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Natural Psychological Functions as a Source of Living Consciousness

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Abstract

Background. L.S. Vygotsky's cultural-historical approach toward children's psychological development was first developed around one hundred years ago. It now requires re-evaluation in light of new experimental studies that have shown complexity and diversity of the innate psychological abilities of new-borns and infants, as well as other theoretical approaches towards understanding the role of culture and learning in cognitive development. Such a re-evaluation aims to draw our attention to those aspects of human psychology that L.S. Vygotsky, due to the limited empirical knowledge available to him and his early death, was unable or did not have time to illuminate.

Objectives. The aim is to consider L.S. Vygotsky's concept of natural psychological functions in a new perspective, as a forerunner of the 'heart' of human psychology — the living consciousness.

Methods. The research method is a comparative and logical analysis of concepts, illustrated by the results of the author's and his colleagues' long-term experimental research.

Results. A distinction between living consciousness, which includes subjective experiences (for example, perceptions, emotions, and creative thinking) and functions according to the laws of magic, and objectified consciousness, into which living consciousness is transformed for consumption by society and culture (for example, scientific concepts, logical thinking, and human artifacts) and which conforms to the laws of nature and formal logic, is proposed. It has been hypothesized that both living consciousness and higher mental functions are genetically related to natural mental functions. Differences between the structure, functions and methods of studying living and objectified consciousness are considered.

Conclusions. Natural mental functions are the psychological basis for two relatively independent but interconnected branches of mental development: living consciousness and higher mental functions. Living consciousness does not obey

the laws of formal logic and is the primary source of creative ideas and truly selfless morality.

Keywords: L.S. Vygotsky, cultural-historical approach, natural psychological functions, higher mental functions, living consciousness, laws of magic

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Living consciousness

Fascinated by modern science, we try our best to be in harmony with the rules of reason and morality, but this does not always work out. Freud was one of the first psychologists to notice this and declare a person's right to be irrational. However, he did not go far enough and placed the irrational in the realm of the unconscious.

But take a closer look at what happens in our minds when it is hidden from the eyes and ears of others, and you see that our thoughts and feelings, like Adam and Eve in the Garden of Eden, are blissfully indifferent to the rules of logic and morality. However, the “fall from sin” is inevitable. Like Adam and Eve, who ate from the forbidden tree of the knowledge of good and evil, our secret thoughts and feelings lose their magical freedom as soon as they turn into knowledge accessible to others. We become reasonable and rational when our consciousness is fixed in the form of oral or written speech, dressed in the forms of logical thinking and morality. But there is a price to pay for entering the realm of rationality: having accepted logic and morality, we part with the magic of creativity.

Sometimes we become so accustomed to wonderful things and events that we stop noticing them. As if enchanted, these things become invisible. This refers to our inner subjective reality, or *living consciousness*. So, what is living consciousness?

Imagine that you are walking through a park on a beautiful sunny day. At some point you feel tired and sit down on a bench under a tree. You close your eyes and sit back, trying to relax. Suddenly, you realize that even though you are completely still and alone, there is something going on in your mind. You remember an episode from your childhood, then by association you return to the present, then you think about some event in the future. If you are a scientist, you keep thinking about the problem you have been trying to solve in recent days, if you are an artist, you are looking for an image most suitable for a painting or a novel, etc. In short,

despite the lack of external activity and direct communication with others, in your inner world, you continue to actively participate in problem solving, memories, imagination, and desire for things. At the same time, you notice that these internal processes are saturated with emotions. Remembering a difficult conversation with your boss, you feel angry and irritated, but when you switch to thinking about your plan to attend an interesting performance, you feel pleasure. You can directly control some of these inner mental processes; others, such as fears or dreams, appear and disappear independently of your deliberate efforts. This private activity of your mind, hidden from others, is your *conscious living consciousness*. It is *private* because no one else has an access to it unless you release it in a word or an action. It is *conscious* because you are aware of it. It is *alive* because it is happening here and now. And it is *consciousness* because it unfolds in the form of subjective experiences. Phenomenologically, living consciousness is *conscious and unconscious irrational*. It includes a wide range of its manifestations, such as movement control, experience, emotion, creative impulse, intuition, poetic inspiration, faith, dreams, phobias and even schizophrenia.

