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## **Cognitive Science in the Context of Global Studies<sup>\*</sup>**

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### **ABSTRACT**

*The article is devoted to the study of the formation and current state of cognitive science (a system of cognitive sciences), which claims to conduct global research on cognitive processes in the human brain (cognitive psychology), the connection between consciousness and speech (cognitive linguistics), on the one hand, and the construction of a 'second reality' – artificial intelligence (AI), big data (BD), information and communication technologies (ICT), etc. The global nature of cognitive science is explained not only by its interdisciplinary status and the fact that its subject field is a dialectical connection between*

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*the material and ideal worlds. The range of interests in cognitive science includes the problems of ethics of AI and neurotechnology, as well as the active essence of humans in the emerging digital world. Moreover, the deep processes of digitalization have led to significant transformations in the theory and practice of contemporary conflicts, in which information and cognitive spheres have acquired the status of independent means of international confrontation and have brought to life a whole range of previously unknown challenges and threats to national security, the main target of which is the consciousness and sub-consciousness, as well as cognitive and spiritual abilities of a person.*

*In conclusion, the authors argue that there is a need for a deep philosophical and scientific justification for the activities of government agencies not only to neutralize the external destructive influence of information, psychological and cognitive technologies on society, but also to use them in medicine, health care, education and upbringing.*

**Keywords:** *cognitive science, philosophy of consciousness, cognitive impact, artificial intelligence, cognitive operations, cognitive security.*

### **GLOBAL PROBLEMS AT A COGNITIVE TURN**

The global problems generated by the scientific and technological revolution and throughout the second half of the twentieth century, which became the subject of specific scientific research and theoretical disputes, global technical and political projects, and philosophical reflections. At the turn of the century, they were supplemented by another global problem of similar magnitude – the development of ‘second nature’ as a result of the computer revolution, or ‘the second reality’ in the information space. By 2002, the amount of digital information accumulated in this space surpassed the amount of analog information accumulated by humanity over all previous centuries (literary works, scientific treatises, cinema and other material media). Suffice it to say that the Sloan Digital Sky Survey (The Sloan) project, which has been operating since 2000, has provided more digital data in a few weeks since the beginning of its work than in the entire previous history of astronomical observations (Ahn *et al.* 2012). In fact, 50 % of all data (approximately 100 zettabytes, *i.e.*  $10^{21}$  bytes) is stored in the global digital world as of the beginning of 2026. 90 % of the world's data has been created in the last two years (DemandSage 2026).

During the cognitive turn (as a global format of the cognitive revolution), cognitive science acquires the status of an interdisciplinary field of scientific research, bringing together the relevant sections of a number of sciences from the socio-humanities, natural sciences and technical cycles (cognitive psychology, linguistics, anthropology, neurobiology, computer science, *etc.*). In other words, new scientific disciplines emerged during the *Cognitive Revolution*. And the *Cognitive Turn* represented a centripetal process of combining these scientific disciplines into a single interdisciplinary field – *Cognitive Science*.

The American psychologist George Miller recognized psychology, linguistics, neuroscience, and computer science as the initial and main branches of cognitive science. In a 2003 article, he noted:

Some veterans of those days question whether the program was successful, and whether there really is something now that we can call ‘Cognitive Science’. For myself, I prefer to speak of the cognitive sciences, in the plural. But the original dream of a unified science that would discover the representational and computational capacities of the human mind and their structural and functional realization in the human brain still has an appeal that I cannot resist (Miller 2003: 144).

However, the *Philosophy of Consciousness* retained its status as the ideological and methodological basis for these sciences of this system and carried out the function of their integration, as a result of which, by now, the ideological, value-based and socio-humanitarian assessments of the achievements of each constituent section of cognitive science are no less significant than scientific discoveries and implemented nanotechnology.

