The existential basis of consciousness: to the analysis of epistemological limits of symbolic description of the consciousness functions

La base existencial de la conciencia: al análisis de los límites epistemológicos de la descripción simbólica de las funciones de la conciencia

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ABSTRACT

The purpose of the study is to establish the epistemological limits of the symbolic description of the consciousness functions. As a result of the study, the author comes to the conclusion that consciousness cannot be explained in computational terms, as there is something in its activity that goes beyond purely algorithmic actions. This is due to the small resource of human memory and there is no clearly fixed, clear purpose. In a situation of such uncertainty, it is impossible to build a clear algorithm of actions in advance, so a person is "doomed" to be a free and creative being. According to the author, consciousness is always opened through activity when it correlates behavior with space-time, cultural contexts, therefore, the existential basis of consciousness is revealed through its manifestation in the "world of ideas", in the "world of values", as well as in the "world of activity", which helps to overcome the boundaries between these worlds in a single integrity of being.

Keywords: consciousness, artificial intelligence, meme, being, culture, behaviorism, functionalism

RESUMEN

El propósito del estudio es establecer los límites epistemológicos de la descripción simbólica de las funciones de conciencia. Como resultado del estudio, el autor llega a la conclusión de que la conciencia no puede explicarse en términos computacionales, ya que hay algo en su actividad que va más allá de las acciones puramente algorítmicas. Esto se debe al pequeño recurso de la memoria humana y no existe un propósito claro y fijo. En una situación de tanta incertidumbre, es imposible construir un algoritmo claro de acciones por adelantado, por lo que una persona está "condenada" a ser un ser libre y creativo. Según el autor, la conciencia siempre se abre a través de la actividad cuando correlaciona el comportamiento con el espacio-tiempo, los contextos culturales, por lo tanto, la base existencial de la conciencia se revela a través de su manifestación en el "mundo de las ideas", en el "mundo de los valores", así como en el "mundo de la actividad", que ayuda a superar los límites entre estos mundos en una sola integridad de ser.

Palabras clave: conciencia, inteligencia artificial, meme, ser, cultura, conductismo, funcionalismo

Introduction

Modern philosophy of consciousness cannot be imagined in isolation from cybernetics, especially from research in the field of AI. The reason for this convergence is, first of all, methodological prerequisites. For the methodology of classical science an exemplary example of rational thinking is the logical conclusion. The emergence of a new "symbolic" logic in the late XIX century is based on the idea that the rules of such a conclusion can be set purely symbolic (formal, syntactic) means. This led to the idea that one could "think" of all cognitive operations in terms of symbol manipulation. One of the embodiments of this idea is the use of concepts such as "language of thought". According to the thought of Ya. Hintikka, this ideology of symbolic logic helped to inspire the development of computer technology (Hintikka, 2011: p. 10).

Computers do perform, in electronic or mechanical terms, operations that were previously performed only by consciously directed actions of the human mind. AI technology is trying to reproduce cognitive operations with the help of computer programs. However, it was found that actual reasoning could not be fully represented by purely symbolic means. For example, it is possible to present all truths of elementary arithmetic as logical consequences of the corresponding logical axioms, but it is impossible to program the computer so that it consistently, one after another, deduced all these consequences. Therefore, it is necessary to investigate the basic epistemological limits of the paradigm of thinking as a symbolic process, which is a purely philosophical task, as these limitations are conceptual and methodological (Abuzjarova, 2018: 21).

Another question becomes relevant: how legitimate is the very comparison of the human mind with a digital computer, consciousness with a computer program? The comparison of consciousness with a computer program leads to the emergence of an erroneous hypothesis based on logical substitution, that the peculiarity of the brain, which serves as a conductor of consciousness, is its computational nature. Tens of billions of neurons in the brain are able to implement complex algorithms, the totality of which can be called consciousness. The program involves the implementation of an algorithm for formal character processing, without taking into account their possible interpretation. Classic computers work with such syntactic programs. However, the problem is that NI does not work as a program at all. If I say, "She is beautiful like a flower", it does not mean that I have to study botany to understand her better. The same logical substitution lies in the hypothesis of the "computational nature of consciousness".