When you open your eyes, you find yourself in a world around you, full of physical objects. You see the trees in the park, and neatly manicured lawns and alleys. Behind the trees, you see the silhouettes of tall buildings and hear the noise of cars. All this was created by people with the help of their living consciousness. It also belongs to consciousness, but now it has become “dead” *objectified consciousness*, which we usually call matter. Unlike living consciousness, objectified consciousness is available to everyone. Most objectified consciousness e.g., cars and buildings, are the creation of the living consciousness of people, others e.g., mountains, trees and birds, are the creation of God or Nature, but the common feature of all things of objectified consciousness is that they exist objectively, outside your living consciousness and independent of your inner self. Taking a physics textbook out of your briefcase and opening it, you see another part of the objectified consciousness — letters, numbers, words, symbols, logical statements and formulas. Concepts and logical thinking also belong to objectified consciousness.

You further note that living consciousness and objectified consciousness are separate but not isolated parts of reality. There is a connection or exchange between them. Looking at buildings or formulas, listening to a lecture or to music, you take objectified consciousness inside, making it a part of your living consciousness in the form of perceptions, images, or thoughts. When objectified consciousness becomes part of your living con-

consciousness, it loses its stability and locality. For example, when you consider a building that is in front of you, you know that it has a fixed shape and size, unchanging unless the building is reconstructed or destroyed. However, in perception, the shape and size of the building change depending on the angle of the view and distance (with a slight correction for constancy). In the imagination, it is possible to mentally make the building higher or lower, to change its shape, size and/or location. Considering the laws of nature or logical thinking, you can start to “play” with them, imagining, for example, that 2 plus 2 equals 5 or that you can fly, defying the law of gravity. In other words, your creative inner self can experiment with its assigned objectified consciousness. We usually call this process the work of imagination. If you are an artist, you might want to recreate the results of your mental experiments in the form of strange paintings like the ones by Salvador Dali or of a supernatural novel like the ones by Franz Kafka. If you are a scientist, most of your creative combinations can be disregarded, but some of them may lead to the emergence of a new original theory, like Albert Einstein’s special theory of relativity.

Sometimes it seems to us that we think in words. L.S. Vygotsky wrote: “Thought is accomplished in the word and not expressed only in it” (Vygotsky, 1982a, p. 162). Words are an example of objectified consciousness. The word “bird” is a pattern of four squiggles or sounds and has nothing to do with a feathered, bipedal creature with wings. When a child is born, they do not have language, but they can perceive the environment in various ways and compare perceived impressions in order to draw conclusions. Even in the womb, a child can distinguish the voice of his mother from the voices of other women, a newborn child can distinguish an image of a face with confused features from an image of a neutral face. At the age of three and a half months, children have been shown to display surprise when a large object that is moving from left to right moves behind an opaque screen and then appears on the other side of the screen without appearing in a window in the middle of the screen (Baillargeon, De Vos, 1991). Finally, we often have a thought but no words to express it. The poet is looking for the right words to “dress” his elusive feelings in socially acceptable “clothes”, and the scientist thinks not in words, but in images that still need to be “put in the flesh” of words or numbers. If we thought in the form of so-called “inner speech,” then it would not be difficult for the poet to find suitable words; he would simply have to voice what was already sounding inside. Vladimir Mayakovsky revealed the secret: “You exhaust for the sake of a single word / A thousand tons of verbal ore”. The need for speech appears only when living consciousness encounters a complex problem and the

need arises to “objectify” thoughts in words in order to look at them from the outside and compare them with each other; there then appears what Jean Piaget and L.S. Vygotsky called *egocentric speech*.

