.С. Выготский.

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Introduction

In recent years there has been a growing interest in the social and cultural contexts of emotional experience. While in the early 2000s, along with rapid improvements in psychophysiological methods and precision recording techniques, interest in the psychology of emotions as a natural science discipline grew [see: 12; 30], after a certain saturation with data the situation is changing. Thus, the famous emotion researcher L.F. Barrett developed the concept of the social construction of emotions [1], which is supported by neurostudies [27]. Although Barrett herself is familiar with the work of L.S. Vygotsky and refers to him, it is not clear how exactly the tradition he started in general psychology turns out to be productive and in demand in this “humanitarian turn” of emotion researchers.

A number of contemporary studies are devoted to the reception and development of the cultural-historical tradition in the world scientific literature [3; 6; 9; 10]. A scientometric study shows that works about Vygotsky have appeared steadily in the ten-year period since 2009, with Russian researchers predominating [9]. Due to the fact that interest in the social development of the emotional sphere among researchers is now high, the (non)using of L.S. Vygotsky’s approach to the psychology of emotions can be considered as a separate case of scientometric analysis. Does a wide range of researchers of emotions resort to the works of L.S. Vygotsky as a source of methodological ideas? And how exactly does this happen?

To answer this question, a thematic analysis of PhD dissertations available through the Pro Quest Dissertations and Theses database was conducted. The dissertations reflected areas that, at a minimum, researchers with

the right to lead PhD students found promising, and, at a maximum, in which interested PhD students were able to obtain a specific result. The criterion for selection was that the dissertations explicitly manifested knowledge of the legacy of L.S. Vygotsky. Therefore, I assumed that the analysis of the use of the ideas of cultural-historical psychology and the predominant themes of works in the field of emotions that mention L.S. Vygotsky allows us to describe the contemporary spread of his approach in this relatively new subject.

The possibilities of quantitative methods in historical-scientific and scientific research are limited and do not allow for a meaningful analysis of conceptual development. Algorithmizing, however, provides research with special tools. The possibility of putting different kinds of programs at the service of scientific reflection becomes very real for modern scientists, including when studying the development of the cultural-historical approach.

Emotions in Cultural-Historical Perspective

Emotion is not a key term for cultural-historical psychology from the experts’ point of view [9], although the analysis of publications in the journal Cultural-Historical Psychology shows that from 2005 to 2016, 11% of articles belonged thematically to the “Personality, Motivation, and Emotion” section, 13 articles were published on “Experiences” and 15 on “Meaning.” Studies of emotional life, despite the fact that their methodological schemes are not as elaborate as those in studies of learning and development, are related to very important problems for L.S. Vygotsky.

By 1933, L.S. Vygotsky wrote the critical part of his treatise “The Doctrine of Emotions”. [4]. His positive part was never written [7]. In 1932, he gave a lecture “Emotions and Their Development in Childhood”. [5]. Vygotsky referred to the related problems of emotion – affect and experience – in their connection with the development of the child’s personality (for example, in “The Crisis at 7”), art (aesthetic emotions), intellect (the unity of affect and intellect), mastery of the actor, etc.

The concept of “experience,” which is difficult to translate into English, is important for Vygotsky’s approach to emotional life [14]. Vygotsky did not explicitly formulate a methodology for analyzing emotional life proper. This incompleteness creates space for discussion of possible cultural-historical versions of the theory of emotions [see: 16; 18; 23].

As a preface to the analysis of materials on emotions, it can be noted that among the followers of L.S. Vygotsky the most developed version of the psychology of emotions known to the Russian-speaking reader can be found in the Moscow psychological school [8]. For A.N. Leontiev, emotions are a tool of activity regulation that signals motivation to the subject. As such, a person’s emotional life is closely connected with his or her life world.

The analysis conducted by Brazilian researcher J. Mesquita is called “Vygotsky and the Theories of Emotion in Search of a Possible Dialogue”. [28]. She suggested the possibility of viewing emotions as a product of mediating cultural scripts of primary emotional reactions with subsequent interiorization by analogy with concepts in the development of thinking. This approach is realized in the Brazilian school of the KIP [see, for example: 31], but not only in it.

A more developed version of the Vygotsky idea of cultural mediation is Holodinsky’s theory of emotion interiorization, known to the Russian-speaking reader due to the textbook by G. Breslau [2]. In 2013, the journal “Mind, Culture, and Activity” published two special issues on emotion in cultural and historical terms. The editor was Manfred Holodinsky; in this issue, in particular,

he also outlined an updated version of his theory [22].

Another way to talk about a holistic theory of emotions from the perspective of cultural-historical activity psychology is offered by I. Burkitt [16]. For him, emotions are also connected with personality and L.S. Vygotsky’s ideas are supplemented by M.M. Bakhtin’s work on emotional and semantic processes.

Thus, the cultural-historical perspective of emotion research constitutes a separate substantive area, succeeding L.S. Vygotsky.

Method

Criteria. The sample of the study consisted of 177 Ph.D. dissertations from the Pro Quest Dissertations & Theses database. Inclusion criteria: dissertations written after 1999 in English, containing in their text the name Vygotsky and among the key words the term emotion. Of the 196 results, language and access criteria excluded: 3 dissertations in Spanish; 8 master’s theses; and 7 dissertations were either unavailable or their texts were not searchable. The distribution of dissertations by year is shown in Figure 1. Of the 177 dissertations in this database, 172 were defended in the United States. The analysis was conducted in 2021.

Parameters. The Pro Quest Dissertations & Theses database contain information about the place of defense, year, subject and subject field. The number of thematic and subject categories assigned to each dissertation is unlimited. Moreover, there are six types of classifications with names: classification, classification codes, major classification codes, subject classifications, subject terms, subjects. For subject coding, the list of subject terms was taken.

The references used to Vygotsky’s work in the literature and the context in which the work was cited were coded. From the array of citations, one subcategory included those in which Vygotsky is mentioned only as the author of the theory of “sociocultural development”

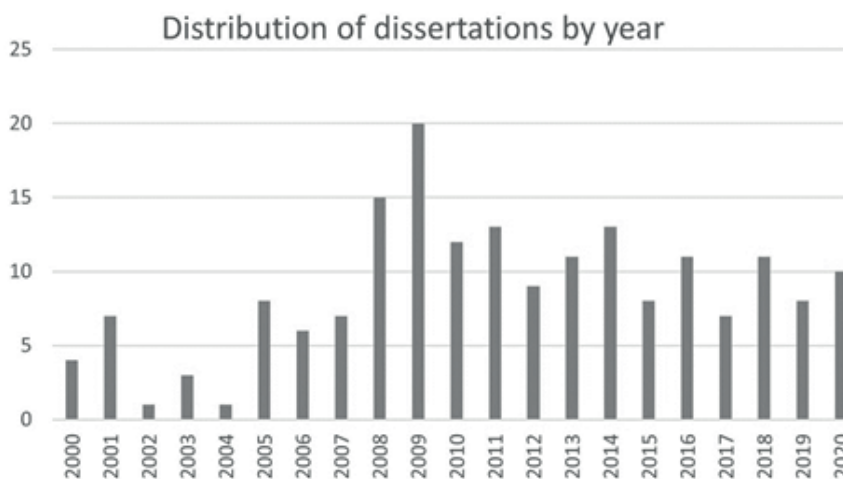


Fig. 1. Distribution of number of dissertations on emotions and Vygotsky by year

without elaboration. The second subcategory included citations in which L.S. Vygotsky is briefly mentioned in connection with the zone of nearest development or the role of cultural tools (scaffolding). An example of the citation defining assignment to such subcategory is “L.S. Vygotsky (1962) also argues that the self-concept of a child emerges through interaction with others. [25]. The works with extended and analytical citations were arranged into a separate subcategory of methodological continuation and considered accordingly.

In a random subsample (alphabetically) of dissertations (n=50), the paradigm of the main study was coded into large categories: 1) correlational research with quantitative measurement, including testing or interviews; 2) experimental and quasi-experimental designs; 3) qualitative research, including ethnographic and anthropological methods; and 4) the “other” category, which included cross-cultural comparisons, action research, and theoretical research.

All types of coding were done by a single coder. In addition, the same database was analyzed using Vos Viewer, a program designed for bibliographic analysis.

Results

Topics of papers. The topics of works displayed by the system Proquest Dissertations & Theses are present-

ed in Table 1. Based on the 22 thematic fields, dissertations were classified by two-stage clustering into two groups. Their size turned out to be almost equal, of 88 and 89 papers (silhouette measure = 0.3).

Thus, there are two groups of research on emotions using the works of L.S. Vygotsky, which can be designated as psychological and pedagogical. It is interesting that studies in the fields of social psychology, cognitive psychology, family studies and communication studies turn out to be integrative. They are represented comparably among both pedagogical and psychological studies of emotions. Clusters do not differ by year ($F=0.90$; $p=.764$) in pedagogical studies ($M=2011.99$; $sd=5.098$) and psychological studies ($M=2010.69$; $sd=5.087$).

Automatic processing of the same base by means of Vos Viewer resulted in not two, but three clusters (Fig. 2.). “Education” and “Psychology” were supplemented by the cluster “Social Sciences” and separate groups like “Language” “Early childhood education,” etc. The main divergence in the analysis is that the clustering method in Vos Viewer is supplemented by MM-algorithm, and it uses a different list of keywords from the metadata of articles.