However, the idea of the computational nature of consciousness has a large number of supporters. It is reflected in the concepts of functionalism: the functionalism of the Turing machine (Putnam, 1960), information-procedural AI theory (Dennett, 1991), the functionalism of the "language of thought" (Fodor, 1975), neurophysiological functionalism (Churchland, 2005), etc. (See table 1)

Table 1. The idea of consciousness and mental processes in functionalism

The concepts of functionalism	Basic ideas
The functionalism of the Turing machine (Putnam)	Mental states of consciousness are neutral functional states similar to the logical states of the Turing machine. The same mental state can be realized on different material carriers. In the study of mental states of consciousness, a relational methodology is used to study the causal relations of logical states in their interaction with physical and behavioral states.
Information-procedural AI theory (Dennett)	The optimal language for describing the mental activity of consciousness is neutral computer language, not mental or physical. The ratio of consciousness to the brain is compared with the ratio of the "soft" computer program to its "hard" structure. Consciousness is reduced to cognitive information processes. Subjective experiences of consciousness ("qualia") are excluded from its theoretical description.
Functionalism of the "language of thought" (Fodor)	Mental processes of consciousness are carried out through mental representations, which should be considered as intermediaries, which have all the key characteristics of language. There are different forms of physical embodiment of mental representations. In living organisms, they are represented by neurophysiological structures of the brain.

Neurophysiological functionalism (Churchland)	Consciousness is represented by countless information systems and operations that were created by billions of years of evolution, they are difficult to simulate.
	The key to understanding consciousness should be sought in the study of the dynamic properties of biological neural networks with high-frequency physical architecture.

H. Dreyfus was the first who subjected to detailed criticism the comparison of consciousness with artificial intelligence (computer program). In his work "What computers cannot do" the philosopher concludes that algorithmic modeling of human needs, motives and goal-setting activities is not feasible (Dreyfus, 1975). A great contribution to the disclosure of this problem was made by John Lucas, stating "Godel's argument" against artificial intelligence. Subsequently this argument was updated and significantly increased by R. Penrose, arguing that conscious brain activity is fundamentally impossible to explain in computational terms (Penrose, 2003: p. 7). In the ability of man to know and in his conscious activity as a whole there is something beyond purely algorithmic actions (See table 2).

Table 2. Criticism of artificial intelligence

The position of AI supporters	Criticism of the AI supporters position
The brain works like a computer, and the mind works like software. Any activity can be mathematically formalized in the form of rules and laws.	Reasoning and intellectual behavior of a person depend primarily on unconscious instincts that are opposed to conscious manipulation of symbolic information. The unconscious inherent in man cannot be embodied in a machine using formal rules (H. Dreyfus).
The brain is a kind of "machine" whose functions can be described quite clearly and unambiguously in the form of a final instruction.	It is problematic to write a clear, unambiguous, final instruction for AI, based on which it would be possible to simulate the activity of the human psyche. Gödel's theorem proves that the functions of consciousness are not computable algorithmically. This gives the superiority of consciousness over the machine, because due to this feature it is able to solve problems that are insoluble for algorithmic systems (J. Lucas.)
Mind performs discrete calculations (in the form of algorithmic rules), therefore, it is a formal system that functions similarly to AI.	Gödel's theorem proves that not only mathematical conclusions, but all the processes associated with the work of the brain, consciousness and thinking, cannot be fully formalized and "quantifiable". Human consciousness is a deterministic system without being algorithmic. Such deterministic and at the same time non-algorithmic processes can play a role in the quantum mechanical wave reduction function and can be used by the brain (R. Penrose).

Methods

We consider phenomenological, constructivist and informational approaches to be methodologically productive in the study of consciousness. Constructivist approach allows expanding the boundaries of the phenomenon of consciousness, overcoming its "specifically human" characteristics. It is possible to postulate the presence of a certain "consciousness in general", reflecting in its ideal plan a much larger totality of being than only human consciousness, but everywhere realizing itself in constructive activity (Bogdanova, 2016). The constructivist approach focuses attention on the activity side of consciousness, which in its ideal plan leads to the supervent conjugation of the basic structures of being. Phenomenological approach allows us to explore the value-semantic and activity-volitional structure of subjective reality (consciousness) and the ability to implement all this in the information interaction through a sign-symbolic code. Information campaign allows discovering the genetic prerequisites of consciousness (information, information interaction), which should be considered as an attribute property of existence.

Results

The question of "smart machines" is largely mythologized in modern culture. Those who work directly in the field of AI, robotics (e.g., H. Ishiguro) are especially clearly aware of this because neither they nor other scientists or philosophers have not defined the goals and prospects for further research in this area. "It is impossible not to notice, – notes Yu. Yu. Petrunin, – that even the most sophisticated and effective program, skillfully imitating human intellectual activity, for the person, understanding mechanisms of its work, loses all visibility of "reasonableness" (Petrunin, 1994: p. 32).