Although irrational unconscious processes in the form of hypnotic states have been known since the Middle Ages (Braid, 2008), it was Sigmund Freud who gave irrationality its rightful place in the human psyche by placing it in the realm of the unconscious (Freud, 2013). There, in the unconscious “Id”, the innate primitive drives act in accordance with the “pleasure principle”, supplying the conscious “Ego” with energy. It is in the “Id” that our “slips of the tongue” and neurotic complexes arise, which become apparent when irrational and immoral drives meet the “principle of reality” in the form of the laws of logic and morality. But is the unconscious the only area where irrational processes reign? As already mentioned, this is not the case.

Indeed, when reflecting on the content of our living consciousness, we see that irrationality in the form of *magical thinking* flourishes there. Thoughts and images arise from nothing, sometimes merging, sometimes dissolving into the air like fog. In our dreams we can travel through time, walk through walls, talk to animals, and do things that would be considered immoral and even criminal in real life. The same magical transformations occur to our feelings. We can see another person or a piece of art and instantly fall in love with them, even though we know nothing about that person and have never seen that piece of art before. In psychology and anthropology, this ability of living consciousness is called “participation” or “co-communion.”

The effect of participation is easy to see in such phenomena as disgust or fear of contagion. When we dine on the veranda of a restaurant and see a dead bird in the garden or smell a corpse, it can ruin the taste of the dish we are eating, even if it has been cooked by a gourmet chef. When shaking hands with a terminally ill person, we may experience the unpleasant feeling that the disease may infect us, although we know that it is not contagious. The most striking manifestation of participation is faith. Faith is the ability of our living consciousness to feel co-communion with something that we cannot perceive but only imagine. Even if we do not believe in God, we still believe in many things. We believe that the world will continue to exist after our death, although we will never see it. We believe that a feather placed in a vacuum will always fall to the Earth with an acceleration of 9.8 m/s^2 , although to strictly prove this we would have to make an infinite number of measurements. We believe that two parallel lines will never meet on a plane, although we cannot personally trace these

lines to infinity. Being objectified, our faith turns into “inviolable” laws of nature, mathematics, and logic. Finally, living consciousness contains the most precious pearl of the mind — our inner Self. It is our inner Self that gives us a sense of freedom i.e., the ability to choose without coercion. In other words, in our inner subjective world, almost all things behave as if in a magical dream.

Almost all of them do, but not all. Some part of the objectified consciousness manages to penetrate our inner world. Mental arithmetic, logical thinking, and rational planning without external support resist the pressure of the magic of living consciousness, although such resistance requires significant effort from our inner Self. It is easy to calculate using a calculator, while mental arithmetic bears a significant chance of making a mistake. It does not take much effort to remember a phone number by writing it down, while memorizing it without writing it down is much more difficult. When we learn foreign languages, it can be difficult for us to remember unfamiliar words without the use of memory aids. If we are criticized by our boss, we may have negative feelings towards him, while continuing to act as if we like them. In other words, there is a bridge in our inner world that connects our living consciousness with the external objectified consciousness and subordinates our private feelings to moral and social norms. The objectified consciousness that functions in our inner world is the *internal objectified consciousness*. Internal objectified consciousness is a buffer region that connects our living consciousness with external objectified consciousness. Like living consciousness, internal objectified consciousness is private and unfolds “here and now”. Unlike living consciousness, internal objectified consciousness is realized in the form of inner speech and is subject to the laws of formal logic and rational thinking. Most importantly, living consciousness and internal objectified consciousness play different roles in our lives. If living consciousness is a *generator of creativity*, internal objectified consciousness is a *transformer of the creative achievements* of living consciousness into a form accessible to others.

More precisely, a new idea arises as a result of a creative impulse that comes from the unconscious area of living consciousness into the sphere of conscious living consciousness, where it is recognized as inexpressible in words “creative languor”. It is an elusive and not yet formalized internal tendency and goal that can go one of two ways. One way is that of *rational transformation*, when a verbally unformed idea falls into the buffer zone of internal objectified consciousness and is transformed into verbal, logical and rational forms, then passes through into the area of external

objectified consciousness, where it takes the form of a scientific discovery, realistic art, or rational behaviour. Another way is when the idea follows the path of *direct invasion*, penetrating into the area of external objectified consciousness, bypassing the buffer zone; the result is a “crazy” idea, a piece of magical art, or magical behaviour in the form of play, prayer, or witchcraft (see Figure 1).

