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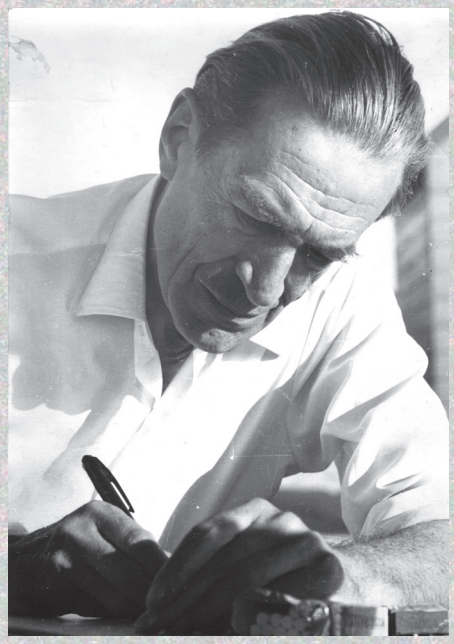

К 120-летию со дня рождения
А.Н. Леонтьева

культурно-историческая ПСИХОЛОГИЯ

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cultural-historical PSYCHOLOGY

To the 120th Anniversary
of A.N. Leontiev

Международный научный журнал

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Культурно-историческая психология

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To the 120th anniversary of A.N. Leontyev

A.N. Leontyev has just turned 120 years old. From the beginning of 20s till the mid-70s of last century, Alexey Nikolaevich did so much, that it is impossible to list. A lot has been written and said about the Theory of Activity, which he constructed in his foundations. Although it is written, it is worth rereading these works, mastering the way of thinking embedded in them; rereading together with mastering and understanding of the structure of A.N. Leontyev's truly brilliant and unique experimental studies. Therefore, from the comprehension of the experimental study of the occurrence of feeling and, of course, the study of musical hearing's emergence, even now, decades later, considerations about the meaning of the Theory of Activity are being born anew.

My generation remembers Alexey Nikolaevich Leontyev as a founder, head MSU's Faculty of Psychology and as its remarkable professor. Under his leadership, the faculty professorship worked with us, students, not only "didactically", but also in a professional and scientific way. We had been writing term papers and theses on topics that interested our professors themselves. We can say that we were, if we even could be, their "youngest" scientific collaborators. That's how professors became our unforgettable teachers. In their faces-images — A.N. Leontyev, A.R. Luria, A.V. Zaporozhets, P.Y. Galperin, D.B. Elkonin, B.V. Zeigarnik, E.N. Sokolova — there was and remained for the whole life a concentration of the Thinking Energy. The face-image of the Faculty of Psychology of Moscow State University was the same, led by its founder and dean A.N. Leontyev.

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Problem of Mediating: L.S. Vygotsky, A.N. Leontiev, D.N. Uznadze

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The subject of discussion in the presented article is the "immediacy postulate" and the task of overcoming it, specified in the methodological principle of mediating a two-term scheme of analysis. The options for solving the problem of mediation contained in the theoretical systems of L.S. Vygotsky, A.N. Leontiev and D.N. Uznadze are considered and analysed. D.N. Uznadze, who was the first to designate this methodological discourse, and A.N. Leontiev represented its essence approximately the same way, namely, as a question of the relationship between internal (mental) and external (transpsychic), while, as a mediating link, they proposed, respectively, the set and activity. The question is posed differently in the cultural-historical theory, where mediation is the process of transforming "natural functions" into higher mental processes, in which the "sign" acts as a mediating agent. In any case, the problem of mediation appears to be fundamental. However, the question of a mediator between the psychic and non-psychic world is inseparable from the psychophysical problem, which makes it difficult to reach the real empirical level of analysis. In the light of some considerations by D.N. Uznadze and certain empirical data, an opinion is expressed about the possibility of limiting the area of action of the principle of mediation.

Keywords: immediacy postulate, principle of mediation, Vygotsky, Leontiev, Uznadze.
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Проблема опосредования: Л.С. Выготский, А.Н. Леонтьев, Д.Н. Узнадзе

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В статье предметом обсуждения выступают «постулат непосредственности» и задача его преодоления, конкретизированная в методологическом принципе опосредования двучленной схемы анализа. Рассматриваются и анализируются варианты решения проблемы опосредования, содержащиеся в теоретических системах Л.С. Выготского, А.Н. Леонтьева и Д.Н. Узнадзе. Д.Н. Узнадзе, первым обозначивший этот методологический дискурс, и А.Н. Леонтьев примерно одинаково представляли его сущность как вопрос о соотношении внутреннего (психического) и внешнего (транспсихического), при этом в качестве опосредущего их звена предлагали, соответственно, установку и деятельность. Иначе ставится вопрос в культурно-исторической теории, где опосредование есть процесс превращения «натуральных функций» в высшие психические процессы, в котором опосредующим агентом выступает «знак». В любом случае проблема опосредования предстает как основополагающая. Однако вопрос о медиаторе между психическим и непсихическим миром неотделим от психофизической проблемы, что затрудняет выход на реальный эмпирический уровень анализа. В свете некоторых соображений Д.Н. Узнадзе и определенных эмпирических данных высказывается мнение о возможности ограничения ареала действия принципа опосредования.

Ключевые слова: постулат непосредственности, принцип опосредования, Выготский, Леонтьев, Узнадзе.

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The concept of "immediacy postulate", as a methodological principle and the main ("fatal") mistake of all previous psychology, was brought into the methodological body of D.N. Uznadze`s psychological system. Its meaning "consists in the fact that objective reality directly and immediately affects the conscious psyche and in this direct connection determines its activity" [18; p. 158]. For quite a long time, the task of overcoming the immediacy postulate remained a central problem for only the Georgian school of psychology. Even Soviet colleagues paid little attention to this principle. The situation changed markedly after the publication of A.N. Leontiev`s epoch-making book: "Activity. Consciousness. Personality", which thoroughly discusses the issue of the need to develop a theory in the direction of identifying a mediating link between external influences and the internal states of the subject [15]. This call of the country's most authoritative psychologist was received with great interest and enthusiasm by the Georgian colleagues, because it opened a direct path to a dialogue between the two leading scientific schools of the Soviet psychology. This and the subsequent brilliant research done by A.G. Asmolov [1] gave impetus to a very long, intellectually and personally loaded discussion, about which the remaining participants still remember with pleasure [13]. The problems associated with the immediacy postulate soon became the focus of attention. The task of overcoming this postulate was designated by A.G. Asmolov as "Uznadze's task" and the research itself was most highly appreciated. "Perhaps some other ideas of D.N. Uznadze will undergo revision, for this is the normal fate of all living theories, but the analysis of immediacy postulate and its fatal consequences for psychology, the idea of mediating the two-term scheme of analysis through the "subpsychic", which crowns this analysis, will remain an enduring value of psychological science, its fundamental idea" [1, p. 17]. Along with the increasing interest in the work of L.S. Vygotsky, allegations appeared that D.N. Uznadze, L.S. Vygotsky and A.N. Leontiev, in their theoretical systems tried to solve this essentially identical methodological problem, but in different ways.

We are talking about the fundamental issue of determining the methodological status of the most popular concepts and assessing the degree of their relationship. And this is very important, at least from the point of view of the history of science. The fruitfulness of such a study primarily depends on an accurate and unambiguous understanding of the meaning of the "Uznadze task". Curiously, two researchers, A.G. Asmolov and M.G. Yaroshevsky, trying to compare methodological foundations of the systems of D.N. Uznadze and L.S. Vygotsky in the light of their solution of the issue of mediation, interpret it differently and come to different conclusions. M.G. Yaroshevsky believes that L.S. Vygotsky tends to "sign" mediation, A.G. Asmolov — to the activity one.

At the same time, it is alleged that L.S. Vygotsky and D.N. Uznadze "destroyed the immediacy postulate, overcoming both the positivist interpretation of scientific knowledge and the principle of the "closed causal series" [24, p. 286]. At the same time, it is noted that these authors set and solved the problem of mediation both in terms of methodology (philosophy), and in terms of science (empirical). In philosophical and ontological terms, the denial of the immediacy postulate prompted both scientists to abandon the identification of psyche and consciousness and turn to the study of "the unconscious as a dimension of the human (rather than animal) psyche and as a psychological (rather than purely physiological) regulator of behavior" [24, p. 297]. This assessment needs serious clarification. L.S. Vygotsky certainly did not have time to "turn to the study of the unconscious". In his works "there are only isolated and not very clear indications of how the unconscious should be understood <...> they are clearly not enough to develop the theory of the unconscious from the point of view of cultural-historical psychology" [8, p. 102]. The nature and functions of the unconscious psyche remain undiscovered [14], so the task of mediation could not lead to it.

As for D.N. Uznadze, the set has always been conceived as a universal mechanism for mediating the mental activity of any dimension, both human and animal. The set, at the very final stage of the development of the conception, was characterized as an unconscious-psychic phenomenon. All the rest of the time D.N. Uznadze identified the psyche and consciousness and rejected the existence of unconscious psyche. Dimitry Nikolaevich began to develop his own system much earlier when he clearly understood all the difficulties associated with the immediacy principle. However, the content and name of the corresponding postulate were formed much later. Consequently, the rejection of this postulate itself did not lead D.N. Uznadze to the idea of the unconscious psyche; instead, it led to the idea of the "biosphere". This is the idea of a philosophical-ontological level in the spirit of "ontological pluralism", meaning the postulation of some "still unknown" reality in which the opposition of subject and object is removed, and thereby mediating their relationship [20].

Significantly, from the very beginning, the formulation of the question of the immediacy postulate is closely linked with the *psychophysical problem*, without the solution of which, according to the author, it is impossible to construct a psychological theory. "Uznadze's task" is to find a link that is a mediator between the environment and mental life. This can be expressed through a three-term system of analysis: environment—subject (set)—behavior (activity). However, the immediacy postulate means not only the connection between the external and the internal (mental), but also the connection between the phenomena of the mental world themselves. In the optics of the psychophysical problem, the first option is linked with the theory of interaction, the second — with the theory of parallelism. However, "the idea of the direct nature of the connection between these phenomena in both theories is a dogmatically accepted postulate" [18, p. 161].

Later, the "biosphere" was replaced by the term "set", which marked the emphasis on the scientific and empirical level of analysis. But methodologically its content remained the same for almost two decades. Speaking about the setting in the generalizing work of the early forties, in which the immediacy postulate was first clearly formulated, D.N. Uznadze characterizes it as "a specific, peculiar reality that precedes the particular — mental and physiological — and is not reduced to them" [21, p. 191].

According to L.S. Vygotsky, the place of the mediating factor is given to the sign [6; 7]. If we imagine the failed dialogue between them, then D.N. Uznadze probably would have asked, if a sign wasn't an objective, external? It turns out that the external is mediated by the external?! To this L.S. Vygotsky would probably answer that this is an external of a different kind, not natural, but historical, social. Accordingly, the psyche is twofold — natural and transformed on sign basis (the so-called "higher mental functions"). "Natural" (primary) mental functions by their nature are *direct and involuntary*, being directly determined by biological and environmental factors. D.N. Uznadze, obviously, would not have accepted such a formulation of the question since he was looking for a universal mechanism of mediation that would work at all levels of mental life. At the highest levels of human psyche, the mechanism of objectification is added to the set mechanism, introducing social content into it, including sign content. However, the primary nature of the mediating principle (mechanism) remains the same, "biospheric", it continues to be the "principle of life". Although natural mental processes are involuntary, the behavior tailored from them also needs to be mediated, like any experience.

One can probably wonder if L.S. Vygotsky ever set the task of overcoming the "immediacy postulate" in the sense that it is formulated by D.N. Uznadze. The latter is always the question of the relationship between subject and object[1]. And mediation in the cultural-historical theory, in essence, is a question of formation of higher mental functions. Being mediated socially, as well as by the sign, natural functions acquire an arbitrary character — and this is a completely different topic, the topic of the genesis of mental functions and their transition from one form of regulation to another [6]. This is first. Secondly, the author of the theory of set considers the problem of mediation in relation to the whole mental life, and not only with *mental processes* or even *consciousness* in general. From the very beginning, this methodological question was asked in relation to any kind of mental activity, including animal behavior and involuntary, impulsive forms of human behavior (except for reflex forms of response). Proceeding from this, one should not equate *mediation and arbitrariness*, and this is exactly what V.P. Zinchenko does [9]. To rehabilitate immediacy, expressed in the form of spontaneity of acts of creativity, intuition, direct discretion, etc., the author doubts the universality of the *postulate of mediation*, which, according to him, was actually approved by D.N. Uznadze and A.N. Leontiev. In his opinion, this methodological principle is also supported by the fact that cultural-historical psychology in the version of L.S. Vygotsky is based on the idea of meditation. The later shows, that the main guideline for V.P. Zinchenko, at least regarding the problem of mediation, is not the theory of activity, and even more so the theory of set, but a cultural-historical conception. And this is generally understandable, since his own analysis is based mainly on the characteristics of the flow and genesis of mental processes and phenomena of consciousness. This is where the fundamental discrepancy between the interpretations of the problem by D.N. Uznadze and V.P. Zinchenko is revealed. D.N. Uznadze seeks to understand what the true nature of the impact of the external world on the psyche and behavior is, as well as the impact on each other of the phenomena of consciousness. For V.P. Zinchenko, the question of immediacy or mediation is the question of how certain mental processes are manifested, in what phenomenological form, and how they are formed. Therefore, he constantly slips into the optics of arbitrariness — non-arbitrariness, although he specifically notes that the mediated and immediate only partially coincide with arbitrariness and non-arbitrariness. In general: for D.N. Uznadze — the whole psyche and activity are central issues, for V.P. Zinchenko — a mental process.

[1] Here you can find similarities with the subject-activity approach, especially with the ideas of A.V. Brushlinsky about the problem of mediation [5].

D.N. Uznadze — through the biospheric reality to the integral subject of behavior, V.P. Zinchenko — to cultural-sign mediation. So, V.P. Zinchenko is focused on the cultural and historical concept of L.S. Vygotsky, and not on A.N. Leontiev`s version of the theory of activity, which, despite the "common genotype", nevertheless, are quite different and independent theoretical systems[2].

According to V.P. Zinchenko, "the mediation of the psyche in the most general sense means the inclusion of all mental acts (processes, functions, functional organs — neoplasms, personal constructs, etc.) in the cultural context of the life and activity of the individual" [9, p. 6]. If this means that activity is simply made up of various functions, then the sense of the very concept of mediation is lost. It presupposes the existence of something that is between two phenomena serving as a mediator of their connection. The difference between the mediated and the immediate is also lost, because the direct activity also includes various functions — it cannot be empty! It is also not clear what means (what kind of mediation) are tools, signs, etc.? "In a narrower sense, the author writes, mediation points to the fact that all mental acts mediate each other. Each of them is influenced by others, so the selection of any one of them in any pure form is an almost insoluble problem for experimental psychology" [ibid.]. Yes, undoubtedly, the mutual influence and interpenetration of mental processes is a very important psychological fact, but what does mediation have to do with it? And how to distinguish the mediated from the immediate, when mutual influence seems to take place always and everywhere. In general, it can be stated that despite many interesting considerations, this study of the venerable scientist does not achieve its goal, since the refutation of the mediation principle is based mainly on its not entirely correct interpretation. Nevertheless, we are ready to support the very desire of the author to oppose the hypertrophy of the ideology of mediation, but on other grounds, which will be discussed at the end.

Since we are talking about misunderstanding of the issue, we have to recall the already mentioned study by M.G. Yaroshevsky, who tried to build bridges between the cultural-historical concept and the theory of set on the basis of the principle of mediation implemented in them. Arguing about the common roots of these psychological systems, the author concludes that D.N. Uznadze and L.S. Vygotsky, developing an alternative to the immediacy postulate, "found it in the philosophy of dialectical materialism. This philosophy became a compass for them in search of a new psychology" [24, p. 91]. For L.S. Vygotsky it may be so, but in relation to D.N. Uznadze, this statement is definitely not true. What kind of "diamat" is this, if he initially builds his psychology on a new "still unknown" ontology, on a "psychophysically neutral" "subpsychic" reality that terrifies any orthodox Marxist-Leninist. And the set, which is characterized as a specific and peculiar reality that is fundamentally different from particular mental and physiological processes, hardly harmonizes with the foundations of "diamat"[3].

At A.N. Leontiev's school, the problem of mediation found a systematic and profound development in the works of A.G. Asmolov. He refers the theories of L.S. Vygotsky, A.N. Leontiev and D.N. Uznadze to the so-called "non-classical psychology", while believing that "the fundamental novelty of these various areas of methodology lies in the breakthrough beyond the boundaries of the immediacy postulate and the search for the mediating link, which, generating mental phenomena, does not itself belong to the sphere of the mental" [2; p. 446]. At the same time, in the context of the distinction between classical and non-classical psychology, he speaks of a single direction of Vygotsky-Leontiev. The same can be found with E.E. Sokolova [17]. "D.N. Uznadze and the leading representatives of the theory of activity <...> solved a common problem — the problem of overcoming the immediacy postulate and the two-term scheme of analysis of mental processes that follows from it: the impact of an object — a change in the current states of the subject. In one case, as the middle link — the substance that generates mental phenomena — the "subpsychic" i.e., the primary set is proposed; in the other case such link is objective activity. The generality of the task, as well as the attributes of the mediating substance, give the right to compare these options for solving it. In case if the concept of a primary set is endowed with the features of a mediating substance, it is alternative to the category of activity, i.e. D.N. Uznadze and A.N. Leontiev offer directly opposite options for solving the problem of overcoming the immediacy postulate [1, p. 24].

Based mainly on the early works of D.N. Uznadze, A.G. Asmolov formulates the requirements for the mediating instance: it should not be either an exclusively physical or mental phenomenon; it must be a transformer, a "translator" of events in the external world into psychic phenomena and conditioning them; it

[2] This question, of course, is entirely an "internal affair" of those who study these theoretical systems in detail. We only note that in the Georgian psychological school, the opinion has always prevailed that the difference between them is quite clearly indicated in their names.

[3] Without going into the appropriate argumentation, we will refer to the opinion of a historian of psychology who specifically dealt with this issue: "the history of the psychology of set <...> allows you to get around the topic of Marxism in a completely natural way: both in its origin <...> and in content, this trend which arose and developed for quite a long time irrespective of Marxism, was in relative independence from Marxism" [3, p. 133].

must be integral, not decomposable into elements; only through it should the subjective mental phenomena, be influenced as well as the reverse impact of the mental on the physiological be carried out; this "substance" is a necessary condition for maintaining the vital activity of the individual, the "principle of life"; it must always precede and determine the conscious psyche that develops on its basis [1].

Since the concepts of primary set and activity are considered alternative from the point of view of the problem of mediation, it is obviously assumed that these features are attributed to an activity that, according to A.N. Leontiev, is conceived as the desired mediator. In this context, the following thesis becomes most important: "in order to study the world of mental phenomena, one must go beyond their limits and find such a unit of mental analysis that would not itself belong to the sphere of the mental" [2, p. 395]. Therefore, as an activity is considered to be such a unit and the one acting as a mediating link, then *it should not belong to the circle of mental phenomena*.

And here the questions that have become the subject of discussion in the course of the noted discussion arise. More than once the idea has been expressed that activity cannot serve as a mediating link, essentially for the same reason as a mental set. The fact is that activity, as a phenomenon, does not exist without and outside the internal, mental principle and content. According to A.N. Leontiev, "activity is the substance of consciousness" [15, p. 157], i.e. psyche and activity are ontologically identical, psyche is inseparable from activity being its essential, inalienable property [17]. But activity, filled with internal content, activity, as a manifestation of mental life, naturally, is not suitable for the role of an intermediary between internal and external, subjective and objective. Considering this obvious circumstance, the opinion is expressed that the category of activity, considered from the perspective of overcoming the immediacy postulate, acts as an explanatory principle, and not as a real phenomenon. In this case, it appears as a "substance" that has neither physical nor mental characteristics [2]. However, such a methodological move does not really explain anything. Whatever the status of an activity, an explanatory principle or a real phenomenon, it will not be able to play the role of a mediating instance, since it is completely saturated with mental content (unless, of course, it is understood in a behavioristic sense). The phenomenon/concept considered from the point of view of the explanatory principle should not lose its attributive feature, otherwise we will get another concept. Such a feature for activity is, of course, *mentality*.

The keynote of the noted discussion between representatives of the schools of A.N. Leontiev and D.N. Uznadze was a question about the primacy of activity or set. Since there is no subjectless activity, and the set in the understanding of the school of D.N. Uznadze, is a state of the subject, then the question of primacy acquires the features of a chicken and egg dilemma. Therefore, in principle, it is possible to formulate the following proposition — to see the mediating instance in the set is the same as in the activity and vice versa. However, at the same time, it will be necessary to "cleanse" both of them from the "mental admixture", which definitely does not seem heuristic. In general, it should be noted that what has been said about the "mediating potential" of the concept of activity also applies to the set, understood as a mental phenomenon. In his latest works D.N. Uznadze qualified the set in this way, thereby creating an aporia that could not go unnoticed [4; 12; 16]. The set, being a purely mental formation, cannot serve as a mediating agent between the mental and physical worlds. This does not apply to the biosphere, which is comprehended as a prepsychic and "subpsychic area" that determines the psyche and main feature of which is the absence of a subject-object opposition.

At the second stage of the development of the theory of D.N. Uznadze, the scientist- empiricist comes to the fore. A methodology has been developed and a comprehensive study of the phenomenon, marked as the set, and not as the biosphere, has begun. If the latter was presented mainly as a certain methodological abstraction (principle), the set had a very real content, because it concerned the *state of the subject*. At the beginning the set was not understood as an unambiguously mental phenomenon, but rather a *psychophysiological* one. Accordingly, the principle of immediacy is interpreted as follows: "if our motor or mental processes represent a direct response to the stimuli acting on them, then it turns out that the relationship with reality is established not by the subject, but by his psyche, or, in particular, by his motor skills, that our behavior or experience arise without significant participation of the subject and, therefore, are uniquely determined by the stimuli acting on them" [21, p. 187]. This is how the principle of *subjective mediation* and the *integral subject* appeared as the initial category of the new psychology. However, this already comes into conflict with the original formulation of the question of mediation, because it lies in the fact that the objective (external) cannot directly affect the subjective (internal). And no matter how hard we try to distinguish the *subjective* from the *subjectivity*, the attitudinal state of the integral-subjective dimension, from the ordinary mental phenomena of the subjective world, both of them remain the property of the inner world, which is influenced by the external world, and therefore, we remain captive to the immediacy postulate. D.N. Uznadze, of course, made great efforts in order not to fall into the "fatal" methodological trap set by himself. Arguing

about the nature of the attitude, he tried in every way to highlight the absolute peculiarity of the set as a phenomenon that cannot be reduced to the known phenomena of mental life. However, in fact, all attempts to fill essentially subjective phenomenon (i.e. set) with objective content, do not reach the goal. In the latest version of the theory, the concept of a *mental set* already clearly comes into conflict with the principle of mediation, which is the methodological basis of this conceptual system.

So, what options for solving the problem of mediation are offered in the theories of L.S. Vygotsky, A.N. Leontiev and D.N. Uznadze and how do they relate to each other? Solving this problem, L.S. Vygotsky moved in the opposite direction from D.N. Uznadze, trying to find the unity of the external and internal (mental) in the phenomenon of the essentially external world, namely — in the sign. If we do not go beyond the binary ontology (external-internal) and recognize the legitimacy of the task of D.N. Uznadze, in fact, one of two options is left — either to attribute the function of the mediating link to *objectified subjectivity* (i.e., to the set — Uznadze's path), or to *subjectivized objectivity* (i.e., to the sign — Vygotsky's path).

L.S. Vygotsky and A.N. Leontiev, in general, also solved the problem of mediating the two-term scheme environment-psyche (behavior) in different ways. L.S. Vygotsky placed a mediating link in the first element of the two-term scheme (sign, culture as a whole), A.N. Leontiev — in the second (activity). Obviously, none of these assumptions, in essence, can be considered as overcoming the immediacy postulate, like the statement about the unambiguous mentality of the set, expressed in the last works by D.N. Uznadze. Of all the considered options for solving "Uznadze`s task" (set, sign, activity and biospheric mediation), oddly enough, the last one seems to be logically the most consistent. But this is just the case when we have us not an object of the study before, but an "explanatory principle", a philosophical and methodological category (hypothesis), which leads into the impenetrable jungle of an "eternal" *psychophysical problem*. It is difficult to imagine a real psychology built on this hypothetical notion. Of course, one can try to turn to the old Eastern ideas, in which the objective and the subjective seem to merge and have certain empirical references in the corresponding psychopractices. In an effort to "update" this idea, one can also look towards new "quantum concepts". But one should not particularly hope for the possibility of operationalizing the hypothesis of a psychophysically neutral reality as the basis of mental life, which would be amenable to empirical research. Realizing this, even D.N. Uznadze rejected such a hypothesis.

As posing the question of overcoming, the immediacy postulate necessarily leads to a psychophysical problem and even implies its solution (from the standpoint of a pluralistic ontology), then, if we turn away from this methodological principle, in any case, we will find ourselves in a dead end. Against this background, doubts naturally arise as to the expediency of raising the task of overcoming this postulate to the rank of a *fundamental methodological principle*. If we do not put the question too radically, then at least we should think about the *universality of the principle of mediation*.

It is noteworthy that the author of the term and the concept of "the immediacy postulate" himself thought about this. In a copybook for notes, where D.N. Uznadze recorded his hypothetical considerations, there is an entry made in 1945 with the following title: "The framework for the legitimacy of the immediacy postulate". It says: "it should not be assumed that, under the influence of the environment, nothing ever arises in the subject outside his mediation, that everything is necessarily mediated by the *subject's set*. It seems that in the absence of a need or the possibility of establishing relations with the environment, the latter may still act on him, causing a direct effect in his psyche, body, somatics. This effect can be called a reflex or *reflexoid effect*. These will be the following: sensations — in the cognitive sphere, pleasure-displeasure — in the emotional sphere, and reflexes — in the motor sphere" [22, p. 261]. Perhaps the old psychology was not so wrong, the author continues, arguing that sensations, feelings (pleasure-displeasure) and reflexes are elementary content of our psyche and behavior. This entry clearly indicates the desire of D.N. Uznadze to limit, in some way, the area of action of the principle of mediation, admitting the existence of elementary forms of experiences and activity that arise as a result of direct stimulation emanating from the body or environment. However, the whole question is how far one can go along this path without destroying the fundamental principle of set based mediation. And how to justify where it works and where it doesn't, and why? For example, how legitimate is it to speak of activity, sign, or set based mediation in cases where a certain area of the brain is directly stimulated, resulting in an emotional *experience* (J. Olds) or inhibition of *behavior* (H. Delgado). In both cases, there is an external influence and a broadly understood psychic response, but neither set nor the activity of the subject are visible between them, which, according to the relevant theories, must necessarily mediate this connection. A psychic fact, seemingly, without any mediation, directly arises from a neurophysiological substrate, and there are plenty of such facts.

Here we, perhaps, will follow V.P. Zinchenko, who completed his research with the following words: "I think that it is too early to sum up the reflections on the relationship between the immediate and the mediated. It is better to put an ellipsis..." [9, p. 10].

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Situation and the Key Sought of a Mediation Action

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The topic of the article refers to the way and method of the Mediation Action implementation. Specified method could be built by the Mediator in the connection of two Positions: in the first place, a consideration of behaviour that will, in the second place, allow to appropriately join («wedge») its flow. Correlating the consideration of behaviour and the method of its reconstruction is the key problem of upbuilding and unfolding the Mediation Action. It implies that the Mediator views the process of action performing by another person as/in a certain language — a language, in which appropriate method of joining the unfolding behaviour could be identified and comprehended.

Keywords: mediation action, mediation action problem, mediation language, axis, support, action field, mutual reflection of axis, field and supports.

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Ситуация и ключевое искомое Посреднического Действия (ПД)

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Тема статьи — способ осуществления Посреднического Действия. Указанный способ может быть выстроен Посредником в связывании двух Позиций: во-первых, такого рассмотрения поведения, которое, во-вторых, позволит уместно включиться («вклиниться») в его течение. Соотнесение способа рассмотрения поведения и способа его реконструкции — ключевая задача построения и развертывания Посреднического Действия. Сказанное предполагает, что Посредник рассматривает сам процесс выполнения действия другим человеком в определенном языке — таком языке, в котором может быть осмыслен и выявлен уместный способ включения в развертывающееся поведение.

Ключевые слова: посредническое действие, задача посреднического действия, язык посредничества, ось, опора, поле действия, взаимо-отображение оси, поля и опор.

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I

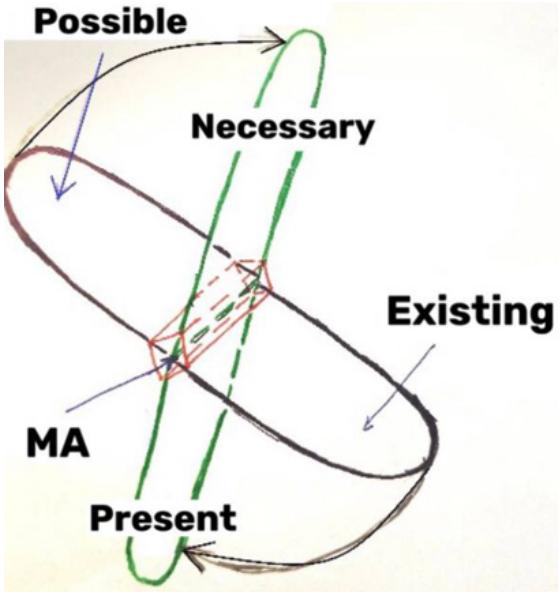
The point of MA is to construct an Action; its motive[1] is to overcome the natural form of behavior in a cultural form [4], where the natural form is an activity involved in some unidentified element, i.e., coming from an external cause, and the cultural form is an activity connected with the construction of its own way (image)

[1] Understood not only "psychologically", but similarly to the " motive of fictional work".

of its deployment — with the construction of Actions. Actions (subject, game, educational, productive) are the essence of cultural forms of behavior [5]. Overcoming the natural form of behavior while constructing an action[2] is an act of development, an Event of MA [20; 22]. The event, the center of which is the "turn" of activity (a change of its semantic field). This is the transition from the efforts of directly achieving the required (necessary) to construction of an image of the path (space of possibilities) to achieving it.

Construction of an image of the action deployment, i.e., of a method of the Action Time saturation, understood as a transition from the previous one ("was") to the image of the pre-visible ("will be") through the present ("is")[3], is the key task[4] of MA. In this situation, the construction of an Image of the Path ("Road") of an action is the motivational and goal-oriented beginning of its orientation, i.e., required in the MA task. The question of what the unknown[5] is remains open.

The event scheme of MA implies the correlation of two transitions in the deployment of the action [23, p. 268]: a) transition from the present situation to the required one and b) the transition from the existing scheme (image) of action (usually unconscious) to another possible scheme. In my opinion, this is the construction of the correlation of Real and Ideal forms of action. The construction and retention of the correlation of two transitions, i.e., the reconstruction of their mutual display is what is sought in the deployment of MA. This is a fairly general assumption and it will be specified in this article.



Pic 1. MA Event

II

The subject of mediation clearly appears in two different ways of understanding experimental genesis and internalization — their comprehension in the works of L.S. Vygotsky and P.Y. Galperin. It is significant that in both cases we are talking, in the words of P.Y. Galperin, about the formation of a "separate action".

In the view of P.Y. Galperin and his collaborators about the third type of orientation (the third type of doctrine), the key is the defining of the means (for example, measures for constructing the Number Concept [7], key points for writing a letter [8]) and through this setting a general method for constructing an orienting basis for action. Approximate basis of action, according to P.Y. Galperin, — a system of support-guidance for the perform an action, in the development of which its zone acts ("Zone of proximal development"). In the further stages of formation—internalization—the orientation of the action decreases and thus mastered. However, the way the subject himself discovers the idea-meaning (function) of the given means, i.e., their "support", remains hidden (removed) in the theory of gradual formation.

In the concept and experiments of L.S. Vygotsky and his collaborators, the instrument for constructing an orientation is the sign (in the words of Vygotsky, "a psychological tool"). Mediation is constructed as the identification of its idea-meaning through correlation of meaning with the conditions of the task (for example, correlation of the idea of a drawing with a phrase to remember).Here the instrumentality, the "support", and the field of possible action are not "given", but they are built up and revealed in the joint comprehension of the sign function by a child and an adult (an experimenter and a subject). This construction is detection and it is individualized (internalized) [4].

In D.B. Elkonin's work on the development of objective actions in early childhood [25, pp. 130—141], to pe precise in observations of the formation of an objective action, he emphasizes the specifics of such a method of transmitting an action pattern from an adult to a child, in which the child turns an adult pattern into his own way of unfolding an action.

In my works, I tried to follow and strengthen the beliefs of D.B. Elkonin [20; 22; 23]. There the construction of an image of the unfolding of an action acted as a statement by the child himself of the boundaries of the natural form of behavior ("natural aspirations"), and this statement was built as a return to the adult of his words of warning in a boundary situation ("ouch-ouch-ouch", "no-no-no", "this way-not this way"). Such reversibility is a condition for signifying the situation

[2] The initiation of direct-emotional communication in infancy, understood as pre-communication, also requires overcoming the infant's reflexive reactions [22].

[3] The 'triplet' of 'Was-Is-Will be' are the key words of B.A. Arkhipov in understanding the evolution of corporeality in ontogenesis [1].

[4] Also understood not as an externally provided 'task' but as a form of cultural behavior.

[5] S.L. Rubinstein calls for a distinction between "required" and "unknown" in problem solving [13].

(the field of action). It is important that an adult, while addressing his word to a child, at the same time carefully, as if probingly, and not "imperiously" acts with the child's body[6] [1]. This adult action can be called a gesture action. The word of an adult emphasizes the compatibility of actions and only in this way there is a chance of the child signifying his behavior in the reverse appeal to an adult.

III

What has been said should be preceded by the question hidden in the above-mentioned studies about the conditions of "wedging" the intermediary into the behavior of the "mediated" (student, child) — the question of the conditions of construction, in the words of D.B. Elkonin, of Cumulative Action. And here it is important to understand and analyze not only the successful actions of the child (the "luck" of mediation), but also the way of "turning" the child's behavior initiated by an adult — a way of building a Cumulative Action.

In the observations cited by D.B. Elkonin and me, the act of mediation was carried out by an adult partly intuitively. But in understanding the structure of the experimental genesis, that is, the device of the Intermediary Act, analytics and a description of the device of the Mediator's way of thinking are necessary — the way of the method of design and solution of the MA problem. It is necessary to say what and how the Mediator sees and how he forms this vision by engaging in the action of his "subject" (child, student), building his presence in it.

Footnote: See an example from an article by D.B. Elkonin about how a grandmother teaches her grandson to get off the couch [25 p. 135]

IV

The stated vision, firstly, and, secondly, the very method of inclusion, "wedging" into the behavior of another person must have different, but related forms, since they are constructed from different Positions. It is one thing to consider from the outside, when the behavior unfolds before you and it is necessary to catch in some language its very unfolding, and another thing is to pertinently enter into the very reconstruction of the unfolding behavior itself. The observation must be displayed in the construction-reconstruction of the observed — the language of description in the consideration of behavior and the language of its reconstruction must communicate, connect with each other. And the main thing here is to find the language of action unfolding in its difference from the language of description of action, as if it has already been done.

Thus, for example, the notion of an action in terms of "motive-goal-method", to the extent that it is required to understand the very possibilities of becoming, unfolding an action, requires an understanding not only of what "goal" and "motive" are and what their features are, but also the way in which goal and motive are maintained or changed in the acts of constructing a mode of action. Only here and so — in the retention or reconstruction of the Meaning of action in its Method, the correlation of Motive and Method (according to D.B. Elkonin, the essence of the action, taken in its development in the periods of childhood [25, pp. 60—77]) will become revealed. These are the requirements for the description of living reality, which presupposes both its consideration and "entry" into its unfolding as a form of presence in its vitality.

And again: the analytics of the form of some already manufactured and pre-given product (whether it be an action, a story or a construction) is not analogous to the analytics of the very process of its cultivation itself. It is very doubtful whether for example, a remarkable analysis of I. Bunin's short story "Light Breathing" in the work of L.S. Vygotsky's "The Psychology of Art" [3] can mediate the very writing of short stories[7].

From what has been said, one of the key questions follows: "How does the Mediator's vision of the actions of another person arranged?" But such a vision, which mediates the presence in the formation of action. What is his, specifically his — that observer of behavior, whose task is to include the form of observation in this behavior itself — language of its comprehension? Or, in other words, how is the positioning of the Mediator, his comprehension of his Place, arranged?