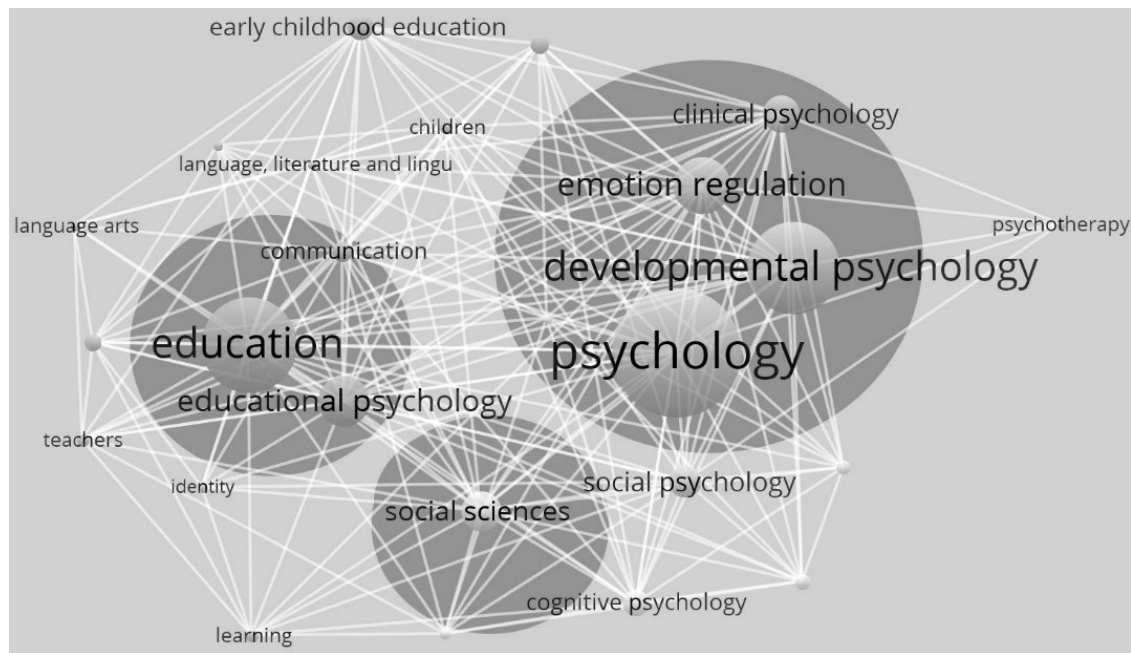
Research paradigm and sources. Of the 50 works selected for additional coding, 24 are based on quantitative measurements, 5 are experimental, and 13 are qualitative. The rest use other paradigms: 3 cross-cultural comparisons, 2 historical-theoretical papers, and 1 each

Table 1

Dissertations topics and cluster distribution (n=177)

Subject terms*		Cluster		H_0 : clusters are equally probable	
Subject	n	Psychology, %	Education, %	Chi sq, df=1	p-value 2-side
Developmental psychology	61	74.1	25.9	19.64	p <.001
Educational psychology	37	-	100	42.56	p <.001
Clinical psychology	25	88	12	16.56	p <.001
Social psychology	20	65	35	1.95	.162
Early childhood education	18	-	100	15.37	p <.001
Cognitive psychology	17	62.5	37.2	1.05	.305
Teacher education	17	-	100	17.79	p <.001
Psychology	11	88.9	11.1	5.65	.017
Education	10	-	100	169.17	p <.001
Personality psychology	10	100	-	9.34	.002
Individual & family studies	9	75	25	2.05	.152
Language & arts	8	-	100	21.53	p <.001
Behavioral psychology	7	83.3	16.7	2.71	.099
Communication	7	66.7	33.3	.67	.414
Elementary education	7	0	100	5.20	.023
Organizational behavior	7	57.1	42.9	.14	.711
Psychotherapy	7	100	-	7.21	.007
Curriculum development	7	-	100	7.37	.007
Higher education	6	-	100	6.28	.012
Neurosciences	6	80	20	1.82	.178
Rhetoric	6	80	20	1.82	.178
Special education	6	-	100	4.14	.042

* based on *subjectTerms* category in the database



Pic. 2. Coherence of thematic fields of dissertations in the area of emotion studies, that mention L. S. Vygotsky. Three thematic clusters established by Vox Viewer processing

research-in-action (formative research) and secondary quantitative data analysis. These distributions showed no significant relationships with year of work (F from .315 to .405). Quantitative dimensions as a paradigm predominated in the psychological dissertation cluster compared to the pedagogical cluster at the trend level ($\chi^2= 3.82$; $p=.051$) and qualitative/ethnographic dimensions predominated in the pedagogical cluster ($\chi^2= 5.03$; $p=.025$).

The analysis of dissertation source lists revealed that half of all dissertations refer to some edition of *Mind in Society* [37] a quarter rely on the English editions of *Thinking and Speaking* [38; 39], and another 16% of dissertations contain no direct references to L.S. Vygotsky, which means that his ideas are presented in them on the basis of secondary sources [15; 32; 41]. Only three papers [24; 33; 42] cited the English translation of the text “Emotions and their development in childhood” in two different editions [35; 36]. The references have no connection to the thesis year and thematic cluster.

In a large part of the works, emotions, although considered, are not the main subject. The context of references to L.S. Vygotsky’s works was specifically examined across the entire database of theses and dissertations. Three types of citations of L.S. Vygotsky on this basis can be distinguished. First, it is the use of reference to indicate the sociocultural approach in general; in this case, Vygotsky is often mentioned together with other authors, such as A. Bandura [e.g.: 17]. Secondly, it is the citation of a specific idea, most often about development or speech: the zone of closest development, mediation, and interiorization [e.g.: 13]. Third, dissertations where L.S. Vygotsky’s ideas are used to construct a hypothesis or argument about emotion. One— early — dissertation is devoted to the theoretical understanding of L.S. Vy-

gotsky’s legacy in understanding personality and emotion [26]. In several papers, the authors use the idea of mediating to the development of socioemotional concepts, such as children’s understanding of the concept of apologetics [34]. One dissertation reveals the idea of experience [19]. Others in one way or another use the approach of L.S. Vygotsky to analyze the development of emotional regulation, considering the connection of emotional experience and language [29; 43].

Discussion

The method of coding the content of dissertations used in the present article has two serious limitations. First, the coding for this work was done by only one researcher, which means that the threat of bias in this evaluation has not been assessed. Second, a search by name was used to determine the context of the use of L.S. Vygotsky’s legacy. This means that works written in the framework of the cultural-historical approach and studying emotion might not fall into the appropriate category if they drew on the developments of later followers. In our sample, for example, there are works that mention L.S. Vygotsky and use only references to abstract works or those that postulate their connection to the theory [15; 21; 32; 40; 41].

In the 2000–2020 dissertation sample, there is no reversal of interest in L.S. Vygotsky’s legacy over the years, although some upsurge took place in the noughties and was expressed by the peak of publications in 2009. This differs from the dynamics of mentioning L.S. Vygotsky in the general array of academic articles, where, according to colleagues [9], there is a slow growth with a peak

rather around 2015-2017. This may be due to thematic specificity, as the presented analysis is focused only on works on emotion, and not on all academic materials. We can surmise that the preparation of the English-language dissertations on emotion is not oriented to the general context of publications in the field of cultural-historical psychology. Perhaps, due to the manifested perception of L.S. Vygotsky predominantly as the author of socio-cultural theory in psychology and pedagogy, there is no close connection in them specifically with the development of cultural-historical methodology.

The data obtained about citations of L.S. Vygotsky's works correspond to the observation of M. Dafermos [6] and N. Veresov [3], who also noted that the predominant references are translations of "Thinking and Speech" and "Mind in Society".

A study by A. A. Shvedovskaya and N. V. Meshkova [11] allows us to compare the topics of works in the field of emotions in dissertations and in the journal of cultural-historical orientation. It showed that out of 316 empirical articles published in the journal "Cultural-Historical Psychology" from 2006 to 2016, 11% can be grouped into the block "Personality, Motivation, Emotion." In this block the themes of fears, the participation of bodily sensations in the understanding of emotions, sense-making, and self-regulation stand out [11]. These themes form a generally unified field with those to which the theses in the analysis presented here are devoted. However, there are possible stylistic differences: for example, in the English-language dissertations the role of language is problematized rather than the participation of bodily sensations in emotional processes, whereas in the Russian-language works the trend is reversed. Also, the Russian-language journal contains 13 publications on experience, which was analyzed only twice in the English-language dissertations (once specifically [19] and once in a paper devoted to the contribution of L.S. Vygotsky [26]). Some materials of Beth Verholt's dissertation on experience were subsequently published in

a special issue of the journal "Mind, Culture, and Activity" [20], including in a polemical way. This is a reminder that dissertations not only mark interest in L.S. Vygotsky, but are themselves factors in the development of the cultural-historical psychology of emotions.

Conclusions

Dissertations on emotions, in which the authors use L.S. Vygotsky's ideas, form two equal blocks: psychological research, mainly on development, and pedagogical research on education and its participants. In the majority of works L.S. Vygotsky is presented as the author of the sociocultural approach and such concepts as "zone of the proximal development", "mediation", etc.; and in them there is no direct connection with emotions as a subject of research. Only two dissertations [26; 19] work with the concept of "experience".

Half of all the theses refers to some edition of "Mind in Society", a quarter refers to the English editions of "Thinking and Speech", and another 16% of theses make no direct references to L.S. Vygotsky. The scientist's work on emotion is relatively underrepresented in English and has yet to find its way to researchers.

In absolute numbers, the number of works based on L.S. Vygotsky's methodology in developing the psychology of emotions is small. Among the dissertations on emotions there is a number where the authors make creative attempts to apply the ideas of mediation, developmental zones, development of concepts to emotions at different stages of childhood, to the cultural specificity of emotional language and experience, and to the emotional side of speech.