In the preprint ‘Your Brain on ChatGPT: Accumulation of Cognitive Debt when Using an AI Assistant for Essay Writing Task’ published in 2025, the authors unequivocally stated that in order to preserve cognitive abilities and creativity, it is extremely important to combine the use of AI with independent skill development. The study covered three groups of participants: one group relied only on their knowledge and memory, another used a search engine, and the third – ChatGPT. It has been experimentally proven that relying on AI writing assistants may lead to reduced cognitive engagement and potential long-term learning impairments.

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### **COGNITIVE OPERATIONS: THEORETICAL FOUNDATIONS AND POLITICAL PRACTICE**

Currently, the information space is actively used for cross-border information trafficking, including by special services of individual countries in order to exert an informational and psychological influence aimed at destabilizing domestic political and social situations in various regions of the world. Global digitalization processes have led to the formation and accelerated development of cognitive technologies, which, together with nanotechnology, robotics, and artificial intelligence, contribute to the formation of a new technological order (Grinin *et al.* 2024b) and at the same time are the source of a system of new threats to the security of individuals, societies, and states. Modern interstate confrontation is carried out not only through military-political and socio-economic methods and means, but also through the use of information, psychological and cognitive technologies that allow influencing the consciousness of individuals. We previously wrote about the fact that large-scale work in this field determined the substantive part of one of the socio-economic trends of the Anthropocene – telecommunications (more broadly, computer science and communications) (Steffen *et al.* 2015: 81–98; Ian: 2015). The phenomenon of cognitive security, as one of the key areas of global security, has a

‘kinship’ with the Anthropocene and its socio-economic roots, and cognitive warfare should be considered as a marker of the onset of the Anthropocene, embodying the ‘dark side’ of the digital world.

The emergence and widespread use of the Internet information network has provided favorable conditions for the development and application of the *Cognitive Warfare* concept. Du Cluzel, the head of the NATO Innovation Center (iHub), published a report on cognitive warfare research in 2020, and in 2021 he co-organized an international conference ‘Cognitive Warfare: The Future of Cognitive Dominance’ pointing out that Cognitive Warfare is the most advanced form of human mental manipulation, to date, permitting influence over individual or collective behavior, with the goal of obtaining a tactical or strategic advantage. In this domain of action, the human brain becomes a battlefield. The pursued objective is to influence not only what the targets think, but also the way they think and, ultimately, the way they act. Cognitive Warfare is necessarily associated with other modes and domains of action for reaching targeted brains, such as Cyber Warfare and Information Warfare. As a concept, Cognitive Warfare also includes another crucial domain that is rapidly evolving: the cognitive neurosciences. By facilitating the understanding of brain cognitive mechanisms, *i.e.*, the way the brain processes different categories of information, neurosciences will allow optimization of the use of other forms of warfare, notably Information Warfare (Claverie *et al.* 2022: x–xi).<sup>\*\*</sup>

In other words, the content and purpose of cognitive warfare follow from the interpretation of the cognitive sphere, which goes beyond information warfare as relatively independent ‘stuffed’ with cognitive technologies that are designed to carry out any manipulation not so much with behavioral, but exclusively of human mental activity, invading the spiritual world and subconscious. Even 30 years ago, the American military analyst R. Szafranski instructed that

Information Warfare is a form of conflict that attacks information systems directly as a means to attack adversary knowledge or beliefs. Information warfare can be prosecuted as a component of a larger and more comprehensive set of hostile activities – a netwar or cyberwar – or it can be undertaken as the sole form of hostile activity... Unlike knowledge systems, belief systems are highly individualized. Why? They include the stuff of the unconscious and

subconscious, powerful elements of which others and even the bearer may be unaware (Szafranski 1995).