V

In his joint article with B.A. Arkhipov [1], B.A. Arkhipov's way of describing the structure and evolution of a child's living corporeality was "tested" in describing another reality-the reality of unfolding Action-the transition from the Past to the Future through the Present. In this article, Action functioned as a relationship of its "Axis," "Supports," and "Field"[8]. Axis, Supports, and Field were presented as the language of Anthropotechnical Action.

The Axis was understood as the conception of the deployment of the Semantic Field of action (building a house, drawing a picture, etc.) — as a certain ideal "line" setting the process (saturation of the time of action), i.e., holding the direction in "turns" of action's realization.

Thus, the Axis was understood as a requirement for accomplishment, and it is in this sense that retention or

[6] See example from D.B. Elkonin's article about a grandmother teaching her grandson to get off the sofa [25 p. 135].

[7] In "Towards a Philosophy of Action", M.M. Bakhtin argues that ethics as a science ('research') cannot pretend to be an analysis of living action itself [2].

[8] "Supports" and "Fields" are P. Ya. Galperin's key words in describing orientation activity [6].

reconstruction of the Axis becomes the goal of action orientation (namely orientation, not fulfillment in accordance with the predetermined image of what is required)[9]. In actions requiring mediation, the direction is constructed and reconstructed, and does not exist in advance; it contains the hidden modes of sought-for action.

The retention and deployment of the direction of action are carried out in a certain Space of Possibilities — the Field as a kind of topic[10] that sets the possibilities of accomplishment together with its "turns" in which it is required to retain the direction[11]. The Field is the Space of Possibilities of action. Supports are the means (e.g., reference points) with the help of which the Field of Action holds its Conception (Axis). The Field of Action is a composition of Axes.

However, once again: the Axis, the Field, and the Supports will become reference points for the Mediator's "entry" into the other person's action only when the way-process of their mutual construction becomes the subject of his "imagination" (embodiment into the image).

In the above descriptions of the construction of subject actions in early childhood [25; 20; 23], the purpose of the adult is the reconstruction of the axial beginning of directly resultant action, i.e., reconstruction of the natural form of action in which the Axis is as if the identity of directions of "gaze and movement"[12]. Exactly in this reconstruction — in comprehension-testing of the adult's gestures-words — that the child still distinguishes the implicit boundaries, i.e., requiring special mastering of "intervals-bonds" of their movements.

VI

The initiation of the construction of the Axis, Supports and Field is required in the Mediator task. What is sought is the objectivity of the act of mediation — the initiation of search, probation and testing of their coherence. It must be obvious that the Axis is represented in the Field of action, and the supports exist exactly in the way of this representation. A child, on the contrary, acts straightforwardly, not cognizing and not creating the way of this representation — not building a system of Supports. The nature of the pattern of action, with which an adult "wedges" into the activity of a child with the words-gestures "that, not that", is the very way of displaying the Axis in the Field — the structure of the "area" of a child's aspiration and thereby initiation of the probation-testing of the Supports as the "bends" of Axes. It is here where a child discovers the shown boundaries of significant aspirations — "natural" activity is transformed into the mastering of the Pattern of unfolding Action. Human action takes place not in the "environment", as a self-sufficient presence of the reaction, but in a certain "X-field" [19, p. 216—220] of mutual mappings of its Axis, Field and Supports[13]. These interactions can be called "internal patterns of action"[14]. Revealing and initiating the probation of the ways of these displays in the Aggregate Action is the key sought for Mediation.

Apart from that, it should be noted that the method of representation of the Axis into the composition of the Supports (Field) is "caught" and identified as being sought in the so-called "tasks for consideration" ("creative tasks"). Their intrigue lies in the "provocation" of the commission of action according to an already known and unconscious pattern, which secretly connects the Axis and Supports in the provoked Field of Action. In mediating their solution, the experimenter, with the help of special sign-symbolic means, had to initiate the search-identification of these hidden patterns-modes of action and their transformation in the materials of the problem itself [18]. Here such a transformation appears as a creative act. Also, the Aggregate Intermediary Action is a Creative Act, an Event of revealing and reconstructing the inner form of action — the hidden relations "Axis—Support—Field", defining the Space of Action Possibilities.

VII

Previous descriptions and judgments were limited to the assumption of the place of mediation only in a "separate" action. It is necessary to consider MA (mediative action) in the evolution of action — inclusion in a larger context.

For example, my daughter, having learned to carefully overcome obstacles, while repeating the word "like that" addressed to me, subsequently built her own space of opportunities for her free movement [20]. In this larger space there were limitations which were not previously encountered in a "separate" action. Curbs at the transition to the carriageway, i.e., a new type of borders could be such limitations. Here a new warning arose, a new "like that—not like that", "yes—no", which

[9] So, for example, when I am writing this article, I am not given an image of its end; the finality, the accomplishment of the article is not just set by the last word, phrase or paragraph.

[10] Not 'metric'.

[11] For example, when walking in the forest using a compass in search of mushrooms, you may encounter bogs, blocked trees that you have to avoid, but you have to go around and return to the direction indicated by the compass - without straying from it.

[12] Very clearly the reconstruction of the action axis came out in D.B. Elkonin's description of how a grandmother taught her grandson to get off a sofa with his feet rather than face down [25, p. 135].

[13] Here we can say, in L.S. Vygotsky's words, that the Axis itself is the Fabula of the action, and the way the Axis is reflected in the Field of Action is its Plot [3].

[14] By analogy with the "inner form of the word" analysed in the works of G. Speth [17].

have a different meaning — a different reason for changing the rhythm of walking. In the process of teaching how to play musical instruments, rhythm, intonation, the way the note sequence is played — change during the transitions from the scale to the performance of a musical piece.

In Development-aimed Teaching (DAT), the notion of generalization — the formation of a class, i.e., fields of objects — is introduced through modeling. The foremost concern of the teacher is the construction of a model (scheme) of a class of objects. We can say that generalization is retained in modeling (the construction of the concept is retained). Modeling (scheme) is the axis of scientific conceptuality. The next step is when the teacher moves to the "expansion" or other change of the class of objects — a new Field — the teacher initiates testing and, if necessary, changing of the model [15; 16]. The model becomes the Basis of generalization.

There are many similar examples, and these are examples of changes in the Design (Semantic field) in the evolution of action [12]. It is in these changes of Meaning, along with the changes of Space of Possibilities (Fields), that the transformation of what was previously an Axis into a Basis of Action should take place. It is important that such changes — changes in the chronotope of action — require special probation-testing of the "former" axis for its "basis-likeness", require a new initiation of orientation[15]. With such changes, the action that "turned into an operation" (in the terminology of A.N. Leontiev) is resumed and transformed. Sequential changes of the Field in the evolution of the action — the place of MA — the place of initiation of probation-testing and reconstruction of the Axis display in the Field.

Here, in the construction of a new Field of Action, requiring the transformation of the Axis into Basis and a change in the way of building the Basis itself, that the meaning of interiorization is revealed. Interiorization can be fully understood not in the construction of a "separate" action, but in the development or evolution of an action — the emergence of its new Axis and, accordingly, the way it is displayed in a different Field of Action. It is likely that it is in such transformations that the actual "Activity" "matures" (this can be traced[16] to the examples of the formation of the so-called "leading activities").

VIII

The question of overcoming-transformation of a mode of action as a hidden display of the Axis in the Field in the so-called creative act or in one`s language (Productive Action) has already been partly discussed above [21].

This overcoming-transformation was revealed in the above-mentioned laboratory experiment on the method of mediating the solution of special "creative" tasks. The limitations of this experiment lie in the fact that what was proposed was a ready-made problem, moreover, a problem having only one correct solution. This correct solution proved that the creative act was made[17].

In the cultural practices of creativity (scientific, artistic, etc.) there are no ready-made, "provided" tasks and their unambiguous solutions. What then can prove that the creative act has been made? I believe that this proof can be the fact of the "capture of the public" (viewers, readers, listeners) by the intrigue of overcoming-transformation of hitherto considered universal models of action, i.e., the intrigue of revealing new space for action.

Such is the essence of the "friend and foe distinction" — where friend confirms or approves of the meaning of what was done. This approval shows that what has been done can become the Support of a new "road" of the Creator — a new Axis (of ideas), as well as confirmation that the Creator is able to build a new Field of Action[18]. In Productive Action, the methods of correlating the Axis, Supports and Field and their confirmation is revealed most fully and extensively.

To summarize:

1. The task of PA is to initiate the identification and reconstruction of the internal form of action, i.e., of a hidden image that starts the action, and builds a new image of its development.

2. The solution of this problem requires the correlation of two Positions — two forms of the presence of the mediator: firstly, the way to consider the development of an action and, secondly, testing the way of its development in the way of reconstructing.

3. Considering action development — creating the image of its development is built in the language of understanding of actions as correlations of Axis, Supports and Field.

4. Revealing of the objectivity of the specified correlation in the form of initiation of the way of mutual display of the Axis-Fields-Support is the essence of PA.

5. The essence of PA is carried out and revealed in the Time of the Development of Action.

[15] In the book "Child Psychology" D.B. Elkonin wrote: "Any new step in development of independence, in emancipation from adults is simultaneously the emergence of a new connection of the child with adults, with society". [24, c. 16].

[16] See the above example of the development of modelling in the evolution of Learning Activities.

[17] And in some cases the catharsis that accompanied it.

[18] In the above examples of Mediating Actions, overcoming the implicit boundaries of the field acts as an appeal: the child's appeal with his/her action-word to the adult (Mediator) and the child's repetition of the adult's praise (evaluation) [24; 19].

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Cultural-Historical Activity Theory and its Contemporary Import: Ideas Emerging in Context and Time

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Alexey N. Leontiev's legacy — as part of cultural-historical activity theory — is discussed as an open-ended, dynamic, and *continuously emerging* system of ideas. The meaning and import of these ideas are becoming transparent in the context of contemporary *conceptual revolution* in psychology. Various trends within this cutting-edge movement have converged on the notion of relationality — in opposition to traditional "substance" metaphysics that posits self-contained, independent entities as the exclusive analytical focus. CHAT is revealed to be a *pioneer* in this conceptual revolution, contributing conceptual advances such as on embodied, situated, distributed, and enacted cognition/mind and on a (non-dual) "natureculture." In CHAT, human development is an open-ended, dynamic, non-linear, and ever-unfolding, that is, *emergent process* with no preprogrammed blueprints. This process is composed of embodied bi-directional interactivities of persons-acting-in-the-world, embedded in fluid contexts — soft assemblages contingent on situational demands and affordances. Moreover, CHAT foregrounds *collective dynamics* of meaningful shared activities extending through history as a unified onto-epistemology of human development and mind. In addition, CHAT also offers, in outlines, steps to move beyond the relational paradigm towards a transformative worldview premised on the notion of a simultaneous persons-and-the-world co-realizing.

Keywords: situated, embodied, enacted, mind, cognition, dynamic systems theory, nature-culture, nativism, Vygotsky, Leontiev, Marx.

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Культурно-историческая теория деятельности и ее современные смысл и значимость: Идеи, растущие в контексте и времени

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В статье анализируется теоретическое наследие А.Н. Леонтьева (как часть культурно-исторической теории деятельности), понимаемое как динамическая, развивающаяся, *живая* система идей. Смысл и значимость этих идей развиваются постепенно становятся яснее в контексте современной концептуальной революции в психологии. Разные направления этого радикального движения сходятся на идее соотносительности (relationality) — в оппозиции к субстанциональной метафизике, которая полагает дискретные элементы единственным уровнем анализа. Показано, что КИТД является пионером этой революции, сделавшим ряд важных открытий относительно телесной воплощенности, ситуационности, распределенности и деятельностного характера познания (ума; mind), а также нондуальности «культуроприроды» («natureculture»), отменяющей постулаты врожденности. В КИТД познание понимается как открытый, динамический, не-линейный и постоянно развивающийся, то есть *эмерджентный,* процесс без каких-либо преднастроек и предзаданных рамок. Познание состо-

ит из непрерывых взаимопереходов между полюсами единой системы — «человек-действующий-в-мире» — встроенной в постоянно меняющиеся контексты, т. е. как «гибкие сонастройки» («soft assemblages»), зависимые от ситуационных потребностей и возможностей. Более того, КИТД полагает коллективную динамичность осмысленной совместной деятельности в ее историческом развитии в качестве единой онто-эпистемологии развития и познания. В дополнение к этому, КИТД намечает, в набросках, выход за пределы парадигмы соотносительности в направлении *трансформационного образа мира* (или мировоззрения; *transformative worldview*), основанного на идее симультанности и недихотомичности процесса *со-реализации человека-и-мира*.

Ключевые слова: ситуативный, телесный, энактивный, познание, разум, динамический, природа-культура, нативизм, Выготский, Леонтьев, Маркс.

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Introduction

In this article, I discuss Alexey N. Leontiev's legacy and ideas as their meaning and import are *continuously emerging*, and gradually becoming more transparent and conceptually rich, in the context of contemporary psychology and related fields, especially as regards a number of recent cutting-edge trends and directions. Note that I consider Leontiev's works to be a continuation of Vygotsky's cultural-historical theory, as the next step in its development, within what I take to be a unique and essentially unified (though not without some internal contradictions and ruptures) approach — the cultural-historical activity theory (CHAT; see [31]; [45]; [49]; [50]).

My main thesis is that CHAT was actually developed ahead of its time, as indeed a "visitor from the future" [6, p. 15] and, accordingly, it is only recently that the conceptual and analytical contexts are emerging wherein its deep implications and full potential can be grasped and truly appreciated though no one final, "correct" interpretation is implied (for methodology of historical analysis, see [45]; [48]). In other words, at the time of its creation, the CHAT authors were developing a truly novel approach and telling a *new story*, against the grain of existing customs and even the language available to tell it in. At the time, theirs was a lonely voice interacting with few interlocutors on a par with their level of work, as yet without a chance for a full acknowledgement of its depths. This especially relates to the import of CHAT's unique philosophical (metaphysical or worldview level) premises and conceptualizations — namely, those concerned with the very nature of human development; closely associated ideas about human mind and its role and place vis-à-vis the world/reality (ontology) including as pertains to processes of knowledge production (epistemology). These philosophical premises and conceptualizations, in my view, though often left un-explicated, inevitably define all other layers of theorizing — such as specific concepts, theories, and methodologies. However, even if these broad premises remain unarticulated, they still are powerfully present throughout, like the deep oceanic currents which, though buried within the ocean's depths, define and shape all of its layers and its whole dynamics [34; 38].

There are several trends and directions that became especially pronounced and influential in the past couple of decades, across several disciplines and fields including psychology, that are making the CHAT's broad import more amenable to understanding, articulation and communication. Indeed, what has taken place in the period since the time of the CHAT's inception and into today is a remarkable shift — indeed *a conceptual revolution* — that we are currently witnessing (if we follow with the general trends). These trends and directions have converged on the notion of relationality of human development, in opposition to traditional "substance" metaphysics that posits self-contained, independent, discrete entities as the prime, and basically exclusive, focus of analysis. There are diverse roots and many versions of these relational approaches, yet the core focus on *processes and relations* and their uniquely *developmental dynamics*, instead of entities and static forms, unites them at the most basic level. Closely associated is the trend of breaking away from all sorts of Cartesian dualisms — such as that of persons versus the world/context, of mind versus body, and of thinking versus acting/doing.

Remarkably, CHAT can be seen to be a *pioneer in this conceptual revolution*, as this collaborative project clearly championed a de facto relational, process-based approach to human development (without necessarily using these terms), practically among the first voices in psychology. Furthermore, CHAT also can be seen to develop a strong foundation for a non-dualist treatment of the mind, specifically positing it to be a facet of embodied, situated interactivity of shared social practices. In addition and quite critically, CHAT provided unique contributions to this revolution that are still to be absorbed by and acknowledged within its contemporary currents and beyond [33; 37; 38, 39]. These cutting-edge contributions include acknowledging the cultural-historical nature of specifically human developmental dynamics as having to do with collaborative, historically concrete, culturally mediated, and socially distributed practical activities (collective praxis) forming the onto-epistemological foundation of human life and society,

essentially lying at the core of all that makes humans human. Moreover, CHAT also opened, in outlines, several avenues to move beyond relational paradigms into a transformative worldview premised on the centrality not just of relational processes but rather, those of incessant agentive social transformations carrying these processes always into the future, in a forward temporal motion [35; 38; 43; 44; 45; 46; 47]. In my view, these contributions need to be spelled out, explored to their logical conclusions and implications, as well as further developed — all of this not without critical reflections on CHAT's gaps and internal contradictions (since it cannot and should not be presumed that this theory did not have these).

What is needed to achieve this goal is a nuanced conceptual/metatheoretical approach combining philosophical and historical analysis with that of a psychological one. Such an approach needs to deal with often implicit assumptions and habitual ways of thinking that operate, implicitly for the most part, in extant theories and methodologies — so deeply ingrained and tacitly presupposed that they often go unnoticed. What is needed, also, is an approach that not only champions new ideas but at the same time resolutely rejects the old ones, clearly demarcating the necessary shifts away from them. This task cannot be disregarded, given that (to paraphrase John Maynard Keynes) the real difficulty in changing the course of theorizing lies not in developing new ideas but in *escaping old ones*.

Historical and Analytical Contingencies in the Development of CHAT

Any theory of and research into topics of human mind inevitably rest upon specific (though often implicit) grounding metaphysical assumptions about human beings and human nature — that is, about the very type of beings that humans are and how they are situated in the world, necessitating also ideas as to what the world/reality itself is [29; 38]. These metaphysical assumptions are rarely acknowledged in psychology, owing largely to a widely accepted allegiance to experimental, positivist models of science [57]. Before spelling them along with the CHAT's overall import, and how it is presently emerging, it makes sense to consider cultural-historical, political, and analytical circumstances that so far hampered this task.

First, the foundational works in CHAT, especially by Vygotsky, did not represent a clear-cut, fully-fledged, systematic, and therefore also easily discernible, system of principles and categories. There are several, far from random reasons for this, in addition to the most obvious one — that Vygotsky died quite young and did not have a chance (unlike Piaget and Dewey who both lived into a very advanced age) to summarize, explicate and synthetize his ideas in a reflective stance. Indeed, Vygotsky apparently worked at a frantic pace, relentlessly pushing forward with developing his ideas while constantly revising them along the way, without pausing for much of a cumulative synthesis. In addition, the very style of Vygotsky's writing is not conducive to formalizations and systematizations because conceptual definitions, analytical precision, strict formal-logical argumentation, systematic classification, meticulous attribution of sources, and similar analytics were not among his favored methodological tools. Instead, he often used metaphors and poetry, and a sort of an impressionistic interpretive style of an "intuitive aperçu" [6] and intertextuality (later elaborated by Mikhail Bakhtin and Julia Kristeva). Vygotsky made frequent references to diverse scholars, writers, and poets, freely bringing them into dialogues and borrowing from them—all of these a source of much difficulty for adherents of scholastic methods (i.e., those purporting to go "by the letter" and stay close to texts, in imputing that meaning can be derived directly from these texts; for critique, see [48]). The style used by Vygotsky was no mere accident — in fact, it was indicative of Vygotsky's overall approach and method of theorizing, as prioritizing situativity, contingency and profound dialogicality of meaning making, the embedding and centrality of language *use* within cultural contexts, coupled with its dynamic interactivity and ineluctable intersubjectivity, paramount at every step in any language use including conceptual analysis. This method itself is in sync with the cutting-edge trends in psychology and related fields discussed in the next section.

As to Leontiev, his style was more systematic and he did endeavor to summarize and explicate core foundations of his works late in his life. However, his focus was more on conceptual developments *after* Vygotsky, in (understandably) his activity theory and thus, a full synthetic treatment of CHAT, as a composite framework combining insights from activity theory with those from cultural-historical theory, was not achieved.

Second, Vygotsky's works, and those of Leontiev and other core CHAT representatives (especially Davydov), were developed from deep philosophical foundations, especially those that they creatively appropriated from Marx. This by itself presents considerable obstacles to understanding core premises of CHAT by those commentators and scholars, especially in the West, who assimilate certain points from this theory, yet without engaging philosophical ideas at its core (with few exceptions). This philosophy remains scarcely explored since many psychologists and educators lack requisite specialization, access, time and, quite often, motivation — given that this is far from what the mainstream standards are. The philosophies engaged by CHAT founders — especially that of Marx but also Descartes, Spinoza, Kant, Hegel, Husserl, Humboldt, Bergson, among others, are notoriously difficult to understand (being often misrepresented; see [8]), affecting how CHAT works have been understood and applied [34]. This is exacerbated by errors in translating Vygotsky's writings, vicissitudes of his brief career (as already mentioned), and that few researchers have time for a systematic study of its broad corpus of ideas, methodology, history, sociocultural context, and political-ideological ethos.

One additional complication is that Marxist philosophy, in particular, is exemplary complex due to its analytical intricacies coupled with its supremely political and highly contested ideological nature. Moreover,

Marxism is a uniquely open-ended system of views, itself changing with time and context and allowing for many interpretations and understandings (as well as misunderstandings) — as a sort of a ''dissipative structure" (to use Prigogine's term) that does not have an "essence" but instead, only exists in conjunction with a particular historical time and place.

To illustrate, Marxism existed through its history and till today mostly in a format of continuing clashes and radical disjunctures among its many sharply discordant versions — often in a fierce opposition to each other (likely a sign of this philosophy's inherent diversity and vitality). Thus, there is arguably neither one "correct" set of applicable Marxist ideas, nor one method of assessing their relevance. Importantly, for political-ideological reasons Marxism became either suppressed in the West (with few Western philosophers specializing in it) or turned into a rigid canon in countries having Marxism as their official ideology. Though exceptions exist and there have been significant developments in both contexts, this philosophy remains one of the most marginalized, contested, and scarcely understood. Till today, it is typically criticized within mainstream philosophy (trickling down into discussions of CHAT) for being mechanistic and economistic, or ideologically utopian and teleological. Note that there recently is a growing interest in Marxism all over the world due to the global sociopolitical and economic crisis, coupled with a resurgence of realism and materialism in fields such as sociology and anthropolgy, leading to its veritable *renaissance*. Existing works applying insights and tools of Marxism to interpreting CHAT (e.g., Engestrom, Jones, Newman & Holzman, Ratner) have been hardly sufficient, for various reasons. This includes that many of them almost exclusively focus on Vygotsky rather than the whole corpus of CHAT and, in addition, they often eschew deeply seated meta-level issues of ontology and epistemology. In CHAT's own homeland, given complicated attitudes to the Soviet past, and accordingly also to Marxism, philosophical discussions of CHAT predominantly turn to any philosophical legacies *but* Marx, such as Spinoza [e.g., 21].

The third reason for complications in understanding CHAT is that this perspective was developed as a multidisciplinary approach. Indeed, the key works in CHAT were drawing together ideas not only from philosophy, psychology and education but also biology, physiology, ethology, anthropology, neuroscience, and evolutionary theory — all coupled, in a peculiar blend, with those from sociology, ethnography, literary theory, semiotics, linguistics, and cultural studies. Vygotsky and to some extent Leontiev had background and knowledge in all of these disciplines, in the old tradition of an "encyclopedic education"; they also both spoke several languages and were avid followers of developments in psychology and other fields during their time, from all over the world. Toulmin [53] aptly observed that Vygotsky (this at least partly applies to Leontiev, too) was perhaps the last of *consumptive geniuses*. In the reception of these works, however, scholars typically apply their own disciplinary lens, interpreting CHAT within particular fields such as education, psychology, and studies of literacy, among others. This has led to a certain narrowing of interpretations so that CHAT became assimilated in a somewhat disconnected way, without much of a synthesis across diverse fields of their application, in sharp contrast with the initial CHAT works[1]. As a result, many contemporary interpretations of these works present their fragmented (albeit important) aspects — such as cultural mediation or the zone of proximal development — rather than its underlying worldview and philosophy. Just as many other broad theoretical systems, Vygotsky's theory and CHAT at large are typically interpreted in a piecemeal fashion, after they have been split up. As a result, what has passed for discussions of CHAT was often a series of exchanges in which misconstruals of this theory were met by refutations of each particular misconstrual, whereupon a fresh set of misconstruals took their place (cf. Chapman's analysis of Piaget's reception; see [3]). This is not to negate many important breakthroughs and advancements that came out of (or in association with) integrating CHAT's insights, in works of leading scholars such as Jerome Bruner, Urie Bronfenbrenner, Barbara Rogoff, Michael Cole, Yrjo Engestrom and others.

Fourth (as the last but not the least important cause of complications),the years when Vygotsky became especiallypopular in the world — during the 1990s and into the first decade of the 21st century — can be seen as a distinct and rather peculiar historical period. This was the time marked by the "end of history" ethos — a broad sentiment that the time for radical social projects was over and that Marxism, as a philosophy associated with such projects, has outlived its potential. Indeed, whereas through the 1980s the goal of radical social changes was still seen as viable, by the end of that decade the major debates have moved on to focus on multiculturalism and globalization, in sync with changes brought about by postmodernity. As Laclau and Mouffe [16, p. vii] wrote, reflecting on precisely this monumental and quite dramatic shift, "the 'short twentieth century' ended at some point in the early 1990s *and the world moved on to a different new order*" — that of a perceived stability and political acquiescence with a supposedly inviolable status quo.

Moreover, not only Marx got sidelined in this "new world order." Another development of the same period was the climaxing of the "end of theory" attitudes — a pronounced strong suspicion of what was (and still is) perceived to be an old-fashioned "grand" theorizing. Such theorizing was always out of favor with the positivist science; however, what has been added to this by the postmodern scholarship of recent decades, reaching

[1] Note that, typically, education at US universities is highly specialized and students of psychology and education at a graduate level often are not exposed to courses in philosophy, sociology, biology (except for neuroscience students), and other disciplines outside of their major specialization, while the bulk of time is taken up by statistics courses.

its peak in the 1990s, was that this style of work became viewed as totalizing, imposing rigid standards of truth and undermining the politics of diversity — as indeed they often do, albeit especially in the context of the western enlightenment tradition.

Mainstream psychology, unfortunately, has been "ahead" of other fields in staunchly promoting atheoretical, ahistorical, and decontextualized approaches (likely due to the behaviorism "spell" that never left psychology). Accordingly, most mainstream psychologists have been calling to cast aside the big issues such as nature and nurture, continuity and discontinuity, mind and matter. Few voices have sounded alarms on this situation, and to no surprise they included scholars working in Vygotsky's tradition (e.g., Bruner). Responding to this dominant attitude, a leading scholar of recent years, Esther Thelen, whose own approach was recently described as "a new grand theory" [30], found it imperative to state:

> ..we need the *big picture*. We need to grapple with *the hard issues at the core of human change*... We must use...bold visions to probe deeply into the mystery and complexities of human development and to articulate general principles that give meaning to so many details. [52, p. 256; emphasis added]

However, against the grain of various contextual-historical contingencies and complications, and of the ever-present dominance of positivist ideals combined with postmodernist influences (on the other pole of the spectrum of views), there is a strong movement in psychology crossing into adjacent fields such as sociology and education — a veritable *conceptual revolution* — creating a context to better understand CHAT and its innovative potential and import. These are the topics addressed in the next section.

The Current Landscape: Persisting Problems and New Developments in a Conceptual Revolution

To understand what CHAT is contributing to contemporary psychology, it is imperative to review its present landscape, including its persisting flaws, to then proceed to recent advances that challenge these flaws. It is remarkable that Vygotsky presciently saw the very core of the situation in psychology during his time, in the first decades of the 20th century. Even more to the point, his estimation is as relevant today as it was almost 100 years ago, since the same trends are still continuing. Namely, Vygotsky [54, p. 283] wrote in his last work, *Thinking and Speech* that extant psychological theories have clustered to form two diametrically opposing groups that "oscillate between the poles of pure naturalism and pure spiritualism."

The presently reigning theories continue exactly along this same dual path. As part of mainstream approaches, there are three persisting (and partly intersecting) orientations to view the mind and psychological processes. The first one is treating them as either by-products of brain or, in a modification of this same position, as simply epiphenomena directly reducible to brain processes and, thus, in both cases without their own status as objects of investigation (on biological eliminativism, also known as brainism, see [1]). Indeed, practically all of neuroscience research rests on the bedrock assumption of reductionism — the belief that all behavioral, experiential, cognitive, and emotional processes are rooted in neurobiology [32; 38; 39; 40]. In my view, it is especially the 1990s and the first decade of the new millennium that witnessed the unabated march of biologically reductionist views expanding without much resistance — with evolutionary psychology and behavioral genetics, for example, mustering much appeal — while sociocultural approaches entered a state of a (relative) disarray.

The second orientation is to treat the mind as an "internal mental realm," that is, an original (and as yet quite mysterious) reality sui generis "in the head." This realm of mental processes, further, is viewed as de facto autonomous and separated — that is, ontologically different — from the worldly processes and dynamics of material practices, social interactions, embodied interactivities, cultural contingencies, vicissitudes of everyday conduct, behavior, and other "this-worldly" phenomena and processes. The content of the mental takes various forms such as "mental modules" for memory, thinking, attention, language and so on [4]. This inner space or mental "arena" is further posited to be the subject of the "mind's eye" inspecting images, ideas, and representations passing before it [1; 11] in a disembodied Platonic form.

This is true even when mentalist views are furnished with more contemporary notions of computation drawn from understandings of how computers work. As Narvaez et al. [25, p. 430] recently summarized, "computationalism's basic refrain has long assumed axiomatic status within many if not most psychological circles: all acts of cognition, even in their most rudimentary form, involve information processing functionally akin to what digital computers do." Similarly to mentalism and brainism, the computationalist doctrine posits cognitive processes to be located between organism's sensory inputs and behavioral outputs, essentially drawing a gap between these. Importantly, as Bidell [4] observes, even for philosophers and psychologists who do not subscribe to the idea of a mental substance/theater, the notion of a separate mental realm has persisted as a viable model. Indeed, most mainstream psychologists would protest that they are not Cartesian mind-body dualists, yet in terms of their de facto epistemology and methodology they remain committed to exactly this position [7].

A related third tendency is to see all psychological processes as rooted in inborn characteristics and capacities contained in and driven by genetic blueprints and programs. This amounts to no less than "the resurgence of extremist biological determinism laden with mythic gender [and other types of] assumptions" [24, p. 411]. For example, concepts such as *instinctive, innate,* and *hard-wired* behavior are popular in psychology across the

board, also polluting much of public discourses. This is by far not an exception — indeed, most major directions in psychology through its history have been mired in nativism. This includes psychoanalytic theory's notions of drives, instincts, and needs primed by inborn blueprints; ethological theory's notion of instinctual patterns; and behaviorism's inborn learning rules.

Critical to all of these trends is that the everyday, the practical, the common — such as the ordinary conduct of life and mundane, daily events of human acting and interacting (e.g., picking up an object; walking, cooking etc.) — are viewed as somehow disenchanted, mechanical, superficial and far removed from anything "mental" presumed to be of a totally different *kind* of a phenomenon. It is one of the major epistemic fallacies of modernity — and indeed of the eurocentric framework overall — that it draws this stark barrier between the everyday activities and the ostensibly higher-order, superior and "privileged" phenomena that supposedly happen "inside the mind." Costall and Leudar [7, p. 292] put it well:

> Modern psychology has taken over from neo-behaviourism an official conception of behaviour which disenchants behaviour and equates it, instead, with "colourless movement," ultimately separable from any wider 'context' and devoid of inherent meaning and value... Given this dualistic conception of behaviour, the mental could only be relegated to a hidden realm, concealed *behind* behaviour, and related to it in an arbitrary, rather than constitutive, way.

The stubborn persistence of mentalism, brainism, and nativism — and how difficult it is to break their spell — suggests that not merely academic, conceptual issues are at stake; instead, what might lie beneath is the fear of *ethical*-political consequences. Namely, this might be about the dangers of what happens if the mental (the intellectual) is not prioritized over the practical and the everyday such as mundane practices of labor (e.g., Miller [23], draws opposition between intellectual/rational pursuits and garbage collection). Many scholars indeed (to paraphrase Eagleton [10]) — typically privileged and engaged, as they are, in contemplation — are averse to the "unpleasurable" labor and look down at positing it at the center of human life.

Ironically, the study of psychological processes, as legitimate and central to psychology, has also been challenged from sociocultural perspectives in positing discourses, dialogues, interactions and other *collective* processes as the ultimate reality, also de facto wiping out psychological processes. These developments, in my view, throw the baby (the mind) out with the bathwater of individualism, mentalism and brainism. Indeed, excluding processes traditionally associated with individual levels of functioning — as if they were definable only in terms of autonomous, solipsistic processes "inside" the person — is itself a remnant of the dualistic worldview.

To emphasize again, these positions all come out of an investment in a particular philosophy, namely that of the internal and the individual: the mind is something inside each individual and, typically, is assumed to be pre-given from birth by way of genetic blueprints; it is disconnected from other people, sociocultural contexts, practices, and even from the body of the person who thinks, feels, and acts. Just behind the surface is a valorization of an isolated individual knower, existing essentially as a solo entity, secluded in the Ivory tower of one's own, typically intellectual and self-centered, pursuits withdrawn from everyday realities and practices including collaboration and dialogues with others.

These mainstream approaches — including brainism and eliminative materialism, disembodied mentalism, nativism and computationalism — are currently being challenged on several fronts. Even though emerging critiques are still not well coordinated, one broad line of challenges is represented by what is often termed relational approaches or relational ontologies. This includes Developmental Systems Perspective (DSP), Dynamic Systems Theory (DST), sometimes also termed Developmental Systems Theory [56], developmental contextualism, developmental psychobiological systems view, and relational metatheoretical framework [e.g., 20]. They all capitalize on relations between processes and entities involved in development, implicating the need to study development as it emerges *in relation to and as part of larger dynamic systems* involving individuals and their surrounds, as well as linkages to embodiment. Human beings, as all other organisms, are profoundly dependent upon, enmeshed with, situated in, and connected to their environment. Analyses of organism-in-environment — conceived as an overarching whole composed of relational processes that enfold both organism and the world — substitutes for analyses into separate and independent characteristics of organisms and environments.

As regards *nativism*, given their focus on emergence and change, these perspectives successfully challenge outdated nativist ideas about preexistent designs and genetic blueprints as purportedly explaining development [27; 51]. In a related line, Gottlieb's [12] *probabilistic epigenesis* emphasizes the holistic reciprocity of influences within and between levels of the developmental manifold (genetic activity, neural activity, behavior, and the physical, social, and cultural influences), focusing on the gene-environment coaction in the realization of all phenotypes. A number of innovative approaches to evolutionary psychology have been developed in this vein, promoting a dynamic, enactivist understandings [25]. Importantly, a number of radical positions on processes traditionally termed natural and cultural go beyond seeing these processes as merely interacting to instead dismantle this binary itself and move past the false "interactionist consensus" [see 37; 39; 41; 42].

As regards *mentalism* and *brainism,* in spite of the still reigning Cartesian dualism, newly emerging trends describe the mind as more than a brain artifact or a "mental theater." The most influential trends today are referred to as 4E cognition — grounding mind and cognition in the body and taking into account their embedding in contexts. Important works such as *The Cambridge Handbook of Situated Cognition* [28] and *The Oxford Hand-*

book of 4E Cognition [26] reveal a number of distinct, albeit partly overlapping, approaches — embedded, extended and enactive ones, along with distributed and situated ones.

These approaches reject interiorized, brain-centric notions of mind to instead focus on complex relations among brains, the bodies, and the world. The "extended" approach, in addition, extends the boundaries of what counts as cognition not only beyond the brain but also beyond the body — considering various material artifacts to be constitutive of the mind. Furthermore, proponents of enactivism make important moves to reject the foundational status of computation as grounding cognition [14] and, in addition, focus on action and behavior as constitutive of cognition. Situated and distributed cognition approaches are close in meaning as they, too, explain cognition in terms of relations between people and environments [e.g., 13; 17]. From this perspective, knowing is a dynamic process distributed across the knower, that which is known, the environments in which knowing occurs, and the activity through which the person participates in environments.

The overall message from these cutting-edge perspectives — especially, those that focus on individuals' *active involvement* in the world (e.g., [15], [51]; summarized in [1]) — is that the mind does not reside in the head, but has to do with functional relations distributed across persons and the environment, constituted by the dynamics of organisms acting in real time, engaged with worldly contexts' affordances and tasks [9]. The mind is necessarily embedded in current activity and, thus, is never a property of the organism independent of the immediacy of the here-and-now; it is "the momentary *product* of a dynamic system, not a dissociable cause of action...always in the service of a task" [52, p. 303].

CHAT as the Next Step in the Current Conceptual Revolution

The relational and 4E approaches bring across many extraordinarily important concepts and ideas. However, all their importance notwithstanding, many conundrums persist. This includes the need to articulate their ontological framework to allow for a coherent integration rather than an amalgamation that brings with it a "conceptual obfuscation" [56, p. 147]. Moreover, that the sources of development could be assigned to both nature and nurture, rather than to one or the other exclusively; that developmental resides not in one component of the whole, such as a genetic makeup, but in the interaction of all participating components; that endogenous and exogenous influences interact in numerous ways; that the mind is extended and enacted — these statements still need to be radically pushed to move beyond traditional ways of thinking. In particular, still missing is the attention to historically situated and culturally mediated developmental dynamics of embodied acting by people not simply as organisms but as *members of human communities*, who fundamentally depend on others for their very existence and, importantly, who live not simply in environments but in social, shared worlds composed of human collective practices evolving through history [38].