It is possible to trace in dissertations both the indirect influence of L.S. Vygotsky's legacy on psychology of emotions, testifying to graduate students' familiarity with the cultural-historical approach, and the direct one, through the development of relevant ideas.

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ПАМЯТНЫЕ ДАТЫ
MEMORY DATES

Как делается деятель. Юбилейное интервью с Н.Н. Нечаевым Часть 1. «Психология и жизнь»

В статье излагается авторский взгляд на свой путь в психологии в рамках научно-исследовательской, педагогической, организационной и других практических сфер ее развития. Автор демонстрирует это на примере собственной биографии, тесно связанной с начальным периодом становления факультета психологии МГУ в середине 60-х годов XX века, а также с последующей активной деятельностью в различных областях психологической науки и практики. Подчеркивается роль научной школы, в качестве представителей которой и одновременно преподавателей выступали такие выдающиеся психологи, как П.Я. Гальперин, А.В. Запорожец, Б.М. Зейгарник, А.Н. Леонтьев, Д.Б. Эльконин и др. Однако особое место отводится роли П.Я. Гальперина, которого автор рассматривает как Учителя в науке и в жизни.

Статья состоит из двух частей. Публикуемая здесь первая часть раскрывает эпизоды биографии автора, включающие краткое упоминание о своих семейных корнях, восходящих к деятелям церкви — известным теологам, проповедникам и педагогам, связанным, в том числе, и с Московским университетом, а также рассказ о судьбе матери, репрессированной в сталинский период.

Определенное внимание уделено студенческим годам, где наряду с описанием эпизодов «психологической жизни», интересных в контексте места и времени, демонстрируется роль активной жизненной позиции автора в выборе своего научного пути и аспирантуры как важнейшего этапа в становлении собственной научной школы.

Рассматриваются также этапы дальнейшей профессиональной научно-педагогической деятельности как специалиста-психолога в системе повышения квалификации преподавателей ряда ведущих вузов Москвы, в том числе на ФПК МГУ. К ним относится также Московский архитектурный институт, работа в котором позволила подготовить и защитить докторскую диссертацию по проблемам проектного моделирования и творчества в архитектурном образовании. Кратко раскрывается организаторская деятельность автора в управлении системой образования СССР и научными исследованиями и разработками в системе Российской Академии образования.

Интервью проведено в рамках проекта «Психолог-и-Я. Живые истории» Московского государственного психолого-педагогического университета (ФБОУ ВО МГППУ). Автор идеи и ведущий проекта — В.Т. Кудрявцев (далее — ВК). Встреча состоялась 4 февраля 2021 года¹.

Ключевые слова: научная школа, теория поэтапного формирования, научно-педагогическая деятельность, система повышения квалификации преподавателей, научно-организаторская деятельность.

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¹ Видео-запись встречи по адресу: <https://www.youtube.com/watch?t=46&fbclid=IwAR2QFHhZeHfkHWccYC-NKXqKUEfHnvzq69D23cOuMaohZYH0usby6EVkxA&v=iaRfcXCCRM0&feature=youtu.be>

How is the Actor Made. The Anniversary Interview with N.N. Nechaev. Part 1, Psychology and Life

The article represents the author's view of his way in psychology including science research, university lecturing, organizational and other professional lines of its development. It is demonstrated through some fragments of the author's biography closely connected with the initial period of the Department of Psychology of the Moscow State Lomonosov University (MSU) that was established in the middle of sixties of the last century and also — with some facts of the author's following activity in the fields of psychological science and practice.

The role of the school of thought is underlined since the author was lucky to meet such outstanding psychologists as P.Ya. Galperin, A.V. Zaporozhets, B.W. Zeygarnic, A.N. Leontiev, D.B. Elconin etc. as his teachers. However the special role of P.Ya. Galperin as a Teacher in science and life for the author is underlined.

The article consists of two parts. The first part published here uncovers some episodes of the author's biography where some of his family roots are described. Several outstanding church figures, theologians, preachers and teachers among them, are meant, some of them appeared to be connected with the MSU. There is also the story of the mother's fate who was repressed at Stalin's period.

Certain attention is paid to the the author's life as a university student. Beside some episodes of "psychological life" that may be interesting within the context of time and place there are some fragments that demonstrate the author's active position at the choice of his scientific path. The post-graduate stage where the author was forming his own "school of thought" is also described.

Then there are periods of the further research and teaching activity as a professional psychologist working at the level of post-graduate and continuing education at the leading Moscow universities, including MSU. The Moscow Architectural Institute is also one of them. It is as the institution where the author's doctoral theses on the problems of project simulation and creativity in the architectural education were prepared and defended.

Another working period connected with organisational activity at the high levels of managing of the educational system of the USSR and the at the Russian Academy of Education are also briefly described.

The article is made in the form of interview with the author conducted within the frames of the project "Psychologist-and-I". Live stories" of the Moscow State University of Psychology and Education (MSUPE). The author and leader of the project: V.T. Kudriavtsev. The meeting took place on the 4-th of February 2021.

Keywords: school of thought, theory of step-by- step formation, scientific and educational activity, the system of the university teachers continuing education, scientific and educational management.

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В.К. Проект называется так, не потому что он посвящен тем, кто исторически дожил до сегодняшнего дня; он посвящен тем, кто делает сегодняшнюю, живую психологию. И современную историю психологии. У нас уже было несколько выпусков, но особенность нынешнего в том, что он выходит «вживую».

Сегодняшняя история называется «Как делается деятель» — это строчка из стихотворения Вячеслава Иванова, и более широко она звучит так: «Свершается свершитель и делается деятель». Итак, сегодняшняя история посвящена 75-летнему юбилею академика РАО Николая Николаевича Нечаева. При этом я считаю, что сегодняшний юбилей намного больше, чем отдельно взятый юбилей.

Н.Н. Круглые даты настигают нас, когда мы совсем этого не хотим. Кажется, что мне лет 60–65, а по самооощущению — не больше 35, и я еще готов вер-

шить какие-то судьбы, а порой, на лекциях позволяю себе какие-то вещи, которые студенты от профессора не ожидают. Я же еще живой.

Я не верю в приметы, не верю в высшие силы, но за мной — определенная семейная традиция: мой прадед Григорий Михайлович Дьяченко был священнослужителем высокого ранга в Московской епархии — протоиереем и настоятелем храма св. мученика Трифона в Напрудном переулке (в наст. вр. — Трифоновская улица). В конце XIX века. это была самая большая церковь Москвы, так как вмещала более 3 000 прихожан, но, к сожалению, снесенная в 1934 году. Прадед был известным российским теологом, его труды до сих пор переиздаются РПЦ. Основной труд его научной деятельности на богословском поприще — «Полный церковно-славянский словарь», который до сих пор цитируется во многих современных работах.

Его сын — мой дед — Владимир Григорьевич Дьяченко был ректором тверской семинарии и, имея государственный чин надворного советника, преподавал в ней не только богословские дисциплины, но и психологию, и логику. А совсем недавно я узнал, что эта традиция церковного служения — еще более старинная: с конца XVIII века мои предки по линии моей мамы были известными в среде российского духовенства проповедниками и преподавателями богословских дисциплин. Так, мой прапрадед протоиерей Петр Алексеевич Смирнов, дочь которого Екатерина Петровна Смирнова стала женой прадеда — Григория Михайловича Дьяченко, в период с 1886 по 1893 год был настоятелем Исаакиевского кафедрального собора, а с 1894 по 1904 год. — председателем Учебного комитета Святейшего Синода РПЦ, управлявшего всей системой духовного образования России: от церковно-приходских школ до духовных академий. Он был женат на Екатерине Петровне Терновской, которая была дочерью протоиерея Петра Матвеевича Терновского, который, что для меня стало полной неожиданностью, был первым настоятелем храма св. Татианы, созданного в Московском императорском университете в 1837 году, доктором богословия и вплоть до 1856 года — заслуженным профессором в Московском университете. А когда Указом Николая I в университете было запрещено светское преподавание философии, то он стал читать не только философию, но и... опытную психологию. Краткая заметка о его деятельности в качестве психолога содержится на сайте факультета психологии МГУ в разделе «Психологи Московского университета». Так что получается, что я, скорее всего, совсем неслучайно тоже стал психологом.

Моя мама, Екатерина Владимировна Нечаева (в девичестве — Дьяченко), очень рано вышла замуж за Сергея Спиридоновича Нечаева, коммуниста с дореволюционным партийным стажем, одного из первых награжденных орденом Ленина за достижения в партийной работе, но арестованного в июне 1937 года и расстрелянного в июле того же года. Мама моя — как член семьи изменника Родины — была осуждена на 10 лет и вышла на свободу лишь в июле 1946 года по амнистии — как имеющая шестимесячного ребенка, которым был я, родившись 28 января 1946 года. Скорее всего, своим появлением я обязан не только маме и неизвестному мне отцу, но и Указу Сталина, который был опубликован в конце 1944 года и в котором санкционировалась амнистия беременных женщин, кормящих матерей и/или имеющих детей до трех лет, находящихся в местах лишения свободы. И лишь в 1956 году моя мама и ее муж — С.С. Нечаев (посмертно) — были полностью реабилитированы.

В.К. Мой первый вопрос обращен к твоему детству: оно проходило в г. Твери (тогда Калинин). Есть ли у тебя какое-то определенное яркое воспоминание, которое ты хранишь не как просто Н.Н. Нечаев, а как профессор, академик, исследователь?