Now, cognitive biotechnology allows us to ‘look into’ human consciousness. The combination of big data, open sources, social networks, mass surveillance, facial recognition technologies, geolocation, and artificial intelligence, using cognitive technologies, allows access to the minds of decision makers, which in 2019 was defined as the *center of gravity* in the NATO's Operation 2040 program. More recent research has provided a detailed and scientific understanding of why the cognitive sphere is constantly under threat (NATO 2022). The appeals of NATO leaders and specialists to include a new domain, Cognitive Warfare, in hybrid warfare can be simply explained: our opponents are waging a cognitive war against us, Western civilization, therefore, we must valiantly defend ourselves. NATO experts are very quick to adopt the most advanced achievements from all fields of modern science, including Cognitive Biotechnology (CBT). Its developers from Johns Hopkins University stated that CBT allows improving human thinking, perception, coordination, and environmental impact. With CBT, a person's limited physical and physiological capabilities can now be expanded and enhanced by biophysical, biochemical and bioengineering means:

- rehabilitation of wounded military personnel and their physical abilities, treatment for post-traumatic stress disorder, recovery (or suppression) of memory and decision-making abilities;
- by increasing cognitive and physiological functions compared to a person's natural baseline level in order to improve sensory perception, accelerate information processing, and expand the ability of the unit to fight through distributed intelligence, thereby reducing the ‘fog of war’;
- by replacing and enhancing mental and physical functions beyond human potential with computer interfaces, making human abilities independent of five senses;
- replacing verbal communication with ‘computer telepathy’ and physical actions with robots or drones.

At the same time, according to the authors, it becomes possible to ‘peek’ into the consciousness of the very ‘target of cognitive operations’, display and reproduce past memories on an external monitor, insert memories and images into consciousness (Cognitive Biotechnology 2021). Thus, NATO having developed cognitive warfare tech-

nologies, is making the main bet on achieving technological superiority over Russia and other non-Western states which it is impossible to do without in creating the combat power of a modern state. At the same time, war in the cognitive sphere mobilizes a wide range of different strategies, tools, and techniques, and represents a kind of locomotive for the soft power of the state. The very essence of cognitive warfare is to use forms and methods of soft power to seize control over groups of the ruling elites, the population of the victim state, and international organizations, while influencing the consciousness and worldview of individuals, both civilian and military, until they are completely under external control. This complicates and confuses the processes of cognition and analysis, ultimately representing a way of using knowledge in order to achieve dominance in the intellectual sphere.

The primary tasks in this area include the theoretical and methodological substantiation of the status of cognitive security proper in the context of global security, as well as the training of highly qualified personnel.

### **COGNITIVE SCIENCE: GUARDING GLOBAL SECURITY**

Cognitive Security technologies are based on a close interaction between socio-humanitarian, natural, and technical sciences and form an applied cognitive science within which methods, practices, and techniques are developed to ensure the safety of each individual's life, society, and of the entire system of international relations. A key role in this process is played by a theoretical and applied symbiosis of cognitive philosophy, cognitive psychology, and cognitive anthropology, which results in the formation of an ideological and technological basis for cognitive security.

*Cognitive Philosophy* should be considered as a branch of philosophy of consciousness (Chalmers 1996; Vasiliev 2022) aimed at the search for the secrets of consciousness and identifying their semantic definitions. One can argue that these searches are exclusively subject to scientific psychology, while another, from the circle of philologists, would argue that it is most important to understand how a person's thought materializes in language, words, or texts. The creators of artificial intelligence, a technology that claims to be superintelligent today (Grinin *et al.* 2024a), sometimes allow themselves to look down on natural scientists, philosophers, and other humanitarians, arguing

that they alone can unlock the secrets of AI that surpasses human intelligence in the coming 'era of robots' (Brooks 2002). Cognitive philosophy performs a philosophical and methodological function in the system of cognitive science. As Viktor A. Lektorsky points out, philosophy and cognitive sciences enter into a dialogue, with mutual enrichment and mutual criticism taking place. At the same time, philosophy does not lose its normative character, as it analyzes and evaluates the prerequisites for the concepts put forward by cognitive sciences (Lektorsky 2021).

Modern philosophy of consciousness is interested in what way language is connected with an organic structure of brain and functioning of consciousness, and this already belongs to the subject area of cognitive linguistics and cognitive neuroscience. However, only philosophical discourse, as a course of reasoning conducted in search of meaning in newly discovered phenomena and patterns, and their social value, allows us to constantly compare 'eternal problems' with 'final solutions' of another round of scientific discoveries, and thereby raise competent questions regarding the object of knowledge. In this case, the conceptual framework corresponding to interdisciplinary research is expanding. At the same time, philosophical reflection is primarily aimed at developing social technologies for shaping public consciousness, an ideology that corresponds to the national interests of the state (in this case Russia) and countering alien ideology.