While internal objectified consciousness is studied in disciplines such as psychology and psycholinguistics, and external objectified consciousness is a favorite subject of specialists in languages, logic, and artificial intelligence, living consciousness has predictably received far less attention. We study objectified consciousness using scientific methods, from a third-person point of view. Physical objects (such as minerals, plants, and animals) are first perceived as phenomena and then compared, measured, and transformed into symbols: numbers, drawings, names, and concepts. The same thing happens with human artifacts (such as man-made objects, languages, and concepts): we perceive them as external objects, and then remember and manipulate their meanings.

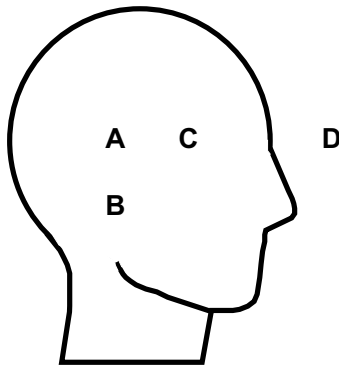


Figure 1

(A) Conscious living consciousness (private subjective reality functioning according to the laws of magic), (B) Unconscious living consciousness (unconscious subjective reality functioning according to the laws of magic), (C) Internal objectified consciousness (private subjective reality functioning according to the laws of formal logic and rational thought), and (D) External objectified consciousness (symbolically represented laws of logic and science, norms of culture and morality, culturally mediated forms of perception, verbal and real behavior and products of human activity). The path of rational transformation from (A) to (C) and to (D). The path of invasion from (A) to (D)

This is a relatively easy task, since objectified consciousness obeys the laws of stability and locality: it can be recorded in the form of words or symbols and operated accordingly, regardless of time. The question is how can we approach living consciousness when our own “observing device,” our inner Self, is a part of our living consciousness and as such is invisible to itself? In addition, our thoughts, images, memories, and emotions are in a constant process of change and transformation. This is one of the reasons why living consciousness is mainly studied not by scientists, but by artists, writers, and poets. Let us at least remember the famous: “There is a whole world in your soul of mysteriously magical thoughts — They will be deafened by the outside noise — Daylight rays will disperse them — Listen to their singing — and be silent!” (Tyutchev, 1830).

Another reason for the underestimation of living consciousness by scientific disciplines is the successes of the natural sciences, which have plunged many scientists into the illusion that magical events are ancient history and exist today only in games and art, while all other magic is falsification or deception. This illusion reached its zenith in the mid-20th century, when semiconductors, portable radios, television, nuclear power plants, flights to the moon, the first computers, genetic engineering and other miracles of science led some scientists to believe that there was nothing in the world that was impossible to explain by science. However, this scientific optimism came at a high price: scientists became blind to their living consciousness. They began to look at the world as if nature and objectified consciousness were the only things that matter. Living consciousness became a shadow that accompanies brain processes but has no causal power. Inspired by the achievements of science, physicists began the search for a “theory of everything” — a certain unified set of laws from which all existing entities and processes could be derived. Artificial intelligence specialists have begun to dream of creating a digital copy of human consciousness. However, physicists and cybernetics study inanimate things, not human consciousness, and the so-called “theory of everything” misses the very source of this “everything”, which is the living consciousness of the physicists themselves. Living consciousness fell “under the spell” of science and cybernetics, which was a grave mistake.