Н.Н. Пожалуй, такого особенного воспоминания нет, хотя мысленно и в снах я часто возвращаюсь к детству.

Думаю, мы с мамой оказались в Калинин (Твери), потому что после смерти деда В.Г. Дьяченко, ректора тверской семинарии, скончавшегося от испанки в 1919 году, его жена — моя бабушка осталась в этом городе, и моя мама после освобождения из лагеря в июле вернулась, естественно, в этот город, где она жила до 1921 года. Кстати, именно там в 1947 году мне была оформлена метрика, согласно которой я родился в г. Калинин.

Мы жили втроем: мама, бабушка и я, в коммунальной квартире на три семьи. Часть нашей 12-метровой комнаты занимала печка, на которой, когда ее топили в холодное время года, мы даже готовили, чтобы экономить керосин. С нами всегда жили кошки, так как квартира была на первом этаже и ночью появлялись крысы, прибежавшие, очевидно, из подвалов центрального гастронома, граничившего с нашим домом. Через дорогу от дома находился городской сад, который тянулся вдоль набережной Волги.

Благодаря маме, в доме всегда были журналы: «Знание — сила», «Наука и жизнь», «Техника молодежи», еженедельник «За рубежом» и т. п. Помню, что по просьбе гостей, которые приходили к нам, я без запинки называл столицы не только союзных республик, но и разных стран мира. Наверное, это связано с тем, что до своего ареста в 1937 году мама работала в Самаре учительницей географии.

Не очень хорошо помню свою начальную школу, но очень хорошо — Ольгу Львовну Жердёву, классного руководителя в средней школе. Сама школа № 6, в которой я учился, размещалась в здании, в котором до революции 1917 года было первое реальное училище г. Твери, наверное, теперь это памятник архитектуры.

В.К. Когда ты последний раз был в Твери?

Н.Н. В 1993 году я был там в качестве приглашенного члена диссертационного Совета на разовой защите. Согласился потому, что захотел вернуться «в детские годы». Удалось посмотреть и сфотографировать все знакомые с детства места — дом, школу, место своей первой работы и т. п.

В 7-м классе осенью я заболел туберкулезом и лечился почти 6 месяцев, из-за чего остался на второй год. Но выкарабкался и вернулся в 7-й класс школы, правда, уже другой: маме выделили небольшую двухкомнатную квартиру, в которую мы переехали из коммуналки. В этой школе я окончил 7-й и 8-й классы и как-то сильно повзрослел. Уже тогда у меня были мысли о философском факультете, что, наверное, странно для мальчика 16 лет. В это время произошла школьная реформа, и в дневных школах вместо прежних 10 лет была введена 11-летка — одиннадцатилетнее среднее образование. Я задумался о том, что мне придется учиться не два, а три года. Именно поэтому я решил перейти в «вечерку» и поступить на работу, чтобы заработать двухлетний

стаж, как минимально необходимый для поступления на философский факультет МГУ.

Работа была специфическая: благодаря маминому знакомству с ведущей актрисой Калининского драматического театра заслуженной артисткой РСФСР Антониной Михайловной Вольской, меня приняли учеником электрика в Театр юного зрителя. Я был ручкастый, быстро соображал и не задержался в учениках. Но через четыре месяца перешел в Калининский драматический театр уже в качестве электрика-осветителя. Была и другая причина моего перехода: мне, как самому молодому, не нравилось бегать за водкой для старших товарищей по электроцеху ТЮЗа.

В этом театре я успешно проработал электриком-осветителем еще 1,5 года — вплоть до зачисления в студенты МГУ. Работа в театре — отдельная история — с разными внутритеатральными событиями, гастролями по стране и даже некоторыми попытками попробовать себя на актерской стезе в процессе окончательного самоопределения — в виде участия в массовых сценах некоторых спектаклей, что, правда, ничем не закончилось, но дало немало для понимания внутренней жизни театральной среды. К тому же навыки электрика очень дажегодились в жизни.

Итак, два года я совмещал работу и учебу в ШПРМ (Школе рабочей молодежи). Удачей для меня было то, что в этой вечерней школе рабочей молодежи также была двухсменка, и я учился днем, а работал вечером.

Школу я закончил с серебряной медалью и укрепился в желании поступить на философский факультет Московского университета, для чего летом 1964 года приехал в Москву. К сожалению, именно в этом году правила поступления в вузы изменились таким образом, что наличие медалей у абитуриентов не давало им никаких преимуществ. Таким образом, я поступал на общих основаниях с остальными абитуриентами — обладателями рабочего стажа или опытом службы в армии: их наличие было необходимым требованием для поступающих именно на философский факультет. Считалось, что основой теоретических штудий в области философии должно быть знание жизни и трудовая закалка. Я был принят, оказавшись, правда, самым младшим на курсе.

Однако мое первое впечатление об университете, мой пиетет перед университетскими профессорами оказались смазанными чуть ли не с 1 сентября. Актовую лекцию студентам-первокурсникам читал академик Митин, тогдашнее «светило» философской мысли образца 1964 года. О его, мягко сказать, непорядочности по отношению к коллегам в тридцатые и пятидесятые годы многие из нас узнали значительно позже. Тогда же, на лекции, перед нами был довольно пожилой человек, который в процессе лекции перепутал меловую тряпку со своим носовым платком: платком он вытирал доску, а тряпкой — запотевший лоб. Внешне это выглядело довольно странно, не говоря уже о содержании лекции, касавшейся основного вопроса философии: утверждалось что «... материя первична, а сознание вторично». Многие первокурсники ждали чего-то большего, чем это банальное ут-

верждение, и начали задаваться вопросом, куда ли они пришли.

Но в эту же первую неделю сентября нам начал читать лекции по психологии седой худощавый профессор невысокого роста, ухоженный, с негромким голосом. Это был П.Я. Гальперин, который, как мы узнали позднее, многие годы читал курс общей психологии для студентов-первокурсников философского факультета.

Слух о том, что эти лекции будут очень интересными, привел к тому, что к началу этой лекции мест в знаменитой 51-й аудитории уже не было. Вслед за П.Я. Гальпериным вошли несколько женщин со своими стульями и сели в проходе. Как я узнал потом, это были сотрудницы психологического отделения нашего факультета, которые тогда входили в группу П.Я. Гальперина: Н.Г. Салмина, В.П. Сохина, А.Н. Ждан, Х.М. Тепленькая и Л.Ф. Обухова, к сожалению, недавно ушедшая из жизни.

Из преподавателей на первом курсе мне запомнился профессор Е.К. Войшвилло, который читал годичный курс по математической логике, очень строгий, и все его боялись. Но были и такие преподаватели, как доцент А.А. Старченко, который вел семинары по обычной — формальной — логике. Он был инвалидом войны и у него вместо правой руки был протез, который он, чтобы было незаметно отсутствие руки, поддерживал другой рукой. Он был очень доброжелательным человеком, мы даже подружились в том смысле, что он выделял и отличал меня, несмотря на то, что я часто «хулиганил» на семинарах, попросту срывал их по просьбе товарищей, не готовых к семинару. Я задавал казуистические вопросы, типа: а что имел в виду К. Маркс, говоря о том-то? Преподаватель, заботясь о реноме классика, вынужден был разъяснять, завязывалась незапланированная дискуссия, а семинар благополучно катился «под гору».

Я-то всегда был готов, хотя не писал конспектов. Мне их для подготовки предлагали равнодушные ко мне девушки — студентки нашего курса. А на выходные я ездил домой в Калинин и по дороге просматривал эти конспекты. Благодаря хорошей памяти этого было достаточно, а дома мама переписывала их своим почерком. Это было необходимо, потому что, например, преподаватель политэкономии всегда проверяла наличие конспектов, свидетельствующих о самостоятельной работе студентов с первоисточниками.

Однако на первом курсе именно Петр Яковлевич с первых лекций произвел на меня самое сильное впечатление не только своими идеями о важности методологических основ определения предмета психологии, ведущей роли обучения в психологическом развитии человека. Хорошо помню, как он принял экзамен по своему курсу. С самого начала он предложил поднять руки тем, кто уверен, что он знает курс на «5». Несколько человек, в том числе и я, подняли руки, и он поставил в зачетки оценку «отлично». Остальным Петр Яковлевич предложил поставить «хорошо» и попросил вышеупомянутых сотрудниц

психологического отделения, входивших в его группу, помочь с зачетками. Вот так получилось: я серьезно готовился к экзамену по этому курсу, но сдавать его не пришлось.

Мы все обожали Петра Яковлевича и вовсе не за его мягкость на экзаменах. Скажу, забегая вперед, что его курс общей психологии для философского факультета я в общей сложности прослушал 7 или 8 раз, будучи уже его студентом, а затем аспирантом психологического факультета — тогда я и стал активным помощником Петра Яковлевича.

Однако в то время на философском факультете после успешной сдачи весенней сессии каких-то особых интересов к психологии, связанных с идеями Гальперина, у меня не появилось. В целом, моя позиция в качестве студента состояла в том, что толстые книги, которые нам советовали читать, уже прочитаны другими людьми, которые, пройдя по материалу, написали краткие пособия. И я готовился к экзаменам и зачетам, читая такие пособия, — это позволяло легко сдавать экзамены.

Уже с первой сессии я стал отличником, но тогда начались размышления иного толка. Они имели отношение к содержанию, которое я осваивал, учась на отделении научного коммунизма философского факультета. Постепенно складывалось ощущение, что я попал «во мрак».

И вдруг я узнал, что некоторые наши студенты думают переходить на психологическое отделение философского факультета. Идея показалась мне замечательной, и после успешной сдачи 3-й сессии на своем отделении я принял такое же решение.