For those who in their research is on the methodological position of classical science, the question of "thinking" machine is relevant, because from the point of view of this methodology, consciousness is largely identical to thinking. The fact is that thinking is a very broad concept, so in the classical philosophical tradition, certainty

was achieved through additional clarifying concepts that characterize "thinking" – the concepts of "intelligence" and "mind". In relation to the intellectual manifestation of the intelligence is the action pattern, a manifestation of the mind – the action of new, not pre-specified way. The machine chooses from the already available options, but it is not able to synthesize a new method of action. For example, the choice of a word's meaning in a person is determined by the context of that or other situation, but the context itself cannot be built into the whole variety of meanings, therefore, the choice of context cannot be programmed to the machine. But the machine can be programmed with a goal to which it must strive, in addition, it should be borne in mind that the patterns of actions that can be stored in the memory of the machine, disproportionately more than can buy an individual in his life. Man is forced to resort to creativity at his own risk, largely due to lack of information. The machine has no such information deficit. If there is a clear goal and defined "rules of the game" (because not only technology, but also culture is based on such principles), the greater chance of success in targeted activities has improved "intelligence" than the creative "mind". So to the question "Can a computer think?" one can answer in the affirmative if thinking means following the defining rules.

The problem of the comparison of consciousness with the program

The assumption of creating artificial intelligence, which is not inferior to the human mind, leads to the idea that consciousness is not a material property of man. But what is it in this case? The method of analytical philosophy, which is dominant in almost all modern concepts of the philosophy of consciousness, requires starting with the study of the vocabulary, through which we express the phenomena given in the experience. Language and its contexts is a socially guaranteed tool. However, the meaning of language expressions may also be closely related to neurophysiological states. For example, it can be recorded empirically that certain thoughts correspond to certain wave oscillations in the cerebral cortex, in which it is possible to distinguish alpha, beta, delta and tetra waves.

In this "cognitive behaviorism" philosophers rightly saw a strong simplification of real life and activities related to consciousness. Based on the experimental data of cognitive sciences, one can see a huge variety of rules, schemes, conventions, etc., used as an explanation of the observed patterns of human activity, including social life. All this shows that social cognitive process is primary in relation to individual acts of thinking. The mental is nothing but a stream of individual and social symbolic patterns created and managed by human agents in accordance with local norms and conventions. That is why D. Dennett comes to the idea that for a rational explanation of consciousness it is enough to turn to the analysis of culture. Solving the problem of explaining consciousness, Dennett applies the R. Dawkins' hypothesis of "memes". "Memes" are the fundamental units of culture. "Memes" are created, perceived, transmitted and "introduced" into the hereditary program of a person in the form of so-called "selfish genes" of the brain (Vasilyev,, 2009: p. 122). "Human consciousness itself is a huge complex of memes (or, more precisely, memo-effects in the brain)" (Dennett, 1991: p. 210). "Each "meme" is an algorithm, a cultural or behavioral simulation; therefore "meme" can be given a scientific formalized description in the form of a simple program. However, Dennett does not offer a clear procedure to identify and describe these "memes". In this case, "meme" is nothing more than another concept designed to explain the nature and functions of consciousness, but it does not have the status of a scientific fact, because it is not available for empirical fixation.

In his theoretical constructions, Dennett draws an analogy between the work of consciousness and a computer program, which brings his views closer to functionalism. Functionalism is based on relational methodology in the study of consciousness, without linking its characteristic properties with the nature of its carrier. The basic principle of functionalism on the multiple implementations of functions indicates the isomorphism of systems that may have different properties and structures, but perform the same functions. This means that the functions of mental states can be traced not only on the material of the brain, a computer or theoretically any conceivable artificial intelligent systems ("silicone brains") can be considered as their carrier with some degree of conditionality. It is not the material properties of the system and not the special "spirituality" of conscious processes, but the stable nature of the functional connection. In this approach, the binary oppositions of classical scientific rationality (mind-body, monism-dualism, and reductionism-non-reductionism) have no methodological meaning (Vinnik, 2010: p. 39). The comparison of consciousness with a computer program leads Dennett to the idea that the functional relations of psychological states of consciousness can be described in a neutral language, which is neither physicalist nor mentalist, although the functions of consciousness are associated with the work of physical structures.