What is brought to the fore in CHAT is exactly the *collective dynamics* of meaningful shared activities extending through history — as a unified, ongoing, and continuous praxis — forming the onto-epistemological core of human development including that of the mind. This is about understanding, in Vygotsky's words, that "the process of mental development in humans is part of the total process of the historical development of humanity" [55, p. 39]. It is here that a continuity with Marx's core ideas becomes apparent, with CHAT taking on the very gist of this philosophy. Thus, the development and the "doings" of the mind are indelibly colored by what the persons *qua social agents of collaborative practices* are striving for in their situated pursuits and life agendas out in *the social world shared with others*. That is, the core idea (though not explicated by CHAT founders in all detail) is that the mind's development can be captured by positing a *unified dynamics* of human collaborative practices/activities as their core ontological foundation.

Based on this assumption, the traditional dichotomies such as those of mind versus body, ideality versus materiality, subject versus object, knowing versus doing are transcended by focusing on the *inherent dynamics* of social practices and their *emergent transformations* as a unique and indivisible (though not homogenous) realm that gives rise to human development and mind. Any and all capacities including psychological processes emerge not merely *within* but, more importantly, *out* of social practical relationships between people and their world, with both poles of this process being *assembled* (or constructed) in the course of their development. Situated at the *intersection* of people and the world, both poles are not only fully permeable and integrated through their relations but also, and most importantly, co-constituted and *brought into existence* within and through these relational processes of historical praxis, rather than them being self-standing, discrete (if even interacting), entities.

Thus, the most critical advance by CHAT is that, ontologically, the mind is understood to be constructed from the same "fabric" as all other cultural practices and activities — that is, from the "fabric" of collaborative (shared), purposeful activities and as a particular *type of such activities*. The faculties of the mind come about as human acting undergoes complex processes of development associated with the growing sophistication of interactions having to do with the use of ever more complex meditational means — culminating in unique *ways of acting* characteristic of human mind based in the use of language and other symbolic means. Importantly, these changes take place within an *ontologically seamless process* — albeit not without fractures, conflicts, and contradictions — of *activity itself* expansively developing and growing in complexity (i.e., becoming more interactively coordinated, structured, and organized). That is, development of the mind is conceptualized as the gradual transformation of socially shared, culturally mediated, fully embodied, and contextually situated activities into

the so called psychological ("internalized" or mental) processes *without positing any ontological breaks* between internal and external, individual and collective, practical and mental types of processes [2].

The mind in this non-discrete and non-dualist, dynamic and emergent account is neither a purely neuronal process inside the brain, nor a shadowy realm of mental representations in some mysterious inner depths "inside the head." Instead, the mind is an *instantiation of this-worldly activities* by embodied intentional agents — acting together within complex matrices of social practices, bound to the materiality of these practices' structuration and temporality including their cultural conventions and cultural tools (meditational means) as instruments of symbolization and interaction (Arievitch provides a detailed discussion, connecting to P.Ya. Galperin's works, see [1], [2]). In this account, the myths about the mind as a by-product of brain processes or a separate reality of internal representations, existing on their own and developing according to some idiosyncratic rules, is emphatically rejected. However, the developmental approach, at the same time, reveals how continuously emerging forms of cultural mediation and social interaction, and the respective *seamless developmental transitions across activity levels*, engender increasingly sophisticated processes that have been traditionally associated with a somehow separate "mental realm" [1; 2]. This account opens doors to understand phenomena of perception, memory, thinking and the like without any mentalist, individualist, solipsistic connotations. All of them are rendered to be forms of activity — whereby the mind/cognition is not something that we *have*, or something that *happens* "within" us but instead, something that we *do* and, moreover, do as agents of *collective practices of world-making*.

Moreover, in a significant advance over relational approaches, CHAT offers, in outlines, a way to more resolutely transcend the polarity between biology and culture, genes and environment, nature and nurture. In clearly identifying development *not* with the relations of genes (and other characteristics of organisms per se) and environments but, instead, with the specifically human ways of people interacting with the world — the collective, shared, historically situated and culturally embedded activities — CHAT is ahead of the recent advances in psychology. For example, Leontiev's (e.g., [18], [19]) critique of nativism, including two-factorial models of development, still stands out as a cutting-edge account.

An additional advance offered by CHAT, briefly, has to do with it making preliminary steps in transitioning towards a transformative worldview — an even more radical approach with many socio-political entailments and implications, as discussed in my works on transformative activist stance (TAS; summarized in e.g., [38], [46]). The core effort in these works is to capitalize on human transformative agency in ways that do not exclude it from material dimensions of the world in its full historicity. In my elaboration, this implicates understanding the world to be composed, in its ethical onto-epistemology, of collaborative practices extending through history and transcending the status quo, as the "world-historical activity" [22, p. 163]. Critically, each human being makes unique contributions to this collective activity (or praxis), inevitably changing its dynamic, and comes into being via mattering in it, thus co-realizing both the world and oneself, in a mutual spiral of a world- and self-creation, as *one process (duo in uno)*. That is, reality is understood in its unfolding and open-ended, dynamic historicity where the present is a continuously emergent process tied not only to previous conditions (as highlighted by many in CHAT) but also, most critically, to future ones as these are envisioned, committed to, and acted upon by people qua social actors of human collaborative practices and their collective history. The challenge addressed in thisapproach is how to stay on the grounds of materiality and collectivity as primary in engendering human development; yet, at the same time, to view human agency and mind (in their individual and collective forms, as a *collectividual* process, see [36]) as co-implicated and instrumental in social practices in their status of agentive/activist interventions in the course of collective history in its productive materiality.

Concluding Remarks

In the context of a contemporary conceptual revolution in psychology, the import and radical implications of CHAT are becoming increasingly clear and significant. They are emerging and growing, in the present and on a trajectory into the future, as if they are alive, rather than some dead remnants of the past. The voices of Lev Vygotsky and Alexey Leontiev, hopefully, can now find more resonance and acknowledgement within the international community of scholars interested in novel approaches to human development and the mind. This observation brings the radical message about the mind — as historically specific, contextually situated, practically relevant, and endowed with meaning in contexts of its use and application — to bear on our understanding of knowledge and ideas including theories as, indeed, *dissipative structures* open to change and growth and highly contingent on context.

Given CHAT's resonance with cutting-edge advances in contemporary psychology, including in DSP, DST and 4E cognition approaches, its meaning and import are revealed with more clarity — as indeed the voice from the future. In CHAT, human development is an open-ended, dynamic, non-linear, and ever-unfolding, that is, *emergent process* with no preprogrammed rules or blueprints and highly contingent on context. Moreover, this process is composed of embodied bi-directional interactivities of persons-acting-in-the-world embedded in fluid contexts — that is, softly assembled and contingent on particular situational demands and affordances. These demands and affordances are themselves fluid, soft-assembled, and ever-emerging as but another pole on the same continuum of embodied interactivities.

Thus, from CHAT's perspective, all forms of knowledge and other products of the mind can be seen as *practical acts* in the world made of the same "fabric" as all other social practices and serving as an important step in

carrying them out. That is, knowledge has its grounding, mode of existence, and ultimate raison d'être in its practical-ethical relevance within ever-emerging collaborative practices and projects. In this sense, knowledge is an alive, generative, and deeply historical process, both social and personal at once, imbued with human values, ethics, and politics, wherein the past, present, and future are interlinked and mutually arising [45; 49].

Theories, ideas, and knowledge in general are all alive — they are born, they grow, evolve and change with time, they certainly also can die at some point in time — as living and almost breathing human creations, contingent on *how they matter* in people co-realizing the-world-and-themselves. And, of course, their fate comes down to us, to a collective effort that can help them to emerge, to continue living and breathing, now and into the future.

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Tools to Study Behavior and Activity: Psychologists' Inventions as a Component of Cultural-Historical Process

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Specially designed cultural tools of psychologists' and ethologists' research activity are considered. The tools are objects stimulating a living being (an animal or a human) to unfold its behavior (activity) and, due to it, providing opportunity to study the behavior (activity). They serve as a base for psychological science and are included in systems of relationships between many people. A history of inventions of these objects (from behaviorists' puzzle boxes, gestalt psychologists' instruments and experimental objects designed in A.N. Leontiev's activity approach to the newest objects) is a part of intellectual history of humankind and unfolding of its creative potential towards self-development and self-cognition. Some part of the objects become, in a transformed form, objects of mass culture (e.g. toys). These inventions by psychologists and ethologists are a component of cultural-historical process and modern humankind's activity structures.

Keywords: tools of psychologists' research activity, activity theory, A.N. Leontiev, invention, creativity.
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Орудия изучения поведения и деятельности: изобретения психологов как составляющая культурно-исторического процесса

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В статье рассматриваются особые специально разрабатываемые вещественные средства, культурные орудия исследовательской деятельности психологов и этологов. Это объекты, стимулирующие другое живое существо, обладающее психикой (человека или животное), развернуть свое поведение, деятельность, процессы психического функционирования и позволяющие тем самым изучать их. Данные культурные орудия служат одним из оснований психологической науки и включены в систему отношений со многими людьми. История изобретения этих объектов, начиная с проблемных ящиков бихевиористов, экспериментального инструментария гештальт-психологов и экспериментальных объектов в научной школе А.Н. Леонтьева и заканчивая последними новинками в данной области, — это часть интеллектуальной истории человечества, история развертывания его творческого потенциала в направлении саморазвития и самопознания. Часть этих объектов в трансформированном виде становятся объектами массовой культуры (например, игрушками). В целом, данные объекты — изобретения психологов и этологов — являются составляющей культурно-исторического процесса и структур деятельности современного человечества.

Ключевые слова: орудия деятельности психологов, теория деятельности, А.Н. Леонтьев, изобретения, творчество.

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> Every object made by man — from a hand tool to the modern electronic computer — embodies mankind's historical experience and at the same time also embodies the mental aptitudes moulded in this experience. This point conies out even more clearly perhaps in language, science, and works of art.
>
> *A.N. Leontiev.* The Development of Mind [7, p. 308].

Stimulus objects of experimental psychology as tools for research

In this article we will consider experimental objects created by psychologists and ethologists with a special purpose. This purpose is to stimulate, provoke another living being, possessing a psyche, to such a deployment of a certain behavior or activity, which allows the researcher to study this behavior's or activity's patterns and features. One can say that these objects are among the types of material tools for psychologists' and ethologists' research activities. A.N. Leontiev wrote: "Vygotskii isolated two principal interrelated features that must be considered basic to psychological science. These are the equipped ("instrumented") structure of human activity and its incorporation into the system of interrelationships with other people. It is these features that determine the characteristics of psychological processes in man" [6, p. 45]. There would be no exaggeration to say that psychologists' and ethologists' tools under consideration are a very important part of their research activity structure, serve as one of psychological science's foundations, and are included in their system of relations with other people — fellow researchers and plenty of those who are neither psychologists nor ethologists.

Hence, E.A. Klimov's classification of tangible means, labor implements can be extended. According to him, there were the following tools of cognition (receiving, obtaining, "mining», processing of information).

"1. Devices, machines that give an image (binoculars, microscope, television system).

2. Devices, machines that give a conventional sign, symbol, signal (voltmeter, thermometer, mnemonic scheme on the dispatcher's control panel signal board).

3. Devices, machines that process information (counters, electronic computing machines)" [4, p. 75].

From our point of view, it is worth adding here material instruments that stimulate another living being (human or animal) to deploy its behavior, activity, mental functioning processes and that allow studying them (collecting and processing information about them).

A.N. Leontiev in his monograph "The Development of Mind" [7] discusses the outcomes of researches when such devices were used. These are, for example, curved spades used by P.Ya. Galperin [2] during his study of the process of children's manual tools acquisition (note that spades here have two functions — they are manual implements for a child and instruments of exploring tool activity for a psychologist), an aquarium with a cheesecloth partition to study behavior of American catfish finding the way to food in A.V. Zaporozhets's experiment, and, certainly, the original apparatus for studying the possibilities of forming light sensivity of the palm skin. Earlier A.N. Leontiev's work, co-authored with V.I. Asnin, presented a child's intellectual activity research using the original variable problem box [1].

The monograph "Development of Voluntary Movements», written by A.V. Zaporozhets, who represented the activity approach and was A.N. Leontiev's colleague and friend, also describes many experimental objects specially designed to acquaint participants of psychological experiments with the tasks important for mental development comprehension [3].

In our view, the objects specially elaborated by psychologists and ethologists to analyze behavior and activity can be interpreted in terms of B. Latour's actor-network theory as research tools — "nonhuman actants». "I propose to call whoever and whatever is represented actant" [5, p. 143; quoted from: 12, p. 250]. The objects we are describing represent their developers — for instance, an experimental setup interacts with a participant in a psychological experiment in some way prescribed by the developer, reacting to some actions and ignoring others, etc. Consequently, in Latour's terms, it is a nonhuman actant.

According to Latour, the research tool (experimental setup) provides "an inscription that is used as the final layer in a scientific text" [19, p. 68] — in an article, dissertation, etc. With regard to psychological researches, an experimental setup (e.g. for studying cogitation) allows the scientist to interpret what a participant does with it, which is reflected in the protocol transcripts, in

terms of rational thinking norms and deviations from these norms, heuristics, algorithms, etc. [10].

Several of these tools of psychologists' research activity become mass-cultural objects after being transformed. For example, observational experimental objects for analyzing children's curiosity and exploratory behavior turn into starting points for the development of bulk products — such as factory-made cause-and-effect toys and discovery toys [11].

The creative thinking of an inventor of object for exploring psychologically alien behavior and activity

Let us ask ourselves the question: how did Karl Duncker invent his famous X-ray problem, which has become a classic of psychological research on thinking and continues to be used today? How was the "Mathematical Imagery Trainer for Proportion" that responds to the ratio of a participant's right to left hand height above the table invented? The display is green if the participant's right hand with a clasped box is twice as high as the left hand with the second clasped box, and in all other cases the display is red [13; 14; 17]. How could such an object come to mind? Whom and how was the puzzle box invented to study thinking and solving problems: a) by two capuchins; b) by two chimpanzees; c) by two preschool children? [16]. And what about the objects for analyzing the "tool activity" of birds [20] and bumblebees [8; 15]? These examples could go on and on — many psychologists and ethologists will surely offer their own sets of examples of such experimental objects.

Take a look at the study of people's creative thinking as an essential part of human psychology and activity.

From our point of view, the invention of problem situations and objects to explore other people's creative thinking is a distinctive kind of creativity, imaginative thinking that forms part of humanity's artistic civilizational potential.

Such a mindset includes at least three components [21].

1. The key element of abilities to create problem situations and tasks for alter is a special segment of the concept model of this alter — how he (an individual, a group, a representative of another biological species) will cope with the difficulty and what happens as a result.

2. Creativity in the field to which the created object's properties and connections, intended for examination and reflection of participants of the experiment (e.g. in mathematics, logic, mechanics, etc.), refer.

3. Engineering-design creativity — ability to invent design and technical solutions.

The stage of such an object's practical construction is also interesting. A.N. Leontiev wrote: "When I occupy myself with scientific work, my activity is, of course, a thinking, theoretical one, but during it several objectives become singled out for me that call for external practical activity. Let us assume that I have, for example, to set up a laboratory experiment (and I mean to set it up, and not just think it up or design it), and that I get about laying wire, driving screws, sawing, soldering, etc.; in mounting the equipment I perform actions that, though practical, nevertheless form part of the content of my theoretical activity and that are senseless without it. Let us assume, further, that the way of including some instrument or other that forms part of the set-up requires me to pay attention to the level of the general resistance of the electric circuit, and that I mentally calculate this while fixing the leads to its terminals; in that case conversely, a mental operation forms part of my practical action" [7, p. 188].

In my turn, I can give an example where the mental activity of elaborating, designing an experimental object and its practical construction were linked by feedback loops. Making one of my experimental objects and practically assembling its electrical diagram (with diodes, electric rectifier, etc.), I realized how to create it in such a way that the object could function in two more modes besides the one originally conceived and provoke the participant to set and solve two more types of arithmetic problems. Subjectively, it was my insight. When I saw the electrical diagram I had already assembled, it provoked me to understand how it could be developed to make the tool for psychological researcher I was creating more multifunctional [9]. The phenomenon of new things emerging (including new goals and themes) during the research practical development is analyzed in [18].

Overall, creativity in creativity studies, as well as in studies using specially crafted implements, appears to be a natural phenomenon.

Conclusion

Psychologists and ethologists create special material means, their research activity's cultural tools. These are objects that stimulate another living being possessing a psyche (a human or an animal) to deploy its behavior, activity, mental functioning processes, and thus allow studying them. Such cultural tools serve as one of the bases of psychological science and are included in the system of relations with many people. The history of these objects' invention, beginning with Thorndike's problem boxes, Köller's experimental toolkit and

the experimental objects in A.N. Leontiev's scientific school, is a part of humanity's intellectual history, the history of its creative potential deployment towards self-development and self-cognition. Some of these objects after being transformed become mass-cultural objects (for example, toys). In general, these objects — psychologists' and ethologists' inventions — belong to the cultural-historical process and modern mankind's activity structures.

Let us repeat A.N. Leontiev's statement in the epigraph: "Every object made by man — from a hand tool to the modern electronic computer — embodies mankind's historical experience and at the same time also embodies the mental aptitudes moulded in this experience». One can ponder what new human experience and mental aptitudes will be embodied in subsequent inventions of such objects and how it will relate to science and, perhaps, to the arts.

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The "I" Status in the Cultural and Activity Discourse[1]

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The concept of the I that is present in the scholarly and mundane consciousness is inwardly paradoxical, as it contains the risk of regression to "bad infinity". Thus, "I see an object" obviously creates in me the image of the object; by implication, "someone" inside me sees the image of the perceived object and, consequently, an image of the image, which has just arisen, emerges then; this new image further transforms into an object of internal perception, and so on and so forth, "to infinity". The same logic of regression into bad infinity applies to the individual's experiences and aspirations regressing into the far reaches of the Transcendental I. An alternative to such an understanding forms a viewpoint on the I as a dynamic whole in the unity of its four modes, "the Existential I", "the Phenomenological I", "the Presuming I", and the "Self-valuable I". The assumed fact that initially there is "someone" "in me", as part of the Phenomenological I, that "feels", "looks", "acts" and "experiences", is revised. It is surmised that the assumed (imaginary) I becomes real (acquires agency) through the mediation of the individual's contacts with his or her environment. The four modes of the I are generated through the individual's activity manifested in various ways (search, imitation, purposeful activity and supra-adaptive activity). The involvement of the I in the culture and activity discourse enables the unified interpretation of concepts that are present in philosophical and psychological systems that are significantly different in their premises.

Keywords: activity, the culture and approach, the Existential I, the Phenomenological I, the Presuming I, and the Self-valuable I.

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О статусе «Я» в культурно-деятельностном дискурсе[2]

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Присутствующая в научном и обыденном сознании идея Я внутренне парадоксальна, заключая в себе риск регресса в «дурную бесконечность». Так, «Я вижу объект» с очевидностью рождает во мне образ объекта; предположительно, при этом «кто-то» внутри меня видит образ воспринятого объекта и, следовательно, далее рождается образ только что возникшего образа; далее этот новый образ превращается в объект внутреннего восприятия и т. д. и т. п., «до бесконечности». Та же логика регресса в «дурную бесконечность» относится к переживаниям и стремлениям индивида, регрессируя в дали трансцендентального Я. Альтернативу подобному пониманию образует взгляд на Я как динамическое целое в единстве четырех его модусов — «экзистенциальное Я», «феноменальное Я», «полагающее Я» и «самоценное Я». Преодолевается мнимость того, что будто изначально «во мне», в составе феноменального Я, есть «кто-то», кто «смотрит», «действует», «переживает». Предполагается, что мнимое Я, опосредуя контакты индивида с его окружением, обретает действительность (субъектность). Источник порождения четырех модусов Я — деятельность индивида в разнообразных про-

[1] The article is based on the author's speech at a conference dedicated to A.N. Leontiev's 120th anniversary (the oral form of narration is preserved).

[2] В основе статьи — выступление автора на конференции, посвященной 120-летию А.Н. Леонтьева (сохраняется устная форма повествования).

явлениях его активности: ориентировочно-поисковой, уподобительной, целевой и над-адаптивной («деятельности переживания»). Вовлечение Я в культурно-деятельностный дискурс позволяет в едином ключе трактовать идеи, присутствующие в существенно разных по своим исходным посылкам философских и психологических системах.

Ключевые слова: деятельность, культурно-деятельностный подход, экзистенциальное Я, феноменальное Я, полагающее Я, самоценное Я.

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This paper aims to outline how the I is interpreted with regard to the activity, or more precisely the cultural-activity approach (A.G. Asmolov et al.). Phenomenologically, the I — partly incognito, without self-promotion — appears in every psychological construction when one speaks of activity and consciousness, as if there is always *someone* who acts, contemplates, thinks, experiences, strives. In other words, "activity" in ordinary consciousness is what ***I*** do (remember the old Russian word *дей*); "consciousness" is what ***I*** have. We often prefer not to think about the fact that activity, according to G.P. Shchedrovitsky [21], can be "impersonal" and that consciousness, as V.P. Zinchenko says [2], is *nobody's,* or rather, we suppress this idea as something unusual or discouraging ("What do you mean by "impersonal"?"; "What do you mean by "nobody's"?!")

However, there is a problem here! For example, when we talk about psychic phenomena, the question remains: *who* are these phenomena to?

This is what S.L. Rubinstein writes in "Fundamentals of General Psychology": "Our *perceptions, thoughts, feelings,* our *aspirations, intentions, desires* etc". — all of these are "... given to us directly, as if they were experience"... *"Belonging to the individual* experiencing them, *to the subject, is the first characteristic feature of all the psychic"* [17, p. 19].

But this is precisely the point at which the question is valid. If the psychic contents are always given to *me,* as a bodily individual (subject), as a unique I, then such an understanding, while seemingly unquestionable, generates an image of endless "little men" in "little men", where each successive one reproduces in oneself what was presented in one's predecessor's mind.

Yet this is true not only in Rubinstein's works... In the phrase "it is not thinking that thinks, it is the person who thinks", we also indirectly, sometimes namelessly, use the idea of the "subject" of the inner life, i.e. the one who thinks, perceives, experiences, who reflects all these things internally. The risk of falling into the abyss of bad infinity is obvious (Fig. 1).

How to overcome, how to curb "at the start" bad infinity? How can we prevent appearing a dull series of little men in little men? Isn't it better not to aspire to visibility at all, accepting the fact that our intention to represent the I in any way is fundamentally utopian? Should we agree that I is crucially invisible, "not visualisable", that it — the I — is *visible,* invisible? Let us imagine one artist's nude self-portrait; we see nothing in front of us, only the artist's signature and his painting's title (Fig. 2).

But wouldn't it be absurd to try to visualize the invisible? The author of these words (not the author of the drawing!) thinks so: yes, it is absurd!

Here is another solution. The I is treated as a psychophysical whole among its four attributes.

- *The Existential I ("the I in feeling", "I-feeling", "The Oceanic I").*
- *The Phenomenal I* ("The I in representation", "The Whimsical I", "The Imaginary I").
- *The Presuming I* ("The I in action", "I-striving", "I-will", "The Intentional I").
- *The Self-valuable I* ("The Authentic I", "The I in experience", "The I for myself").

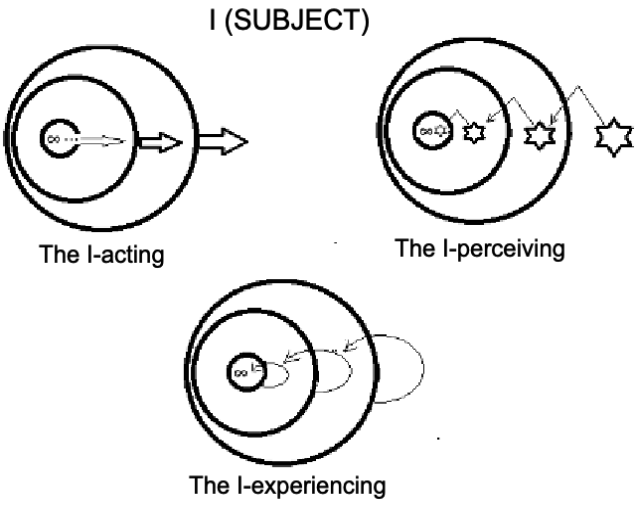

Fig. 1. Naïve picture of I. Sometimes three images are combined, which doesn't save the theorist from "falling" into "bad infinity" (Petrovsky [10])

As we shall see, a special role in forming the I's four attributes (hypostases) is played by *activity*, which combines complex activity manifestations.

The Existential I is represented by multiple sensations, or, more accurately, by a *co-sentiment of sensations: feelings* [19], *"sensuous fabric", "amodal sensations"* [5]. It is *a fabric of subjectivity*, the *"matter of the I"* ("material cause", according to Aristotle). In psychoanalysis the Existential I corresponds in part to the "oceanic feeling" noted by R. Rolland and featured in Sigmund Freud's letters to the writer [23].

The activity involved in the Existential I emergence is represented by the individual's *activity* transforming the "irritability" of the body into *sensation* as such (orientational-seeking activity in the cultural-activity paradigm). The idea of co-senses as a "matter" of the I is, to some extent, a reincarnation of David Hume's [22] and Ernst Mach's [8] well-known views on the nature of the I.

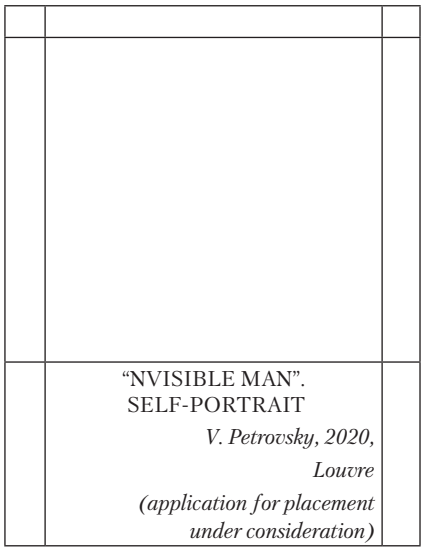

Fig. 2. "Another solution?"

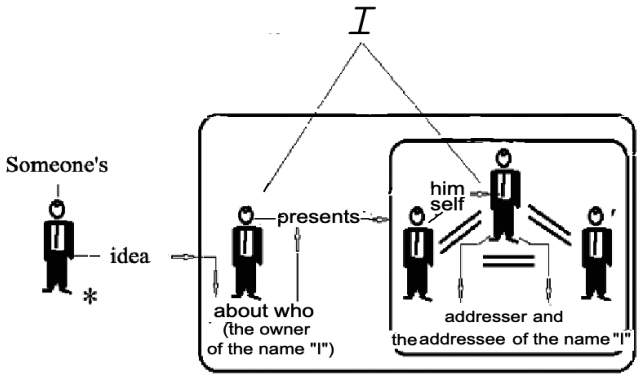

Fig. 3. "Little men" with word-chain comments. Note that the commentary words are not a "who is who" explanation for the reader. They are as much a part of a structured phenomenal field as the other elements that make it up [12]

The Phenomenal I. It is the image of the individual as a bodily being combined with images of other elements of the environment, which forms an overall structured phenomenal field ("territory of the I", James [1]). The foregoing is represented as a configuration of impressions, perceptions, fantasies and can be schematized as "little men" and symbols of their presence in each other as well as "things", existing and reflected. Additionally, the territory of the I includes trajectories of connection between elements, visual-audio paths, they conjugate images of people and things; we call them "tracks" (Fig. 3).

All this, in the process of development of the I, the individual will consider "his", saying "It is mine" [1]. This scheme relates our understanding of the Phenomenal I to the constructions of V.A. Lefebvre [6; 7], the creator of "little men" who have been living in the expanse of G.P. Shchedrovitsky's and his followers' [21] organizational-activity games for more than half a century.

This view of the I significantly corrects the conventional notions, differing from them *in principle*. As part of the phenomenal field, the "drawn" I itself does not "perceive" anything, does not act "out of itself", and is not ready to "experience" anything. To illustrate this, there is a fragment of the phenomenal field sketched by Ernst Mach [8] (Fig. 4).

One may ask: "Who, though, sees the subjective contents-creations of the psyche?" — I answer: "Nobody". The art gallery is empty. There are no viewers there. There is no artist. His self-portrait is present. But it is also a painting, one of those in the gallery [9]. None of the elements of the phenomenal field, none of their combinations contain activity, are not endowed with secret "psychic energy", "psychic causality", according to V.V. Zenkovsky, which has been and is still being written about by many people without even a slightest thought about

Fig. 4. The Phenomenal I (Mach [8, p. 37])[3].
Hint: eyebrow, nose, moustache

[3] In the article [12] the author gives a more detailed commentary on this figure.

consequences — it was once criticized by Gustav Speth (in his critical works he strongly emphasized the "non-energetic character" of I [20]).

The Phenomenal I is the result of *assimilative (reflective) activity* that "absorbs" the socio-cultural life realities: people's behavior, the movement of things, communication acts, signs and their handling, the image of the individual's own mobile physical body — all that forms the "territory of the I". An integral "image of the world" is formed in the context of associative activity [5], synthesizing diverse elements of the phenomenal field, imaginary "I see", "I experience", "I act", some "imprint" of the world (society, culture, things) in the material of the individual's "feelings" (a pattern of co-sensations).

Our thesis, then, is that the Phenomenal I, as a pattern of co-sensations, mediates the individual's interaction with his environment. What is meant is that combinations of structured phenomenal field's elements are capable of guiding behavior, configuring an individual's contacts with the world. *Such* an I is a model of a *possible* future, a *"formal cause"*, according to Aristotle.

The Presuming I manifests itself in action. In characterizing this mode of the I, we introduce the notion of *subjectless activity* [14], which means the *dynamic material of becoming activity*. Once upon a time Immanuel Kant left a short and rather elegant definition of activity — *"causality of cause"* — "for use" by grateful posterity. Thus *the Purpose* was not written in the definition of activity. Subjectless activity, as a "part" of activity, is not characterized by purposiveness.

We accept three assumptions:

1) human individual's activity is *not always* purposive, i.e. it can be, in particular, *subjectless*;

2) encountering the "picture" (where the "subject", with its "inner world" and other elements of the structured phenomenal field, is already "drawn"), activity becomes *oriented* (Fig. 5)[4].

3) Purposive processes are conditioned by a mismatch between the Phenomenal I's structures mediating the activity and the new structures corresponding to the produced activity results. The *dissonance* possible in this case generates an impulse to overcome the discrepancy, and in this way the I converts into the *acting cause* (in Aristotle's terms) of subsequent acts. The *needed future* model appears in the phenomenal field (we use N.A. Bernstein's well-known term in the new context). It stimulates and directs activity. Thus, the mirage of a spring in a desert does not quench thirst in itself, but it induces and directs the traveler's behavior —sometimes towards the spring, sometimes past it.

The Self-valuable (Authentic) I means the experience of the fullness of one's own subjectivity. When the desired and produced effects of activity coincide, a sense of *consonance* is born, experienced as pleasure, be

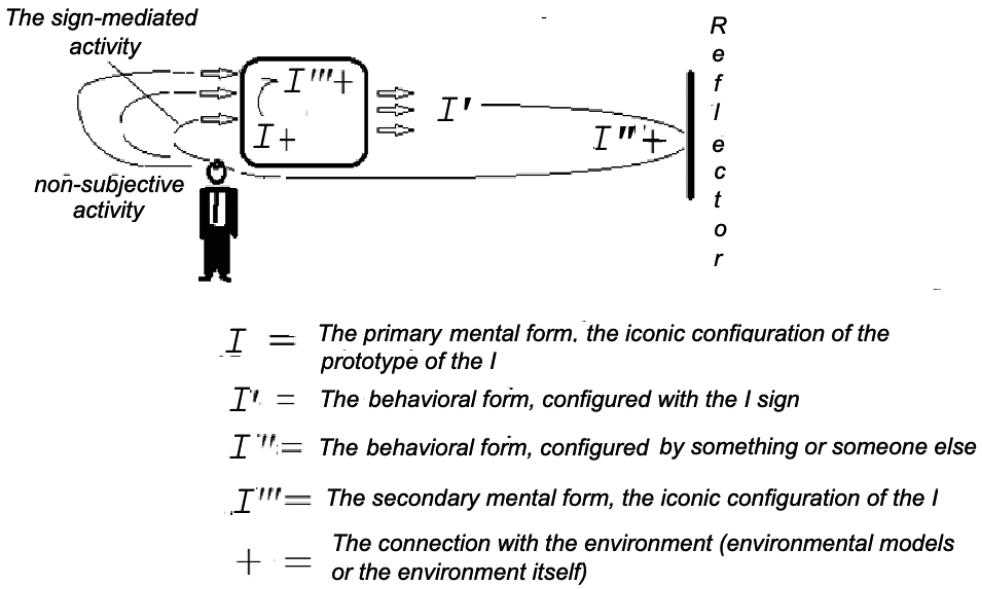

Fig. 5. The configuration of the I is not only a mediator in the row "activity—sign—world", but also a form of behavior (the I'), an isomorphic configuration of the phenomenal field; reflected in the object thus becoming a new stream of impulses (the I''), activity returns to its source (the individual) and establishes a new order in the sign mental field (the I ≠ the I''') or confirms the previous order (the I = the I'''). It means that the I acquires the status of a signifier: the I (the signifier) joins the I''' (the signified). It is conceivable that this unification corresponds to the Fichtean "I am"

[4] Whereas in E.V. Ilyenkov's famous interpretation of the *ideal* [3], activity assimilates the form of a thing existing externally, giving it a second life ("being a thing outside a thing"), in our case the ideal *comes from I*, a pattern of co-phenomena in the inner world.

it pleasure of *rest* (according to S. Freud), or *excitement* (in heterostasis concepts)[5]. Pleasure here is the *ultimate cause* (according to Aristotle) of *supra-adaptive* activity [16] (the self-renewing *"activity of experience"* [15]). In E.B. Starovoitenko's terms [18], we could say about acquiring and reproducing a higher state of "self-identity of the I", "clarity of the I". Developing the metaphor of a traveler going to a mirage, we can state that in this case the mirage of the spring turns into a thirst-quenching spring itself. For more details see our articles [10; 11; 12; 13; 14; 15; 16].

As a result, the I appears as a wholeness — *causa sui* ("cause of self"), uniting in itself *four causes (according to Aristotle) — material ("from what"), formal ("on the form of what"), acting ("because of what") and final ("for what").*

In conclusion, please allow me to synthesize the possible status of the I in cultural-activity discourse. I think that the category of the I is a unique condition for viable integration of ideas developed at different times in history by creators of diverse philosophical and psychological systems — ideas of D. Hume ("the I" is a knot or a complex of current perceptions), B. Spinoza (causa sui, "reasons of the self"), J. Fichte ("I am"), E. Mach (the I as a stable perceptual complex), L.S. Vygotsky (the I imbued with psychological systems and the instrumental function of signs), V.A. Lefebvre (with his "little men" and the algebra of reflexion), M.K. Mamardashvili...

One episode comes to my mind. I was lucky to be in Alexei Nikolaevich Leontiev's office at that dramatic hour. During my presence there was a telephone conversation, and the event in question was sad — Merab Konstantinovich was dismissed as editor-in-chief of "Voprosy Filosofii" [Questions of Philosophy]. Leontiev has never heard of it before. What happened? Apparently, one of the great Soviet philosophers, the powers that be, had publicly called E.V. Ilyenkov a "machist" (in those days this sounded like a sentence); and then Mamardashvili, in a sonorous, artistic whisper, across the room, uttered: "It is better to be a machist than a fool". I remember with what pleasure Leontiev quoted these words of Merab Konstantinovich at that time, squinting his eyes and laughing acerbically.

Let me conclude. There are many works devoted to the I as a special mysterious entity. Their authors consider the I by analogy with the objects of natural scientific cognition that exist "beyond" the researcher (stars, birds, volcanoes, etc.). Meanwhile, the I is "not quite" an object, but rather a "construct" that we form and which resuscitates each time we address it as the source, the goal, the means and the result of the activity carried out.

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[5] N.R. Anashkin's forthcoming master's thesis (National Research University Higher School of Economics, Department of Psychology, 2023) develops the idea of happiness as transcendence of pleasure; happiness is self-valuable and contains the prospect of being experienced again and again. Acknowledging this, we must agree that happiness as a value is always a "for-no-point", and that the expression "short-lived happiness" is an oxymoron.