Нас, решившихся на такой переход, было трое: помимо меня — Саша Никишенков, к сожалению, умерший еще в те университетские годы, и Андрей Вербицкий, всем нам хорошо известный педагог и психолог, академик РАО Андрей Александрович Вербицкий, которого мы, к величайшему сожалению, тоже недавно потеряли. Он скончался от ковида в декабре 2020 г., не дожив двух месяцев до своего 80-летия.

Алексей Николаевич Леонтьев, декан психологического отделения, посмотрев наши зачетки, согласился на наш переход на 2-й семестр II курса с условием сдачи всех экзаменов и зачетов всех трех прошедших сессий психологического отделения — а их было не меньше шестнадцати. Для ликвидации этой задолженности нам был дан срок три месяца.

Вначале задача казалась почти неподъемной, но, слушая лекции по общей психологии, которые на моем 2-м курсе читал А.Р. Лурия, и одновременно читая учебную литературу для сдачи экзаменов по другим курсам, я осознал, что содержание ряда дисциплин частично пересекается: по большому счету речь идет об одном и то же. Исходной точкой послужил курс «Введение в психологию»: я вдруг увидел параллели и с курсами «Основы биологии», «Анатомия ЦНС», «Физиология человека», «Антропология» и с некоторыми другими.

Помню, что замечательный ученый-антрополог проф. М.Ф. Нестурх, который вел у психологов со-

ответствующий курс, прямо-таки удивился «обширности» моих знаний: я отвечал, используя то, что освоил, конечно, «по верхам», в рамках подготовки к экзаменам по другим дисциплинам биологического и психологического цикла. У меня до сих пор хранится его книга с надписью, начинающейся словами: «С удовольствием даю свой автограф энергичному молодому человеку, интересующемуся биологией...». Естественно, моя оценка была «отлично», в то время как у этого добрейшего профессора, который, согласно факультетской легенде, всем девушкам-студенткам ставил «отлично», да еще при этом целовал руки, мой товарищ Андрей Вербицкий получил тройку и очень из-за этого переживал.

А дело было так: Андрей, отвечая на вопрос почему доисторические приматы перешли к прямохождению, сказал что-то вроде: «обезьяне надоело скакать по деревьям». Это вызвало у Нестурха глубочайшее возмущение. «Она страдала!», — воскликнул он и вlepил Андрею тройку.

В целом, эта история со сдачей образовавшейся академической задолженности из-за расхождения учебных планов оказалась очень поучительной для становления меня как психолога: я узнал и почувствовал, что значит системность знаний. К сожалению, в высшей школе мы до сих пор изучаем учебные курсы как бы линейно, друг за другом, не сопоставляя содержание одних дисциплин с другими. Нужен иной ход, направленный на комплексное освещение проблем. В этой связи можно вспомнить идеи Г.П. Щедровицкого о различии между предметно ориентированным и проблемно ориентированным знанием. В вузе, на мой взгляд, акцент должен быть сделан на проблемно ориентированное знание — так, по крайней мере, кажется мне как человеку, который в свое время серьезно занимался психологической проблематикой целей и содержания высшего образования.

Кстати, позднее я использовал этот стихийно сложившийся подход к системной организации учебного материала в своей кандидатской диссертации, показав, что освоение того или иного понятия всегда должно строиться как освоение системы понятий, в которой это понятие выступает элементом.

Мне относительно недавно даже удалось продемонстрировать эту идею руководству Московского университета — моей альма матер, откуда я по разным причинам несколько раз уходил и куда несколько раз возвращался. Последний раз это случилось в 2016 году: деканом психологического факультета Ю.П. Зинченко я был приглашен на должность его заместителя и заведующего кафедрой психологии языка и методики его преподавания и уже в этом качестве участвовал в совещании, проводимом ректором университета В.А. Садовничим. Выступая на этом совещании, я для иллюстрации тезиса о негативном влиянии сложившихся стереотипов мышления на творческое решение задач попросил присутствующих нарисовать параллелограмм. Как я и ожидал, почти все присутствующие нарисовали ко-соугольный параллелограмм, который в порядке ди-

дактического материала используют для объяснения его свойств. А ведь параллелограммом может быть и ромб, и прямоугольник и квадрат. Надо отметить, что В.А. Садовничий, который вел это совещание, нарисовал квадрат, о чем он радостно сообщил участникам, и это, конечно, неудивительно, ведь он, как известно, является академиком в области математики. Однако всем остальным привычнее показался «классический» косоугольный параллелограмм — какой им в школе рисовала «Марьиванна», потому что это было удобно для объяснения способа определения его площади. К сожалению, со школьных времен мы все приучены к частным представлениям, отсутствию системности осваиваемых в школе понятий.

В связи с этим, возможно, представляет интерес мой опыт подготовки к сдаче экзаменов в студенческие годы, где я использовал материал программ учебных дисциплин. Я выстроил свою систему работы с программами как со своего рода обобщающим материалом, который дополнял теми подробностями, которые мне казались важными. Не знаю, можно ли считать это подготовкой шпаргалок. Я не брал дополненные мною таким образом программы на экзамен. Но если какой-то вопрос билета был для меня не совсем ясен, я просил у экзаменатора программу, которая, как известно, должна предоставляться студенту по его просьбе. Мне было достаточно просмотреть программу — и те важные дополнения, которые я делал заранее, всплывали в памяти. По сути, эти мои «шпаргалки» — это был способ углубления и расширения материала. При этом я, как правило, шел отвечать первым. А так как в моей зачетке были сплошь отличные оценки, то экзаменатор понимал, что перед ним «явление природы» — это было нужным фоном для того, чтобы вновь получить «отлично».

Итак, весной 1966 года я стал полноправным студентом психологического отделения философского факультета, а осенью 1966 года отделение уже стало самостоятельным факультетом Московского университета, который окончили многие достойные и известные люди.

В.К. Помимо людей, разговоров и встреч в этом времени жизни каждого, наверное, есть какая-то важная книга, которая определяет многое в дальнейшем. Была ли в твоей жизни такая книга: психологическая, философская, гуманитарная?

Н.Н. Отвечу на это очень хитро. Я жил в общежитии на Ломоносовском проспекте, и в мою бытность на философском факультете книги мы читали только в библиотеке факультета и по необходимости, для подготовки к семинарским занятиям и сдаче сессий. Самое сильное впечатление на 1-м курсе на меня произвел конспект лекций П.Я. Гальперина, сделанный одним моим товарищем, который я прочел, готовясь к экзамену по психологии на философском факультете. Многие не всё понимали, а я всегда был готов разьяснять то, что понял сам.

Библиофилом я стал уже на 3-м курсе психологического факультета. Это относится к книгам по

психологии и философии, в том числе редчайшим дореволюционным изданиям, которые я собирал, систематически обходя известные букинистические магазины в центре Москвы. Многие из этих книг со мной до сих пор.

В.К. Известно, что ты был организатором легендарной летней психологической школы — замечательной практики, которую затем позаимствовали другие вузы. Но эта была первой и, очевидно, самой замечательной. Расскажи, как это все было организовано?

Н.Н. Начну с того, что я быстро прижился на факультете, позади остались многочисленные экзамены, я был отличником и очень активным студентом. Меня «заметил» декан факультета А.Н. Леонтьев. В октябре 1966 года, будучи студентом третьего курса, я был избран секретарем комитета комсомола факультета. Со мною в комитете работал Андрей Подольский, мой товарищ с тех времен, учившийся на курс младше меня, тоже ставший учеником П.Я. Гальперина. Сейчас это профессор Андрей Ильич Подольский. Одновременно я активно участвовал в работе Научного студенческого общества (НСО). Интересно, что во многих вузах эта общественная организация студентов называется СНО — Студенческое научное общество. У нас же, кажется, с подачи А.Н. Леонтьева это было НСО — Научное студенческое общество: название с акцентом на слове «научное». Его куратором в годы моего студенчества была Любовь Семеновна Цветкова, тогда доцент, а потом профессор, известный специалист по нейропсихологии речи и восстановительному обучению.

На одном из заседаний она рассказала о предложении декана собрать летнюю психологическую школу. Идея была отличная, и мы организовали отбор среди студентов 1—4-х курсов, желающих принять участие: ребята должны были получить рекомендации от преподавателей, а также написать небольшие сочинения на интересующую их научную тему. Таким образом, была отобрана группа в 15 человек, и вместе с двумя преподавателями и куратором НСО мы в конце августа отправились в поселок Джемете, недалеко от Анапы, где была расположена одна из летних баз университета. Причем по нашей задумке мы сами пригласили тех преподавателей, с которыми хотели бы общаться во время этой необычной научной практики. Одним из них был Алексей Николаевич Леонтьев, скорее не как декан, а как автор идеи организации такой школы, а вторым приглашенным профессором был Петр Яковлевич Гальперин.

Надо заметить, что он очень поздно, лишь в 1965 году получил ученую степень доктора психологии, причем он защищал не диссертацию, а обзорный реферат своих работ и докторскую степень ему присудили по совокупности работ. Но к нам в Джемете он приехал уже профессором.

Жизнь в лагере Джемете в бытовом плане была простая и неприхотливая: мы жили в палатках, загорали и купались, но не забывали и о том, зачем при-

ехали — дважды в день проходили «сессии»: встречи, беседы, обсуждение ключевых проблем психологии. Вновь услышав идеи Петра Яковлевича, я осознал, что хорошо их помню с 1-го курса философского факультета, и я с удовольствием разъяснял другим то, что было непонятно большинству участников школы. Они, студенты 2—4-го курсов, не слышали прежде Гальперина, который на психологическом отделении в то время читал лишь историю психологии на 4-м курсе. Петр Яковлевич меня в этом поддерживал. Вот тогда произошло наше личное знакомство.