The mechanism of thinking, whatever it is, must be meaningful. Understanding involves setting goals and objectives of thinking by the subject. In the Dennett's concept, the work of human consciousness is not different from the behavior of a complex robot. The main function of the psyche is to process information. The nervous system can be compared to an information network that is connected to the body through special nodes – sensors (or input devices) and effectors (or output devices). A sensor is any device that receives information from one environment and transmits it to another. In a computer, the role of input devices is performed by a keyboard, mouse, microphone, television camera, which translate external information into an electronic environment, where it is stored in the form of "bits".

However, in a computer there is a very clear boundary between the "outside" world and information channels, which cannot be said about a person. In humans, much of the information generated by its own structures, and the existence of the structures of the "external" world independent of them is always in question. On the basis of this representative of radical constructivism G. Roth defines the human brain as an autonomous and operationally closed system. The incoming information from the environment is translated into neurodynamic processes of the brain and thus already loses its original properties and characteristics. Receptors in the form of neural code transmit information to the brain, but it is completely modified. Only one hundred thousandth part of the brain activity is caused by the work of the senses, the rest of the brain activity is aimed at constructive activities carried out on the basis of their own information. Thus, the brain does not "reflect" the world, but constructs reality from "raw" data obtained from the senses and a large number of innate and acquired cognitive structures (Kezin, 2004: p. 14).

Such designs are not arbitrary; they are created according to criteria that are either innate or based on individual experience. Not only the process of transformation of information from the outside into neurodynamic processes is interesting and inexplicable, but also the transition of material processes of the brain into intangible states of consciousness. Dennett notes that if nerve impulses are to be regarded as the matter of consciousness, then the nervous system should resemble a telephone network without subscribers or a television network without spectators. A person used to believe that there should be a Central Agent, a Spectator, and Boss who accepts, transforms, evaluates information and uses it in his activities. Many people consider consciousness as a certain essence of such "Boss". Dennett believes that this approach is wrong, because it is impossible to separate the individual from his body, containing a large amount of coded information. Consequently, the brain cannot be considered as the host of the body, it is just one of the organs among many others. The functions of the brain can only be properly understood if you consider it not as a master, but as another rather restless servant working for the body (Dennett, 2004: p. 83-86).

However, Dennett calls to abandon the identification of the psyche not only with the brain, but also with the body as such. If a person's consciousness is like a program, and behind any program there is a programmer who determines its content, then who or what performs the role of the programmer of consciousness? Dennett argues that the programmer is Darwinian natural selection, which contributes to the formation of behavioral patterns, the implementation of which is conducive to survival and procreation. It is natural selection that establishes appropriate, "intelligent" behavior that helps to adapt to the conditions of the environment. Intelligent behavior is usually described with intentional idioms, in the language of mental, conscious states (Vasilyev,, 2009: p. 116). Significant for the body reactions to environmental stimuli are formed under the influence of natural selection and are fixed at the level of neural connections in the brain. Schemes of neural connections can be interpreted as a kind of programs that control the behavior of the body (Vasilyev, 2009: p. 119).

But in addition to genetically determined schemes human consciousness contains data of individual experience that a person receives, plunging into the socio-cultural environment. In this environment, the individual essence of consciousness also disappears, because it is completely dissolved in this environment, is derived from it. The appearance of the individual consciousness, the one Self, creates a natural language that connects the sketches of "texts" from the received sensory information. Human consciousness is formed as a result of the superposition of language and culture structures on the biological substrate (brain) through training and education (Yulina, 2011). Thus, according to Dennett, human consciousness is not only a product of natural selection, but also the result of socio-cultural construction. Consciousness seems to man something individual, unique, personal, because a person simply has no idea about all its components and its genesis (Dennett, 2004: p.158).

The Dennett's concept can be attributed to a kind of behaviorism. Consciousness consists of many information flows caused by physical mechanisms and culture. Information flows compete for access to the brain. Human behavior depends on what information flow will take over the function of control. There is no single control center in the subject, which would direct these flows in the right direction. Dennett has no evaluative consciousness, and no "qualia". He ignores those aspects of consciousness that are the most mysterious and in need of explanation. But even this is not the main problem of his theory, and that the activity of consciousness becomes programmed and meaningless. It is only the unconscious realization of cultural and evolutionary programs.