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The Roots, Trunk and Crown of the Psychology of Activity[1]

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The text is a review of the historical and theoretical book by E.E. Sokolova Psychology of activity: formation and prospects of development. The panorama of the ideas of the psychology of activity is reproduced based on the historical and logical foundations of the concept of activity in philosophy and psychology. These ideas are revealed in the context of the polylogue of scientists within the A.N. Leontiev school and its wide reference circle. Special attention is paid to the understanding of activity as casa sui as opposed to its mechanistic interpretation. The contradictions and paradoxes of activity are considered, through the fixation and resolution of which the way of thinking that characterizes the theory of A.N. Leontiev was formed.

Keywords: activity, theory of activity, history, substance, causa sui.

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Корни, ствол и крона психологии деятельности[2]

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Текст представляет собой рецензию на историко-теоретическую книгу Е.Е. Соколовой «Психология деятельности: становление и перспективы развития». Панорама идей психологии деятельности воспроизведена с опорой на исторические и логические основания понятия деятельности в философии и психологии. Эти идеи раскрываются в контексте полилога ученых внутри школы А.Н. Леонтьева и ее широкого референтного круга. Особое внимание уделяется пониманию деятельности как casa sui в противовес ее механистическому толкованию. Рассматриваются противоречия и парадоксы деятельности, через фиксацию и разрешение которых складывался способ мышления, характеризующий теорию А.Н. Леонтьева.

Ключевые слова: деятельность, теория деятельности, история, субстанция, causa sui.

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[1] Review of the book: *Sokolova E.E.* Psikhologiya deyatel'nosti: stanovlenie i perspektivy razvitiya. Moscow: Kanon+ ROOI «Reabilitatsiya». 2023. 496 p.

[2] Рецензия на кн.: *Соколова Е.Е.* Психология деятельности: становление и перспективы развития. М.: Канон+ РООИ «Реабилитация», 2023. 496 с.

V.P. Zinchenko once noted that psychology, according to A.N. Leontiev, should grow "not into a bush, but into a trunk". Be that as it may, in fact, the trunk of psychological activity theory has over time grown into a powerful crown, some branches of which resemble independent trunks. We will not enumerate the directions and names. And the explanation for this should be sought not in the trunk, but in the roots. In the very *way of thinking* that characterizes the activity theory. An analysis of this way is done in E.E. Sokolova's fundamental historical and theoretical study — in her searches one can see an encyclopedism unthinkable in today's times.

A.N. Leontiev's activity theory is sometimes called *psychological (general psychological)*. It is implicitly assumed that it presents an understanding of activity as a *psychological phenomenon*. In fact A.N. Leontiev studies the *phenomenon of activity as such*, but in psychological concepts with the preserved philosophical and anthropological quintessence of its analysis by the classics of German dialectics (Kant, Fichte, Schelling, Hegel, Feuerbach) and Marx. We can find in Leontiev's works an enrichment of this quintessence. K. Marx has a captivatingly simple, but at the same time revolutionary formula for socio-humanitarian knowledge: history is "the activity of an individual pursuing his own goals". A perspective on history (the humanity's activity) in the optics of goal-seeking still sets the horizon of human knowledge. History, as the history of activity's ends, always at odds, according to Hegel, with its results, is an alluring prospect for the human sciences. We know it as the history of human's achievements and (less frequently) defeats in the human world creation, into the conception of which he inscribes the rest of the world available to him. Not having understood the nature of goal-setting, its development, contradictions and paradoxes within activity theory. A.N. Leontiev has already done this. Influenced by his works, V.V. Davydov once proclaimed goal-setting to be a subject of psychology. A human always comes from the future, from the world of goals. It is not by chance that a genuine goal is realized when the result is achieved and the gap between what has been planned and what has been done opens. The paradoxical metamorphoses in the goal formation processes is one of A.N. Leontiev's activity theory's leitmotifs (this line was later developed by O.K. Tikhomirov and his school on the basis of creativity research, which is quite natural). Here is both a challenge and an answer to many questions of modern humanitarianism.

A.N. Leontiev's conception was at times banalized, being reduced to a set of self-evident propositions according to the level of accessibility to interpreters, or rather, to their time. But Leontiev's texts are arranged in a complex and "artful" way. Some of the bases of the streams of thought were not explicit even for the author himself (which is natural for thinking). In some instances, Alexei Nikolaevich thought not in "sentences", but in "word combinations" and even in "words". Let us take, for example, the well-known position on the relationship between individual activity and generic activity: the former must be *adequate*, but *not identical* with the latter. Leontiev does not mean that one activity cannot be understood as a mere copy of the other. In the mismatch of "adequacy" and "non-identity" lies the main problem, which A.N. Leontiev raised in his book "Activity. Consciousness. Personality" — it is the *problem of activity development*. It was picked up, in various ways, by psychologists such as V.V. Davydov, A.G. Asmolov, V.A. Petrovsky and others, who have offered their own variants of its solution. The situational, though always natural, "shift of the motive to the purpose" (and this is one of activity development's key mechanisms) can become tectonic in individual consciousness, radically, sometimes irreversibly, changing the way a human relates to the world and to himself.

E.E. Sokolova's book is about the *potential* of activity theory for the development of human sciences in the 21st century. It is very important to note that E.E. Sokolova explores not the "paradigm evolution" but the historical logic of the "activity development" in building the activity theory — **ab ovo usque ad mala,** the theory that is still in the *formation* process (this term in the title of the book has not only "historical meaning").

E.E. Sokolova's work shows the image of this developing whole with the coverage of its development's sources, including implicit ones. For all its rigid integrity maintained by the author, the study is deployed in the broadest historical perspective with comprehension of the presented genetic panorama's each fragment. There are no "non-shooting guns" in the work. Therefore, it is not possible to cover all significant nuances (and they are all significant) in the journal review format. So I will limit myself to the most important nuance, in my opinion.

The author convinces the reader that the key to the originality of the methodology of "non-classical psychology", which is cultural-historical and theoretical-activity psychology, should be sought in Classical-Dialectical philosophy — a tradition of theorizing rooted in Spinoza's philosophy. As Hegel wrote, "Spinozism is first of all philosophizing", a historical and logical beginning. Even E.V. Ilyenkov, the eminent Spinozist philosopher of the 20th century, described Fichte as "Spinoza in reverse". A.N. Leontiev's "Implicit Spinozism" is one of the most interesting subjects in E.E. Sokolova's monograph. By the way, E.V. Ilyenkov and A.N. Leontiev were close friends — but not only friends, they were also colleagues who thought together about problems of theoretical psychology. It is not difficult to find their traces in both authors' published texts, though much remained in conversations that we will never hear. And K. Marx was im-

portant to them insofar as he was a Spinozist (for Ilyenkov, also a Hegelian).

L.S. Vygotsky saw the beginning and the ideal of scientific psychology in Spinozism (respectively — in Marxism) — the only thing that could be opposed in his science, as well as in philosophy, to Cartesianism, which is not only still alive today, but is in some ways experiencing its second birth in the 21st century. Although Cartesianism went west a century ago along with... Bergson's philosophy. A.M. Pyatigorsky is right: Bergsonianism is the "end" of modern European philosophy, in the sense that it is the summation of all the dead ends into which Descartes led it. From this point of view, Pyatigorsky's characterization of Bergsonianism as a return to Cartesianism — which continued afterwards, but precisely through Bergson, in philosophy in the second half of the 20th century — is absolutely fair.

Bergson, however, might have had hope of breaking Cartesian deadlocks. It is in this famous formula: "Our mind is metal extracted from form, and form is our action". But this form seems, in Bergson's interpretation, to have been too narrow for such metal to be extracted from it. Bergson's thought resembles a silent, panting "Spinozian" song that has been "stepped on its throat" by immobilizing its vocal apparatus.

L.S. Vygotsky fought against Cartesianism in all his theoretical-psychological texts in one way or another, gained victories, but failed to create a Spinozian psychology. N.A. Berstein, who "fought" not at all with I.P. Pavlov (he tirelessly emphasized Pavlov's greatness as a psychologist), but with the way of thinking that underlines his theory, directly characterizing this way as Cartesian, later waged a struggle on the adjacent physiological "front".

A.N. Leontiev and S.L. Rubinstein created two versions of monistic Spinozian psychology — and this is what brings them together, despite all their differences. E.E. Sokolova comes exactly to this principal conclusion and gives a convincing argumentation of it. (We contrasted Vygotsky and Rubinstein, but one had Spinoza's portrait on his office wall, while in the other scientist's diaries he topped the list of major philosophers).

E.E. Sokolova reconstructs the grounds on which A.N. Leontiev interpreted activity as the *substance* of the mental. And thus she proves the groundlessness of A.N. Leontiev's accusations of mechanistic "activity reductionism" (where activity is simply substituted for "behavior") — behind these accusations lies the traditional understanding of substance. But Spinozian substance is *causa sui*, the cause of itself. The traditional understanding of substance is Cartesian in origin, framed in the coordinates of stimuli-stressors and reactions.

Stephen Covey, a well-known American organizational consultant, read a phrase in a book (he did not name the source) that he claims changed his life: "There is a gap between a stimulus and our reaction. Our freedom and our ability to choose our reaction lies in this gap. Our development and happiness depend on it"[3]. But even by filling the gap between "stimulus" and "reaction" with "freedom" and "ability to choose" we will not get far from neo-behaviorism. Edward Tolman would simply call it *intervening variables*.

This is the point: as soon as "freedom" (which, incidentally, is not reducible to the implementation of a wide variety of choices) is asserted, the "stressor" ceases to be a "stressor" and the "reaction" ceases to be a "reaction". The "stressor" no longer "stresses", but makes one think, as it turns into a problem, and problem turns into a task. The "reaction" loses its prefix and becomes "action", in the limit, creativity. The "action" is not chosen, but is produced, created by itself (N.A. Bernstein, V.P. Zinchenko, M. Cole and B.D. Elkonin have discussed this). The "solution of a problem" is only one of this process results, and often there is no happiness in it, which can be "overslept" — together with "development", with what has changed in you.

Yes, Leontiev puts "activity" between S and R. After discussing the book "Activity. Consciousness. Personality" in 1975, his generally "sympathizers" F.T. Mikhailov (I tell from his words), A.S. Arseniev, A.V. Brushlinsky approached him with bewilderment: "Alexei Nikolaevich, what have you done? You only strengthened the positions of behaviorism with the concept of activity?". They were right. By introducing the concept of activity, in A.N. Leontiev's (and S.L. Rubinstein's) interpretation, the picture of the human world is freed from the dictate of stimuli and the obsequiousness of reactions. They simply do not fit into it. Leontiev took this radical "liberating step" by keeping the behaviorist terminology "to the side". "The same ones and Sophia" (as in Griboedov — "the same" ones are no longer the same!)

Certainly, one must understand that A.N. Leontiev did this while arguing with behaviorists. Outside this context, this substitution is meaningless. Leontiev thought of human activity only inside the organism of culture, which is created by it, and, of course, he did not consider culture as a set of special — "social" stimuli. Hence, at least, his reproach to J. Piaget, who saw thinking as a human's specific mechanism of homeostasis: it makes no sense to talk about "equilibrium with the concept" that a child masters, A.N. Leontiev wrote.

The "stimuli-stressors" and "reactions" have no place today even in psychophysics, which has dealt with them throughout its historical road from Fechner to Stevens.

[3] *Kovi S [Covey S.J.* Sem' navykov vysokoeffektivnykh lyudei: Moshchnye instrumenty razvitiya lichnosti *[The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change].* Moscow. 2009, p. 34.

Experiments show that the thresholds of elementary sensivity (for example, pain sensivity) can shift up or down in a person depending on what task and how he solves it, how significant for him is the situation in which the "stimulus" occurs. K.V. Bardin has created an entire area of psychophysics to describe and explain these phenomena. And any mother will confirm that a child's bruise is twice as painful from annoyance, from resentment. And we, blowing on the bruised spot, hit the "bad chair", which should not have been here and get in the baby's way in this wonderful safe world called "nursery". A small sphere of the big world called "human subjectivity" (according to Leontiev, "the constitutive characteristic of activity").

The world of meanings, where only a child's or a person's own "powers", powers that have yet to become, in Marx's words, "essential", generic, and therefore, by definition, free, are endowed with semantic weight. At the cost of *special efforts* on the part of those who master these forces. A.N. Leontiev's theory is all about individual efforts to master generic, essential forces, the productive "energy" of human activity. This also follows from E.E. Sokolova's analysis.

Certainly, the author could not avoid the debatable issue of L.S. Vygotsky's cultural-historical theory's and A.N. Leontiev's activity approach's correlation. Their continuity is shown on the pages not in the form of statement of coincidence and consonance, but in the form of development which assumes "keeping" dialectic opposites and consequently does not close the possibility of further movement in the discussion field.

For example, Vygotsky's semantic structure of consciousness turns into semantic activity "traces" in A.N. Leontiev's works, which allows this structure to be organized in a special way. E.E. Sokolova absolutely rightly calls A.N. Leontiev's theory "activity-meaning". It points to its originality, permitting it to be clearly and unambiguously singled out among other (including "daughter") versions of the activity approach.

According to A.N. Leontiev, psyche is not just an "image" but always a "sense-image" (Ya.L. Golosovker's term) of the world, without which the "image of the world" will remain fragmented. Meanwhile, individual activity is a tool of search and production of sense in order to insert it into what is already endowed with meaning in the process of generic activity's historical development. "Meaning-making" always actualizes the activity results "with meaning". But, after all, its generation — culture — is not only that which is "valid", it is also that which makes each of the people in absentia not indifferent to each other. Hence there is the cultural objectification of senses, not only meanings. A.N. Leontiev even named the activity sphere in which senses are objectivized (being completed!) and transmitted across the generations. It is art, from the analysis of which L.S. Vygotsky, not by chance, began constructing his "non-classical", objective, psychology, penetrating into the mysteries of the birth of the ultimate "subjective", the most intimate thing — human experience.

Similarly, A.N. Leontiev does not reduce the personality to a "system of activities" but expands the boundaries of the personal world to the scale of the larger human world through activity, without losing its profound originality. Moreover, analogous to Vygotsky, it is a movement from "apical psychology" to "depth" one, not of the Freudian type.

Hence the need for "systemic", as E.E. Sokolova puts it, monism. Monism is a question of truth, which is "always concrete" (according to the author, "systemic"), and pluralism is a question of opinions. Their broadest panorama is also presented in the work.

The connection of A.N. Leontiev's activity theory with other attempts to build psychological concepts based on this definition — they belong to S.L. Rubinstein, P.Ya. Galperin, D.B. Elkonin, etc. — is revealed in a most interesting way in the book. Against this background, these authors' contributions to the undoubtedly "common cause" (for all the sometimes acute discussions they had with each other) become much more prominent.

In E.E. Sokolova's theoretical-historical study the reader is presented not only with the roots, trunk and crown of the tree of psychological activity theory, but at the same time with the environment where it has sprouted and continues to grow. The tree is evergreen, which the book also convinces of.

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DEVELOPMENTAL PSYCHOLOGY
ВОЗРАСТНАЯ ПСИХОЛОГИЯ

The Role of Parental Beliefs about their Sleep and Sleep of their Child in the Regulation of Sleep and Wakefulness in Children 5—13 Years Old: Cultural-Historical Approach in Psychosomatics

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From perspective of cultural-historical approach in psychosomatics, the psychological regulation of a child's sleep and wakefulness is developed in children in interaction with significant adults. The aim was to reveal the relationship between dysfunctional beliefs of parents about their own sleep and its vulnerability as well as their violations of sleep hygiene and parental beliefs about the sleep of their children aged 5—13, the beliefs of the children about their sleep and their quality of sleep and wakefulness. 147 pairs of "parent-child 5—13 years old without diagnosed sleep disorders" participated (47 pairs with a child 5—6 years old, 49 pairs with a child 7—9 years old, 51 pairs with a child 10—13 years old). Parents answered questions about their child's sleep pattern, filled children's sleep habits questionnaire, dysfunctional beliefs about sleep and sleep vulnerability scales about their own and their child's sleep, insomnia severity index, and a scale of behavioral factors of sleep disturbances about their own sleep. Children answered the questions of children's self-report about their sleep, dysfunctional beliefs about and vulnerability of their sleep scales, pediatric sleepiness scale. According to the analysis of mediation, dysfunctional perceptions of parents about their own sleep are indirectly associated with sleepiness and sleep difficulties in children, since they increase the likelihood of the same perceptions of parents about their children's sleep. Sleepiness, according to the children appraisals, is additionally indirectly related to the dysfunctional beliefs of parents about their sleep through the mediation of the child's beliefs about their sleep. Parents' beliefs about their sleep vulnerability are associated with children's poorer sleep and sleepiness, as they increase the likelihood of the child's sleep vulnerability beliefs, which, in turn, increase the likelihood of the child's own perceptions of the vulnerability of his sleep. The data are consistent with the perspective of the psychology of physicality about the development of the psychological regulation of sleep and wakefulness of the child in interaction with significant adults.

Keywords: psychological regulation of sleep, children, parental beliefs, dysfunctional beliefs about sleep, beliefs about sleep vulnerability.

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Роль родительских представлений о своем сне и сне ребенка в регуляции сна и бодрствования у детей 5—13 лет: культурно-исторический подход в психосоматике

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С позиций культурно-исторического подхода в психосоматике психологическая регуляция сна и бодрствования ребенка формируется во взаимодействии со значимыми взрослыми. Цель нашей работы — выявление связи дисфункциональных представлений родителей о своем сне, его уязвимости, нарушениях гигиены сна с родительскими представлениями о сне их детей 5—13 лет, представлениями самих детей и их качеством сна и бодрствования. Участвовали 147 пар «родитель—ребенок 5—13 лет без диагностированных нарушений сна» (47 пар — с ребенком 5—6 лет, 49 — с ребенком 7—9 лет, 51 — с ребенком 10—13 лет). Родители отвечали на вопросы о паттерне сна ребенка, заполняли опросник о привычках детей в отношении сна, шкалы дисфункциональных представлений и уязвимости сна по отношению к своему сну и сну ребенка, индекс тяжести инсомнии и шкалу поведенческих факторов нарушений сна по отношению к своему сну. Дети отвечали на вопросы самоотчета детей о своем сне, шкал дисфункциональных убеждений и уязвимости своего сна, педиатрической шкалы сонливости. По результатам анализа медиации, дисфункциональные представления родителей о собственном сне связаны с сонливостью и трудностями со сном у детей косвенно, поскольку увеличивают вероятность таких же представлений о сне детей. Сонливость, по оценкам самих детей, дополнительно косвенно связана с дисфункциональными представлениями родителей о своем сне через медиацию представлений ребенка о своем сне. Представления родителей об уязвимости своего сна связаны с трудностями детей со сном и сонливостью, поскольку усиливают вероятность представлений об уязвимости сна ребенка, а те, в свою очередь, — вероятность представлений самого ребенка об уязвимости его сна. Данные согласуются с представлениями психологии телесности о формировании психологической регуляции сна и бодрствования ребенка во взаимодействии со значимыми взрослыми.

Ключевые слова: психологическая регуляция сна, дети, родительские представления, дисфункциональные представления о сне, представления об уязвимости сна.

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Introduction

The cultural-historical approach in psychosomatics [1; 2] and psychology of corporeality [5] suggest that the system of psychological regulation of somatic functions is developed in a childhood in the process of interaction with significant adults, and later with peers and other adults. Human sleep is a characteristic example of such a function: sleep disturbances provoke people to actions aimed at intensification of direct sleep regulation, which lead to sleep fragmentation only [7].

This study extends these assumptions about the psychosomatic development of various physiological functions and bodily processes [1; 3] to children's sleep. In young children, the regulation of sleep and wakeful-

ness is carried out by the parents, shaped by the parents' own system of sleep and wakefulness regulation and the child's beliefs about sleep. As the child grows and is confronted with sleep difficulties, parents' reactions to these difficulties, and their demands and constraints, sleep becomes a "partially transparent" function for the child [5]. In essence, he or she begins to recognize his or her sleep as a separate, organized process. The child develops his or her own rules and tools for regulating his or her sleep, which may be partly based on or borrowed from the parental system and partly determined by other experiences or even by experiences of counteracting to parental demands. As a result, the child's sleep and wakefulness regulation system that is initially controlled by parents is gradually interiorized by the child and partly transformed — depending on his/her relationship with the parents, the parents' behavior regarding their own sleep (which may diverge significantly from what they do regarding the child's sleep), and other life experiences (such as sleeping at camps or at friends' houses).

Unfortunately, a review of research of sleep in children demonstrates that most of studies do not address the psychological factors of sleep regulation, with the exception of behavioral factors.

Behavioral factors and the organization of children's sleep are so important that they are now included both in diagnostic criteria for sleep disorders [4; 18] and in descriptions of so-called "optimal" sleep in children as nighttime sleep without waking up and in one's own bed [14]. In particular, children's sleeping habits with regard to laying down, falling asleep, and maintaining sleep are considered to be some of the key psychological factors of insomnia in children if this insomnia is related to child and parental behavior [24]. A number of studies reveal the association (and frequent comorbidity) of sleep disorders in children with symptoms of **anxiety and depression** [8; 12], as well as lower perceived well-being [21].

As in adults, **cognitive arousal before sleep** [12] and severity of **dysfunctional beliefs about sleep** have been shown to be associated with worse sleep quality in children as assessed by both children and parents [13], although the association of dysfunctional beliefs with sleep quality in children often disappears after statistical control of anxiety and depression [8], but these studies are isolated. The **sociocultural factors** of sleep and wakefulness in children also remain under-investigated [22], which makes research on children's sleep in different countries and cultures especially relevant.

One of the few exceptions in this area is a study conducted on 45 pairs of 11—12 year old children and their parents that included objective registration of children's sleep by actigraphy [20]. Maternal dysfunctional beliefs about children's sleep were demonstrated to be associated with worse sleep quality in children, but only according to maternal appraisals (not children's own appraisals), and were also associated with children's own dysfunctional beliefs. Although indirectly this result suggests that children at least partially internalize their parents' beliefs, it remains unclear what exactly is learned by children during socialization — the parental beliefs about their sleep, about their own sleep, or the sleep regulation strategies that parents implement in their own lives.

The **aim** of the study was to identify the relationship between parents' dysfunctional beliefs about their sleep, its vulnerability, and sleep hygiene disturbances with parents' beliefs about their 5—13 year old children's sleep, the children's own beliefs about their sleep, and the children's quality of sleep and wakefulness.

The following **hypotheses** were proposed:

1. Parental subjective sleep quality and their dysfunctional beliefs about their sleep, its vulnerability, and sleep hygiene disturbances are related to their 5-13 year old children's beliefs about sleep, children's sleepiness and sleep difficulties (as assessed by both children and parents).

2. Parental dysfunctional beliefs about their sleep and its vulnerability are indirectly related to children's sleepiness and sleep difficulties, as parents with such beliefs are more likely to think the same about their children's sleep, and children, in turn, think the same about their own sleep (mediation effects).

Methods

Pairs of "child 5—13 years old without diagnosed sleep disorders — one of his/her parents" were invited to the study. The parents filled the questionnaires and the children were interviewed, with the interviewer completing the instruments either by interview or with the child, depending on their age and ability to understand and complete the instruments.

Parents answered **questions** about their chronotype ("owl" or "lark"), the child's chronotype, their and the child's habitual sleep patterns (presence and duration of daytime sleep, time and regularity of bedtime, time to fall asleep, number and duration of night awakenings, time of awakening in the morning and time of rising in the morning), and the necessary and actual duration of their and the child's sleep. Their responses were used to calculate the child's sleep duration, time in bed, and sleep efficacy.

Parents then filled the following **scales about their child's sleep**:

1. *The Children Sleep Habits Questionnaire* (CSHQ, [23; 17]) is a questionnaire for parents designed to diagnose various aspects of sleep disturbances and child sleep patterns, including sleep behavior. It includes scales of resistance to falling asleep, delayed falling asleep, insufficient duration of sleep, night terrors, nocturnal awakenings, parasomnias, sleep breathing disorders, and daytime sleepiness. Additionally, parents rated each item by the extent to which each aspect of the child's sleep is a problem for them. In this study, Cronbach's alpha of the total score was 0.80 (0.55—0.92 for the various subscales).

2. The *Subjective Sleep Vulnerability (Fragility) Scale* [6] is based on the subjective sleep vulnerability checklist, a list of 12 subjective causes of sleep disorders, which was used for screening differential diagnosis of sleep disorders. Cronbach's alpha in this study was 0.78.

3. *The Dysfunctional Beliefs About Children Sleep Scale* (DBACS, [20; 16]) is a modification of C. Morin's Dysfunctional Beliefs About Sleep Scale to examine parents' dysfunctional beliefs about their children's sleep. Cronbach's alpha in this study was 0.81.

Parents then filled a series of **scales about their own sleep**:

4. *Insomnia Severity Index* [3; 19] is a screening scale to assess insomnia-type sleep disorders. In the normative sample the index is used as an indicator of subjective sleep quality (higher scores indicate worse sleep quality). Cronbach's alpha was 0.82.

5. *The Dysfunctional Beliefs About Sleep Scale* [3; 19] includes beliefs about sleep and sleep disorders that are associated with worse sleep quality in the normative sample and with the perpetuation of insomnia in patients. Cronbach's alpha was 0.84.

6. The *Subjective Sleep Vulnerability (Fragility) Scale* [6]. Cronbach's alpha was 0.76.

7. *Behavioral Factors of Sleep Disorders Scale* [6] — a screening scale for assessment of sleep hygiene disturbances and adherence to stimulus control principles. Cronbach's alpha was 0.74.

Children, depending on their age and ability to understand the questions, replied to the scales either as part of a structured interview or by themselves. The *scales* were as follows:

1. *The Sleep Self-Report* (SSR, [25; 21]) was developed as an analogue of the Children's Sleep Habits Questionnaire for use with children; it includes 26 items, the content of which is as comparable as possible to the parental version. The scale includes four subscales: sleep habits/bedtime routine, refusal to go to bed, night terrors, and sleep quality. In this study, Cronbach's alpha of the total score was 0.81 (0.55—0.71 for the various subscales).

2. *Dysfunctional Beliefs About Sleep — Children's scale* (DBASC-10, [9; 13]) is a modification of C. Morin's Dysfunctional Beliefs About Sleep scale for use with children. Young children were given the scale in the form of an interview; if they could not fully understand it, the scale was skipped (132 of 147 children, 89.8%, understood and responded to the scale). Cronbach's alpha for this study was 0.75.

3. The *Subjective Sleep Vulnerability (Fragility) Scale* [6]. Cronbach's alpha was 0.69.

4. *The Pediatric Daytime Sleepiness Scale* (PDSS, [11]) includes eight items and has been proposed for subjective assessment of sleepiness in school-age children. In this study, it was translated to Russian and used for the first time; Cronbach's alpha 0.73.

A total of 147 pairs of "child 5—13 years old — one of his parents" participated in the study. Sixty-seven respondents were girls (45.6%), 79 were boys (53.7%), and in one case the gender of the child was not specified (0.7%). The mean age was 8.29±2.53 years. Of these, 47 (32.2%) were older preschool age (5-6 years), 49 were 7-9 years (33.4%), and 51 (34.9%) were 10-13 years. Sixty-one parents (41.5%) identified their children as "larks", 72 (49.0%) as "owls", and the rest indicated either a mixed type ("doves") or skipped this question. No differences in chronotype ("larks" / "owls") between children of different ages were found.

Parents included 11 fathers (7.5%), 134 mothers (91.2%), and two did not indicate their gender (1.4%). Parents ranged in age from 24 to 56 years (mean age 35.69±5.86 years).

Data were processed in SPSS Statistics 23.0 software and included descriptive statistics, group comparison methods, correlation analysis, regression analysis, and mediation analysis.

Results

Parents' beliefs about their and their children's sleep and children's sleep quality

In families with better subjective quality of parental sleep, children had less sleep difficulties and sleepiness, and sleep itself was longer (Table 1). Interestingly, parental subjective sleep quality was more closely related to parental appraisals of child sleep than to child's assessments (e.g., not related to how sleepy children themselves felt during the day). Poorer parental sleep quality also correlated with poorer child sleep efficiency, as well as parent and child beliefs in child sleep vulnerability.

Dysfunctional beliefs and beliefs about sleep vulnerability regarding both own parental and children's sleep were related (Table 1; in children, the relationship was $r=0.40$, $p<0.01$).

The more pronounced parents' dysfunctional beliefs about their own sleep, the more often they tended to think the same about their children's sleep, and children, in turn, were also more likely to express dysfunctional beliefs about their sleep. Parents' own dysfunctional beliefs about their own sleep were related only to children's sleep difficulties as appraised by parents, whereas parents' dysfunctional beliefs about children's sleep were related to both children's sleep problems and their daytime sleepiness as appraised by both children and parents.

Parents' beliefs about own sleep vulnerability and their children's sleep vulnerability were associated with worse sleep quality in children and sleepiness according to parental appraisals, whereas their associations with sleep quality and sleepiness according to children's appraisals were weaker and did not reach the accepted level of significance in all cases.

In order to test the hypothesis that parents' beliefs about their sleep were indirectly related to the quality of children's sleep and sleepiness (through parental beliefs about the child's sleep and the child's own beliefs) a series of mediation analyses with two mediators was conducted. The dependent variables were children's difficulties of sleep and children's sleepiness as appraised by the parent and by the child's own perceptions, respectively (i.e., four dependent variables, Table 2). Sleep duration and sleep efficiency were not included in the analysis because they were not related to children's and parents' beliefs by correlation analysis.

No direct effects of parents' dysfunctional beliefs about their sleep and beliefs about their sleep vulnerability were found in any case. Parents' dysfunctional beliefs about their own sleep were indirect predictors of children's sleepiness and sleep difficulties (as appraised by parents) through mediation by parents' beliefs about children's sleep. In addition, all three possible mediation effects on subjective sleepiness (as appraised by children) were established. In the other words, parents prone to dysfunctional beliefs about their own sleep were more likely to think the same about their child's sleep, which, in turn, was associated with more pronounced sleep difficulties and sleepiness in their children (as assessed by parents). Sleepiness (as appraised by children) was related both to the fact that parents with dysfunctional beliefs about their own sleep also think the same about their children's sleep, which is related to the risk of sleepiness, and also to the fact that parents' dysfunctional beliefs about their children's sleep were in turn related to the risk of similar beliefs in the children themselves.

Parents who tended to consider their own sleep as vulnerable and fragile were more likely to think in the same way about their child's sleep, which, in turn, was associated with a greater likelihood that the child would consider his or her sleep as more vulnerable and — as a consequence — with more pronounced difficulties with sleep (according both to children and parents), and subjective sleepiness (according to children's appraisals). In addition, if parents considered their sleep to be vulnerable and, as a consequence, their child's sleep to be vulnerable, this latter beliefs predicted more pronounced sleep problems in the child, but only according to parental appraisals.

Table 1

Relationships between the subjective quality of sleep and parents' beliefs about their and their child's sleep and the beliefs and quality of their children's sleep: results of a correlation analysis (N=147 pairs)

	DBACS — Parents: Dysfunctional beliefs about child's sleep	**Parents: Subjective vulnerability of child's sleep**	**ISI — Parents: Insomnia Severity Index**	**DBAS — Parents: Dysfunctional beliefs about own sleep**	**Parents: Subjective vulnerability of own sleep**	**Parents: Sleep hygiene disturbances**
DBACS — Parents: Dysfunctional beliefs about child's sleep	1	.36**	.18	.42**	.38**	.18
Parents: Subjective vulnerability of child's sleep	.36**	1	.26	.14	.44**	.14
CSHQ — Daytime sleepiness (parental appraisal)	.32**	.19	.26	.09	.18	.18
CSHQ — Total score in child (parental appraisal)	.34**	.32**	.38**	.26	.29*	.30*
Sleep duration	-.04	-.09	-.26	-.07	-.13	-.02
Sleep efficacy	-.13	-.17	-.35**	-.12	-.17	-.09
Daytime sleepiness (child's appraisal)	.32**	.21	.16	.09	.14	.19
SSR — Total score of sleep diffculties (child's appraisal)	.21	.11	.21	.10	.18	.25
Children: Subjective sleep vulnerability	.29*	.35**	.18	.19	.21	.21
DBASC — Children: Dysfunctional beliefs about own sleep	.32**	.16	.15	.42**	.24	.18

* — p<.05, ** — p<.01 (with Bonferonni adjustment for multiple comparisons).

Table 2

Children's sleep quality and sleepiness as affected by parents' dysfunctional beliefs about their own sleep and sleep vulnerability, their children's sleep and children's own beliefs about their sleep and its vulnerability: results of mediation analyses

Dependent variables in models	Total indirect effect			Mediation	Specific indirect effects		
	β	se	95% CI		β	se	95% CI
Model 1: indirect effects of parental dysfunctional beliefs about their sleep and their children's sleep							
CSHQ — Daytime sleepiness (parental appraisal)	.86	.33	[.29-1.63]	Parent about his/her own sleep- about his/her child's sleep	.86	.31	[.37-1.60]
CSHQ — Total score of child's sleep difficulties (parental appraisal)	1.93	.83	[.50-3.79]	Parent about his/her own sleep- about his/her child's sleep	1.62	.79	[.38-3.55]
Daytime sleepiness (child's appraisal)	.16	.04	[.09-.26]	Parent about his/her own sleep- about his/her child's sleep	.08	.03	[.03-.16]
				Parent about his/her own sleep- about his/her child's sleep — child about his/her own sleep	.01	.01	[.00-.05]
				Parent about his/her own sleep- child about his/her own sleep	.06	.03	[.02-.13]
Model 2: indirect effects of parental beliefs about their sleep vulnerability and their children's sleep vulnerability							
CSHQ — Total score of child's sleep difficulties (parental appraisal)	2.83	1.16	[1.01-5.54]	Parent's appraisal of his/her own sleep vulnerability- of his/her child's sleep vulnerability	1.97	.97	[.44-4.29]
				Parent's appraisal of his/her own sleep vulnerability- of his/her child's sleep vulnerability — child's appraisal of his/her own sleep vulnerability	.56	.39	[.06-1.70]
Daytime sleepiness (child's appraisal)	.13	.07	[.00-.29]	Parent's appraisal of his/her own sleep vulnerability- of his/her child's sleep vulnerability — child's appraisal of his/her own sleep vulnerability	.06	.03	[.02-.15]
SSR — Total score of child's sleep difficulties (child's appraisal)	.06	.06	[-.04-.19]	Parent's appraisal of his/her own sleep vulnerability- of his/her child's sleep vulnerability — child's appraisal of his/her own sleep vulnerability	.06	.03	[.02-.13]

Discussion

The psychological system of children's sleep regulation as shared between children and parents: the relationship of parental beliefs and sleep quality with beliefs, difficulties with sleep and sleepiness in children. When parents' subjective sleep quality was low, children's sleep efficacy was lower (which is an indicator not only and not so much of sleep difficulties as an indicator of ineffective sleep regulation in a situation of sleep difficulties) and both children and parents appraise children's sleep as more vulnerable. It is also interesting that parents' subjective sleep quality was more closely related to parents' than to children's appraisals of children's sleep: for example, parents with their own sleep difficulties were more likely to believe that their children appeared tired and sleepy during the day, whereas children were likely not to feel that way. From our perspective, parents who have difficulties with their own sleep are more likely to worry about their children's sleep and to choose ineffective strategies for regulating their children's sleep (e.g., disrupting the child's routine), resulting in decreased sleep efficiency. Indirect evidence that the relationship between children's sleep quality and parents' sleep quality is partially explained by the use of dysfunctional sleep regulation strategies in both cases is the association of children's sleep difficulties and sleepiness with their parents' poor sleep hygiene.

According to mediation analysis, parents' dysfunctional beliefs about their own sleep are indirectly related to children's sleepiness (as assessed by children and parents) and children's sleep difficulties (as assessed by parents only) through mediation by parents' dysfunctional beliefs about their children's sleep, and in case of sleepiness as appraised by children — also through mediation by children's beliefs about their own sleep. In other words, the more dysfunctional beliefs about their own sleep parents have, the more likely they are to think the same about the child's sleep, which, in turn, is associated with children's sleep difficulties and sleepiness. In addition, both parents' dysfunctional beliefs about their sleep and parents' dysfunctional beliefs about their child's

sleep are related to the child's own beliefs about their sleep, which is a predictor of greater subjective sleepiness. The data are consistent with the results of the previous study of the relationship between dysfunctional beliefs about sleep in parents and children [20].

Parents' beliefs about their sleep vulnerability were indirectly related to children's sleep difficulties (as assessed by children and parents) and their sleepiness (as assessed by children) through the following mediation: parents with such beliefs were more likely to consider their child's sleep as vulnerable as well, which, in turn, increased the likelihood that the child also appraised his/her sleep as vulnerable, and indirectly affected sleepiness and sleep difficulties. For sleep difficulties, an additional mediating effect was identified: parents' beliefs about their sleep vulnerability were related to their child's sleep difficulties through child's own beliefs about his/her sleep vulnerability.