Подчеркну еще раз, что до этого времени я не собирался связывать свои научные интересы с подходом Гальперина. Курсовую третьего курса я писал у А.Р. Лурии, который на втором курсе читал нам курс общей психологии. Неудивительно, что тогда я решил: заниматься нужно мозгом — и в начале 3-го курса выбрал специализацию по медицинской психологии. Александр Романович курировал всех студентов этой специализации, а моим непосредственным руководителем была Н.К. Корсакова.

В.К. Интересно, как ты видишь стилистические различия между тремя профессорами: Леонтьевым, Лурия и Гальпериным?

Н.Н. Леонтьева как лектора я услышал лишь на 4-м курсе, он читал нам курс методологии психологии. Его ассистентом тогда был В.А. Иванников, который вел семинары. Большинство выпускников МГУ помнят его как многолетнего заместителя декана факультета психологии, грозу нерадивых студентов.

Специфическая манера Алексея Николаевича заключалась в том, что он говорил негромко, заставляя прислушиваться к себе. Свое общение со студентами он строил проблемно, хитро улыбался, красиво жестикулировал, я бы сказал, завораживал своими руками, которые, как я потом заметил, всегда были хорошо ухожены. Его манера снижать тон к концу фразы заставляла вслушиваться и строить догадки, что же было сказано.

Петр Яковлевич был другой. Его манера предполагала спокойный доброжелательный тон, были шутки, которые он произносил, прихлебывая чай — ему всегда приносили стакан чая. Читал лекции просто и при этом очень академично. Причем его манера, запомнившаяся мне с первого курса философского факультета, осталась такой же, когда на 4-м курсе он читал нам историю психологии.

Александр Романович был совсем не похож ни на Леонтьева, ни на Гальперина: ведя лекцию, он мотался по аудитории, мог присесть на стол сзади и сбоку так, что студенты вынуждены были выворачивать шею, чтобы видеть и слышать профессора. Еще для него было характерно закрывать аудиторию для опоздавших, очевидно, с воспитательной целью. Для этого он вставлял ножку стула в ручку двери — в то время дверные ручки имели форму прямоугольной скобы, куда удачно входила ножка стула. (Потом, начав собственную педагогическую деятельность, я по-

пытался делать так же, пока не узнал, что запирать аудиторию запрещено по требованиям пожарной безопасности.)

Представляется, что все это характеризует Александра Романовича как человека эмоционального и равнодушного. На мой взгляд, трагедией для А.Р. Лурии как лектора стало то, что он издал свои лекции, но продолжал излагать их материал студентам в неизменном виде по своим конспектам. Он делал это с выражением, с юмором, с яркими примерами, но ... все это уже можно было прочитать. И студенты стали меньше ходить на его лекции. Свою роль сыграло еще и то, что по настоянию декана базовые лекционные курсы для дневного и вечернего отделений должны были быть одними и теми же и поэтому читались вечером. А мало ли у студента дел вечером, если он знает, что курс лекций у него под рукой?

Я к таким студентам не относился, ведь Лурия был руководителем моей специализации и мне было важно слышать его вживую.

В целом, я считаю, что мне очень повезло: я учился у многих корифеев отечественной психологии в ее лучший период. Так, детскую психологию нам читали по очереди А.В. Запорожец и Д.Б. Эльконин, каждый — свой раздел курса. Александр Владимирович на своих лекциях всегда обращался будто бы к какому-то незнакомому человеку. Он ходил по диагонали и неторопливо рассказывал то, что считал важным. Даниил Борисович же был огонь! Своим сорванным голосом — во время войны он командовал артиллерийской батареей — он всегда очень эмоционально доносил до нас то, что важно знать о психологии ребенка. Он кричал, жестикулировал, показывал — каждая лекция была событием.

В отличие от Запорожца, который, конечно, знал меня, всегда тепло здоровался, но не более, с Даниилом Борисовичем у меня сложились почти дружеские отношения. Однажды он даже попросил меня оказать воспитательное воздействие на его сына Бориса, который тогда был первокурсником и для которого я, соответственно, был старшим товарищем. Я сделал это так, как считал нужным, и проблема была снята.

В.К. Если вести разговор по гамбургскому счету, то какой главный урок ты извлек из школы Гальперина?

Н.Н. Очень трудный вопрос. Хочется надеть котурны и подняться повыше.

Наверное, главный урок — понимание того, что до настоящего времени не решены самые главные вопросы психологии: ее предмет, методы и задачи. Стремление обострить нерешенные проблемы по многим аспектам психологии. И одновременно — научиться простоте сообщения другим того, что тебя волнует, т. е. рассматривать это сообщение как сообщение, адресованное другим, но позволяющее тебе самому понять, что тебя мучает.

Я для себя понял, что надо максимально просто рассказывать сложные вещи: добиваться такой про-

стоты и ясности, которые делают это сообщение очевидным для других — значит, это станет очевидным и тебе.

В инженерной практике есть такой прием, который называется «беседа с дураком». Если у специалиста возникает трудная проблема, он должен найти себе подобного собеседника и попытаться как можно более просто и ясно изложить эту проблему. И если собеседник поймет — то поймет и сам специалист (но, с этой точки зрения, собеседник не должен быть умнее, ведь тогда он поймет раньше).

По большому счету — это метод Гальперина. Ведь для участия в экспериментальном формировании отбирались не отличники, а совсем наоборот, плохо успевающие дети. И если у них получалось, это означало, что была выявлена полнота условий, позволявшая добиться появления заранее планируемых и необходимых психологических новообразований, обеспечивающих успешность деятельности. Это главный тезис метода П.Я. Гальперина, который я готов и дальше защищать.

В.К. В те ранние годы ты «открыл» для себя подход Гальперина, а потом на старших курсах, в аспирантуре и в дальнейшей самостоятельной работе практически применял и теоретически расширял его. К нынешнему времени, с твоей точки зрения, появились ли некоторые спорные моменты? В чем они заключаются?

Н.Н. В работах последних лет я пришел к необходимости «взорвать» аксиоматику поэтапного формирования, которая, на мой взгляд, стала застывшим скелетом, мешающим дальнейшему развитию нашего понимания ключевых проблем психологии. Если посмотреть, как в Сети представляется поэтапное формирование, то становится очень грустно: это какие-то мертвые останки от когда-то живой теории. Перечисляются шесть этапов: мотивация, ориентировка, материальное и материализованное действие, громкая социализованная речь, внешняя речь про себя, внутренняя речь. Что вам еще нужно?

Это убогая точка зрения, ложная по сути. Сам Петр Яковлевич ставил задачу по-иному. Чтобы картина закономерностей возникновения исследуемых психологических новообразований возникла, надо понять, что необходимо учесть для того, чтобы человек справился с заданием.

Помню, как однажды он меня расцеловал. Это было во время подготовки им рукописи своей основной книги «Введение в психологию», которую он писал очень долго. И это при том, что мы, активные помощники Гальперина, организовали запись его лекций на магнитофон (в то время!) и нашли машинистку, которая печатала стенограммы. Однако Петр Яковлевич все время вносил правки в текст. Однажды мы обсуждали с ним его точку зрения о том, что отдельные науки исследуют не отдельные объекты, а те его стороны, которые и составляют собственно предмет этой науки — здесь он шел вслед за Лениным и его известным примером со

стаканом, который — как объект — может исследоваться разными науками, каждая из которых может найти в нем свой предмет. А я нашел, что Ленин эту точку зрения воспринял конспектируя «Метафизику» Аристотеля. И П.Я. Гальперин был очень рад этой моей находке, так как сам В.И. Ленин излагал эту точку зрения Аристотеля в виде иллюстрации в своем выступлении в «Дискуссии о профсоюзах...», что, конечно, снижало методологическую значимость этих аргументов. И со словами «Какой же ты умница!» — он расцеловал меня.

Теперь, конечно, мне очевидно, что этот аргумент для методологического основания определения предмета науки является ошибочным: у стакана — как инструмента для питья — нет «сторон», «сторон» как интересующие человека свойства принадлежат объекту как фрагменту объективного мира, который — в зависимости от нашего способа деятельности — может выступить для нас разными предметами, и лишь в том числе и ...«стаканом».

Моим научным руководителем Петр Яковлевич стал после 4-го курса, отчасти благодаря Блюме Вульфовне Зейгарник.

Как я уже упоминал, курсовую 3-го курса я писал у Лурии, она была посвящена проблеме выявления особенностей запоминания у больных с затылочными и височными поражениями мозга. Исследование проводилось в Институте нейрохирургии имени Н.Н. Бурденко и полученные данные были даже использованы в докторской диссертации Н.К. Корсаковой, работавшей с курсовиками по поручению А.Р. Лурии. Однако уже в процессе проведения я понял, вернее, скорее почувствовал, что для меня важно не рассматривать больных как объекты исследования — в клинике надо помогать людям. Это должны быть диагностика и восстановительное обучение.

Думаю, что и здесь определенную роль сыграла научная и нравственная позиция Петра Яковлевича Гальперина, которую я усвоил из его лекций на своем первом курсе. По образованию он был врачом-психоневрологом и иногда вспоминал, как он, владея методикой гипноза, помогал больным, давая им возможность просто отдохнуть от своих проблем, погружая их в гипнотический сон. И сам при этом немного отдыхал на соседней кушетке. Живой человек.