Natural mental functions as a source of living consciousness and higher mental functions

L.S. Vygotsky suggested that the age of approximately 2 years, a child’s pre-verbal thinking (natural mental function) merges with pre-intellectual language and speech (verbal) thinking (higher mental function). Thus,

he writes: “...in ontogenesis, thinking and speech, up to a certain point, follow different genetic paths and only after a certain point do their lines intersect...” (Vygotsky, 1982b, p. 116), and further: “Everyone agrees that the initial forms of the child’s intellectual reactions, established experimentally after Köhler’s experiments by himself and others, are as independent of speech as the actions of chimpanzees... Further, everyone agrees that the initial stages in the development of a child’s speech are pre-intellectual stages”. Finally, in the final part of the chapter “Genetic roots of thinking and speech” L.S. Vygotsky writes: “We think that the previous parts showed with sufficient clarity that verbal thinking is not a natural form of behavior, but a socio-historical form and therefore distinguished mainly by a number of *specific properties and patterns* that cannot be discovered in natural forms of thinking and speech” (ibid., pp. 117–118). Considering the role of speech in detail, L.S. Vygotsky sees this role in the child mastering his own behaviour, reflecting on his actions “as if from the outside,” planning actions and solving problems by creating “second-order stimuli,” such as remembering through associations or thinking about a problem using egocentric speech (Vygotsky, 1984). He assigns the same role to speech in the behaviour of an adult. At the same time, the appearance of inner speech L.S. Vygotsky explains using the descriptive term “internalization,” the psychological mechanism of which remains mysterious. Indeed, why is native and even foreign language easily acquired (interiorized) by a child and why is it so difficult for an adult to learn a foreign language? It would seem that the more developed the higher mental functions are, the easier the internalization of the external into the internal should occur, but the reality is the opposite. Often L.S. Vygotsky’s idea that verbal thinking plays a leading role in the behaviour of an adult is accepted as an axiom. But let us think to what extent and in what situations does speech really determine our conscious actions?

More than half a century ago, the author of this article, under the leadership and initiative of A.R. Luria, was involved in research into so-called *programmed behaviour* in children. It was established that a child begins to subordinate his actions to verbal instructions (both those given by adults and those given by the child to himself) at the age of approximately 2.5 years (Subbotsky, 1976). These data confirm the hypothesis of L.S. Vygotsky that speech does not begin to influence behaviour immediately, but only at around 2 years of age (Vygotsky, 1982b). However, both before and after this age, most of a person’s behaviour is regulated not by verbal instructions, but by living consciousness, and even if it is “programmed,” it is not

by speech, but by the surrounding objective environment. Our walking, running, manual and other movements are conscious, voluntary, but not programmed by verbal instructions, and this gives our body the opportunity to feel natural. Let us imagine, for example, that we were asked to sit on a chair, subordinating the movement not to living consciousness, but to verbal instructions regulating the actions of the limbs and other parts of the body; carrying out such a programmed action would take a lot of time and effort, and the action itself would look clumsy. That is why we always unmistakably distinguish the living movement of a person or an animal from the movements of a robot, whose actions are subject to pre-created algorithms. Our actions and thoughts are subject to verbal programs only in a limited number of situations: in a social environment (school, hospital, theater), when driving a car on the road, when solving mathematical and logical problems; in most situations though, *actions and thoughts are regulated not by speech, but by living consciousness*.

Summarizing what has been said, it can be argued that L.S. Vygotsky's hypothesis that verbal thinking is born as a result of the merging of pre-speech thinking with pre-intellectual language raises some questions. In particular, (a) is pre-intellectual language free from logical structures, and (b) what is the psychological mechanism of internalization, that is, the transition of speech from an interpsychological form of existence to an intrapsychological one? From the perspective of the *theory of living consciousness*, we have to give a negative answer to the first question.

In fact, when an infant first hears the word "cat," it is nothing more than a chain of meaningless sounds accompanied by visual images, one of which subsequently becomes a special kind of animal and the other an image of an adult making sounds. Similarly, when a preschooler is first shown the letter "a," he does not know what a letter is. The child sees a visual image accompanied by a special sound, and an image of an adult producing this sound. It is the innate living consciousness in the form of perceptions, memory and associative thinking that allows the child to put things together, and with some practice begin to perceive the sound pattern "cat" as the name of an animal, and the visual pattern "a" as a letter included in the context of other letters ("b", "c", "d", etc.), and gradually master the ability to speak and then read. When babies create their first words, such as "cat," "mama," and "spoon," the *meanings of these words* already obey the laws of formal logic, such as identity, consistency, and excluded middle. In particular, the child understands that "mom" is always called mom, that this woman is called mom or not mom, but not both at the same time, and that this woman cannot be called both mom and cat. Thus, pre-intellectual language

as a *system of words with meanings* is a form of objectified consciousness that obeys the laws of logic.