Conclusion

1. Parents' dysfunctional beliefs about their own sleep and its vulnerability, their children's sleep and its vulnerability, and the children's own beliefs are related to each other and to the children's worse sleep quality and sleepiness.

2. Parents' dysfunctional perceptions of their own sleep are indirectly related to children's sleepiness and sleep difficulties — as they increase the likelihood of the same parental beliefs about the children's sleep.

3. Children's own sleepiness is additionally indirectly related to parents' dysfunctional beliefs their own sleep through mediation by children's beliefs about their own sleep.

4. Parents' beliefs about their sleep vulnerability are related to children's difficulties with sleep and sleepiness because they increase the likelihood of children's beliefs in sleep vulnerability, and those, in turn, increase the likelihood of children's own beliefs in their sleep vulnerability.

This study demonstrates some opportunities for research of the development of the psychological system of sleep and wakefulness regulation during ontogeny as shared between parent and child. We concentrated on the only one example of such "transmission" of sleep regulation in the interaction between child and parents (on the example of cognitive representations), but this result is fully consistent with the assumptions of psychology of corporeality about psychological regulation of sleep [5; 7]. Further research may extend the findings to other cognitive, emotional, and behavioral factors of sleep regulation.

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Cultural Actions in the Play of Preschool Children

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The article is devoted to the analysis of the key mechanisms of children's development in the play — the correlation of cultural actions and the conditions of their formation that arise in the process of children's play. A detailed analysis of the concepts of "situation" and "normative situation" is given. According to L.S. Vygotsky, a special role in children's play is assigned to the imaginary situation, which determines the subjective nature of children's activity, and directs it to the development of the semantic side of actions due to the specifics of the imaginary situation. In other words, conditions are created in preschool childhood both for mastering normative action and for establishing an attitude to normative action. This is possible due to the presence of two spaces: culture and the space of an imaginary situation. Within these spaces, cultural artifacts themselves are mastered and a subjective attitude to various aspects of cultural objects is generated. The relevance of the theoretical analysis of the mechanisms of development in the play is due to the growing interest in the play as a means of purposeful development and education of preschool children.

Keywords: cultural-historical approach, play, normative situation, imaginary situation, cultural action, natural action.

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Культурные действия в игре детей дошкольного возраста

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Статья посвящена анализу одного из ключевых механизмов детского развития в игре — соотношения культурных действий и условий их формирования, возникающих в процессе детской игры.

Дается подробный разбор понятий «ситуация» и «нормативная ситуация». Согласно Л.С. Выготскому, особая роль в игре отводится мнимой ситуации, что определяет субъективный характер детской активности и направляет ее на освоение смысловой стороны действий, обусловленных спецификой мнимой ситуации. Другими словами, в дошкольном детстве создаются условия и для освоения нормативного действия, и для установления отношения к нормативному действию. Это оказывается возможным благодаря наличию двух пространств: культуры и пространства мнимой ситуации. В рамках этих пространств осваиваются сами артефакты культуры и порождается субъективное отношение к различным аспектам культурных объектов. Актуальность теоретического анализа механизмов развития в игре обусловлена возрастающим интересом к игре как средству целенаправленного развития и обучения детей дошкольного возраста.

Ключевые слова: культурно-исторический подход, игра, нормативная ситуация, мнимая ситуация, культурное действие, натуральное действие.

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Introduction

The problem this paper is focused on is related to the analysis of actions performed by children of preschool age in the framework of socio-dramatic play. This topic appears to be of the immediate interest, both for theory and practice. It opens additional opportunities for the studying of socio-dramatic play and its potential in the context of purposeful teaching and development of preschoolers. N.Y. Mikhailenko considered the situation where a role is performed as one of the key elements of the structure of play activity [19, c. 183]. Therefore, it seems important to begin with the analysis of the very concept of situation, and the possibility of its use for the characteristic of play activity of preschoolers.

L.S. Vygotsky, in his analysis of child development, suggested the concept of social situation of development. This is how he understood it: "We must admit that at the beginning of each age period, there develops a completely original, exclusive, single, and unique relation, specific to the given age, between the child and reality, mainly the social reality that surrounds him. We call this relation the social situation of development at the given age." [6, p. 258]

As one can see, this definition of social situation of development includes a child and the reality surrounding him/her (also the social one), and the child's relation to this reality (emotional experience — "perezhivanie") [23]. Characterizing a child's actions implies the detailing of surrounding reality. To this end, it's necessary to define the units forming the category. We suggest situations as such units. Let us introduce a working definition of a situation, and use classical psychological works that included this concept, as a foundation. Thus, J. Watson equated a situation to a stimulus (a cause situation): "When a human being performs a series of acts — moves his/her arms, feet, or strains the vocal cords — there must be necessarily a group of preceding factors that form the "cause" of the act. The latter can be conveniently defined by a term "situation" or "stimulus"... Therefore, psychology faces two direct problems: 1) to define potential cause situations that triggered a situation, and 2) to forecast a possible reaction caused by a certain situation." [15, p. 263]

E. Tolman in his work "Behaviour as a molar phenomenon" analysed the watsonian position and defined a situation as a group of stimuli: "In a psychological laboratory, when we are dealing with relatively simple factors such as the impact of air waves, sound waves, etc. on the human adaptation, we're talking with a stimulus. On the other hand, when the factors causing certain reactions are more complex, for example, in the social world, then we're dealing with situations. A situation, through an analysis falls into a complex group of stimuli." [14, p. 147].

Moreover, E. Tolman clearly understood the limitations of J. Watson's approach, and suggested viewing a situation in the context of the concept of a purpose: "Behaviour in its own sense apparently is always characterized by orientation of a purpose, or it derives from the purpose object or a purpose situation." [14, p. 147].

The idea of a purpose as an essential characteristic of a situation was also reflected in Gestalt psychology that introduced the concept of a problem situation [5] as a group of conditions where an individual had a goal to achieve but the ways of doing it were unknown. In that case, the situation was not only considered as a combination of external conditions, but also included the individual's relation to these conditions determined by the goal. Thus, the understanding of a situation is psychological science included both subjective and objective characteristics.

In the light of this distinguishing of two aspects of a situation, the following words by A.F. Losev are of special interest: "Even a toddler knows that there is something internal and external in everything. This is the most basic and universal antithesis of thought and being. In fact, before any philosophizing, before any methodical reasoning, we can already notice that these two sides are present in things, and they are in different relation to each other... There is no reality without an external material base, implementing and embodying some internal content; and there can be no reality without an internal, immaterial image and shape, or, a meaning that forms and conceptualizes the matter, and makes it real." [9, pp. 805—806].

Z. Freud [16] focused on the moral aspect of a situation, where individual's behaviour was determined not only by external conditions or internal tendencies, but also by the system of moral values dictating certain way of behaviour.

These mandates can be clearly observed in social psychology in the theory of role. Thus, T. Shibutani wrote that a role in a play could be understood as "... the idea of a proper behavioural pattern expected and required from a person in a certain situation, in case his/her position in a joint action is known." [18, p. 46].

As a preliminary conclusion, let us indicate that a situation can be analysed from two perspectives, the objective and the subjective one. The latter is defined by the attitude of the acting subject, and depends on his/her individual characteristics, values, emotional reactions, feelings, goals and purposes, etc. [1; 4; 12] The objective aspect of a situation includes objective features, such as mandates, requirements, or rules. Objective situations have two components — an external (visible) aspect, and a rule (hidden). These two elements, despite being opposite to each other, are still objective. This objectivity manifests itself in their existence independently from a particular individual.

Normative situation and child's actions

In the social environment, it is the artefacts that determine the situation where each object, feature, or circumstance has a standard behavioural pattern or action assigned to it. Therefore, when a person approaches an object, he/she finds him/herself in the framework of pre-set mandates and indications, and the society expects them to be complied with. In this case, the behaviour will be considered adequate. This is why such situations can be viewed as the units of social space. They are not random but normative situations due to the existence of standard behavioural rules or actions with the given object, in them. [3] In this case, normative situations can themselves be considered as cultural units. An individual facing such a situation is supposed to act following the indicated cultural pattern. Therefore, we can assume that a cultural action is an action dictated by a normative situation, and it complies with the accepted cultural norms that are mandatory for everyone finding him/herself in such a situation. Obviously, a normative situation is the space where cultural actions exist.

Let us emphasize and important aspect related to children's actions in a normative situation. One should keep in mind that the actions that are the result of objective characteristics of a normative situation, and the actions determined by the personal characteristics, do not only differ but are also located in different fields. The specifics of a child's behaviour reside in the fact that his/her actions can fall within the framework of a normative situation, or stay beyond. The intrinsic quality of a normative situation is that of all the multitude of possible ways of acting and behaviour, only one particular option of activity is suggested as the most appropriate and desired under these circumstances. In other words, in a particular normative situation, even though culturally, may ways of action or behaviour exist, but only one pattern would be acceptable. It can be also called a cultural action, accentuating the fact that this action is a normative one, i.e. a standard way of action accepted by a particular society which was not invented by the child but is the result of his/her mastering of social norms of behaviour. Obviously, performing of this action can be more or less successful, and children meet the expectations differently, varying their behaviour. Nevertheless, the socially dictated action will remain the same. It is not determined by individual's own will, but by the mandates existing for this normative situation. Thus, the structure of a normative situation includes a certain objective cultural action.

It is notable that children of preschool age can distinguish play actions and the actions dictated by a normative situation, or cultural actions. This differentiation was described by D.B. Elkonin in detail [19, p. 196]. Preschoolers were suggested to "play themselves". The particular interest of this situation resides in that a play situation is replaced by a normative one. As it was mentioned before, the specifics of the latter requires that a child reproduces certain expected actions, i.e. the actions that are multiply repeated in his/her daily life. The children's response was a paradoxical one, because it was not technically complicated to perform the task, since this is what they did on a daily basis. However, psychologically the participants could not understand the instructions of the experimenter as a play situation because of the drastic difference between a play and a normative situation.

According to L.S. Vygotsky, a cultural action possesses the following characteristics: mediacy, consciousness, arbitrariness, and systematicity. [6] If we compare these two definitions it is valid to ask if they both describe the same action, or two different ones. We believe that it is the second option. First, a cultural action acts in its external form as a cultural pattern, and further, as a result of the mastering of this cultural pattern by the child in the process of learning under the adult guidance in the zone of proximal development as an action possessing the characteristics indicated by L.S. Vygotsky.

Play and child's actions

There is another aspect to be taken into consideration. As it is known, L.S. Vygotsky emphasized that the zone of proximal development emerges in a play. He said, "play-development relationship can be compared to the instruction-development relationship, but play provides a background for changes in needs and in consciousness of a much wider nature. Play is the source of development and creates the zone of proximal development." [7, p. 65]. Therefore, in a play a child also masters cultural actions. However, according to A.N. Leontyev, play actions differ from perfect cultural actions in their operational composition which is related to the use of substitute objects. It is the opportunity not to reproduce the operations or to only reproduce them partially, in a simplified way that distinguishes play from other activities. The result of this particularity is also of special interest [11; 20]. Apparently, in a play a child acts within the zone of proximal development, but independently from the adult guidance. Then, what is this activity? Is it a cultural form of action, or a natural one? D.B. Elkonin believed that in a play, children mastered the meaning of human behaviour in different situations. Since the acquisition of the operational aspect of adult activity does not take place in a play due to the complexity of its operational composition, a child has to deal with the motivational and meaningful aspect. Thus, a play is a totally new framework, different from the social scope of culture consisting of normative situations as its basic units. In this case, play becomes a semantic space, and, therefore, a subjective one. This is where play actions aimed at building the relationship with cultural artefacts, are implemented.

Now, we have approached to the definition of two frameworks or scopes, one of which is related to the mastering of perfect standard forms (the patterns of cultural actions). It is objective and is, in fact, the social cultural space. Its mastering takes place in the zone of proximal development. The other framework or space is the one of play. It is subjective and allows building a relationship with different cultural objects.

Two frameworks where the actions exist

L.S. Vygotsky considered play actions in the context of an imaginary situation. In the cultural-historical approach, an imaginary situation is the space where play actions exist. He wrote: "Thus, in establishing criteria for distinguishing a child's play from other forms of activity, we conclude that in play a child creates an imaginary situation."[7, p. 62].

In order to understand the specifics of play actions, it is necessary to analyse the phenomenon of an imaginary situation. As L.S. Vygotsky emphasized, its emergence "...becomes possible on the basis of the separation of the visual field and the field of meanings—the ability that develops in the preschool age." [7, p. 63].

From our point of view, in psychological perspective, the phenomenon of imaginary situation is a merging of two different fields, of perception and of imagination. In this union, the meanings of both components are taken into account. [22]

In this case, according to L.S. Vygotsky, the specifics of a play action in an imaginary situation are the following: "An action in a situation that is not seen, but only conceived mentally in an imaginary field (i.e., an imaginary situation), teaches the child to guide his behaviour not only by immediate perception of objects or by the situation immediately affecting him but also by the meaning of this situation." [7, p. 64].

For more accurate understanding of play actions taking place in an imaginary situation it would be convenient to juxtapose its structure with the structure of a normative situation. As it was mentioned above, the latter typically contains an object and rules (or mandates) of action with this object. However, one should keep in mind that in a normative situation, the rule doesn't just exist but in fact, dictates the individual the need to act in a certain way. In other words, a normative situation is a space of the subject's activity. It is no coincidence that D.B. Elkonin indicated that "... the connections of the actions with the object and the word that means it form a single dynamic structure." [19, p. 242]. From our point of view, this structure can be called a normative situation.

To our opinion, an imaginary situation possesses the following features. First, it contains a normative situation determined by the external characteristics of an object located in the perception field and the rule related to this object. Secondly, it contains a representative image of another normative situation with another object and corresponding rule. Thirdly, the rule from the imaginary

normative situation substitutes the rule of actually perceived normative situation. This replacement is reflected in the use of substitute objects. Otherwise speaking, an imaginary situation is the result of the transfer of desired behaviour from one normative situation to another. [22] The results of various research works on renaming the objects confirm the validity of our assumption. In particular, D.B. Elkonin described an experiment where such renaming was studied on children of preschool age. First, the child was asked to name the objects that were placed in front of him/her, and then rename them in accordance to the names suggested by the experimenter. The data, obtained for 5-year-old children is of a special interest for us. The author discovered that some of them "... made immediate attempts to handle the objects in compliance with the new name." [19, p. 235] This evidence confirms that, indeed, each object has certain rules of acting with it which is the characteristic of a normative situation. Children's handling the objects in accordance with the new name indicates the emergence of an imaginary situation, because the rule of one normative situation was transferred to another one.

As mentioned above, in a normative situation, it is expected that the subject would act in a certain way. Therefore, the very fact of activity is an intrinsic feature of an imaginary situation. E.O. Smirnova who understood preschool play to the ground up wrote in this regard: "It is impossible to think of a child who after taking up the role of an adult would remain idle and only act in the mental plane — in his ideas and imagination." [11, p. 270]

This is why, compliance with the rule transferred to the new situation seems crucial to us. It is the rule that determines the meaning of an imaginary situation and, therefore, of the entire play. It is the rule that makes the child act. Multiple research works dedicated to play emphasized the significance of the rules in this context. For example, L.S. Vygotsky indicated that "it is absolutely impossible to imagine that a child doesn't follow any rules in an imaginary situation. If he takes up the role of a mother, then, there are the rules for a motherly behaviour. The role played by the child, his relation to an object that changed its meaning will always derive from the rule, i.e. an imaginary situation will always contain rules in it." [7, p. 66]. J. Huizinga, the well-known culture expert, also mentioned the absolute necessity of following the play rules: "play is a voluntary activity or occupation executed within certain fixed limits of time and place, according to rules freely accepted but absolutely binding, having its aim in itself and accompanied by a feeling of tension, joy, and the consciousness that it is 'different' from 'ordinary life." [17] Another play expert, R. Caillois added: "Any play is a system of rules. They define how the play should be "played" [de jeu], and how not, i.e. what is allowed and what is prohibited. These conventions are at the same time arbitrary, imperative, and dictatorial. Under no circumstances they can be violated, otherwise the play immediately stops and gets ruined by the very fact of that violation. The play is maintained in the first place, with the wish to play, i.e. the willingness to follow the rules. One should "play the play" [jouer le jeu] or not play at all." [8]

It is in this obligation to follow the rules, where L.S. Vygotsky saw the paradoxicality of play. The paradox resides in the fact that the child, in order to operate with an independent meaning needs another thing. Technically, this is the description of the mechanism of building an imaginary situation. A child finds some objects in one space that can be identified with other objects from another space.

Thus, a child has to orientate on two levels simultaneously to be able to act in an imaginary situation, on the level of real actions determined by the visible field, and on the level of play actions in an imaginary situation.

One can say that a normative situation forms part of the structure of preschool play, since it introduces the rules that children have to follow when taking up a certain role. But on the other hand, this normative situation has to be different from the others that a child encounters in his/her life. The distinction of a play and a real situation resides in that in the first case, they are already mastered by children, and in the second one, are only supposed to be eventually mastered.

Thus, there are two different types of actions performed by children in normative situations. The first one complies with cultural norms, and the other one is related not to the norms but to the meanings of adult activities. In this regard, play actions are in fact, subjective, and their operational aspect is symbolic, and is implemented by means of substitute objects. Herewith, a normative situation can be considered as an evaluation criterion for the developmental potential of a play depending on the extent of enrichment of symbolic aspect of play action by the child.

Now it is clear what kind of actions can be performed in a play. If we follow T. Parsons's perspective, play actions performed by preschoolers can be categorized as cultural actions because they are variants of social activities. He wrote: "A social action is an action that in accordance to its subjective meaning for the actor or the actors implicitly includes the attitudes and actions of others, and in its development, is oriented at them." [10]

In other words, in case of children it is valid to assume that a cultural (social) action is a form of child activity that always takes another subject into account. Here, the actions performed by the child both in a normative and

imaginary situation are cultural: objective normative actions follow a sample, while subjective play actions follow the role framework. Consequently, at preschool age as whole range of actions can be observed that is performed by children both in different normative situations, and in a play. Moreover, a normative situation can be used as an evaluation criterion for the developmental potential of play [24].

Preschoolers' actions

Talking about the actions of preschoolers, we mean both objective actions (per example) and subjective play actions. They are different from natural actions and can characterize the specifics of children's activity.

Natural actions imply inappropriate use of an object if compared to the corresponding norm. They can lead to the destruction of the object the child is handling (for example, he/she takes a toy car and bangs it against the table). A natural action is different from the action with a substitute object, because the latter follows the logic of the substituted object. Meanwhile, a natural action is beyond the object logic [21].

Cultural or objective actions (per example) are the actions mastered by the child under adult guidance or following the example of other children. These actions are social because they're acquired through social interaction and imply the possibility of someone else's participation. It is important to note that building a normative situation takes place in the point of social tension, i.e. where the subject can act egocentrically or prosocially. The latter occurs in accordance to the mandates existing for each and every normative situation.

Play actions are, as we mentioned before, implemented in compliance with the role taken by the child in a play. An imaginary situation becomes the space where these play actions deploy. They allow children forming their relation to normative situations, and that is why they take place in subjective space. However, play actions should be also considered as social ones, since they imply the participation of other children and are aimed at the understanding of meaning of played situations typical for the social surrounding of the child.

Conclusions

We compared children's actions in normative and imaginary situations. Each of them is oriented on a certain type of actions of preschoolers. Culture mandates mastering of cultural samples or patterns. Normative situation is the space where objective cultural actions exist. It also characterizes such developmental tool as the zone of proximal development, and the learning process related to it.

Normative situations form part of preschool play structure as social patterns to be mastered by children. Play, as emphasized by L.S. Vygotsky, A.N. Leontyev, and D.B. Elkonin emerges due to the complexity of the operational aspect of adult activities. Since the operational aspect of play actions is of symbolic nature, play becomes the space where children's subjective actions exist, and where their relation to culture is being formed. An imaginary situation, meanwhile, becomes the play tool.

All these actions can be considered social to a greater or lesser extent, and therefore, cultural. However, play and normative actions are different in their nature: the former deal with values, and the latter, with meanings; the former are objective, and the latter, subjective. Normative actions can also be used as the criteria for the development of children's sociodramatic role actions.

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Relationship between the Development Rate of Executive Functions within a Year and Screen Time in 5—6 year Old Children from three Regions of Russia

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The aim of this work was to investigate the relationship between the development rate of executive functions and the screen time in 5—6 year old children within a year. The study involved 495 children from Kazan, Moscow and the Republic of Sakha (Yakutia), who were 5—6 years old at the beginning of the study. The sample population was divided into three equal percentage groups based on the total screen time per week. This approach made it possible to analyze contrasting cases, that is, children with minimum (from 1 to 11 hours per week) and maximum (from 19.5 to 70 hours per week) screen time. It has been shown that the level of cognitive flexibility improved throughout the year in children with minimum screen time, and dropped in children with maximum screen time. In children with minimum screen time, the level of cognitive inhibitory control increased statistically more significantly over the year than in children with maximum screen time. For the development rate of working memory and behavioral inhibitory control, there were no statistically significant differences between the groups.

Keywords: executive functions, cognitive flexibility, working memory, inhibitory control, digital devices, screen time, preschool age.

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Связь темпа развития регуляторных функций за год с экранным временем детей 5—6 лет из трех регионов России

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Цель работы заключалась в изучении связи темпа развития регуляторных функций за год с экранным временем детей 5—6 лет. В исследовании приняли участие 495 детей из г. Казани, г. Москвы, Республики Саха (Якутия), которым на момент начала исследования было 5—6 лет. Выборочная совокупность была поделена на три равные в процентном соотношении группы на основе суммарного экранного времени за неделю. Такой подход обеспечил возможность анализа контрастных случаев, т. е. детей с минимальным (от 1 до 11 час. в неделю) и максимальным (от 19,5 до 70 час. в неделю) экранным временем. Показано, что у детей с минимальным экранным временем за год улучшился уровень когнитивной гибкости, а у детей с максимальным — ухудшился. У детей с минимальным экранным временем уровень когнитивного сдерживающего контроля за год увеличился статистически более значимо, чем у детей с максимальным экранным временем. В темпе развития рабочей памяти и поведенческого сдерживающего контроля статистически значимых различий между группами не обнаружено.

Ключевые слова: регуляторные функции, когнитивная гибкость, рабочая память, сдерживающий контроль, цифровые устройства, экранное время, дошкольный возраст.

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Introduction

At preschool age, the voluntariness, or, in other words, self-control is in process of active formation [4]. The development of self-control in childhood predicts life achievements, health and quality of life in adulthood [9], hence voluntariness can be considered a key formation at preschool age [1]. The formation of voluntariness in preschoolers is sensitive to systematic environmental influences [4]. One of such influences may be the access to digital devices [12], which preschool children now use for about 3 hours a day on average [7]. The term "digital devices" (hereinafter — DD) refers in this text to a TV, smartphone, computer or a tablet. The amount of time preschoolers spend in front of DD screens worries researchers and parents in view of the potential negative impact of DD on the development of voluntariness [13].

A number of studies have shown that the time spent in front of DD screens ("screen time") is inversely associated with the development of voluntariness in preschool children [16; 18; 21]. There are also connections between excessive screen time in early childhood and a low level of self-control development at the age of 5—7 years [8]. At the same time, many studies only consider the time spent watching TV, not taking into account various gadgets (the term "gadget" conventionally refers to a smartphone, tablet and computer as opposed to a TV) [16; 21]. Meanwhile, gadgets provide more diverse opportunities than a TV, which only allows watching video content [17]. With gadgets, a child can engage in various interactive activities (educational applications, multiplayer games, etc.), which, unlike passive TV viewing, can contribute to the development of self-control [2]. Thus, the time spent at gadgets may differ qualitatively from the time spent watching TV, so it is worth considering screen time for different types of DD separately — as passive and active screen time [17].

Some authors come to the conclusion that it is not screen time as such that negatively affects the development of voluntariness, but the fact that it takes time that a child could spend on other activities more beneficial to the development of self-control: live communication, games, physical and developmental activities [7]. Content is also important: often, children who get a lot of screen time consume a large share of poor-quality content unsuitable for their age, which negatively affects the development of self-control [2], while high-quality and age-appropriate developmental content can contribute to the development of voluntariness, if the screen time norms are not exceeded [15; 16].

In this work, the concept of executive functions by A. Miyake's was applied to study the voluntariness in preschoolers. The advantage of his approach lies in the detailed characteristics of self-regulation [1]. Originally developed for adults, but it has been shown to be applicable for children [3]. Executive functions (hereinafter referred to as EF) are a cluster of cognitive skills that enable purposeful problem solving and adaptation to new situations [19]. The components of the EF are: 1) working memory (auditory and visual) — the ability to retain information and use it to solve problems; 2) cognitive flexibility — the ability to switch between tasks, rules and stimuli; 3) inhibitory control — the ability to inhibit impulsive reactions and the dominant response in favor of a response required in the current context [9].

The purpose of this study was to clarify the relationship between the development rate of the EF over a year and the screen time in children aged 5—6 years. In order to obtain a more reliable representation for the children's use of DD, the study involved children from three regions of Russia with different populations and varying cultural, economic, infrastructural and climatic characteristics: from Kazan, Moscow, Yakutsk and other settlements in the Republic of Sakha (hereinafter — Yakutia). The main hypothesis of the study was that an increase in screen time happens at the expense of some opportunities for EF development, and, consequently, children with more screen time will have a lower rate of EF development than children with lesser screen time. This hypothesis is based on the cultural-historical approach and its ideas on the mechanisms of the development of voluntariness in preschoolers [4]. According to the cultural-historical approach, the main regularity of a child's cognitive development is the transformation of "natural" cognitive functions into culturally conditioned ("higher") ones [4]. This is achieved by mastering cultural means through communication with adults or peers. Spending a lot of time in front of the screen not only leads to a more limited experience mainly reduced to the visual component, but the child also misses opportunities to be included in activities crucial for this age: live play, communication, experimentation [15].

Sampling and research procedure

The study participants (495 children, 52% boys) live in three regions of Russia: 35.6% from Kazan, 32.5% from Moscow, 31.9% from Yakutia. At the start of the study, the average age of the children was 65 months (SD=5.04). The overwhelming majority of mothers (78%) rated the level of family financial security as average, 74% of mothers have higher education. All children attended municipal kindergartens.

In the course of the study, two stages of the EF evaluation were carried out. The first involved 1100 children aged 5—6 years from the senior groups of kindergartens. The first stage of the evaluation took place between October 2019 and May 2020. A year later, 891 of these 1100 children took part in the second stage of the EF evaluation. At the first stage, the mothers of 1029 preschoolers filled out an online questionnaire on how their children use DD. The results of both longitudinal diagnostics and mothers' questionnaires have been obtained for 495 children, who then made up the sample of this study.

At the first stage, mothers received a link to the questionnaire in an email from a municipal educational institution or in a parent chat in a messenger. All mothers who filled out the questionnaires gave informed consent to participate and to the participation of their children. The approximate time required to fill out the questionnaire is 20 minutes. It can be assumed that the mothers who took part in the survey are more interested in the issues related to the children's use of DD than those who did not.

At both stages of the study, the EF evaluation was carried out individually, in a quiet room familiar to children. The evaluation was conducted in two sittings, each about 15 minutes. The diagnostic techniques were split into two meetings to avoid children getting tired during the tests.

Methods

A set of EF diagnostic techniques previously tested on preschoolers was used [3]. This set includes subtests of the NEPSY-II complex [14]: ***"Sentences Repetition"*** to assess auditory verbal working memory, ***"Memory for Designs"*** — for visual working memory, ***"Inhibition"*** — for cognitive inhibitory control, ***"Statue"*** — for behavioral inhibitory control. To assess cognitive flexibility, the ***"The Dimensional Change Card Sort"*** technique was used [23].

An online questionnaire for mothers was launched to explore the use of DD by children. It includes questions about socio-demographic factors, additional developmental activities, and screen time (how many minutes a day the child spends in front of the TV screen and on gadgets; TV and gadgets assessed separately).

Statistical data analysis was performed using the SPSS 23.0 program. Methods of descriptive statistics, two-factor analysis of variance (ANOVA), t-test for dependent samples, one-sample Kolmogorov-Smirnov test, Mann-Whitney U-test, and Pearson's chi-squared test were used.

Results

Screen time statistics and socio-demographic factors

Based on the survey of 1029 mothers (52% — mothers of boys; 45% live in Kazan, 24% — in Moscow, 31% — in the settlements of Yakutia), the relationship between socio-demographic factors and screen time in 5—6 year old children was described.

Two-factor analysis of variance (ANOVA) revealed a significant effect of the region of residence factor on the total screen time ($F(2958)=82.436$; $p<0.001$), as well as a significant interaction between the factors of the region of residence and gender ($F(2958)=9.516$; $p<0.001$); no significant differences in gender were found. It has been shown that children living in Yakutia had the highest indicators of screen time compared to children from Moscow ($t=-12.780$; $p<0.001$) and Kazan ($t=-7.281$; $p<0.001$); children living in Kazan differ significantly from those from Moscow ($t=6.691$; $p<0.001$) (fig. 1). The separate analysis of gender differences in screen time by region showed the significant difference between boys and girls only for Yakutia ($t=3.889$; $p<0.001$) (Fig. 1).

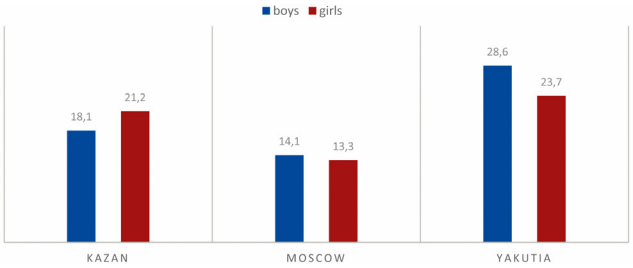

Fig. 1. Screen time of children from different regions (hour per week)

Using the t-test for dependent samples, differences were found in the average time spent on gadgets and watching TV per week ($t=24.680$; $p<0.001$; $d=0.77$). Children spend more time watching TV (13 hours per week) than at gadgets (7 hours per week).

The relationship between the development rate of the EF over the year and the screen time in 5—6 year old children

When assessing the differences in changes in the EF over the year between the groups, the differences between the groups shown in the first assessment were also taken into account. The purpose was to make sure that the differences in dynamics over the year are not due to the initial developmental level of the EF components.

To select contrasting samples by total screen time (active and passive screen time combined), the sample was divided into three equal percentage groups (each representing 33.3% of the total set of observations): (1) from 1 to 11 hours per week, (2) from 11.3 to 19 hours per week, (3) from 19.5 to 70 hours per week. In the further analysis, two extreme groups were considered — the group with the minimum (130 children) and the maximum (142 children) screen time. The differences in the group size are due to the fact that not all children were able to carry out all the EF diagnostic tests, for example, they said they were tired and did not want to continue.

The Kolmogorov-Smirnov test indicated that the data on all the EF indicators did not correspond to the normal distribution. In this connection, the comparison of two independent samples was carried out using the Mann-Whitney U-test. It has been shown that in children with minimum screen time, the level of cognitive inhibitory control increased statistically more significantly over the year than in children with maximum

screen time (Table 1). In children with minimum screen time, the level of cognitive flexibility improved over the year,while in children with maximum screen time, it decreased (Table 1). There were no differences between the groups in the development rate of working memory and behavioral inhibitory control over the year.

Socio-demographic characteristics of children's groups with various screen time

Children from three regions were included unevenly in the group with minimum screen time: the majority of children being from Moscow and only 11% from Yakutia (Table 2). Meanwhile, in the group with the maximum screen time, almost 48% of children were from Kazan and almost 30% from Yakutia (Table 2). The mothers' education level was also unevenly represented throughout the groups: in the group with the lowest screen time, there were more mothers with higher education (Table 2).

Discussion

The study aimed to explore the relationship between the EF development rate over the year and the screen time of 5—6 year olds from Kazan, Moscow and Yakutia. The hypothesis that children with increased screen time would show a lower rate of EF development compared to children with lesser screen time has been confirmed, but only partially. The results of the study showed that children from the group with screen time from 1 to 11 hours per week (no more than 1.5 h per day) improved their cognitive flexibility during the year, while in children with screen time of 19.5—70 hours per week (more than 2 h 45 m per day) the indicators of cognitive flexibility have decreased over the year. In the group with screen time of no more than 1.5 h per day, the level of cognitive inhibitory control increased statistically more significantly than in the group with screen time of more than 2 h 45 m per day. Contrary to the expectations, there were no statistically significant differences between the groups in the development rate of behavioral inhibitory control and working memory over the year.

The differences between the groups in the development rate of cognitive flexibility over the year can be explained by the fact that children with maximum screen time spend little time on activities beneficial to the development of cognitive flexibility [7]. Specifically, to improve cognitive flexibility, it is necessary to switch between different rules, conditions and contexts. This happens in communication and live play, during organized classes (physical education, music, etc.), in the course of exploring something new. While interacting

Table 1

Comparison of groups of 5—6-year-old children with different screen time by the rate of EF development over the year

Technique parameter	1—11 hours per week		19.5—70 hours per week		Mann-Whitney U-test	p-level
	M	SD	M	SD		
"Inhibition". Inhibition, combined score	1.63	3.25	0.95	3.37	4722.000	0.045
"The Dimensional Change Card Sort», task with frames score	0.15	3.31	-0.85	2.93	5410.000	0.007
"The Dimensional Change Card Sort», total score	0.16	3.41	-0.81	3.25	5462.000	0.013

Table 2

Distribution of children in groups with various screen time by socio-demographic parameters

		1—11 hours per week, %	19,5—70 hours per week, %	Pearson's Chi-square	p-level
Child's gender	Girls	48.5	47.9	0.072	0.965
	Boys	51.5	52.1		
Mothers' education	Secondary general education	1.6	7.5	23.112	0.003
	Secondary vocational education	4.0	14.3		
	Incomplete higher education	4.0	6.0		
	Higher education	88.0	69.9		
	Academic degree	2.4	2.3		
Family income	Low	6.4	14.9	7.279	0.122
	Average	79.2	76.1		
	Above average	14.4	9.0		
Region	Kazan	26.2	47.9	46.308	0.000
	Moscow	62.3	23.2		
	Yakutia	11.5	28.9		

with DD, the child stays within only one context and type of conditions and rules determined by the kind of digital activity. Furthermore, a long, uniform pastime in front of the screen makes it impossible to alternate between diverse activities during the day, and hence between various tasks and rules.

Another possible explanation for the difference in the development rate of cognitive flexibility over the year between the groups could be that when children spend more than 2 h 45 m on DD, it is mostly video content, which, unlike some video games, does not require cognitive flexibility [2]. There are types of digital activity that demand cognitive flexibility, for example, multiplayer games, where children need to simultaneously respond to several other players and quickly change their course of action depending on them, as well as adapt to the changing context of the game. But when watching video content, cognitive flexibility is not involved — on the contrary, the child merely passively follows the plot. Thus, it can be concluded that children who spent less than 1.5 h a day in front of the screens were more likely to engage in activities that contributed to the development of their cognitive flexibility, while children with more than 2 h 45 m of screen time a day spent not enough time in changing conditions and rules, so their cognitive flexibility has deteriorated over the year.

Differences in the development rate of cognitive inhibitory control between groups can be explained by different degrees of parental control. Probably, children with 2 h 45 m and more screen time are not sufficiently supervised in their use of DD, while children with screen time less than 1.5 h have more parental control. The fact that parents monitor the child's screen time suggests that they establish appropriate rules and restrictions, which contributes to the development of inhibitory control. It can also be assumed that in these families, parents generally monitor the daily regimen and routine for the child, which creates favorable conditions for the development of inhibitory control.

There are a number of factors that can be valid explanations for the differences between the groups, in terms of the development rate of both cognitive flexibility and cognitive inhibitory control over the year. Thus, based on the survey completed by 1029 mothers at the first stage of this study, 40% of children have a total screen time of more than 3 hours a day, and for 10% of children it is more than 5 hours a day. From this, it can be assumed that in families where mothers reported extended screen time, the TV is on for the best part of the day. Therefore, it is not only about purposeful viewing of video content by a child, but also about spending time with a TV constantly turned on in the background, which can also affect the development of both cognitive flexibility and cognitive inhibitory control [16; 21]. There is another factor connected to the time spent consuming video content: it has been shown that the study participants spent significantly more time watching TV than on gadgets: on average 13 and 7 hours per week respectively. That means, the screen time for children from the maximum screen time group is mostly passive, which, unlike active screen time, cannot, by definition, involve cognitive flexibility and cognitive inhibitory control [2]. Moreover, studies have shown that the amount of time watching video content is inversely related to the development of the EF [16; 20]. In addition, the longer the child's screen time, the more likely it is that the child will watch age-inappropriate content associated with deterioration of the EF, in particular inhibitory control [2].