Итак, после летней школы в Джемете, уже на 4-м курсе в качестве своего научного руководителя я выбрал Б.Ф. Зейгарник и делал курсовую работу по Курту Левину, используя материалы, которые дала мне Блюма Вульфовна. Тогда еще работы Левина у нас не были изданы, а она, как известно, была его непосредственной ученицей. Это была теоретическая работа, связанная с анализом взглядов Левина и их сопоставлением со взглядами А.Н. Леонтьева. Наверное, я как-то переусердствовал, потому что однажды она сказала: «Коля, вы слишком умны для меня. Вам надо к Петру Яковлевичу». Может, это звучит нескромно, но это были ее точные слова. Надо сказать, что она, прожившая непростою жизнь, в личном плане была одним из самых светлых людей на факультете.

На 4-м курсе под новый 1968 год Алексей Николаевич Леонтьев собрал у себя дома всех «джеметевцев» — участников летней психологической школы. Было белое сухое вино и закуски, но вина была больше, и я, что называется, немного перебрал. Там был и Петр Яковлевич, который тоже был «джеметевцем». И вот в таком несколько расслабленном состоянии я подошел к нему и поставил вопрос ребром: либо он берет меня под свое руководство, либо я ухожу с факультета. Петр Яковлевич, видя мое состояние, перенес разговор на следующий день, назначив встречу у себя дома. Когда на следующий день я пришел, он обратился ко мне с неожиданной просьбой — заменить ушедшую в творческий отпуск А.Н. Ждан в качестве преподавателя, ведущего семинары по его знаменитому курсу общей психологии для студентов философского факультета.

Я действительно был хорошо знаком с этим курсом еще на философском факультете, потом вновь актуализировал его содержание в Джемете, помогая другим участникам школы «войти» в проблематику идей Гальперина. Конечно, я был поражен, ведь я был еще студентом, но выходило, что Петр Яковлевич считал, что мне можно доверить эту «взрослую» и профессиональную задачу. И я согласился.

Так началась моя первая педагогическая работа, впрочем, не оформленная документально. Основная сложность в подготовке к ведению таких семинаров, однако, возникла не по моей вине. Из-за особенностей расписания получалось, что мои семинары шли раньше соответствующих лекций Петра Яковлевича, которые я должен был разъяснять, если у моих студентов-первокурсников возникало непонимание, и мне порой приходилось импровизировать. При этом каждый раз после семинара я приходил к Петру Яковлевичу, чтобы рассказать ему, что и как обсуждалось, получить оценку моих «теоретических» новаций с его стороны. Порой, он хвалил, а порой говорил: «Ну, ты, Коля, загнул!». Наверное, к этой ситуации подходит поговорка о том, что крылья распускают для полета тела, а хвост — для полета души. Очевидно, что мне временами очень хотелось распушить хвост перед первокурсниками философского факультета.

Но наука в контексте теперь частого еженедельного общения с Петром Яковлевичем интересовала меня все больше.

В.К. С чем тогда был связан твой уход с факультета?

Н.Н. Это сложный сюжет, и, наверное, он тоже обусловлен как моими особенностями, так и обстоятельствами следующих нескольких лет: выпускной курс, аспирантура, защита кандидатской диссертации.

Начну с того, что я — не москвич, и, практически не имея материальной поддержки, каждое лето, начиная со 2-го курса, ездил работать со стройотрядом и к осени зарабатывал существенную по тем временам сумму. Так было и по окончании 4-го курса, когда мы уехали в Подмоскowie. И вдруг мне

во время этого «летнего трудового семестра» пришло письмо от Петра Яковлевича: он написал мне о просьбе одного своего бывшего студента, который работал в Министерстве высшего и среднего специального образования СССР, найти психолога в отдел, в котором тот работал. Петр Яковлевич очень хотел, чтобы после выпуска я остался на факультете, он хотел продолжать работу со мной. Но камнем преткновения было отсутствие у меня постоянной московской прописки. Поэтому он постарался не только передать информацию, но и связать меня с человеком, предлагавшим работу.

Я вернулся в Москву. Наверное, кто-то может считать, что я «продал душу», чтобы окончательно стать москвичом: ради московской прописки я решил обменять свою небольшую квартиру, оставшуюся в Калининe, на комнату в коммуналке в Москве. Причем надо было иметь право на такой обмен: по законам того времени подходящим для меня основанием обмена мог быть только «перевод по работе» — и для этого вариант стать сотрудником союзного министерства был удачным. Был, конечно, еще один верный путь, которым пользовались молодые люди, приехавшие из провинции, — жениться на москвичке. Но это был не мой путь. Я выбрал работу и сумел получить нужную бумагу для обмена. Дело было хлопотным, потребовалась сложная схема «тройного обмена», но в конечном итоге все получилось.

Мое новое московское жилье представляло собой большую комнату в коммунальной квартире в одном из Кадашевских переулков, на втором этаже старинного купеческого дома с толстыми стенами и проваливающимся полом. Зато там уместились все мои книги, которых к 5-му курсу было уже немало.

Итак, я был принят на работу в одно из подразделений Министерства высшего образования СССР на должность старшего инженера-методиста. В целом — ситуация нетипичная для того времени, студенты дневного отделения в основном учились, а не работали.

Наше подразделение называлось «Научно-методический кабинет по высшему образованию и повышению квалификации», оно было создано для изучения возможностей совершенствования высшего образования и образования взрослых в рамках последилового обучения. Его руководитель слыл человеком прогрессивным, он набрал специалистов, в основном молодежь, которые занимались передовыми по тем временам направлениями, вроде ТСО (технических средств обучения), учебного кино и учебного телевидения, программированного обучения, а также изучением зарубежного опыта по данным направлениям.

Итак, имея репутацию студента-отличника, на 5-м курсе я учился уже штрих-пунктирно, потому что работал в союзном министерстве. Оказалось, что новая работа даже придавала мне вес в глазах руководства факультета. Помню такой эпизод. Я сидел на кафедре общей психологии, где шло обсуждение хода выполнения дипломных работ. И вдруг Алексей Николаевич Леонтьев через головы всех сидящих

там преподавателей и студентов обратился ко мне за советом: «Коля, — сказал он, — как следует ответить на письмо, пришедшее из Министерства»? Все были поражены, и я не менее других, но быстро собрался и даже дал какой-то совет декану, за что получил благодарность.

В это время Алексей Николаевич очень хорошо ко мне относился. С середины 4-го курса я был его помощником, работая (вместе с Андреем Вербицким) в качестве технического секретаря Общества психологов СССР, председателем которого был он. Мы занимались расшифровкой стенограмм выступлений на Президиуме общества, подготовкой документов и т. п. Приходилось часто бывать у него дома.

После окончания факультета в сентябре 1969 года, когда я собирался поступать в аспирантуру, чтобы продолжить в научном плане сотрудничество с Петром Яковлевичем, Леонтьев неожиданно вызвал меня к себе в кабинет и спросил: «Коля, зачем вам эта аспирантура? Вы сможете быстро защитить диссертацию и без нее». И предложил работу младшего научного сотрудника у него в лаборатории. С учетом реалий того времени место младшего научного сотрудника на факультете МГУ предполагало ровную дорогу к защите кандидатской, а затем и докторской диссертации, одним словом, твердую основу для научной карьеры. В МГУ того времени этот путь всегда был длинным, частыми были ситуации, когда даже кандидаты наук подолгу работали лаборантами, методистами и т. п.

Поскольку мне уже было очевидно, что и моя аспирантура, и мой дальнейший путь в психологии могут быть связаны только с Гальпериным, я очень испугался этого предложения и сказал Леонтьеву, что я подумаю. И тотчас же отправился к Петру Яковлевичу домой, чтобы рассказать ему о предложении декана. Петр Яковлевич, наивная душа, при мне позвонил Леонтьеву и сказал: «Леша, у меня впервые за долгие годы появился стоящий парень, а ты его у меня сманиваешь». Я не знаю, что ответил А.Н. Леонтьев, но Петр Яковлевич меня упокоил: «Все в порядке. Можешь поступать в аспирантуру». Я обрадовался, решив, что коллизия разрешилась, столкновения интересов уважаемых мной ученых не будет. Однако буквально на следующий день, встретив Леонтьева на факультете, я как всегда с ним поздоровался, но в ответ было ледяное молчание. Он просто прошел мимо так, как будто меня не было.

И когда я закончил аспирантуру и защитился, причем раньше срока, оказалось, что для меня на факультете работы нет, хотя «место» формально должно было быть зарезервировано — ведь это была так называемая целевая аспирантура. Алексей Николаевич закрыл мне все возможности остаться на факультете. Он не простил мне мой выбор Гальперина вместо него.

Возможно, дело было еще и в неоднозначном отношении Леонтьева к самой теории Гальперина, хотя с начала 30-х годов они вместе работали в Харькове (так называемая харьковская группа учеников Выготского, куда входили также Д.Б. Эльконин, А.В. Запо-

рожец, П.И. Зинченко и другие); там П.Я. Гальперин под его руководством выполнил свою кандидатскую диссертацию. Потом их совместная работа продолжилась в Московском университете. Но в 90-е годы Алексей Алексеевич Леонтьев вспоминал, как его отец довольно резко критиковал первоначальный вариант рукописи П.Я. Гальперина «Введение в психологию», представленный А.Н. Леонтьеву в 1972 году и принял решение ее не печатать.