However, the *formation of meanings itself* has a completely different psychological nature. Living consciousness, through its property of participation, allows the baby to identify the sound pattern “cat” with the visual image of a four-legged animal covered with fur. Such identification gives *meaning* to a meaningless combination of sounds, and thereby turns this sound combination into a *word*, but at the same time violates the logical laws of identity and contradiction, turning a series of meaningless sounds into a material object, and vice versa, identifying a material object with a chain of sounds. From this it is clear that it is the innate living consciousness that makes the emergence of early language possible.

Understanding this changes the way we think about early speech. If according to L.S. Vygotsky, before merging with innate forms of intelligence, the *initial stages* in the development of speech represent a lower psychological system not associated with intelligence, then the emergence of language on the basis of living consciousness makes it obvious that early language is already subject to the laws of formal logic, and therefore includes logical intelligence. In other words, language and intelligence mediated by logic appear *simultaneously as a single whole* — as a form of objectified consciousness, connected with the trunk of living consciousness thanks to the magical law of participation (co-communion) — the ability of living consciousness to identify sound patterns coming from society with visual ones and, thus, turn these patterns into words. Somewhat later, according to the same magical law of participation, written speech appears. It is the *natural mental functions* that, branching out, give rise to both living consciousness and objectified consciousness in the form of higher mental functions. The very process of “attaching” the social in the form of early speech to living consciousness is described by L.S. Vygotsky as the law of development of higher mental functions. “Every higher form of behaviour,” Vygotsky writes, “appears on stage twice in its development—first as a collective form of behaviour, as an interpsychological function, and then as an intrapsychological function, as a known way of behaviour” (Vygotsky, 1982c, p. 115). With a certain approximation, interpsychological forms of behaviour can be associated with external objectified consciousness, and intrapsychological forms with internal objectified consciousness. The very process of transforming “intra” into “inter”, designated by L.S. Vygotsky as internalization is nothing more than another manifestation of the magical law of participation — the ability of living consciousness to identify with

external stimuli, in this case — with words that came from society, literally *turning* an external sound pattern into an internal image of this pattern — internal speech.

This explains why learning foreign languages becomes more difficult with age, as well as the psychological mechanism of internalization. The point is that if interiorization were a simple translation of the external into the internal according to the principle of “accumulation,” then the effectiveness of interiorization would not depend on the content of what is internalized. On the contrary, participation is most effective when it is free from the logic of the external world, which is subject to the laws of identity and contradiction. Therefore, the primary identification *of a word with an object* occurs naturally, but at the same time it introduces the logic of the external world into living consciousness. If a given type of animal is identified with the Russian word “sobaka,” then identifying it with the English word “dog” means violating the law of contradiction (A or not-A). In childhood, when learning languages, this problem does not arise, since participation is based on immediate (natural) memory, free from logic, but at an older age, participation increasingly encounters already formed logical thinking, which makes participation difficult. As L.S. Vygotsky rightly assumed, already in adolescence, memory becomes dependent on logical thinking (see the next section of the article). Mediated memory promotes better memorization of new ideas, but interferes with the memorization of other designations for the same subject, that is, participation in the acquisition of a foreign language.

Living consciousness and cultural-historical method

Most applications of the cultural-historical method grew out of operating with the concept of higher mental functions. For example, in Russia such applications include the concept of the orientational basis of action by P.Ya. Galperin, school programmes for teaching generative concepts by D.B. Elkonin and V.V. Davydov, neuropsychological methods by A.R. Luria and others. These methods worked, but the properties of living consciousness remained a mystery. The goal of the cultural-historical method is to direct living consciousness along predetermined channels, using higher mental functions as “psychological tools.” But, having devoted all its attention to the development of “psychological tools,” the cultural-historical method loses sight of the very object with which these “tools” are intended to work — living consciousness.