Another factor explaining the differences between the groups in terms of the development rate of both cognitive flexibility and cognitive inhibitory control over the year is the different amount of physical activity in the groups. Studies have shown that for preschoolers, excessive screen time is inversely correlated with the amount of physical activity [11], while a sufficient level of physical activity is important for the EF development [10]. At preschool age, lack of physical activity negatively impacts the maturation processes of the structures of the third block of the brain [5], which are responsible for programming, regulation and control in the course of cognitive activity. It can also be assumed that children from the maximum screen time group have worse sleep quality than their peers with the minimum screen time, which could be one of the reasons for the lower rate of EF development in children from the first group. A number of studies have shown that the use of DD before bedtime and long screen time negatively affect the quality of sleep in preschoolers [6], and that full sleep is necessary for the development of the EF in preschool age [13].

According to the cultural-historical approach, adults play a key role in the development of voluntariness in preschoolers [4]. It can be suggested that in the maximum screen time group, children communicated with their parents less than children from the minimum screen time group, since it is known that long screen time and even a TV in a background tend to impoverish child-parent communication [15]. Thus, in families where children spend a lot of time in front of a screen, there are fewer child-parent interactions, during which inhibitory control and cognitive flexibility could develop. Another explanation for the differences between the groups may be the different level of mothers' education. In families with lower income and mother's education, screen time is higher [22]. In such families, parents more often perceive DD as useful for development and education, but at the same time they do not monitor the content and screen time for children [22]. Low socio-economic status is not an unambiguously negative factor, as it rather increases sensitivity to both negative and positive effects of the DD [22].

The absence of differences between the groups over the year in the development rate of working memory can be explained by the fact that this EF component is as involved during the use of DD as in non-digital activities.

Thus, working memory is trained both when watching video content and when playing a video game, because one needs to keep visual and auditory stimuli in working memory in order to follow the plot of a video or deal with the tasks of a video game. Whereas for the development of cognitive flexibility and inhibitory control, one's own actions are required [2].

The absence of differences between the groups over the year in the development rate of behavioral inhibitory control may be due to the fact that most children received high scores for respective tasks at the first stage of evaluation, thus, it can be assumed that the technique was not sensitive enough for this age. At the same time, it was initially expected that, compared with children with minimum screen time, children with maximum screen time would have a lower development rate of behavioral inhibitory control, since they do less physical activity and, hence, fewer opportunities for training behavioral inhibitory control.

There are a number of limitations of this work that should be taken into account when planning further studies. Firstly, other aspects of the use of the DD, besides screen time, have not been considered. In particular, no information has been collected about what kind of video content children watch and what video games they prefer. At the same time, content characteristics are an important factor in the influence of DD on the EF development in preschoolers [2]. Also, it has not been analyzed what is the parents' role in the use of DD by children. Meanwhile, many studies have shown that, in terms of the EF development, the parental control of children's use of DD is of utmost importance [2]. Secondly, the collection of data on children's screen time by means of parents' questionnaires does not exclude the possibility of participants giving socially desirable responses. The third limitation of the study was the small sample size and unequal distribution of children from different regions within the compared groups. In addition, an analysis of regional differences is required, which would take into account the specifics of each region. Another limitation of the study was the lack of data on the home educational environment and the nature of child-parent relationships, which can play a key role in the EF development [16].

Conclusion

The main purpose of this work was to explore the relationship between the development rate of the EF over a year and the screen time in 5—6 year old children from Kazan, Moscow, Yakutsk and other settlements of Yakutia. The regional specificity in the screen time has been registered and requires further analysis. An inverse relationship between screen time and the development rate of cognitive inhibitory control and cognitive flexibility in preschoolers over the year was revealed. There were no statistically significant differences between the groups in the development rate of behavioral inhibitory control and working memory within the year. The relationship between EF development and TV time and the relationship between EF development and gadgets time require separate investigations. The data obtained in the study are relevant for parents, psychologists, teachers and are valuable for determining optimal ways for preschoolers to use DD.

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EMPIRICAL RESEARCH
ЭМПИРИЧЕСКИЕ ИССЛЕДОВАНИЯ

Connection Between the Image of the World and Volunteering Experience among Russian Students

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The relevance of the study of the conditions for the formation of world image as an integral characteristic of the individual semantic system of personality, that determines one's interaction with the world and their life position, is due to the transitivity and high uncertainty of modern society. The aim of the study is to investigate the image of the world in the current and future perspective among young people with different experiences of participating in volunteering activities. The hypothesis was the assumption of differences in the image of the world in the "present — future" time coordinates among students with different experiences in volunteering. The study used the Bipolar Semantic Differential method for two consecutive assessments of the image of the world: "The world now" and "The world in 5 years"; a world assumptions scale, a questionnaire for participation in volunteer activities. The data consists of 211 Russian students aged from 18 till 23 (M=19.7; SD=1.61). Among them are 91 (43.1%) men and 120 (56.9%) women. Significant differences in world image in present and future are revealed. The image in present is contradictory, characterized mainly negatively as unpredictable, uncontrollable, anxious, complex. The image of "The World in 5 years" is positive, characterized as meaningful, active, fair and reliable (t-Student criterion, $p \le 0.02$). The connection between the characteristics of the image of the world and basic assumptions, primarily with the perception of the justice of the world, has been established. The positive role of participation in volunteer activities of student youth for the formation of a positive image of the world is proved: world nowadays is regarded as more active, and in future more controlled and benevolent (t-Student criteria, $p \le 0.02$, and significant (t-Student criterion, $p = 0.043$).

Keywords: world image, youth, volunteering, basic assumptions.

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Связь образа мира у российской студенческой молодежи с опытом участия в волонтерской деятельности

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Актуальность исследования условий формирования образа мира как интегральной характеристики индивидуальной смысловой системы личности, определяющей взаимодействие с миром и ее жизненную позицию, обусловлена транзитивностью и высокой неопределенностью современного общества. Цель исследования — изучение особенностей образа мира в актуальной и будущей перспективе у молодежи с разным опытом участия в волонтерской деятельности. Исходной гипотезой стало предположение о различиях в образе мира во временных координатах «настоящее—будущее» у студенческой молодежи с различным опытом волонтерской деятельности. В исследовании были использованы методика «Биполярный семантический дифференциал для двух последовательных оценок образа мира: “Мир сейчас” и “Мир через 5 лет”»; опросник «Шкала базовых убеждений», опросник участия в волонтерской деятельности. Выборку составили 211 российских студентов в возрасте от 18 до 23 лет (M=19,7; SD=1,61).Среди них 91 (43,1%) юноша и 120 (56,9%) девушек. Выявлены значимые различия образа мира в настоящем и в будущем. Образ «Мир через 5 лет» — позитивный, характеризуется как осмысленный, активный, справедливый и надежный (критерий Стьюдента, $p \leq 0,02$). Установлена связь характеристик образа мира с базисными убеждениями, прежде всего с восприятием справедливости мира. Доказана позитивная роль участия студенческой молодежи в волонтерской деятельности для формирования позитивного образа мира: мир в настоящем видится более активным, а в будущем — более управляемым, доброжелательным (критерий Стьюдента, $p \leq 0,02$) и ценным (критерий Стьюдента, $p = 0,043$).

Ключевые слова: образ мира, студенческая молодежь, волонтерская деятельность, базисные убеждения.

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Introduction

The modern world is a rapidly changing space of possibilities, meanings and values. Reflection upon the psychological consequences of world changes and high social uncertainty is today represented by a number of psychological studies [1]. However, recent socio-political events influence people's ideas on the world, society, relationships, one's place in today's society greatly, which puts an emphasis on the relevance of researching world image among modern youth. Modern society is also characterized by high transitivity, creating a constantly changing space with a high level of uncertainty of the contents of events happening, and the unpredictability of the consequences of societal changes [3].

The *multiplicity* of macro- and micro-social spaces options arises, and these spaces require the estimation and development of an attitude towards the occurring changes from a person. One could speak of a rigid (crisis) form of transitivity in the modern world, which is characterized by rigid and instantaneous changes, followed by the growth of intra- and inter-group conflicts and

contradictions. On an individual level, crisis transitivity is connected to more advanced requirements for a person's emotional stability and resilience. We suggest that one of the reasons, as well as the one of the consequences of transitive transformations, is the worldview change, related to the reestimation of the value of life [4]. What is happening is the transformation of the ideas on the world, the image of the world, society's opportunities and possibilities, its values and individual meanings.

In psychology, the "image of the world" varies in its interpretation and understanding. Several development directions of the ideas on the image of the world can be distinguished: the image of the world as a personal meanings system; the image of the world determined by its functions; the image of the world in the estimation of its development [13]. Let us focus on the works of A. Leontyev's school, in which both the concept of a mental image and the concept of an image of the world are consistently revealed [6]. The mental image is viewed as: "...the product of practical life connections and relationships between the subject and the objective world" [7]. In this idea of world image interpretation, much attention is paid to the meaning that mediates ideas about the world. The author designates this as "the fifth quasi-dimension", which allows the objective world to receive subjective coloring through the semantic field space [6].

The nature of the semantic field is connected to the concept of "personal meaning", which, as "the meaning of the meaning", reflects "one's personal life relationships" [2]. The realization of personal meanings of one's own life determines the attitude towards oneself, the surrounding society and the world in general [7]. Thus, the image of the world includes a system of one's personal meanings in their interaction with the outside world. In the works, the image of the world is a holistic view of the world, in which the specifically-historical, ecological, social, cultural background is reflected, and it is within its framework in which the overall human mental activity unravels [11].

The events happening in the surrounding society and human vital activity finds its reflection in the image of the world. According to the activity approach (A. Leontyev), human social practices determine one's relationship with the society, and the features of the image of the world. Life changes and transformations differ depending on a person's ability to control their behavior ranging from a conscious choice of types of activity to a passive encounter with the events that transform the living conditions, which are also out of the person's control. The image of the world, as the integral characteristic of an individual meaning system determining one's interaction with the world, undergoes significant changes in transitivity. The adulting period, as the time of idealistic views of the world clashing with reality, sets a task to reassess the image of the world. We suppose that the correction of the world image will be significantly connected to one's social practice experience, which also includes volunteering.

Volunteering activity as an accessible social practice is gaining more popularity in Russian society, uniting people of different social and professional groups. Volunteering implies willing human participation in activities aimed at helping people, animals, and nature. Federal Law on Volunteer Assistance, adopted in 2018, has legalized, simplified and organized the volunteer activities opportunities, which has significantly broadened the accessibility and attractiveness of this form of helping behavior. According to various data, the total number of volunteers with different levels of self-investment shows from 4,5 to 15 million people [5]. Psychological studies demonstrate the link between the participation in volunteering activities and the parameters of somatic and psychological well-being: volunteering promotes an increase in the level of somatic health and life satisfaction, a higher level of self-esteem and the experience of happiness, as well as a decrease of depression risks. There is a cumulative effect of participation in volunteer activities for the overall level of physical and mental health [8; 16; 17; 19; 20]. It is noted that the values determine youth's choice of social activities [15].

Scientific novelty of researching the image of the world among youth in their adulting period in terms of transitivity of modern society is determined by the fact that despite the relative development of the "image of the world" construct in different theoretical approaches, up until this moment, psychological features of youth's (with different experiences with social practices) image of the world in the "the world today — the world in the future" time dimension have not been studied. Volunteering could be approached as a means of socially-oriented activity, which determines the space for personal self-discovery and acts as a meaningful condition for the image of the world formation among youth entering their adulthood. In our research, operationalization of the image of the world is implemented through psychosemantic description [10] and personal world assumptions system [18].

Methods

The purpose of the research is to study the features of the image of the world in volunteering student youth in its actuality and future perspective.

The research hypothesis suggests the following: there are differences in world images in the "The present — The past" time coordinates in youth with different volunteering experiences. The positive world perception

manifesting in the world image is more characteristic of young people participating in volunteering activities.

Research tasks:

1) to study the features of the world image among student youth entering their adulthood;

2) to conduct comparative analysis of the world image in "The present — The past" time coordinates;

3) to study the connection between the image of the world and volunteering experience among student youth entering adulthood.

In this research, the following methods were used:

1. "Bipolar Semantic Differential" method, consisting of 11 adjective pairs, was used for two consecutive assessments of the image of the world: "The world now", "The world in 5 years". The adjective pairs included the following characteristics: stable — unpredictable, just — unjust, secure — unreliable, controllable — chaotic, friendly — hostile, divided — whole, calm — anxious, precious — useless, mindful — mindless, active — passive, simple — complex. The "minuses" in these assessments refer to the choice of the first adjective out of the pair, and "pluses" indicate the choice of the second one.

2. The World Assumptions scale developed by R. Janoff-Bulman and adapted by M. Padun, A. Kotel'nikova. [18]. This method estimates 5 world assumptions forming the core of our subjective world: " the friendliness of the outside world", "the justness of the outside world", "the positivity of self-image", "faith in luck", "belief in control over life".

3. A questionnaire aimed at the identification of attitudes towards volunteering activities and personal volunteering experience acquisition.

211 Russian students, ages from 18 to 23 years old took part in the research. (M=19.,7; SD=1.,61), with 91 (43.,1%) male and 120 (56.9%) female participants. The research was conducted in direct group interaction conditions. The data was collected in May of the year 2022. The data processing was carried out using the SPSS V.23.0. statistical information processing program. Various methods of statistical data processing were used, including the Kolmogorov-Smirnov criterion, t-Student criterion for both independent samples, and Pearson correlation coefficient.

Results

First of all, let us focus on student youth's assumptions of "The world now" and "The world in 5 years". Table 1 shows the distribution of the respondents choosing different polarities (positive or negative) of "The world now" and "The world in 5 years" in each adjective pair.

We note that "The world now" is viewed by most respondents in a contradictory manner. On one hand, it is unpredictable, unreliable, chaotic, divided, anxious and complex, but on the other, it is friendly, precious, mindful and active. The "just — unjust" assumptions are not pronounced by any polarity. We also note that according to the respondents, the "mindful" and "active" categories have turned out to be universal for "The world in 5 years" image, as no less than 75% of research participants have chosen these polarities [20]. No universal polarities were revealed for "The world now" image, which shows the lack of unanimity on this topic.

With the help of Kolmogorov-Smirnov criterion it was established that the distribution of students' estimates on the "World Assumptions scale" and by separate adjective pairs of Bipolar Semantic Differential is normal.

Let us focus on the presence of statistically significant differences for "The world now" and "The world in 5 years" images. In Table 2, the averages, medians and standard deviations of "The world now" and "The world in 5 years" estimates are given by all adjective pairs,

Table 1

The distribution of the respondents choosing different polarities (positive or negative) of "The world now" and "The world in 5 years" in each adjective pair (N = 211)

Adjective pair/Group	The world now			The world in 5 years		
	-	0	+	-	0	+
Stable — Unpredictable	27%	10%	63%	40%	11%	49%
Just — Unjust	41%	20%	39%	50%	19%	31%
Secure — Unreliable	41%	11%	49%	56%	13%	31%
Controllable — Chaotic	35%	19%	46%	49%	15%	36%
Friendly — Hostile	45%	20%	35%	58%	17%	25%
Divided — Whole	46%	19%	35%	32%	17%	51%
Calm — Anxious	28%	16%	56%	55%	14%	31%
Precious— Useless	66%	22%	22%	70%	19%	11%
Mindful — Mindless	65%	17%	18%	75%	9%	16%
Active — Passive	67%	17%	16%	76%	13%	11%
Simple — Complex	20%	13%	67%	34%	19%	47%

along with the results of these estimates (t-Student criterion for paired samples). Figure 1 shows the diagram of the estimates' range.

The results show that "The world in 5 years" image is viewed by research participants as much more stale, just, secure, controllable, friendly, whole, calm, mindful and simple, compared to "The world now".

For every parameter identified, statistically significant differences were obtained. For "The world now" and "The world in 5 years" "precious — useless" estimates, there is no difference. The world is perceived as precious from a modern point of view, and in regards to the future. Thus, "The world in 5 years" is seen by participants as a more positive place, compared to "The world today".

The world assumptions scale reflects a personal worldview, connected to one's own image of the world. Base world representations (assumptions) are personal constructs formed into a system of hierarchically organized cognitive-emotional implicit representations, which determine human behavior and interpersonal relationships. As shown before, base assumptions play the role as the value component of psychological well-being [20]. This is the basis of development of personal world image.

With the help of the world assumptions scale, estimates on "Outside world's friendliness", "Outside world's justness", "Self-image positivity", "Faith in luck", "Belief in control over life" scales have been obtained. Let us conduct a correlational analysis consecutively between "The world now" (11 adjective pairs) and personal world assumptions (Pearson correlation coefficient). Significant connections stronger than 0-2 have been highlighted.

The obtained results allow us (taking into account the connections with their significance greater than 0,2 in module only) to state that all identified connections are direct: the more positive "The world now" is seen as, the greater the world assumptions estimates are. "The world now: estimates have the strongest connection with the sense of justness of the outside world (9 out of 11 adjective pairs, except for "controllable — chaotic", "active — passive" pairs). As data shows, the world assumptions estimates have the greatest connection with "The world now" estimates by the following adjective pairs: "precious — useless" and "mindful — mindless" (4 world assumptions out of 5), and the weakest connection with the "controllable — chaotic" adjective pair (no connections).

In Table 4, the result of correlational analysis of "The world in 5 years" (11 adjective pairs) and personal world assumptions (Pearson correlation coefficient) is demonstrated. Significant connections greater than 0,2 have been highlighted.

It has been revealed that (taking into account the connections with their significance greater than 0,2 in module only) all the connections are direct. The more positive "The world in 5 years" is seen as, the greater are the personal world assumptions estimates. "The world in 5 years" estimates have the strongest connection with the sense of "justness of the outside world" (11 pairs out of 11), and the weakest — with the "faith in luck" estimate (5 pairs out of 11). World assumptions estimates have the greatest connection to "The world in 5 years" estimates by the following adjective pairs: "just — unjust", "precious — useless", and "mindful — mindless" (4 world assumptions out of 5), and the weakest connection is associated with "stable — unpredictable", "divided — whole", "simple — complex" pairs (1 world assumption out of 5).

So, we can note that personal world assumptions are more connected to "The world in 5 years" estimates, than "The world now" ones.

Let us analyze the role of volunteering practice in basic world assumptions and "The world now" and "The

Table 2

Descriptive statistics for estimates of "The world now" and "The world in 5 years" for all pairs of adjectives; differences between them (N = 211)

Adjective pair/Group	The world now			The world in 5 years			Differences	
	M	Me	SD	M	Me	SD	t	p
Stable — Unpredictable	0.81	1.00	1.999	0.18	0.00	2.196	**4.669**	**<0.001**
Just — Unjust	–0.15	0.00	1.924	–0.57	0.00	1.890	**3.632**	**<0.001**
Secure — Unreliable	–0.01	0 .00	1.992	–0.63	–1.00	1.924	**5.517**	**<0.001**
Controllable — Chaotic	0.14	0.00	1.789	–0.28	0.00	1.850	**3.704**	**<0.001**
Friendly — Hostile	–0.35	0.00	1.834	–0.82	–1.00	1.801	**4.354**	**<0.001**
Divided — Whole	–0.16	0.00	1.865	0.43	1.00	1.859	**–4.136**	**<0.001**
Calm — Anxious	0.50	1.00	1.888	–0.53	–1.00	1.888	**7.315**	**<0.001**
Precious — Useless	–1.10	–1.00	1.566	–1.24	–1.00	1.607	1.590	0.113
Mindful — Mindless	–0.94	–1.00	1.627	–1.17	–1.00	1.698	**2.350**	**0.020**
Active — Passive	–1.14	–1.00	1.723	–1.34	–2.00	1.573	**2.329**	**0.021**
Simple — Complex	1.01	1.00	1.853	0.29	0.00	2.058	**5.819**	**<0.001**

Table 3

The connection between "The world now" and personal world assumptions (N = 211)

Adjective pair/ WAS scale		WAS 1	WAS 2	WAS 3	WAS 4	WAS 5
Stable — Unpredictable	r	–0.163*	**–0.234****	–0.099	–0.104	–0.091
	p	0.018	**<0.001**	0.153	0.133	0.189
Just — Unjust	r	–0.183*	**–0.284****	**–0.232****	–0.190**	**–0.226****
	p	0.008	**<0.001**	**0.001**	0.006	**0.001**
Secure — Unreliable	r	–0.183*	**–0.236****	**–0.217****	–0.085	–0.183**
	p	0.008	**0.001**	**0.002**	0.218	0.008
Controllable — Chaotic	r	0.004	–0.131	–0.098	–0.101	–0.076
	p	0.957	0.058	0.155	0.143	0.271
Friendly — Hostile	r	**–0.238****	**–0.261****	**–0.213****	–0.132	–0.136*
	p	**<0.001**	**<0.001**	**0.002**	0.056	0.048
Divided — Whole	r	0.118	**0.212****	0.062	0.004	0.062
	p	0.089	**0.002**	0.371	0.953	0.368
Calm — Anxious	r	–0.104	**–0.201****	–0.148*	–0.137*	–0.142*
	p	0.134	**0.003**	0.031	0.046	0.039
Valuable — Useless	r	–0.149*	**–0.265****	**–0.316****	**–0.247****	**–0.205****
	p	0.030	**<0.001**	**<0.001**	**<0.001**	**0.003**
Mindful — Mindless	r	–0.175*	**–0.218****	**–0.267****	**–0.226**	**–0.271****
	p	0.011	**0.001**	**<0.001**	**0.001**	**<0.001**
Active — Passive	r	–0.142*	–0.151*	**–0.253****	–0.197**	–0.177*
	p	0.039	0.028	**<0.001**	0.004	0.010
Simple — Complex	r	–0.120	**–0.219****	–0.161*	–0.046	–0.057
	p	0.082	**0.001**	0.019	0.510	0.410

*Comment:*WAS scales: WAS 1 — outside world's friendliness; WAS 2 — outside world's justness; WAS 3 — self-image positivity; WAS 4 — faith in luck; WAS 5 — belief in control over life: «*» — significance less than 0,05; «**» — significance less than 0,001.

Table 4

The connection between "The world in 5 years" estimates and personal world assumptions (N = 211)

Adjective pair/ WAS scale		WAS 1	WAS 2	WAS 3	WAS 4	WAS 5
Stable – Unpredictable	r	–0.160*	**–0.279****	–0.186**	–0.118	–0.128
	p	0.020	**<0.001**	0.007	0.088	0.064
Just – Unjust	r	–0.263**	–0.396**	–0.324**	–0.216**	–0.295**
	p	<0.001	<0.001	<0.001	0.002	<0.001
Secure – Unreliable	r	**–0.242****	**–0.318****	**–0.236****	**–0.209****	–0.185**
	p	**<0.001**	**<0.001**	**<0.001**	**0.002**	0.007
Controllable – Chaotic	r	–0.105	**–0.223****	–0.185**	**–0.265****	–0.187**
	p	0.128	**0.001**	0.007	**<0.001**	0.007
Friendly – Hostile	r	–0.322**	–0.370**	**–0.265****	–0.140*	–0.182**
	p	<0.001	<0.001	**<0.001**	0.042	0.008
Divided – Whole	r	0.105	**0.202****	0.054	0.145*	0.157*
	p	0.130	**0.004**	0.436	0.035	0.023
Calm – Anxious	r	–0.140*	**–0.334****	–0.185**	–0.183**	**–0.223****
	p	0.042	**<0.001**	0.007	0.008	**0.001**
Valuable – Useless	r	–0.206**	–0.291**	–0.217**	–0.296**	–0.269**
	p	0.003	<0.001	0.002	<0.001	<0.001
Mindful – Mindless	r	**–0.206****	**–0.268****	**–0.208****	**–0.271****	**–0.273****
	p	**0.003**	**<0.001**	**0.002**	**<0.001**	**<0.001**
Active – Passive	r	**–0.212****	**–0.231****	**–0.276****	–0.178*	**–0.220****
	p	**0.002**	**0.001**	**<0.001**	0.010	**0.001**
Simple – Complex	r	–0.137*	**–0.212****	–0.197**	–0.038	–0.074
	p	0.048	**0.002**	0.004	0.587	0.286

Comment: WAS scales: WAS 1 — outside world's friendliness; WAS 2 — outside world's justness; WAS 3 — self-image positivity; WAS 4 — faith in luck; WAS 5 — belief in control over life: «*» — significance less than 0,05; «**» — significance less than 0,001.

world in 5 years" images. In our sample, 126 (59.7%) students have and 85 (40.3%) do not have any volunteering experience.

In Table 5, the averages, medians and standard deviations of estimates of students with or without volunteering experience are presented, as well as the

difference between the results of the analysis of the estimates differences (t-Student criterion for independent samples).

Figure 1 shows the diagram of world assumptions estimates range for highlighted student groups.

Base world representations (assumptions) are personal constructs formed into a system of hierarchically organized cognitive-emotional implicit representations, which determine human attitude towards self, behavior and interpersonal relationships. The results allow us to confirm high or average base world assumptions estimates. The highest estimates among all participants have been discovered by "Self-image positivity", "Belief in control over life" and "Faith in luck" scales. The lowest — by the "Outside world's justness", and "Outside world's friendliness". It has also been revealed that world assumptions estimates are higher throughout all scales among students with volunteering experience, compared to those without it. Statistically significant differences in world assumptions estimates have been obtained for the "Outside world's justness"(p=0.006) and "Faith in luck" (p=0.006) scales. Students who have volunteering experience see the world as more just and believe that luck follows them in life, compared to students who never participated in volunteering activities.

Table 6 shows averages, medians and standard deviation for "The world now" estimates by all adjective pairs among students with and without volunteering experience, and the results of comparing the estimates (t-Student criterion for independent samples).

Comparative analysis of the image of the world in "present" time dimension demonstrates a significant similarity of estimates from respondents with and with-

Table 5

Descriptive statistics for world assumptions estimates in students with and without volunteering experiences; estimates differences (N = 211)

WAS scale/Group	Has experience			No experience			Difference	
	M	Me	SD	M	Me	SD	t	p
Outside world's friendliness	3.74	3.90	0.782	3.56	3.60	0.880	–1.528	0.128
Outside world's justness	3.74	3.70	0.681	3.45	3.50	0.807	**–2.796**	**0.006**
Self-image positiveness	4.24	4.35	0.913	4.19	4.10	0.889	–0.409	0.683
Faith in luck	4.15	4.10	0.677	3.87	3.90	0.781	**–2.753**	**0.006**
Belief in control over life	4.08	4.10	0.595	3.96	3.90	0.655	–1.377	0.170

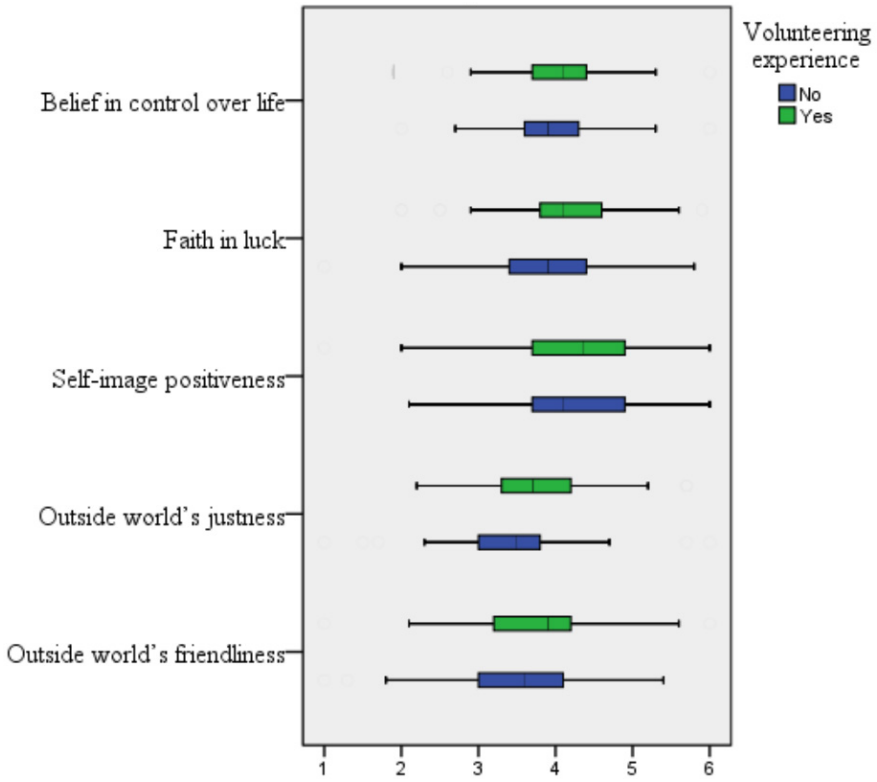

Fig. 1. Diagram of world assumptions estimates range for students with and without volunteering experience

Table 6

Descriptive statistics for "The world now" estimates by students with and without volunteering experience; the estimates difference (N = 211)

Adjective pair/Group	Has experience			No experience			Difference	
	M	Me	SD	M	Me	SD	t	p
Stable — Unpredictable	0.82	1.00	1.945	0.79	1.00	2.088	0.104	0.917
Just — Unjust	–0.13	0.00	1.897	–0.19	0.00	1.973	0.226	0.821
Secure — Unreliable	–0.03	0.00	1.963	0.01	0.00	2.044	–0.155	0.877
Controllable — Chaotic	0.02	0.00	1.826	0.32	0.00	1.727	–1.172	0.243
Friendly — Hostile	–0.49	0.00	1.836	–0.14	0.00	1.620	–1.366	0.173
Divided — Whole	–0.05	0.00	1.832	–0.33	0.00	1.911	1.077	0.283
Calm — Anxious	0.52	1.00	1.832	0.48	1.00	1.980	0.126	0.900
Precious — Useless	–1.18	–1.00	1.562	–0.98	–1.00	1.573	–0.937	0.350
Mindful — Mindless	–0.99	–1.00	1.656	–0.86	–1.00	1.590	–0.582	0.561
Active — Passive	–1.37	–2.00	1.724	–0.80	–1.00	1.675	**–2.395**	**0.017**
Simple — Complex	1.10	2.00	1.826	0.89	1.00	1.896	0.773	0.441

out volunteering experience. "The world now" image is contradictory for most research participants, it is unpredictable, unreliable, chaotic, divided, anxious and complex, but at the same time it is friendly, precious, mindful and active. The ideas of justness or unjustness of the world are not pronounced in any polarity. Statistically significant differences have been revealed only in one characteristic of the present world. The activity of the world is valued more highly by the students with volunteering experience(p=0.017). For them, "The world now" is a far busier place, leading to transformations, it is more active than for students without volunteering experience.

In Table 7 averages, medians and standard deviations of "The world in 5 years" estimates by all adjective pairs among students with and without volunteering experience have been demonstrated, along with the results of comparing these estimates (t-Student criterion for both independent samples).

We can see that the image of the world in the "future" time dimension is also contradictory for the respondents. "The world in 5 years" may be perceived as unpredictable, divided and complex, but it is also just, safe, controllable, friendly, whole, calm, precious, mindful and active. We also note that for "The world in 5 years", the "mindful" and "active" categories have been universal, as no less than 75% of research participants chose these polarities. Statistically significant differences by four categories of the future world image have been revealed: "controllable — chaotic" pair (p=0.027), "friendly — hostile" scale (p=–0.32). Students with volunteering experience see "The world in 5 years" as much more controllable, friendly, precious and active, compared to students with no volunteering experience.

So, the significant differences in "The world now" image among participants with and without volunteering experience, concerns only one adjective pair, while "The world in 5 years" concerns 4 of them.

Table 7

Descriptive statistics for "The world in 5 years" estimates by students with and without volunteering experience; the estimates difference (N = 211)

Adjective pair/Group	Has experience			No experience			Difference	
	M	Me	SD	M	Me	SD	t	p
Stable — Unpredictable	0.24	1.00	2.264	0.09	0.00	2.102	0.466	0.642
Just — Unjust	–0.66	–0.50	1.812	–0.44	0.00	2.003	–0.842	0.401
Secure — Unreliable	–0.80	–1.00	1.846	–0.36	–1.00	2.017	–1.624	0.106
Controllable — Chaotic	–0.52	–1.00	1.765	0.06	0.00	1.929	**–2.234**	**0.027**
Friendly — Hostile	–1.05	–1.00	1.706	–0.48	–1.00	1.894	**–2.258**	**0.025**
Divided — Whole	0.60	1.00	1.821	0.19	0.00	1.899	1.565	0.119
Calm — Anxious	–0.67	–1.00	1.850	–0.31	0.00	1.934	–1.394	0.165
Precious — Useless	–1.41	–2.00	1.519	–0.98	–1.00	1.704	**–1.947**	**0.043**
Mindful — Mindless	–1.31	–2.00	1.622	–0.95	–1.00	1.792	–1.501	0.135
Active — Passive	–1.53	–2.00	1.500	–1.06	–1.00	1.643	**–2.161**	**0.032**
Simple — Complex	0.25	0.00	2.070	0.35	0.00	2.051	–0.369	0.712

Discussion of results

The comparative analysis of world assumptions in students with volunteering experience and without it allows us to conclude that students who participated in volunteering activities have a more positive image of the world, they see the world as a more just, lucky place, thus, with many opportunities for success.

The analysis of results of the Bipolar Semantic Differential method demonstrates a high level of inconsistency in the "present" time dimension among student youth. The combination of such negative world characteristics as unpredictability, unreliability, randomness, disunity, anxiety and complexity, with such positive characteristics as friendliness, preciousness, mindfulness and activeness, reflects transitivity and high social uncertainty. On the contrary, "The world in 5 years" is characterized to be positive, yet unpredictable. The future world image is seen by the respondents as just, reliable, controllable, friendly, whole, calm, precious, mindful and active, but also complex.

Statistical significances of the differences in the world images in "present" and "past" by all characteristics show a prevalence of positive characteristics of the world in the "future" (t-Student criterion $p \leq 0.02$), which also signifies positive expectations and hopes in regards to the necessity and unavoidability of accepting world transformations.

This is also confirmed by comparative analysis of the present world and future world images, the results of which are demonstrated in Figure 2.

The results of correlational analysis of world assumptions and world image characteristics revealed with the application of Bipolar Psychosemantic Differential have shown the greatest connection of most positive characteristics of the world image in the "present" and in the "future" with the scale of world justness, and the weakest — with the world mindfulness and activeness scales. It is the sense of the outside world's justness or unjustness that largely determines the overall assessment and image of the world, both in the present and in 5 years. And the sense of the outside world's friendliness is largely linked to the assessments of the world in the future, rather than in the present. With this, a significant connection between practically all world assumptions scales and separate world characteristics has been discovered, which allows us to consider world assumptions the core of the world image.

The research data analysis generally confirms the hypothesis of differences between the world image in "the present — the past" time coordinates in student youth with various volunteering experiences. Figures 3 and 4 demonstrate range diagrams for "The world now" (Fig. 3) and "The world in 5 years" (Fig. 4) estimates by all adjective pairs in students with or without volunteering experience. These diagrams show the confirmation of the given hypothesis.