Conclusion

The intentionality of consciousness is impossible without understanding. It is necessary to use a dynamic approach to mental phenomena, considering them as attributes of samples of meaningful actions, unfolding in close connection with each other, which opens up opportunities for new models of explanation of the sequential development of events instead of the model of cause-and-effect relations, borrowed from classical physics. For example, many events can be understood if we take into account the need to follow conventions, goals, ideals. This is something like a compass needle, consistent with the local (and global) structures of the magnetic field. This deviation of the trajectory of movement can be called a "discursive turn" (R. Harre), the transition of the system

from the readiness to react less differentially to the readiness in the same situation to react more differentially, which marks the rejection of the principles of causality and opens up new opportunities for solving the problem of consciousness. Mental activity of consciousness is the manipulation of symbols in accordance with the rules, designed for certain purposes. If we want to determine the meaning of a particular behavior of the system or understand the purpose of some of its actions, we must know what rules the system followed in this case, to what purpose it sought. It should be noted that the target conditionality of search in humans is fundamentally non-algorithmic. People cannot search for a goal using a single algorithm. But when a person has a clear goal, he "finds" it; he will inevitably perceive it as a kind of reality, objectivity, truth, and not as a figment of his own imagination. Therefore, it can be assumed that successful work requires a clear goal. To move effectively towards the goal you need to work with the available information consistently and systematically, weed out the excess and leave the main thing, that is, in fact, to set goals. The psychologist V.P. Zinchenko believes that successful results in any kind of activity, where a person is involved, are possible only because of his freedom. "The existence of freedom in choosing and positing goals inevitably entails freedom in the choice of means and methods of achieving the result. The absence of any of these components or its rigid fixation transforms mental activity into something else, for example, into artificial intelligence" (Zinchenko, 2011: p. 191). We fully agree with that statement. AI frees a person from the routine "rational" functions to develop an algorithm of actions and sequence of tasks, providing NI with time and effort for the "creative" goal search. Thus, if we compare human consciousness with AI, we can find qualitative differences in the flow of information processes in consciousness and artificial intelligence (the differences are reflected in the table 3).

Table 3. Comparative analysis of consciousness and artificial intelligence

Parameter to compare	Consciousness	Artificial intelligence
The ability to store information and operate it in the presence of a specific task	Capable	capable
Feature of information processing	Parallel processing of huge amounts of information data in the structures of the brain	Linear information processing
The existence of "qualia"	Having "qualia"	No
The ability to synthesize a new way of acting based on the context of the situation	Capable to develop a new strategy	Selects from available pre- programmed options
The ability to understand the context of an expression (situation)	Captures the context and thinks within it (acts on it)	Does not capture the context as its selection cannot be programmed
Having a clear goal before the start of active actions	Active action can be taken without a clear objective	The goal is programmed and implemented in the actions of the system
Target search	Not implemented by a single algorithm	To be carried out by a single algorithm
Formalization of activities	It goes beyond the algorithmic rules, because the purpose of the activity is not always clearly expressed, the consciousness functions in conditions of lack of information	There is no shortage of information, a goal is clearly set, so there is the full formalization of activities
The ability to exercise freedom and creativity	Capable	Incapable

Orientation of consciousness to the purposes, ideal plans is the evidence that existence is much richer than the content of initial representations of consciousness, but implementation of this or that activity is impossible without these representations. To overcome this contradictory position, it is believed that consciousness from the very beginning is a social product. However, it can be assumed that the social nature of consciousness hides an even more large-scale and powerful source of its genesis and development. Public consciousness should be considered only as a private form of reflection of real life, which in its totality includes both society and nature as a whole. Therefore, for the formation of ideal plans of this real integral being, new permanent improving structures of consciousness, overcoming its individual and social forms, are required.

Consciousness opens up through activity when it relates behavior to spatial-temporal, cultural contexts. Thus consciousness and activity are a contradictory unity. "Consciousness" is not just an epithet used in relation to the concept of "activity", it is its essential property is included in the definition of activity. Although society, at first glance, always emphasizes the importance of consciousness, nevertheless, its real measures are directed to transformative activities. Social, mental and technical aspects of these activities represent the functional manifestations of a single in its existential basis of consciousness. Consciousness is present in the "world of ideas", concepts, meanings, scientific knowledge; and in the "world of values", emotions and meanings; and in the "world

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of images", representations, symbols and signs; as well as in the "world of activity" (projective and reproducing). As consciousness exists in each of these worlds, it possesses not only reflexive but also existential features. It solves certain essential problems in the structure of being, responds to its "calling", directs, according to V. I. Vernadsky, "unconscious aspirations of science and technology" and in general human activity to overcome the boundaries between these worlds in the unity of being (Vernadsky, 2012).

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