Despite the fact that living consciousness has a common genetic basis with higher mental functions, phylo- and onotogenetically it develops as an independent branch. A monkey, pursued by a predator, jumping through trees, demonstrates the work of living consciousness in its *early phylogenetic form*. Even if the monkey could think in words, it would not have time to consciously decide which of the many branches of the tree ahead could support its weight; it makes decisions instantly, and every decision is vital, since a mistake means a fall and death. This is a model of how living consciousness works in humans, only instead of tree branches, our creative imagination “jumps” to images and ideas.

L.S. Vygotsky, in the same way as Jean Piaget, recognized that newborns have some mental abilities (i.e., reflexes, sensations, perceptions, mental abilities and movements), but insisted that these abilities are qualitatively different in their level of complexity from higher mental functions that come to the child through learning. Thus, he argued, for example, that orthoscopic perception, which includes the constancy of the size and shape of an object, is not innate, but is acquired during postnatal development as a result of the formation of higher psychological systems, including the interaction of perception, thinking and memory. Denying the claims of Gestalt psychologists that the integrity of perception is innate, L.S. Vygotsky wrote: “What then is the process of development of children’s perception, if the most essential feature of perception, its structure, its holistic character, is equally evident both at the very beginning of development and in an adult at the very end of this development?” (Vygotsky, 1982, p. 367).

In fact, studies of the cognitive abilities of newborns and infants of the first year of life, about which L.S. Vygotsky could not have known, confirmed that the natural mental functions of infants are holistic and structural, although they differ from higher mental functions in such parameters as mediation by speech, interfunctional connections and voluntariness (Bremner, 1994; Subbotsky, 1996). It seems that in the course of cognitive development, the child does not internalize the externally given knowledge inside the “blank slate” of consciousness, but through participation identifies *those natural mental functions* that are prerequisites for rationality with similar structures of society, thus transforming natural structures into objectified “higher mental functions”. Such natural premises of rationality are, for example, infants’ early intuitions about physical causation and the constancy of physical objects (Baillargeon, 1987; Baillargeon & De Vos, 1991). Even language is not a purely social phenomenon, but relies on natural premises in the form of *generative grammars* (Dovey, 2015). *Other*

natural mental functions, such as emotions, magical thinking and creative imagination, develop as living consciousness (Figure 2).

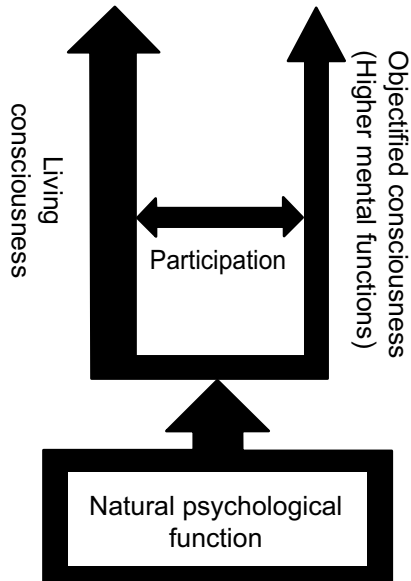


Figure 2

Development of living consciousness and objectified consciousness (higher mental functions) in ontogenesis

In ontogenesis, the development of higher mental functions occurs in the form of restructuring the connections in the system consisting of these functions. So, with regard to the development of thinking and memory, L.S. Vygotsky writes: “If the thinking of a pre-adolescence child was based on memory and thinking meant remembering, then for a teenager memory is based mainly on thinking: remembering is, first of all, looking for what is needed in a certain logical sequence” (Vygotsky, 1982c, p. 120). This restructuring of connections between verbal memory and thinking, expressed by L.S. Vygotsky theoretically, was later confirmed experimentally (Subbotsky et al., 2002). On the contrary, living consciousness is not a *system of individual functions, but a unity of interconnected forms flowing into each other, a “psychological polyhedron” of perception, thinking, imagination, feeling and faith*. Therefore, the development of living consciousness occurs not in the form of a restructuring of connections, but in the form