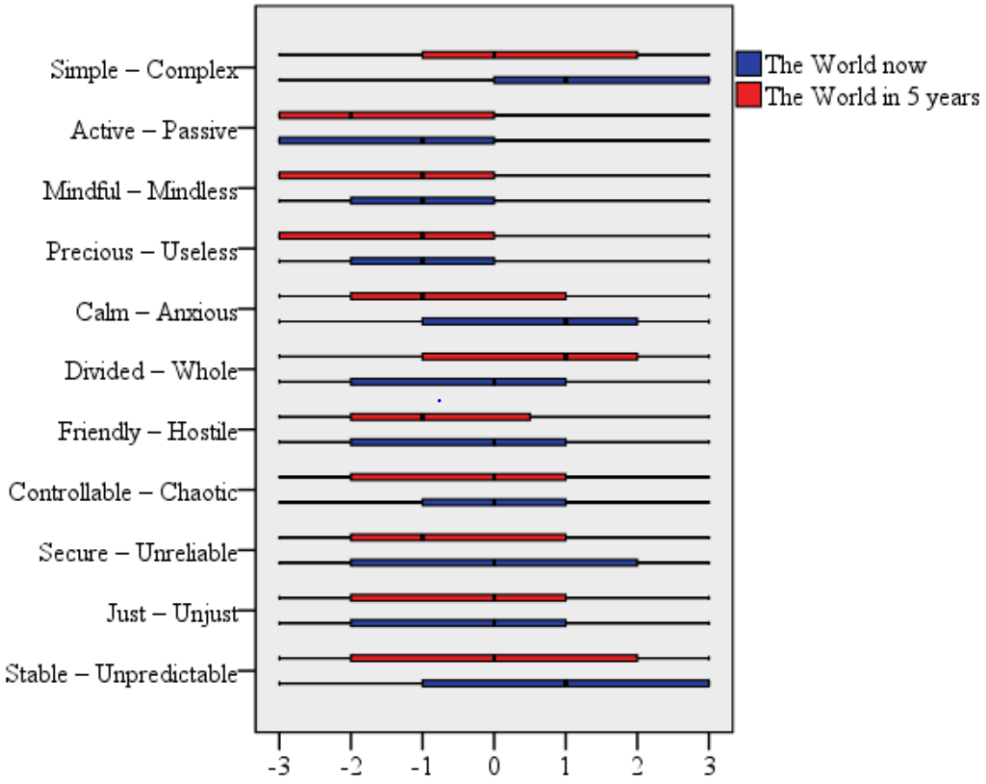

Fig. 2. Diagram of the range of "The world now" and "The world in 5 years" estimates

Students with volunteering experience perceive the present world as more active and more controllable, friendly (t-Student criterion $p \leq 0.02$) and precious (t-Student criterion $p = 0.043$) in the future. Student

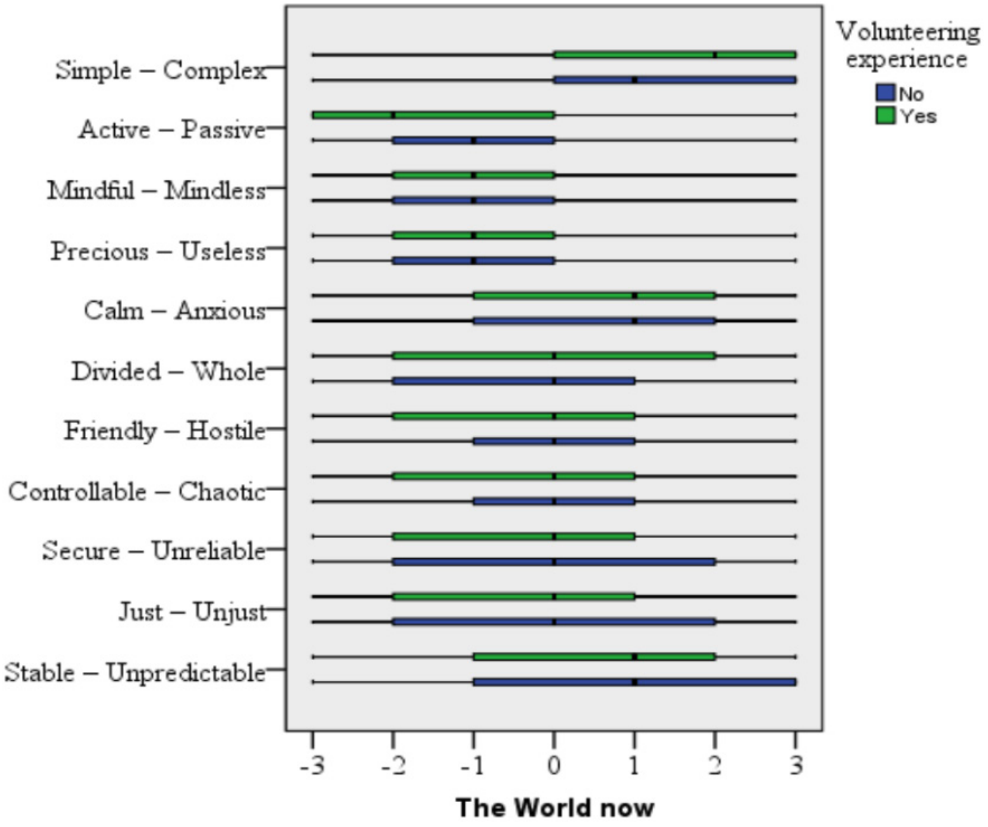

Fig. 3. Range diagram for "The world now" estimates in students with and without volunteering experience

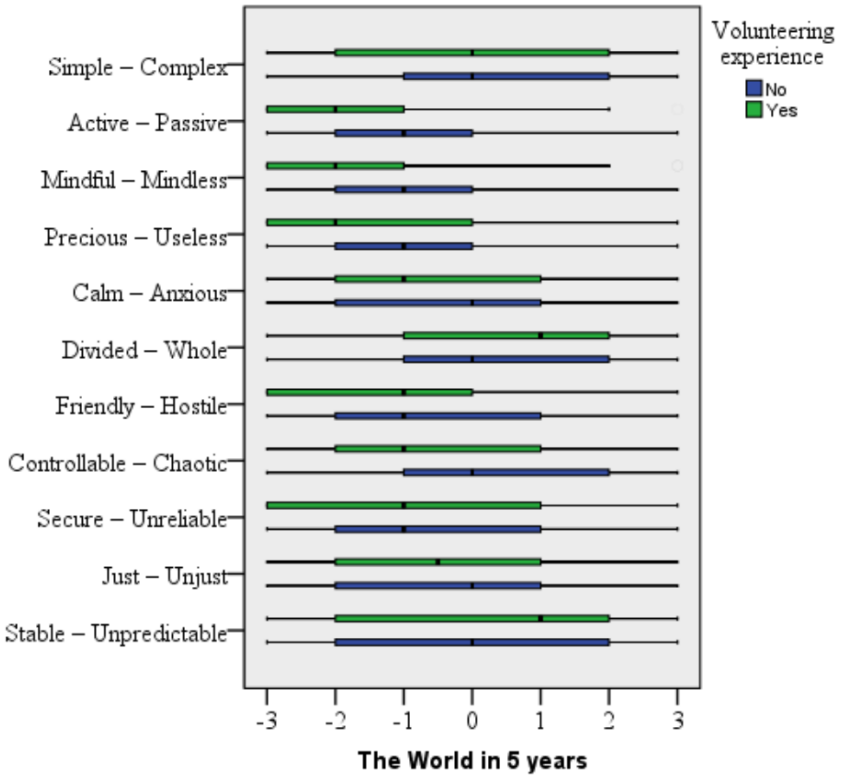

Fig. 4. Range diagram for "The world in 5 years" estimates in students with and without volunteering experience

youth that partakes in volunteering has more defined world assumptions on the justness of the outside world, along with faith in luck. Positive world perception manifested in psychosemantic world image description is more typical for students who participate in volunteering activities. The obtained results confirm the hypothesis of the connection between volunteering experience and the world image. An active personal position in social space, volunteering experience and helping others, acts committed in the name of social well-being become the source of positive world image formation, with the world seen as secure, yet transforming, just and personally controllable to an extent, which becomes the condition for the formation of a positive image of the world in the future.

Conclusion

The image of the world among student youth in the "The present — The future" system of time coordinates has significant differences. The image of "The world now" is contradictory, is of mostly negative modality and is characterized as unpredictable and anxious, unreliable, out-of-control, chaotic and divided. The positive traits of the world in the present are the following: value, mindfulness and activeness. The image of "The world in 5 years", on the contrary, is characterized by positive modality, high mindfulness and activity, and is perceived by the student youth as just, secure, friendly and calm, controllable to an extent, but complex and unpredictable. A positive world image indicates an optimistic future outlook on the basis of adoption of the attitude to universality of activity and meaningfulness as key characteristics of the image of the world.

The discovered tendency is most pronounced in student youth with volunteering experience. The world assumptions and, firstly, the perception of the world's justness form the core of the modern student youth's world image. The research results generally confirm the put out hypothesis of the importance of volunteering experience in positive world image formation, which allows us to consider youth's participation in volunteering activities as the base of an active individual life position in relation to the social and natural world, as well as the self-determination and self-development resource potential.

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Psychological Problems of Adolescents in Real and Virtual Environments: Questionnaire Development

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The need to create a questionnaire to study the psychological problems of adolescents in real and virtual environments arose since previously created and available methods in this sphere did not consider the influence of the virtual environment as a factor of socialization. The article reveals the continuity in the development of methodological tools for the study of psychological problems of adolescents and shows the novelty of the new questionnaire. The questionnaire was created and standardized during five consecutive stages (collection of primary empirical material, procedures of linguistic and frequency analysis, assessment of reliability, validity, double factorization, determination of age norms). 566 teenagers aged 13—17 years took part in standardization. The result of this work is a new psychodiagnostic tool that allows to determine the degree of adolescents' concern with psychological problems, both in real life and in connection with their immersion in the Internet environment.

Keywords: psychological problems, teenagers, virtual environment, questionnaire.

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Психологические проблемы подростков в реальной и виртуальной среде: методика исследования

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Необходимость в создании методики для изучения психологических проблем подростков в реальной и виртуальной среде возникла в связи с тем, что ранее созданные и имеющиеся методики аналогичной направленности не учитывали влияния виртуальной среды как фактора социализации. В статье раскрыта преемственность в разработке методических средств для изучения психологических проблем подростков и показана принципиальная новизна вновь созданной методики. Методика создавалась и была апробирована в течение пяти последовательных этапов (сбор первичного эмпирического материала; процедуры лингвистического и частотного анализа; оценка надежности, валидности; двойная факторизация; определение возрастных норм проблемной озабоченности), в которых приняли участие 566 подростков в возрасте 13—17 лет. Результатом этой работы стало получение психодиагностического инструмента, позволяющего определить степень озабоченности психологическими проблемами, как в реальной жизни, так и в связи с погруженностью подростков в интернет-среду.

Ключевые слова: психологические проблемы, подросток, виртуальная среда, методика.

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Introduction

An individual's psychological problems, including those of adolescents, are conditioned not only by the individual's own development situation and environment, but also by the socio-economic conditions in which the individual lives—in other words, by the microsystem, the mesosystem and the macrosystem, as described by U.

Bronfenbrenner. That is why any study of psychological problems which does not take into account the environment and its changes will either lack objectivity or fail to be informative. This assumption is based on the results of a 20-year-long study of psychological problems in adolescents—during this entire period, the research tools have been constantly improved and adapted to keep pace with Russia's socio-economic reality. Digitalization profoundly transforms people's lives and brings not only increased comfort, but also psychological problems. That is why the available tools used to study psychological problems in adolescents needed to be adapted to take into account the new conditions of socialization.

Our questionnaire is a modification of I. Seiffge-Krenke's Adolescents' Psychological Problems Questionnaire which was developed and standardized in 1984 [34]. When both Germany and Russia entered a period of socio-economic crises, the questionnaire was adapted having regard to the new conditions—specifically, to the new stressors [3; 32]. Psychologists in Russia started to use the questionnaire in 1993 to identify both the content and degree of adolescents' concerns in the conditions of socio-economic crises followed by stabilization and economic growth (1993—2005) [10]. The years preceding 2010—12 were another period marked by major changes which increased the tension in people's lives: terrorism, drug abuse, aftermath of the economic crisis, etc. These changes necessitated an update of empirical data about adolescents' psychological problems and called for a new version of the questionnaire to be developed and standardized [14]. The new questionnaire was used in multiple studies and proven to be valid and reliable [2; 5; 6; 11].

Digitalization has made its own contribution to the process of socialization of people belonging to different age groups, but academic literature shows that it is adolescents who are most affected by it [4; 9; 17; 21; 28], and this fact needs to be factored in when studying psychological problems. Psychological studies focusing on the internet and technology—i.e., studies on computer addiction, the impact of technology on psychological boundaries, and involvement and self-representation on the internet—are paying increasing attention to the awareness of various aspects of one's self, including psychological problems, in real and virtual environments [12; 16; 30; 35].

We examined the available methods of psychological assessment and carried out a theoretical analysis of different up-to-date approaches used to operationalize the concepts "psychological problem" and "immersion in the internet environment" [13; 15]. This revealed a need for another modification of the original questionnaire in order to study psychological problems in real and virtual environments within the emotional-reflexive approach.

We define a "psychological problem" within the said approach as the "presence of—1) a contradiction which is realized by an individual in the context of his/her current life situation; 2) an emotional response to that contradiction as a factor which makes life more difficult; and 3) the willingness (or need) to resolve the contradiction in order to improve the course of one's life" [13].

Measurement methods and questionnaire development stages

We developed and standardized Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire in compliance with the applicable requirements and using standard procedures to test the validity, reliability and factorial structure of the questionnaire [36].

The following statistical methods were used to test the psychometric properties of the questionnaire: descriptive statistics, the Kolmogorov—Smirnov test to compare the forms of distributions, the reliability index (Cronbach's *a*, the Guttman split-half coefficient), correlation analysis (Spearman's), factor analysis (principal component analysis, Varimax rotation with Kaiser normalization) and confirmatory factor analysis.

Our questionnaire sought to have regard to the current changes in adolescents' environment and was developed in five stages from February to November 2021.

The first stage involved collection of empirical data on psychological problems faced by adolescents in the internet environment. The empirical data were collected using focus groups interviews with 132 adolescents. The work of the focus groups was based on the standardized Adolescents' Psychological Problems Questionnaire [14] which included questions corresponding to various problem areas which we identified and described earlier: school, leisure, relationships with parents and peers, self-image, health, future, and situation in society [11; 14]. However, in the present study we paid primary attention to the interrelations between the problems which the respondents encounter in various areas of life when using the internet or influenced by the internet environment. The processing and linguistic analysis of the data obtained in focus groups allowed us to make a list of such problems. The list was structured by the areas mentioned above and, after an expert examination of the problems voiced by the respondents, contained 91 items.

The second stage involved a sample of 292 adolescents aged 11—17 who were surveyed (both online and offline) in order to statistically confirm the relevance and commonality of internet-related psychological problems. The second stage also involved frequency analysis of the data. The most frequent psychological problems

(28 survey items) turned out to be mainly connected to two factors—personal safety on the internet and the lack of self-sufficiency (dependence on the internet).

The third stage aimed to ascertain whether internet-related problems constitute a separate area of concern for adolescents or supplement the problem areas described earlier. To that end, we complemented the previous version of the Adolescents' Psychological Problems Questionnaire, which consisted of 93 items, with the 28 items selected during the frequency analysis. The resulting list (121 items) corresponded to various problems experienced by adolescents both in real and in virtual environments. We surveyed 299 adolescents aged 13—17 who assessed the intensity of experiencing each problem on a scale of 1 to 5.

We carried out a factor analysis on the data obtained from the sample (299 respondents) using the principal component analysis with Varimax rotation. As a result, we identified six factors which explain 44.5% of the variance.

The factor analysis confirmed that internet-related problems constitute a separate group (factor 5) in the structure of adolescents' concerns—this group includes 17 out of 28 questions which focused on this topic in the initial list. At the same time, internet-related problems affect various areas of adolescents' life: communication, self-awareness, emotional well-being, etc. The examples are: "If I don't have the internet, I'm afraid to miss some of the events which are important for my friends and me", "I'm afraid that my life will be joyless if the internet disappears", "Without the internet, I feel as if my hands are tied". This confirms the change in adolescents' life reality [21; 24] and mutual penetration of their real and virtual environments—the facts that have been also described by other scholars [8].

The factor analysis produced one more important result. It revealed the transformation of problem areas. In addition to the internet, new areas emerged: problems related to personal safety both in real and virtual environments and problems related to identity formation. The former correlates with the data of G.U. Soldatova and E.I. Rasskazova [19], while the latter embraces two previously separate areas of problems related to the future and to oneself.

The obtained empirical data revealed a need for the modification of Adolescents' Psychological Problems Questionnaire that would embrace a new structure of problem areas relevant for adolescents. The modification includes six scales. Each scale contains 10 statements with the highest factor weights.

Sixty new questions were used during the fourth stage to survey additional 340 adolescents aged 13—17. Then, at stage five we confirmed the structure and standardized the new questionnaire through a confirmatory factor analysis on the total sample of 566 adolescents aged 13—17. The sample included 306 females and 260 males with a median age of 14.9 (Table 2).

Results and discussion

The scales are highly reliable. The internal consistency calculated with Cronbach's alpha coefficient varies between 0.84 and 0.90. The Guttman split-half coefficient varies between 0.80 and 0.89 suggesting a high reality of the scales. The only exception here is the scale "Problems related to internet immersion", where the coefficient value is 0.76, which is close to high (Table 3).

Table 1

Results of primary factor analysis—explained variance

Factors	Number of questions	Rotation sums of squared loadings		
		Total	% Variance	% Cumulative
1. Problems related to public and personal safety	27	12.836	10.61	10.61
2. Problems related to identity formation	25	9.621	7.95	18.56
3. Problems related to communication and peers	20	8.636	7.14	25.69
4. Problems related to the relationships with parents	18	8.176	6.76	32.45
5. Problems related to the immersion in the internet	17	7.837	6.48	38.93
6. Problems related to school	14	6.695	5.53	44.46

Table 2

Sample's age and gender distribution

Gender	Age			Total
	13—14	15	16—17	
Females	111	80	115	306
Males	114	77	69	260
Total	225	157	184	566

Table 3

Reliability index: Cronbach's alpha and Guttman split-half coefficient (N=566)

Scale	Cronbach's alpha	Guttman split-half coefficient	Number of elements
1. Problems related to public and personal safety	0.90	0.89	10
2. Problems related to identity formation	0.89	0.86	10
3. Problems related to communication and peers	0.88	0.84	10
4. Problems related to the relationships with parents	0.89	0.86	10
5. Problems related to the immersion in the internet	0.89	0.76	10
6. Problems related to school	0.84	0.80	10
Integral indicator of concern about problems	0.95	0.81	60

The scales and the total score were tested for normality using the Kolmogorov–Smirnov test. It showed that scales 2, 6 and the integral indicator of concern about problems are normally distributed, while scales 1, 3, 4, 5 are asymmetrical. This might be due to different degrees of commonality or variance of problems facing adolescents.

As is seen in Table 4, all the scales of the new tool are significantly correlated ($p \leq 0.01$). The lowest correlation ($r=0.18$ to 0.28) is observed between the scale "public and personal safety" and the other scales. This might indicate that social processes influence problematic experiences indirectly. The scales "communication and peers" and "immersion in the internet" as well as "communication and peers" and "identity formation" have the highest correlation with $r=0.58$ and $r=0.57$, respectively. This indicates a major role of communication with peers in identity formation during adolescence and a significant contribution of the internet as a means of communication in this process. Overall, the identified scales are not independent. Each of the scales contributes to the assessment of total concern of the sample of adolescents about their problems.

The identified correlations between the scales became the basis for the development of a structural model of the new Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire. It was used to conduct a confirmatory factor analysis of the empirical data (Table 5).

Basic statistical indices obtained with the confirmatory factor analysis satisfy the requirements. This allows us to state that the obtained empirical data confirm the proposed model that includes 6 factors with 10 questions each. Specifically, CMIN/DF is higher than 5.00; TLI, CFI, IFI, NFI are higher than the critical value of 0.9; RMSEA is close to the critical value of 0.051.

Descriptive statistics in Table 6 shows that the biggest reason for concern is public and personal safety (scale 1). Here, we see certain continuity with the scale

Table 4

Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire: Correlation of scales (Spearman's ρ)

	Problems related to public and personal safety	Problems related to identity formation	Problems related to communication and peers	Problems related to the relationships with parents	Problems related to the immersion in the internet	Problems related to school
Problems related to public and personal safety	1.000	0.22**	0.18**	0.15**	0.27**	0.28**
Problems related to identity formation		1.000	0.57**	0.52**	0.46**	0.42**
Problems related to communication and peers			1.000	0.50**	0.58**	0.36**
Problems related to the relationships with parents				1.000	0.53**	0.47**
Problems related to the immersion in the internet					1.000	0.43**
Problems related to school						1.000

** indicates significant correlation at 0.01 level.

Table 5

Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire: Results of confirmatory factor analysis

Value	5.412	0.900	0.904	0.903	0.903	0.051

"Problems related to the development of society" from the previous version of the questionnaire. Apart from common social and environmental threats, this scale includes internet-related issues of privacy, fraud, etc. Apparently, adolescents see the internet not only as an awareness-raising tool that keeps them informed about current global issues—they also relate to these issues personally. Rooted in social processes, this problem area is difficult to control and regulate.

The second major area of problems are those related to school. Among them are reduced motivation for learning, insufficiently equal and dialogue-based relationships with teachers, rejection of school rules and school environment. The item "Other (please specify)" features statements about boring classes, packed timetables and, on the other hand, the necessity for additional training with private teachers. Other studies also provide evidence for the relevance of school-related problems for adolescents who write about school in a critical and contradictory manner [23]. Digitalization in education creates new problems for educators and, to no lesser degree, for students [7; 25]. Yet, the studies focusing on digitalization-related problematic experiences of students are almost non-existent.

Problems related to identity formation come third. Obtaining one's identity is one of the key tasks facing adolescents. The supporting evidence is E. Erikson's developmental theory and its fifth stage identity vs. role confusion as a turning point in human development. Similarly, R. Havighurst highlights the importance of self-identification as regards universal values, communication, a struggle to understand the meaning of life and one's place in the world. Identity is about where an adolescent sees him/herself in lifetime and whether he/she perceives life as a continuous journey and realizes the continuity of the past, present and future. Identity formation is associated with a range of problems related to making personal choices as regards moral values, career, responding to challenges, and self-identification across different areas of life. Today, adolescents make an extensive use of the internet with experimental purposes, including trying themselves in different roles. This is a way to solve age-related tasks that concern the development of self-awareness and the Self-concept. Importantly, the level of Self-concept correlates with risky behavior on social networks and internet addiction [16].

Interestingly, the problems related to the immersion in the internet cause more concern than experiences related to real-life interactions with parents or peers. This leads us to suppose a transformation in socialization tools as they are shifting towards a virtual environment. According to D.P. Tkachenko, the proliferation of information technology encourages the emergence of a new social reality that transforms development and socialization patterns [22]. Mastering information technology is also part of socialization as it goes along with the acquisition of cultural rules and values and the new picture of reality. Digitalization entails a range of psychological problems in adolescents. Among them are stress induced by information, internet addiction, ineffective time management, etc. On the one hand, the internet is a source of useful supporting content that helps adolescents in problem-solving. On the other hand, it offers tools and stimuli for aggressive and self-destructing behavior [18; 26; 35]. At the same time, destructive and self-destructive outcomes of problematic experiences are often down to destructive relationships with peers, including online (cyber aggression, cyberbullying). This is aggravated by a lack of parental support and difficulties in family relationships [20; 29; 31]. A range of studies claimed the necessity of designing a valid diagnostic tool to investigate the roots of psychological problems facing adolescents in this regard, e.g., the Cyber-Aggression Typology Questionnaire (CATQ) developed by K.C. Runions and adapted by S.S. Antipina for Russian researchers focusing on adolescent cyber aggression. The questionnaire is based on the analysis of motivational goals and ability for behavioral self-control depending on the four types of aggressive online behavior [1; 33]. D. Graf et al. designed the Face-to-Face Aggression Typology Questionnaire (FATQ). The research team analyzed the driving forces behind aggressive behavior and compared how these forces manifest in samples of adolescents with problem behavior in real-life and digital settings [27].

Table 6

Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire: Descriptive statistics

	Median	Average	Standard deviation
Problems related to public and personal safety	3.50	3.38	0.99
Problems related to identity formation	2.65	2.66	1.01
Problems related to communication and peers	2.00	2.18	0.91
Problems related to the relationships with parents	2.30	2.35	0.98
Problems related to the immersion in the internet	2.40	2.45	0.94
Problems related to school	3.00	2.96	0.92
Integral indicator of concern about problems	2.67	2.66	0.68

You can find the form of the Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire and the keys in the Appendix.

The Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire can be used for the following research purposes:

- to investigate psychological problems of adolescents with different socialization backgrounds, i.e., education, family, place of residence, socio-economic environment, etc.;
- to identify specific behavior of adolescents caused by their psychological problems;
- to diagnose the mental state of adolescents with pronounced individual characteristics of mental development (giftedness, developmental delay, advanced developmental milestones, etc.).

The Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire can find the following practical application:

- to assess the level of concern about problems in a specific aspect of an adolescent's life followed by targeted psychological support;
- to identify the relationship between the level of concern about problems and intensity of the internet immersion;
- to identify risk groups prone to identity loss, etc.
- to substantiate the need for the implementation of social and psychological support of adolescents in a specific educational institution, city's district, region, etc.

Further, the Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire may find an application in research focusing on psychological problems of other social groups, e.g., university or vocational school students. It may also be subjected to criterion validity tests using the A.M. Prikhozhan's Personal Anxiety Scale and test-retest reliability tools.

Another promising avenue of future research is the investigation of psychological problems facing adolescents from other parts of Russia and beyond. It is also reasonable to explore the possibilities and ways of coping with psychological problems related to the immersion in the internet.

The identified areas of high concern about problems may become the focus of an in-depth study of grounds for the concern and subsequent qualitative analysis.

Conclusions

1. The Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire was developed and tested in five consecutive stages from initial collection of empirical data from adolescents to primary and secondary factorization of its scales.

2. The application of a set of psychometric and statistical tools determined the final structure of the Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire.

The questionnaire includes six scales and an average score of overall concern about problems:

— Problems related to public and personal safety;
— Problems related to identity formation;
— Problems related to communication and peers;
— Problems related to the relationships with parents;
— Problems related to the immersion in the internet;
— Problems related to school.

Each scale contains a list of 10 real-life situations that can cause psychological problems (Appendix).

3. The questionnaire was statistically tested on a sample of adolescents aged 13, 14, 15, 16, 17. All the statistical methods were used on an age- and gender-balanced sample of 566 school students from Saint Petersburg and the Leningrad Region, Russia.

4. The questionnaire has sufficient psychometric characteristics: high reliability of individual scales and the internal consistency of all the scales throughout the questionnaire as well as convergent validity confirmed on the basis of correlations with the indicators of the scales of Adolescents' Psychological Problems Questionnaire. The Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire can find an application in scientific research and practical psychodiagnostics on Russian-speaking samples.

Appendix

Adolescents' Psychological Problems in Real and Virtual Environments Questionnaire

Guidelines. *The questionnaire offers some situations that your peers or you personally may experience as problems. Use the scale below to say how much you agree or disagree with each of the statements.*

1—strongly disagree
2—somewhat disagree
3—neither agree nor disagree
4—somewhat agree
5—strongly agree

		1	2	3	4	5
1	I'm worried about drug and alcohol abuse in modern society.					
2	I'm worried that in modern society people are often indifferent to each other.					
3	I'm worried about terrorism and violence in the modern world.					
4	I'm worried that a war may break out.					
5	I'm worried about the decline of moral standards in society, permissiveness and rudeness.					
6	I'm worried about the proliferation of diseases many of which are incurable.					
7	I'm worried about the environment. People do not seem to care about nature anymore.					
8	I'm worried that laws and human rights are violated.					
9	I get upset because of bad news (pandemics, disasters, etc.)					
10	I'm worried that many things from real life will disappear because of the virtual environment.					
11	My future seems too uncertain.					
12	I'm afraid to fail to live up to my parents' expectations.					
13	I still don't know what to do after I leave school.					
14	I'm afraid that I won't be able to fully use my potential in the future.					
15	I'm not sure I'll earn enough to be independent from my family.					
16	I have difficulties in understanding myself.					
17	I don't know what I want to achieve in my life.					
18	I can't figure out where my potential lies.					
19	I often feel lonely and left out.					
20	I feel guilty about some of the things I've done.					
21	I often feel insecure when talking to friends.					
22	I feel constrained to speak to people of the opposite sex.					
23	I find it difficult to find a common ground with peers.					
24	I'm worried that I'm not popular with the opposite sex.					
25	I'm shy to initiate a relationship or to make an acquaintance.					
26	It's difficult to communicate with my peers because of their rudeness.					
27	I don't often voice out my opinion as I fear being laughed at by my peers.					
28	I'd love to be the leader of a team of peers but I keep failing.					
29	At times it's hard for me to support my point of view.					
30	I find it difficult to share my feelings with others.					
31	I fear that when I become an adult my parents will keep interfering in my life.					
32	I often fall out with my parents.					
33	My parents often fail to understand me.					
34	I get angry when my parents interfere in my life.					
35	I often fail to understand my parents.					
36	I don't like it that my parents still treat me as a child.					
37	My parents still control me.					
38	It often happens that my parents and I have absolutely nothing to talk about except for my studies and meals.					
39	My parent put too much pressure on me because of my school grades.					
40	My parents try to regulate my leisure time.					
41	Without the internet, I feel as if my hands are tied.					
42	If I don't have the internet, I'm afraid to miss some of the events taking place in my country or beyond.					
43	A power cut or an internet connection problem means you can't solve many of the everyday issues.					
44	I'm afraid that my life will be joyless if the internet disappears.					
45	If I don't have the internet, I'm afraid to miss some of the events which are important for my friends and me.					
46	I find it hard to effectively manage my time between the internet and household chores.					
47	I can't manage time I spent online.					
48	I'm angry that because of my addiction to the internet, I put off important things for later time and then never do them in time.					
49	I can't keep pace with all the new possibilities offered by the internet.					
50	The internet takes up all of my free time.					
51	I'd like my teachers to treat me with more understanding and respect.					

		1	2	3	4	5
52	I can't manage that much homework.					
53	Sometimes teachers treat me unfairly.					
54	Many school subjects are boring.					
55	I don't like the school dress code.					
56	I don't like the school timetable.					
57	I'd feel much better if school started one or two hours later.					
58	Classrooms and school corridors look uncomfortable.					
59	If I could opt out of school, I'd do it.					
60	School and household chores take too much time.					
61	*Other (please specify):*					

Keys:

Scale 1. Problems related to public and personal safety: items 1—10

Scale 2. Problems related to identity formation: items 11—20

Scale 3. Problems related to communication and peers: items 21—30

Scale 4. Problems related to the relationships with parents: items 31—40

Scale 5. Problems related to the immersion in the internet: items 41—50

Scale 6. Problems related to school: items 51—60

The calculation includes an average score for every scale and an average score of overall concern about problems.

A 1 to 5 rating scale is used to measure the magnitude of concern about problems.

Quantitative methods are used to determine the average concern about problems for each scale and for the psychodiagnostic tool as a whole.

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Does Cultural Intelligence & Emotional Intelligence Differ by Region in India? A Comparative Study

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Students from various parts of India periodically migrate to universities for academic and professional reasons. They reflect various cultural diversities and have to overcome obstacles like intergroup prejudice and acculturative stress. Although these factors can differ by region, the response tendency may be influenced by their respective cultural intelligence/quotient (CQ) and emotional intelligence/quotient (EQ). The comparisons of CQ and EQ across students from significant regions of India, however, have never been recorded in a prior study. This study attempted to examine the level of CQ and EQ among students who were enrolled in educational institutions in Kalaburagi City, who belong to three major regions of India (North, South-East, and South-West). A total of 385 students between the ages of 18 and 31 (mean age: 20.56; standard deviation: 2.633) were recruited for the study. Surprisingly, there were significant geographical disparities in the use of emotions and metacognitive CQ. Compared to students from the other two regions, students from the south-eastern area performed better while using emotional EQ and scored less while using meta-cognitive CQ. The study deduced the plausible factors and potential explanations for CQ — EQ disparities and inter-regional acceptability among students from three major regions, which may be used to develop a CQ & EQ training program for usage across India's educational system.

Keywords: cultural intelligence, emotional intelligence, students, region.

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Различаются ли культурная и эмоциональная компетентности в регионах Индии? Сравнительное исследование

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Студенты из разных уголков Индии периодически меняют институты по академическим и профессиональным причинам. Они обладают разными культурными отличиями и должны преодолевать такие препятствия, как межгрупповые предубеждения и аккультурационный стресс. Несмотря на то, что эти факторы могут различаться в зависимости от региона, на тенденцию реагирования могут влиять соответствующие показатели культурной (КК) и эмоциональной компетентности (ЭК). Однако сравнения КК и ЭК у студентов из значимых регионов Индии никогда ранее не фиксировались в работах. В данном исследовании была предпринята попытка изучить уровень КК и ЭК у студентов, обучавшихся в учебных заведениях города Калабураги из трех основных индийских регионов (северного, юго-восточного и юго-западного). Для участия в исследовании было набрано в общей сложности 385 студентов в возрасте от 18 до 31 года (средний возраст — 20, 57; стандартное отклонение — 2,633). Удивительно то, что существовали значительные географические различия в использовании эмоций и метакогнитивной КК. По сравнению со студентами из двух других регионов, студенты из юго-восточного региона показали лучшие результаты при применении ЭК и меньше набрали баллов при использовании метакогнитивной КК. В ходе исследования были выявлены вероятные факторы и причины различий в КК — ЭК и межрегиональной приемлемости среди студентов из трех основных регионов, которые могут быть использованы для разработки программы обучения КК и ЭК во всей образовательной системе Индии.

Ключевые слова: культурная компетентность, эмоциональная компетентность, студенты, регион.

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Introduction

India is one of the most culturally and socially diverse country in the world. It is a home to diverse communities and social groups differing in cultural markers including language, region, religion, race, and caste. Due to globalization and urbanization, masses from various social and cultural groups converge at certain hubs to

procure education. Institutions of higher education have become a multicultural hub, consisting of varied groups of students from different regions of India. Despite this, these multicultural hubs have both benefits as well as challenges. For instance, cultural diversity and cultural capital improve academic performance [7; 63], but they might cause acculturation stress and intergroup perception-bias (stereotype, prejudice & discrimination). This can increase the risk of discrimination [9; 41; 47] and harm the psychological well-being of students [4; 36] while inclining the rate of student dropout [52]. Especially, cultural discrimination triggers severe psychological disturbances, like suicidal tendencies & depression among students [32; 38]. Therefore, there is an urgency to explore, accept and adapt to cultural diversity through the empathetic understanding of others, considering them as individuals rather than a representative of a social group.

This can be possible through inoculating cultural intelligence (CQ) and emotional intelligence (EQ) within academic context. Previous studies demonstrated the effective role of EQ in reducing prejudice [14; 39] and discrimination, thereby reducing acculturative stress [64]. In addition, CQ directly moderates acculturative stress [21; 45], which helps to improve social skills [31], and innovative behavior among students [30]. Nevertheless, it is essential to assess the participant's level of CQ & EQ before assigning the intervention program. In line with this, the preliminary aim is to assess the level of CQ and EQ among the students.

Cultural diversity across India

Culture and language are inextricably linked [17; 24]. Although there are languages like Punjabi, Gujrathi, Marathi, which were once part of the Indo-European language family, people from the North Indian states primarily speak Hindi [67]. However, each state in the South India has its own pronoun language, which is descended from the Dravidian linguistic group [33]. Scholarly research has shown that there were significant differences between the North Indian and the South Indian individuals in terms of skin tone, height, life values, and degrees of happiness [8; 50]. The southeast and southwest areas were historically governed by several colonial powers, which had a significant impact on their respective cultural and traditional values [26]. Overall, the diverse behaviors that people displayed at a multicultural hub like a university represented the different cultural perspectives.

With the best of the researcher's knowledge along with a thorough literature review, it was found that there is no prior study that has been conducted to assess the differences in CQ and EQ among students from different regions in India. This might be possible due to the system of integrative cultural values enforced by the Indian education system [59], although the ground reality can differ. Moreover, most of the previous studies were conducted in the international context [37; 44; 56; 60] but neglected the impact of regional variations on CQ and EQ within the nation. The present study proposed to reveal the inter-regional acceptance and cultural adaptation of the students belonging to different regions. Therefore, the study aimed to compare CQ and EQ among students from the north, southeast, and southwest regions of India.

Cultural intelligence (CQ)

Understanding the underlying meaning behind how individuals from other cultures portray themselves and being able to successfully adjust oneself in various cultural circumstances are two characteristics of someone with cultural intelligence [15]. It catalyzes negotiations in intercultural meetings/situations [3]. In the educational context, cultural intelligence plays a crucial role in cross-cultural adjustment and psychological adaptation [25; 28; 51]. It serves as a conduit for conceptualizing metacognitive, cognitive, behavioral, and motivational elements that are reflected in a cultural context. [15]. Moreover, it aids an individual in adapting to a multicultural environment [43]. People with high CQ tend to have high cultural competency that eventually can lower their acculturative stress.

Emotional intelligence (EQ)

Emotional intelligence or emotional quotient (EQ) is the capability to perceive, understand, manage and act on one's own or other people's emotions [53]. It has been associated with physical and mental health, intercultural competence, aggression, cultural adjustment & work productivity [18; 20; 23; 39; 40; 55; 65]. The optimal level of EQ bolsters interpersonal relationships [48]. Specifically, in the academic context, it improves scholastic performance along with enhancing social cohesion among students [1; 46]. Furthermore, EQ lowers acculturative stress by prompting appropriate coping responses in an educational environment [26; 64].

Cultural intelligence & Emotional intelligence

However, previous studies indicated the similarities between CQ and EQ, despite they are distinct from each other [2; 11; 35; 49; 57]. EQ is culturally specific since it allows a person to roughly understand and react to the emotions of a corresponding culture [16; 62]. In contrast, CQ is culture-free, as it effectively functions among diverse social and cultural groups [42]. Nonetheless, EQ is the sub-set of CQ. For instance, studies demonstrated that interpersonal skills and social skills belonging to EQ are associated with CQ [31]. Although a few studies supported the overlapping of CQ with EQ [11; 12]. In line with this apparent contradiction, the third aim of the study is to assess the correlation between CQ and EQ among students.