Как я понял позднее, были и другие осложнения, сыгравшие свою негативную роль в истории моего ухода. В первый год моей аспирантуры ситуация на факультете сложилась таким образом, что А.Н. Леонтьеву нужно было срочно найти замену профессору О.К. Тихомирову, читавшему курс общей психологии студентам 2-го курса, но уехавшему на стажировку в США. В результате читать лекции по этому курсу было поручено Гальперину, который начал в рамках этого курса излагать свои идеи, сложившиеся у него в процессе чтения курса «Общей психологии» на философском факультете. При этом Петр Яковлевич сделал сильный, но неосторожный ход — для ведения семинаров он отказался от услуг известных преподавателей факультета, которые должны были ассистировать ему для проведения семинаров, и пригласил меня, как знающего его курс, вести эти семинары.

Результатом такого нашего содружества стало «новообращение» студентов: значительная часть пришла писать курсовые, а затем дипломные работы на кафедру детской (возрастной) психологии, которую возглавлял Гальперин, кафедру педагогической психологии, в НИИ ОПП. Фактически в это время под общим руководством Гальперина я вел более десятка дипломных работ, несколько диссертационных исследований, о чем свидетельствуют мои совместные публикации с А.И. Подольским, Г.И. Лернер, И.М. Ариевичем, О.А. Карабановой, С.Л. Маловым и другими. Появлялись и «интересующиеся» со стороны: используя практический потенциал теории поэтапного формирования, я давал консультации о возможностях совершенствования деятельности в юридической сфере, в спорте, при подготовке по ряду военных специальностей.

Конечно, все это делалось на безвозмездной основе — мне нравилось «расширять границы» своих возможностей. Так, на факультете, используя соответствующее оборудование, я на основе принципов поэтапного формирования умственных действий и понятий провел экспериментальное исследование по формированию звуковысотного слуха, оказавшееся более успешным, чем известное исследование на данную тему самого А.Н. Леонтьева.

Наверное, моя активность кому-то показалась избыточной, во всяком случае она явно не осталась незамеченной и, похоже, устраивала не всех. В конечном итоге после защиты кандидатской диссертации в 1972 году я вопреки своему желанию должен был уйти с факультета, хотя был в «целевой» аспирантуре.

Так я получил удар, пережить который было не просто. Петр Яковлевич в знак несогласия с реше-

нием Леонтьева хотел написать заявление об уходе, но я отговорил его от этого, ведь наша научная, а тем более духовная связь на этом не обрывалась.

В.К. Какие значимые моменты своей дальнейшей научной, профессиональной жизни ты бы выделил? Что из того, что было потом, ты считаешь важным?

Н.Н. Так сложилась жизнь, что после этого с 1973 по 1987 год я работал в системе повышения квалификации преподавателей высшей школы: работал уже не со студентами, а со взрослыми опытными людьми, и это была другая жизнь, предполагавшая обретение опыта, недоступного в лабораториях факультета. В 1973—1974 годы я был доцентом на Межвузовской кафедре, созданной в МАДИ решением Минвуза СССР для организации повышения квалификации преподавателей периферийных технических вузов, приезжавших в ведущие московские вузы, такие как МЭИ, МАИ, МХТИ, МВТУ и, конечно, МАДИ, которым я читал разработанный мной курс «Основы психологии и педагогики высшей школы», стержнем которого стала моя попытка приложения основных идей теории поэтапного формирования умственных действий и понятий в проблематике обучения в высшей школе. Особенно важным для этой линии моего развития было общение с преподавателями — представителями самых разных специальностей: от физиков и математиков до филологов и историков. Благодаря моим попыткам связать идеи П.Я. Гальперина с их профессиональными интересами в целях совершенствования методик преподавания я от них узнавал много нового, пробовал иные подходы к внедрению идей П.Я. Гальперина в практику высшего образования.

Я никогда по-настоящему не учился лекторскому мастерству, подготовка подробных конспектов своих лекций для меня — специальная задача, мне легче импровизировать по ходу дела, опираясь на общую схему по теме лекции. Но учебный план есть учебный план, и я научился работать в соответствии с заранее разработанной программой. (Особенно интересно стало позднее, когда появились технические возможности использования презентаций: так много интересного материала можно найти на просторах Интернета.)

Важная часть этого периода — работа в течение восьми лет (с 1974 по 1982 год) в Московском Архитектурном институте — уникальном вузе, где сочетается инженерная и художественная подготовка, сильны традиции наставничества, уважения к мастерству. Там у меня тоже появились ученики — молодые преподаватели архитектурных специальностей, часто сочетавшие преподавание с архитектурной практикой. Я читал им психологические курсы в рамках факультета повышения квалификации МАрХИ, руководил их выпускными работами и диссертационными исследованиями и сам многому у них учился. Я увидел новые возможности применения принципов теории поэтапного формирования в проектно-творчестве — через моделирование и творческое преобразование

модели в условиях учебного проектирования. Именно это стало основой для моей докторской диссертации «Проектное моделирование как творческая деятельность».

Завершающим этапом моей работы в последипломном образовании стал шестилетний период (1982—1988 годы), когда я вновь оказался в МГУ, но не на родном факультете психологии, а на факультете повышения квалификации преподавателей, на кафедре, возглавляемой А.В. Петровским. Здесь в большой аудитории я почувствовал себя настоящим лектором — на мои лекции приходили даже люди со стороны, прослышавшие о необычном лекторе, взрывавшем традиционные каноны вузовского преподавания.

Между тем шла уже вторая половина «эпохи перестройки», были надежды на изменения к лучшему в разных сферах жизни и в том числе в образовании. Тема образования тогда вдруг стала очень актуальной. Тысячи людей собирались в Концертной студии Останкино, чтобы послушать учителей-новаторов: Ш.А. Амонашвили, В.Ф. Шаталова и других; предлагались разные проекты преобразований в средней и высшей школе. И мне хотелось как-то поучаствовать в назревающих изменениях.

Поэтому закономерно, что после защиты докторской диссертации, состоявшейся по случайному стечению обстоятельств 2 октября 1987 года — в день 85-летия Петра Яковлевича — я согласился на предложение стать заместителем директора НИИ проблем высшей школы. Работал я в нем недолго. Думаю, я немного расшевелил эту типично советскую тихую заводь, где основным делом было написание отчетов для разных управлений Министерства. После успешной подготовки выставки, приуроченной к февральскому Пленуму ЦК КПСС (1988), посвященному анализу состояния системы образования, я был приглашен Геннадием Алексеевичем Ягодиным, председателем Госкомитета СССР по народному образованию, на пост начальника Главного управления общего среднего образования в Госкомитете, члена Коллегии этого Госкомитета.

В это время действительно многое менялось, хотя какие-то базовые идеи, к сожалению, оставались не ассимилированными. Одна из них — идея непрерывного образования, о необходимости которого вновь заговорили лишь сейчас. В 1988 году я организовал группу сотрудников НИИВШ для разработки Концепции непрерывного образования, которая была утверждена Всесоюзным съездом работников народного образования, состоявшемся в декабре 1988 года. Краеугольным камнем этой концепции является идея образования через всю жизнь, а значит, постоянного развития, что требует изменения подхода ко всем ступеням образования, включая высшее.

По объективным причинам эта работа, по своему важной и интересная, продолжалась недолго. В 1991 году, после краха СССР, все союзные структуры прекратили работу. Это был еще один удар, который в той или иной форме вместе со мной ощутили многие граждане Советского Союза.

Моя профессиональная карьера предполагала новый поворот: А.В. Петровский, опытный и уважаемый человек, помнивший нашу совместную работу на кафедре ФПК МГУ, позвал меня налаживать работу Академии педагогических наук СССР, которая стала Российской Академией образования; я был избран Главным ученым секретарем Академии. Мне кажется, я сделал много полезного для содержательной работы академии в новых условиях, достаточно сказать, что за время моей организационной работы число институтов Академии возросло в два раза, и это в условиях постоянно урезаемого бюджетного финансирования.

Одновременно я продолжил педагогическую работу — теперь со студентами, причем и на этот раз — в уникальном вузе со своими традициями — Московском государственном лингвистическом университете (МГЛУ), преобразовавшемся из Института иностранных языков имени М. Тореза, создав единственную тогда в России кафедру педагогики и андрагогики, нацеленной на разработку психолого-педагогической проблематики обучения взрослых.

После завершения своей работы в РАО в 1997 году я перешел в МГЛУ на постоянную работу.

За годы работы в Лингвистическом университете в течение почти 25 лет я — при поддержке ректора МГЛУ Ирины Ивановны Халеевой — организовал в университете психологическое отделение; эта специализация психологического образования пред-

полагала сочетание профессиональной психологической подготовки с основательной подготовкой по двум иностранным языкам. Я читал там несколько курсов. Отделение было небольшим, складывались доверительные отношения со студентами. Я благодарен этому вузу, многому там научился, подготовил нескольких аспирантов, с моей поддержкой были защищены ряд докторских диссертаций, в том числе и преподавателей-лингвистов, интересовавшихся психолого-педагогической проблематикой.

С 2016 года после отставки И.И. Халеевой я вновь оказался в психологической среде, вернувшись сначала на психологический факультет МГУ, о чем упоминал раньше. Однако я понял, что общей направленности моих научных устремлений в значительно большей степени отвечает МГППУ — ведущий психолого-педагогический университет России, куда я окончательно перешел в сентябре 2017 года в качестве профессора Международной кафедры ЮНЕСКО «Культурно-историческая психология детства». Мне нравится эта работа: думаю, что накопленный профессиональный и, что немаловажно, разносторонний опыт использования психолого-педагогических идей в практике подготовки специалистов различной профессиональной ориентации позволяет мне как психологу на новом уровне подходить к решению больших теоретических вопросов развития культурно-исторической психологии и деятельностного подхода.

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