of an increase in the number of facets, awareness and volume of such a “polyhedron”. Thus, in young children the number of forms of manifestation of living consciousness is limited and living consciousness is mostly unconscious, but at a later age most of it becomes a conscious subjective experience. An example of an increase in the volume of conscious living consciousness is an increase in the number of things that cause a feeling of disgust. Disgust is initially caused by entities that involve innate negative physiological responses (Curtis et al., 2011), but later the number of such entities increases due to cultural conditioning (Haidt et al., 1997). With age, the number of forms of manifestation of living consciousness increases, the forms of living consciousness differentiate and grow expansively: for example, a feeling of attachment to close adults can expand and include attachment to other people, imagination expands from covering the immediate childhood environment to covering almost the entire universe, and faith expands from belief in Santa Claus to faith in the universality of the laws of nature and in a single God.

Study of living consciousness in psychology

It so happened that the development of the ideas of L.S. Vygotsky followed the path of controlling living consciousness with the help of objectified structures of consciousness — symbolic formations, such as speech, logical thinking, scientific concepts, social norms or learning models. The cultural-historical method works with living consciousness through the construction of external “scaffolds” in the form of guidelines and algorithms. This method is effective in teaching scientific knowledge at school, developing cognitive skills, restoring lost cognitive functions in patients, and developing social and moral forms of behaviour based on the external control. However, this method is not applicable to the use of the *internal potential of living consciousness* as such: subjective experiences, motivation, emotions, non-pragmatic moral behaviour and creative thinking.

On the contrary, the method applicable to the study of living consciousness can be called the method of *liberating influence* — placing the subject in conditions where he can freely structure reality. Using an analogue from cosmology, we can say that this method creates conditions when living consciousness is considered as a “black hole” emitting “Hawking radiation” in the form of creative impulses (Alekseev, 2022). This method originated in psychoanalysis as a method of free association and analysis of fantasies and dreams, and later developed into other projective techniques.

Unlike the cultural-historical method, the purpose of which is to influence living consciousness through coercion, the method of “releas-

ing influence” allows living consciousness to unfold in the form of play, fantasy, participation with observable events, or behavior free from social control. In personality psychology, a way to reveal the creative potential of living consciousness is an altruistic style of communication, which, when consistently applied in the classroom over a significant period of time, has a stimulating effect on children’s non-pragmatic moral behavior, critical thinking and creative activity (Subbotsky, 1979; 1981). In the field of cognitive development, research has shown that exposure to magical phenomena while watching films activates children’s creative thinking (Subbotsky et al., 2010), improves recognition of commercial brands (Subbotsky, Matthews, 2011) and improves the ability to distinguish between fantasy and reality (Subbotsky et al., 2010; Slater, 2011).

As for the practical impact on living consciousness, it has long existed in the form of magic and religion, and in medicine — in the form of the placebo effect. Today, the influence on living consciousness is known under the names of psychotherapy, psychological assistance and suggestion, which are widely used in medicine, politics, commercial advertising, the entertainment industry and other areas of working with living consciousness. Any psychological therapy works on the basis of co-involvement — the client’s participation with the therapist’s message. Since the word in objectified form concentrates a living consciousness and experience of society, it has an inspiring magical effect on the individual, who involuntarily experiences involvement with the word addressed to him. This means that, along with positive aspects, therapy is fraught with the danger of intentional or unintentional manipulation of living consciousness in such forms as fraud, degeneration, overdose of influence, violation of the privacy of the inner world and energy vampirism (Subbotsky, 2022; 2023).

Conclusion

Despite L.S. Vygotsky’s belief in the impossibility of the existence of complex natural mental functions, which did not stand the test in the light of new empirical research, his distinction between natural and higher mental functions has not lost its significance for understanding modern data on the cognitive abilities of infants. The analysis shows that the natural mental functions of infants of pre-speech age, the number of descriptions of which is steadily growing with the development of research technology, in parallel with their development in the form of living consciousness, must also go through the development path described by L.S. Vygotsky as the formation of higher mental functions.

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