Method

Participants

This study included 385 students who were studying in various educational institutes in Kalaburagi City, and who hail from different regions of India. In accordance with their native state, they were categorized into 1) The northern region (n=122, female=66, male=56), 2) the

south-eastern region (n=131, female=61, male=70) and 3) the south-western region (n=132, female=93, male=39). Overall, a total of 155 male and 230 female students with a mean age of 20.56 years (SD=2.633) have been recruited for this study. Out of them, two hundred fifty-one were undergraduates, one hundred thirty-three were postgraduates, and four were research scholars. The researchers excluded international students and regional language students who cannot write and comprehend the English language.

Tools

Cultural Intelligence/Cultural Quotient Scale (CQS): This scale was developed by S. Ang, L.Van Dyan and C. Koh to assess the cultural intelligence of individuals [2]. It is a rating scale that included four sub-domains; Motivational Cultural Quotient (5 items); Cognitive Cultural Quotient (6 items); Metacognitive Cultural Quotient (4 items); and Behavioral Cultural Quotient (5 items). The reliability through Cronbach Alpha of CQ is .86, while the reliability of each subscale is as follows: Motivational CQ is 0.80, Cognitive CQ is 0.81, Metacognitive CQ is 0.76, and Behavioral CQ is 0.77 respectively.

Emotional Intelligence Scale (EQS): this scale was developed by C. S. Wong and K. Law K. [66]. It is a rating scale used to assess the emotional intelligence of an individual. It has four subscales with four items in each; Self-Emotional Appraisal; Other's Emotional Appraisal, Use of Emotion, and Regulation of Emotion. The reliability was tested using Cronbach's Alpha; the 'self-emotional appraisal' is 0.61, 'other s emotional appraisal' is 0.79, 'use of emotion' is 0.82, and 'regulation of emotion' is 0.81.

Procedure

A list of educational institutes in Kalaburagi City was prepared by the prime investigator. With the help of Research Randomizer, 10 educational institutes were selected and approached to gain permission for data collection. After cognitive briefing, the students from the permitting institutes who volunteered to participate were taken to a comfortable space, where their consent and basic socio-demographic details were obtained. The emotional intelligence and cultural intelligence scales were administered along with assuring the confidentiality of the study. The data was analyzed using SPSS version 25.

Data analysis

Descriptive analysis was performed to compute the mean, standard deviation, and percentages of variables. One-way analysis of variance (ANOVA) was computed to understand the significant differences in EQ and CQ depending on the region. In addition, a post hoc Tukey Test was used to compare the lowest as well as the highest significant differences in CQ and EQ across the regions. Furthermore, correlational analysis (*r*) was carried out to find the relationship between CQ and EQ among the students belonging to 3 regions, where the value of *r* determines the strength & direction of correlation.

Results

Descriptive Analysis

The study consists of 40% of male and 60% of female students, among which 65% were undergraduates, 34% were postgraduates & 1% were PhD scholars. In addition, 32% of the students belong to the northern region, while students from the south-eastern region & south-western region constitute 34% each. The mean age of the students was 20.56 & SD is 2.63. The mean & SD of the sub-variables of cultural differences were as follows: motivational cultural quotient (Mean=26.14, SD=5.98), cognitive cultural quotient (Mean=23.7, SD=7.68), metacognitive cultural quotient (Mean=20.3, SD=5.0) and behavioral cultural quotient (Mean=23.3, SD=6.0). The mean & SD of sub-variables of emotional intelligence are as follows: self-emotional appraisal (Mean=21.3, SD=6.6), other's emotional appraisal (Mean=21.1, SD=4.7), use of emotion (Mean=21.04, SD=5.2) & regulation of emotion (Mean=19, SD=5.6). Table 1 shows the details of the descriptive analysis.

Table 1

Descriptive statistics

Variables	n	Percentage
Gender-Male	155	40%
Female	230	60%
Education-Undergraduate	251	65.2%
Postgraduate	130	33.8%
PhD	4	1%
Northern Region	122	32%
South-Eastern Region	131	34%
South-Western Region	132	34%
	Mean	**SD**
Metacognitive CQ	20.0	5.03
Cognitive CQ	23.7	7.68
Motivational CQ	26.1	5.98
Behavioral CQ	23.3	6.05
Self-emotional appraisal	21.3	6.64
Other's emotional appraisal	21.1	4.70
Use of emotions	21.0	5.2
Regulation of emotions	19.4	5.63

One-way ANOVA

The results (Table 2) demonstrate the comparison of sub-components of CQ & EQ with the students' regions. Except for meta-cognitive CQ [F (2,382) = .622, *p*=.002] & the use of emotions [F (2,382) =4.45, *p*= .012], there was no significant difference in sub-components of CQ & EQ among students from the northern, south-eastern & south-western regions. This can be seen in cognitive CQ [F (2,382) =.476, *p*=.621], motivational CQ [F (2,382) =1.82, *p*=.16], behavioral CQ [F (2,382) =1.63, *p*=.196], self-emotional appraisal [F (2,382) =1.96, *p*=.14], other's emotional appraisal [F (2,382) = .156, *p*=.85], and regulation of appraisal [F (2,382) = .158, *p*=.85]. The Tukey post hoc analysis was conducted while finding a significant difference in metacognitive CQ (*p*=.002) and use of emotions (*p*=.012) among the

students from the 3 regions. The lowest difference in meta-cognitive CQ was found among the students from the south-eastern region (18.79±1.98, p=.005) compared to the students from the south-western and northern region. In contrast, the use of emotions shows the highest difference among students from the south-eastern region (22.14±1.67, p=.027) when compared to the students from the south-western and northern regions. However, a significant difference in the use of emotions was not found between the south-western and northern students.

Correlational Analysis

Pearson correlation analysis was used to find the relationship between CQ and EQ. Metacognitive CQ has a significant positive correlation with self-emotional appraisal (r =0.23, p <0.01), other's emotional appraisal (r =0.29, p <0.01), use of emotions (r =0.27, p <0.01) & regulation of emotion (r =0.19, p <0.01). Cognitive CQ has a significant positive relationship with self-emotional appraisal (r =0.23, p <0.01), other's emotional appraisal (r =0.31, p <0.01), use of emotions (r =0.33, p <0.01) & regulation of emotion (r =0.26, p <0.01). Motivational CQ has a significant positive relationship with self-emotional appraisal (r =.28, p <0.01), other's emotional appraisal (r =.37, p <0.01), use of emotions (r =.30, p <0.01) & regulation of the emotion (r =.29, p <0.01). Behavioral CQ has a significant positive relationship with self-emotional appraisal (r =.26, p <0.01), other's emotional appraisal (r =.31, p <0.01), use of emotions (r =.28, p <0.01) and regulation of emotion (r =.24, p <0.01).

Discussion

This study aimed to 1) investigate the level of cultural intelligence and emotional intelligence among the students of three regions 2) compare CQ & EQ among students from the northern, south-eastern, and south-western regions of India 3) explore whether there exists any relationship between CQ and EQ among the students. First, the results demonstrated a significant differences in CQ and EQ, especially in meta-cognitive CQ that is about how an individual seeks knowledge about culture and monitors one's thoughts related to a particular culture [19], which includes pre-planning and shifting the pre-existing mental models toward cultural norms [3]. This infers that due to grown up in specific region a student's meta-cognitive CQ can be different from another student who belongs to a different region. Similarly, a significant difference was found in the 'use of emotions' among the students from the three regions. The use of emotions is a sub-component of EQ, which deals with using one's emotions in a proper way that subsequently results in constructive activities that improves

Table 2

One-way ANOVA results

Variable	Mean (SD)			df	F	P	Post hoc Turkey
	(1) Northern Region (n=122)	(2) South-Eastern region (n=131)	(3) South-Western region (n=132)				Sig Difference
Metacognitive CQ	20.7 (4.9)	18.8 (5.7)	20.6 (4.2)	2, 382	6.22	.002**	1>2, 3>2
Motivational CQ	23.9 (8.6)	24.1 (7.3)	23.2 (7.2)	2, 382	1.82	.16	
Cognitive CQ	26.7 (5.7)	25.4 (6.4)	26.3 (5.7)	2, 382	.47	.62	
Behavioral CQ	24.0 (6.4)	22.6 (6.1)	23.3 (5.7)	2, 382	1.6	.19	
Self-emotional appraisal	20.4 (5.9)	22.2 (8.5)	21.4 (4.7)	2, 382	1.96	.14	
Other's emotional appraisal	21.02 (5.3)	21.02 (4.9)	21.3 (3.9)	2, 382	.16	.85	
Use of emotions	20.5 (5.6)	22.1 (4.8)	20.5 (5.0)	2, 382	4.45	.012*	2>1, 2>3
Regulation of emotions	19. 7 (5.6)	19.3 (5.4)	19.3 (5.9)	2, 382	.16	.85	

**p <0.01 *p<.05

Table 3

Bivariate of correlation

	1	2	3	4	5	6	7	8
1. Metacognitive cultural quotient		0.27**	0.47**	0.36**	0.24**	0.30**	0.27**	0.20**
2. Cognitive cultural quotient			0.28**	0.33**	0.23**	0.32**	0.34**	0.26**
3. Motivational cultural quotient				0.44**	0.28**	0.37**	0.30**	0.29**
4. Behavioral cultural quotient					0.26**	0.31**	0.28**	0.24**
5. Self-emotional appraisal						0.40**	0.39**	0.38**
6. Other's emotional appraisal							0.50**	0.38**
7. Use of emotions								0.46**
8. Regulation of emotions								

** p <0.01

one's performance [13; 34]. This infers that the students from different regions might identify specific emotions and utilize them in accordance with appropriate context.

The post hoc Tukey analysis showed that the difference in meta-cognitive CQ is the lowest and the use of emotions is the highest among students from the south-eastern region when compared to the northern and south-western region. This may be due to their advanced level in science and the higher standard of facilities available in the south-east [26]. This may have subsequently contributed to cultural acceptance [10], lowering the differences in meta-cognitive CQ among students of that region.

Second, considering the modern history of India, missionaries first appeared in the south-eastern region, aiming to 'enlighten' the peasants and gave them a new perspective on life by employing the educative systems, libraries, and religious activities they established [26]. As a result, in the south-eastern area, compared to other locations, disparities in the usage of emotions among the students emerged as a result of the collision of existing communities and missionaries. To clarify whether this clash of civilizations actually impacts different EQ subdimensions, more research is required.

Unexpectedly, there was no significant difference among other dimensions of CQ and EQ, except for meta-cognitive CQ and the use of emotions. This may be due to the ability of students from all three regions to adapt to the new situations, which was not assessed in the current study [27; 29; 60]. Nevertheless, the first-year students were found to have more adjustment issues than the second-year or the final-year students [6]. However, individual differences can play a critical role in determining both CQ and EQ and should be studied in the future.

A positive correlation between EQ and CQ was obtained corroborating with previous literature [61]. In the present study, meta-cognitive CQ, motivational CQ, and behavioural CQ have a relatively strong correlation with the other's emotional appraisal, which indicates that prior knowledge of the other's culture is important to perceive, interpret and comprehend one another's emotions. Further, it may involve questioning one's pre-existing perceptions of the other's culture [16]. However, this can motivate appropriate behavior in a multi-cultural setting through the apprehension of the other's emotions. Similar to emotional usage, cognitive CQ has a substantial association, suggesting that knowledge gained from diverse cultural experiences [15] can control emotions during performance in a multicultural setting. Nevertheless, cultural experiences include norms and customs that enable an individual to accurately comprehend their emotions [54]. However, the strength of the correlation is no more than .3, which may be attributed to the low sample size.

Implications & Limitations

The study can aid in ascertaining the overlap of CQ and EQ. Both CQ and EQ in coordination can enrich the management of both emotions and cultural acceptance among students, which can nurture a conflict-free educational environment. This research showed the overlap between EQ and CQ, highlighting the necessity to investigate this relationship together with moderating factors including self-efficacy and self-adjustment. The study also advises utilising a qualitative research approach to evaluate CQ and EQ because it can provide a more thorough explanation of students' perceptions in a multicultural setting.

There were certain limitations of the study. The study focused primarily on differences in CQ and EQ based on the students' region in general but did not consider individual differences such as multicultural attitudes, personality traits, or self-efficacy. These factors can be considered in future research. Second, socio-demographic variables such as socio-economic status, religion, and family type may also have a role in both CQ and EQ [5; 58]. Third, the study excluded international students, the inclusion of which might have helped in comparing the differences in CQ and EQ between Indian students and foreign students. Finally, the study's findings cannot be generalized to other populations like employed people, grade-school students, labor workers, or migrants, but these may become the focus of the future studies.

Conclusion

This study aimed to find the level and difference in CQ and EQ based on which region students studying in educational institutions (a multicultural context) in Kalaburagi City came from. The study indicated that EQ and CQ largely overlap and highlighted significant differences in meta-cognitive CQ and the use of emotions among students from the three regions. The findings of the study contribute to the literature on cultural intelligence & emotional intelligence as this area remains less prioritized by researchers. Understanding the relationship between cultural and emotional intelligence might aid education system administrators in better comprehending the needs and challenges faced by students. This may lead to the creation of suitable support networks for students, particularly first-years. After all, education is intended to transform the next generation into a responsible, culturally and socially flexible individual. However, the implications and limitations of this study should be taken into account and may be used for future, related studies.

Conflict of Interests

The authors declare no conflict of interests in the authorship and publication of this work.

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THEORY AND METODOLOGY
ТЕОРИЯ И МЕТОДОЛОГИЯ

The Psychological Nature of Generalizations

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The article analyzes the fundamental problem, known in philosophy as the problem of universals, and in psychology as the problem of the essence and types of generalizations. The authors point to the internal inconsistency and lack of persuasiveness of the traditional interpretation of the nature of generalizations proposed by Aristotle. All modern psychology, as indicated in the article, remains a prisoner of the empirical way of generating the general, imposed by the Stagirite. The authors see ways to solve the problem of generalizations in the paradoxical formula proposed by L.S. Vygotsky, who argued that generalization and communication are two sides of the same time. According to this formula, as we communicate, so we generalize, and vice versa.

Guided by the most important principle of the cultural-historical approach — the principle of historicism, the authors consider the origin and essence of generalizations in ontogeny. The article highlights and discusses six types of sequentially emerging generalizations. The very first generalization that appears in young children, which can be called primary, sheds light on the inner nature and essence of generalizations, which are a folded program of actions to achieve the goal generated by the child. The next type and level of generalizations can be named after L.S. Vygotsky, worldly concepts and ideas. They differ significantly from the empirical generalizations imposed on children by existing educational methods and programs. According to the authors, the child's mastery of certain levels and types of generalizations is a natural process of development of the psyche and consciousness. At the turn of preschool and primary school age, children develop theoretical thinking with a predominant focus on the mode of action; in the middle grades, they master functional generalizations and a functional style of thinking. In older adolescence and youthful age, opportunities open up for them to familiarize themselves with the scientific and philosophical level of thinking, thanks to the scientific and philosophical types of generalizations. The development of generalizations in the cultural-historical theory is an internal, and, therefore, an essential characteristic of the development of human consciousness.

Keywords: cultural-historical approach, the problem of types of generalizations and the nature of universals, theory of activity, developmental education, consciousness, meaning, significance, methodology of non-classical psychology.

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Психологическая природа обобщений

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В статье анализируется фундаментальная проблема, известная в философии как проблема универсалий, а в психологии — как проблема сущности и видов обобщений. Авторы указывают на внутреннюю противоречивость и неубедительность традиционной трактовки природы обобщений, предложенной еще Аристотелем. Авторы видят пути решения проблемы обобщений в парадоксальной формуле, предложенной Л.С. Выготским, утверждавшим, что обобщение и общение это две стороны одной медали. Согласно этой формуле, как мы общаемся, так мы и обобщаем, и наоборот.

В статье выделяется и рассматривается шесть видов последовательно возникающих обобщений. Самое первое обобщение, появляющееся у детей раннего возраста, которое может быть названо первичным, проливает свет на внутреннюю природу и сущность обобщений, являющихся свернутой программой действий по достижению порожденной ребенком цели. Следующий вид и уровень обобщений может быть назван, вслед за Л.С. Выготским, житейскими понятиями и представлениями. Они существенно отличаются от эмпирических обобщений, навязываемых детям существующими образовательными методами и программами. На рубеже дошкольного и младшего школьного возраста у детей появляется теоретическое мышление с преимущественной ориентацией на способ действия, в средних классах они овладевают функциональными обобщениями и функциональным стилем мышления. В старшем подростковом и юношеском возрасте, благодаря научному и философскому видам обобщений, перед ними открываются возможности приобщения к научному и философскому уровню мышления. Развитие обобщений в культурно-исторической теории — это и есть внутренняя, а, значит, существенная характеристика развития сознания человека.

Ключевые слова: культурно-исторический подход, проблема видов обобщений и природы универсалий, теория деятельности, развивающее обучение, сознание, смысл, значение, методология неклассической психологии.

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Generalizations are typically interpreted in ways consistent with the historical tradition established by Aristotle. Almost all academics and practitioners, both in Western civilization and in Russia, came under the hypnotic influence of this tradition. Aristotle had to devise a convincing method to contrast his philosophy with that of Plato while deriving the common from the singular elements of the world around. All in all, it was obvious that the challenge was insurmountable. It is impossible to use the singular "modes of substance" to derive what belongs to the ideal world — generalizations. As we know, Ren Descartes asserted that there are two substances, one of which has extension as its primary quality while the other has conceivability. Baruch Spinoza, a student and adherent of Descartes as he insisted upon calling himself, states in the very first pages of his Ethics, written geometrically: "Proposition 2. Two substances, whose attributes are different, have nothing in common." And then: "Proposition 3. Things which have nothing in common cannot be one the cause of the other." [14, p. 4].

It is reasonable to assume that the man who developed the formal logical apparatus, to which all sciences are still subject, was aware that the general cannot, in principle, be deducted from the singular. Therefore, in an effort to balance his logical constructs, he opted for a blatant concept substitution. He used the idea of the same properties in a certain group of things to substitute the concept of the common, traditionally understood as a verbal representation of the essence of this or that thing. Giving such a group a singular name results in a typical empirical generalization that is still in wide use today and is regarded as the only kind that can be made,

with the possible exception of Vasiliy Davydov's theoretical generalization.

The main philosophical issue at hand includes the problem of generalizations, known as the problem of universals in the Middle Ages. With his paradoxical claim that generalization and communication are the same thing, Lev Vygotskiy was able to shake off the centuries-old dust from this issue and bring it up correctly. In other words, how we communicate is how we generalize, and vice versa; the two are the sides of the same coin. This, in our opinion, is the only accurate formulation of the philosophical problem of universals, yet to be resolved.

In accordance with the fundamental tenet of the cultural-historical approach, stated in its very name, and known as the principle of historicism, which insists that the subject of our study must be taken into account as a part of the history of its natural emergence, formation, and development, we will attempt to start studying generalizations' nature and essence in their most basic, one might even say, embryonic, state. It would seem that this type of psychological research requires not complex experimental methods, but rather simple observation of mundane events, with psychological analysis and due reflexion.

One family's newly-taught-to-walk granddaughter approached her grandfather lounging on the kitchen couch, took his thumb, and started to pull it, inviting him to get up and come with her to the next room. The grandfather, of course, gave in to this request. The family's next room was designated as the library because it had glass-doored cabinets lined with bookshelves. Many different figurines, including glass angels, porcelain animals, oriental beauties, and more, could be found on the shelves as well. When the grandfather arrived at a specific cabinet, the girl pulled the door handle while pointing at him and exclaimed firmly, "Ku-ka." The grandfather was aware that she used to refer to dolls ("kukla" in Russian) in that way, but at that moment, it could very well mean any other kind of figurine. The grandfather opened the cabinet door as the granddaughter was not yet tall enough to reach on her own and began offering her the figurines standing there, one by one. However, the girl stretched her arm out again and again, shaking her head, and kept demanding, "Ku-ka." A porcelain figurine of Przewalski's horse was finally placed in her hands. The girl, overjoyed, immediately ran off to play with the figurine, leaving her grandfather be.

Every family has probably experienced a similar scenario: a young child draws an adult's attention in a bid to enlist the adult's help in achieving a goal. It would appear that the child is manipulating the adult; however, this is merely how things look on the surface. In actuality, this relationship between the child and the adult is something altogether different. It all comes down to the adult being the one person actually close to the child. Therefore, the adult cannot be used as a tool for manipulation or as a means to achieve the child's goal. There is no boundary between the consciousnesses of the child and the adult close to him. They share a "proto-we" type of consciousness, which Lev Vygotskiy described as the primary new psychological formation of the first year of a child's life. In the case mentioned above, the grandfather was just as happy with how his granddaughter and he conducted their "business" communication as she was when she finally got her hands on the coveted porcelain horse.

Vygotskiy observed that at the autonomous speech stage, children communicate with close adults in a way that fosters mutual understanding, largely through gestures; the peculiar "words" they utter only serve to supplement their gestures, enriching the semantic context of communication. This gesture to word ratio is reversed over time. Adults only use gestures to emphasize the emotional and semantic aspects of speech; the word takes center stage. The girl's gesture — her hand reaching out toward the cabinet door, along with her turned head and the demanding gaze at the adult, took center stage in the above scenario. However, there was also what might be called a primary meaning to the word "Ku-ka" that accompanied these movements. It was obvious from the context that it essentially meant, "Give me a figurine of a living creature that stands on a shelf." A word is a sign, according to Lev Vygotskiy; a sign is a sign because it has meaning; and meaning is a generalization. He then asserts, somewhat unexpectedly, that communication and generalization are two sides of the same coin. From our perspective, this is the key to resolving the age-old problem of universals, also known as the problem of generalizations in the modern era.

The mundane situation under discussion contains many psychologically relevant elements. It is important that children can already set goals at this age and work toward those goals using any means necessary. Their behavior is built around such goals. They plan out a series of behavioral acts that will help him get closer to the end goal he set himself. However, the very phenomenon of being able to lock on the goal shows that the child is now living in a future-oriented space. He transformed into an entirely new being with a purpose and increased self-awareness. Whereas as an infant, he was entirely at the mercy of the circumstances at hand, he has now broken the confines of the current environment and, as some philosophers say, transcended into another dimension. He now lives in a future that he himself created. It is still unknown in its entirety why and under what conditions a child develops the capacity for proactive goal-setting. However, this is a key turning point that separates children into those who

live primarily in the present at hand and those who live in the future from an early age. Children fall into these two categories by the age of three, according to some experimental data. The quality and nature of communication between parents and their children is where we can see the root of this division. Our findings indicate that children lack proactive goal-setting and transcendence into the realm of the future if they have not fully and completely gone through the stage of living together with close adults where "proto-we" consciousness rules. For instance, children from these two groups with qualitatively different mental development have different speech utterance construction styles. In some, they are focused on the future, while in others, they are restricted to the here and now [11, pp. 88—97].

The word the girl used in this situation had the meaning of a condensed intrasubject action program that resulted in the accomplishment of a goal. It is interesting to note that, bringing an adult to the bookcase and making him concerned about her goal, the girl did not consider any specific strategy to reach this goal. The adult simply started to offer her the figurines that were there, one by one. This is the first aspect of the girl's words communication function. The girl was able to imagine for the adult the same goal that she had and to outline the broad contours of how to reach it, which is the second aspect of this generalizing function of words and gestures. Therefore, the earliest generalizations that emerge in young children during the period of vivid autonomous speech manifestation are condensed behavioral programs intended to accomplish a child-set goal.

The critical period Lev Vygotsky described in his article, "Crisis of Three Years," is known to exist between the early age and preschool age. The child whom the adult used to lead by hand now pulls the hand away, both literally and figuratively. The slogan and essence of this crisis is "I can do it myself!". Quite often, as noted by Vygotskiy, the child insists on getting their way not even because he wants it so much, but simply to make a point. For parents, this time in their life with their child is not an easy one. Nevertheless, it is a very important and meaningful period in a child's development. Our data show that children who, for whatever reason, do not go through the crisis of three years are indeed troubled children [12].

The child experiences a qualitative shift in the development of their psyche, consciousness, and personality during the crisis of three years, which, according to Vygotskiy, can last up to a year. A qualitatively higher level of self-awareness develops in the child. Many child psychologists hold the opinion that we can only begin to talk about the child's personality from this age, and with good reason. After going through the three-year crisis, a child establishes their own place in the system of their relationship with adults and adopts a stable, proactive goal-setting approach as opposed to situational and episodic. Furthermore, at this age, the system of interfunctional relations undergoes a very significant restructuring. The imagination, which we believe children have in some capacity at all ages, assumes a central role during this time and stage, serving as the primary new psychological formation that defines preschoolers' entire developmental trajectory. Children's play, which Lev Vygotskiy called the dominant activity of the preschool age period, is produced by imagination, a volitional function of the psyche. Only in play can a child do things he is unable to do as part of any other activity because play is imagination in action [2].

The aforementioned developmental leaps and accomplishments of post-crisis children entering the preschool stage are a crucial psychological requirement and condition for the emergence of generalizations that are more advanced than the early age's primary generalizations. We can better comprehend the essence and nature of these generalizations by drawing an analogy with the emergence of primary generalizations at an early age, when generalizations were linked to the manifestations of autonomous speech. Primary generalizations were found in words that had neither an accepted pronunciation nor meaning. A peculiar "whyer" stage during the preschool years, in our opinion, plays roughly the same role as early autonomous speech.

Children who have gained some experience and gone through the "whyer" stage start learning the semantic underpinnings of normative human interactions and relationships on their own through play. Children's play is fundamentally a creative activity, which is its most important characteristic. The play is immediately ruined by anything that restricts creativity. In turn, creativity in play implies that the child is surpassing himself; in other words, he "reaches up," exerting voluntary effort. Play also has the notable quality of not producing anything. A valid question is then raised: why do children play, and what do they play for? It may look as though they played a bit and went their separate ways, while things remained as they always were. Play, however, is a very appealing activity for children. Just mentioning the mere opportunity to play to children is sufficient to get their attention and get them actively demonstrating how eager they are to participate. This draws us to the heretical conclusion that play activity, as it is typically understood in the activity-oriented approach and others besides it, is not even an activity at all.

According to Aleksey Leontyev's theory of activity, the motive, or the object toward which a given activity is directed, is what defines this distinctive activity. The closest basis and criterion for differentiating between activities is motive. Many eminent child psychologists

have tried to pinpoint the motive behind play. From our perspective, the fact that all of these esteemed psychologists were confined to the activity-oriented approach was the primary cause of these attempts' failure. Play lacks a motivation in the form of an activity object because it is not an activity in and of itself but rather a reflexion manifesting as an activity [13].

Reflexion, in its broadest sense, is the focus of consciousness on oneself. An essential component of human consciousness is self-awareness. William James asserts, for instance, that no matter what a person does, he is always aware that he is doing it [8] in the opening paragraphs of the personality-focused tenth chapter of his Psychology. The authoritative philosophical teachings of Oriental cultures prioritize internal consciousness over external consciousness. In Western civilization, however, during the New Age, the action-oriented mindset took over philosophy and popular culture. Karl Marx, for instance, asserts this attitude in his Theses on Feuerbach. Governmentalized Marxism provided the activity-oriented approach in the Soviet Union with very strong ideological armor.

Returning to the topic of play activity motivation, we shall cite Daniil Elkonin's remarkable statement that play is not preceded by or stimulated by any motives. Play is motivated solely by intrinsic factors that are created during the play process. The question, however, stands: why do children find play to be so appealing? After all, for them, play means not rest and relaxation but rather the highest possible level of concentration and volitional effort [16].

From our perspective, the sweet word "freedom" should be considered as the answer. In pedagogy, children's play falls in the free activities category, and for good reason. Children truly exercise their free will when they play.

Upon studying the various forms and characteristics of human emotions, Baruch Spinoza came to the conclusion that anything that broadens the scope for free action is followed by positive emotions, while anything that limits our freedom is followed by negative ones. From this angle, it is easy to understand why playing children enjoy the satisfaction of overcoming challenges, the joy of creativity, and the satisfaction of rising to a higher level of subjective existence through volitional effort. Lev Vygotsky defined play as a "school of emotions"; a person cannot have a fully developed, substantial, adult (according to Aleksey Losev) personality without a cultivated system of refined feelings and sensations.

Sometime after turning six, some older preschoolers have either entered or already emerged from the notorious crisis of seven years. Numerous of these kids have what Elkonin called a theoretical attitude toward a task situation, based on our experimentally collected data. A predominant orientation to the way of action was what he called "theoretical attitude." This is the very theoretical generalization, in our opinion, that characterizes the consciousness of younger schoolchildren. Following Vygotskiy, if preschoolers' generalizations can be referred to as mundane concepts, then the next age stage in a child's development of consciousness is indicated by their capacity for theoretical thought [4].

According to Lucia Bertzfai's research, carried out under the supervision of Daniil Elkonin, typical preschoolers are "practitioners" in the sense that they are focused on achieving the set goal, whereas fully developed schoolchildren are able to push the goal to the side, as if on the periphery of their consciousness, and focus on determining the best course of action to take in order to solve the given task. Elkonin labeled them "theorists." Vasiliy Davydov describes Bertzfai's methodology in his monograph, Theory of Developmental Teaching [7, p.187—192], as it was used to assess the third-grade students' level of theoretical thinking. According to Davydov, schoolchildren only develop theoretical generalizations and theoretical thinking while engaged in learning activities under the guidance of their teachers. However, our research has shown that many older preschoolers are fully capable of understanding theoretical generalizations. It was demonstrated that some older preschoolers are quite capable of sustained attention focus on the way of action in the dissertation paper by Batdelger Jamerandorjiin, intended to study the personality-related readiness of children to school. Daniil Elkonin claims that this type of reflexion on the way of action is a theoretical attitude to a problem situation [9].

According to Yuliya Bogatyonkova's master's thesis from 2022, there is a conditioning link between children's ability to sustainably understand the way of performing actions and their going through the crisis of seven years. Therefore, there is strong evidence to support the claim that the development of theoretical generalizations in children occurs naturally as a result of the child's general mental and personal development throughout full-fledged child ontogenesis rather than as a result of the child taking in information from the teacher [1].

The emergence of functional generalizations in young children marks the next stage of age-related development of consciousness. Felix Klein, a mathematician, made the logical case that there is a functional way of thinking. Functional generalization and thinking are just as significant from our perspective as theoretical generalization and thinking. The basic idea behind functional generalization is monitoring and making use of the dynamic interaction between the dependent and independent variables.

All students are familiar with the application of the law of kinematics, expressed by the formula $s=v*t$, in

typical school problems involving motion from point A to point B. We will either be dealing with a direct or an inverse proportional relationship, that is, with a specific type of functional relation, depending on the circumstances of the problem and on which of these three interrelated values is sought. Though schoolchildren start solving all kinds of motion problems in fourth grade, modern educational programs maintain that the concept of functions should only be introduced in the seventh grade. This equals putting the cart before the horse. As a result, students must use their wit and ingenuity to solve motion problems when acting in situations where there is an insufficient indicative basis for actions, as defined by Pyotr Galperin [5]. Meanwhile, as far back as in 1977, on Vasiliy Davydov's request, one of the authors of this article carried out a dissertation study which demonstrated through experiment that fourth-graders were quite successful at mastering the mathematical concept of functions. However, mainstream schools never adopted the approach developed as part of this study for introducing the concept of functions to fourth-grade students. Our educational system appears to be resistant to psychological advancements [6].

It stands to reason that students who have mastered functional generalizations and a functional way of thinking are free to enter the realm ruled by scientific consciousness and thought and explore the system of scientific concepts. The scientific method, built around the corresponding theory that is based on its explanatory principle, is the cornerstone of scientific generalization and scientific thinking. All statements and implications of the expanded theory can be inferred from the explanatory principle; vice versa, all facts and statements that a given theory purports to explain can also be reduced to this explanatory principle. Any mathematical theory can therefore be derived from a suitable system of axioms and rules of inference from them. A theory's corresponding law serves as its explanatory principle in the natural sciences. One can easily ascertain what occurs in any area of an electrical circuit where direct current flows by applying Ohm's law, for instance. In psychology, however, the explanatory principle that satisfies certain methodological requirements is the central idea, as Lev Vygotskiy noted in his methodological study, The Historical Meaning of the Psychological Crisis [3, pp. 292—436].

The aforementioned kinematics explanatory principle, known to students as the law represented by the formula s=v*t, can serve as the starting point on the path that leads them into the world of scientific consciousness and thinking in scientific concepts. The relationship between the three parameters, which can also be thought of as a relationship between the three variables, is indicated by this formula. However, in order to use this law of mechanics practically to solve any given motion problem, it must first be converted into a certain mathematical function that matches the problem's conditions. The above law of kinematics is transformed into a direct proportional dependence function, wherein distance is the dependent variable and the other two parts of the formula are transformed into an independent variable and coefficient, if the sought value is the distance traveled. If motion velocity or travel time is the sought value, the law of kinematics' formula must be transformed into a function of inverse proportional dependence, where the dependent variable, or the function itself, will be either velocity or time. The dynamic relationship between the three-variable law and the particular work function it generates — which is exactly a scientific generalization — is what enables one to think in terms of the scientific concept system.

The sixth and the highest category of generalizations we have identified is referred to as philosophical generalizations. Adolescence is when people start to master this kind of generalization. Philosophical generalizations stand out for their internal flexibility and the acceptance of constructive contradictions, which would be impossible in the realm of scientific knowledge. Every term or symbol in traditional science has precisely one meaning. Words may have multiple meanings in common speech, but ambiguity is inacceptable in science. As a result, there is only one function value for each value of the argument. Similarly, contradictions are inconceivable in science. Science defines a contradiction as a deadlock which shows that either our reasoning was flawed from the start or that we made an error along the way.

One might say that contradictions are present everywhere in philosophy. Zeno's aporias, which remain logically unsolved, serve as an example of how we are unable to consistently model simple physical motion in concepts. Georg Hegel "overcame" this challenge by blatantly ignoring the fundamental rule of formal logic — the law of excluded middle — when confronted with this reality. He used Existence and Nothing, two concepts that are mutually exclusive, as the starting point for his logical constructs. As per certain logic experts, Hegel's dialectical logic as presented in his philosophy is not logic at all because it violates the law of excluded middle, which prohibits contradictions; this appears convincing in view of the above. We see the Hegelian dialectic as either empty verbal gymnastics or, at best, an intriguing heuristic tool for philosophical exploration and reflexion.

In his lectures on child psychology, Daniil Elkonin stated that the "individual-society" relationship, which manifests as the "child-mother" relationship in child psychology, is the starting point for building a psychological theory of a child's development [15]. This dyad/monad

is the one that has the capacity to develop through self-development. A child sees his mother as the entirety of society and all of humanity; not as an abstract idea but as a tangible reality. From this angle, it is clear what "proto-we" consciousness, the main age-related new psychological formation of the infant period, according to Vygotskiy, is. The child extends "proto-we" consciousness to other adults in his immediate social circle as he enters early age. With the grandfather and granddaughter and their relationship in the above case of Przewalski's horse, there was complete understanding from the outset; using the word "Ku-ka," the hand extended to the cabinet door, and the head turned toward the grandfather with the corresponding facial expression, she eventually succeeded in "transplanting" the desired action program from her own head to her grandfather's. A child's initial generalization is therefore an idea that contains a condensed mental action program geared toward a goal that the child has created.

The next category of generalizations, as per Lev Vygotskiy, can be categorized as mundane, and as has already been mentioned, children are most adept at this category at the "whyer" age. Children are fascinated by practically everything. In the world of things, questions like "What is it?" and "What is it for and who needs it?" as well as "What do you do with it?" are asked regarding the meaning and function of various objects. But ultimately, meaning is a generalization, in Vygotskiy's view.

By the way, theoretical generalizations can also be referred to as spontaneous if they are viewed as a stable reflexion on the way of action that naturally occurs in children at a particular developmental stage. However, if the term "theoretical" is interpreted in accordance with Vasiliy Davydov, then the teacher who set up a learning activity (whose subject matter is the fundamentals of science) that led to the development of theoretical generalizations and theoretical thinking in children should be commended [10]; in our opinion, this activity does not correspond at all to younger schoolchildren's development level and abilities.

The modeling of dynamic relationships between variables is the main component of the next level of generalization, which we called functional. The presence of functional style of thinking in students is a crucial indicator of generalizations of this kind.

Scientific generalizations and thinking inherent to classical-type traditional science first appeared in mechanics, later spreading to other natural science branches. As we have already mentioned, the realization of the dynamic relationship between a scientific law with three interrelated parameters and a particular function with dependent and independent variables, as derived from this law, lies at the heart of these generalizations.

Philosophy and its categories represent the highest level of conscious knowledge and thinking that young people can access as they enter adolescence. Philosophical generalizations and concepts are tools for the reflexion on existence and the search for ways to obtain true knowledge.

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