*Cognitive Psychology.* In the context of cognitive psychology, consciousness, as argued by Alexei N. Leontiev, is 'the central mystery of the human psyche ... not as a field contemplated by the subject where he or she projects images and concepts, but as a special internal movement generated by the movement of human activity' (Leontiev 1975: 91). The formation of an interdisciplinary field of research on consciousness (as the ideal world of thoughts, images, and knowledge), mental processes in the human brain (as the natural basis for the development and functioning of consciousness) and human social activity have defined the subject field of cognitive philosophy and finding a place in it for reflection on the 'forced control' of consciousness and, accordingly, ensuring cognitive security.

Numerous studies in the field of psychology of human intelligence provide ample food for the creators of artificial intelligence. However, beyond psychology of intelligence, many other aspects of the human spiritual world remain untouched. This includes a worldview

as a synthesis of various features of a person's spiritual activity, the emotional and psychological sides of which is the view of life and perception of environment.

*World perception* is a cognitive-intellectual side of the worldview, which determines the way and character of an individual's mental activity, representing the most developed form of worldview, a kind of its framework and its essential part. In turn, the worldview includes the perception of environment (it is exclusively individual, since people feel what directly affects them with the help of their senses) and worldviews with a whole range of characteristics. The level of intelligence and the degree of emotional saturation in worldviews may vary. But, one way or another, they have both of these 'poles'. Even the most mature forms of worldview are not completely limited to intellectual components.

A *Worldview* is not just a set of neutral knowledge, unbiased assessments, and prudent actions. Its formation involves not only the cold-headed work of the mind, which is primarily of interest to the creators of artificial intelligence, but also human feelings, emotions and doubts that are 'intertwined' in the world perception.

In this 'cluster' of humanitarian knowledge, it is the philosophical reflection that makes it possible to distinguish between the spheres of human intellectual activity itself, aimed at solving a predetermined range of tasks (in the field of education and professional activity), and human daily life, whether it is family education, church visits, participation in public and political life, leisure, volunteering, and much more. Evald V. Ilyenkov repeatedly argued that ideality is social in nature and origin (Ilyenkov 1984). The 'Ideal' is identified and fixed in historically established forms of spiritual culture, it represents the sphere of phenomena of the world of spiritual and material culture collectively created by people (including in cybernetic engineering), as well as in the total set of links of social culture (culture of human relations – moral, aesthetic, religious, legal, political).

*Cognitive Anthropology.* Cognitive Anthropology in the context of cognitive science is an interdisciplinary field of knowledge that includes sections of social and cultural anthropology related to the interpretation of knowledge, traditions of representatives of different cultures, as well as exploring cognitive structures regulating behavior, lifestyle of people, and their perception of the world. Initially, cognitive anthropology, based on the methods of cognitive linguistics, fo-

cused on the study of taxonomic systems of traditional societies in order to classify various objects and phenomena of natural environment, as well as ‘conceptual categories’ indicating the connections between them and the normative prescriptions regulating life (Goode-nough 1957; Douglas 2000). Since the 1980s, cognitive anthropology has been interested in the study of cognitive structures (worldview, scenarios, and media) and their effects on emotions, motivations, and neuroprocesses. Cognitive anthropology, using the methods of cognitive psychology and other branches of cognitive science, has created opportunities for the formation of a system of social technologies that can be used in ensuring cognitive security, which has been confirmed in the works of Svetlana V. Lurie (Lurie 2004). We should also mention a valuable publication by Rejabek and Filatova (2010).

### **THE RESULTS OF THE COGNITIVE TURN: THE ETHICS OF AI AND THE ETHICS OF NEUROTECHNOLOGY**

In November 2021, 193 Member States adopted the ‘Recommendation on the Ethical Aspects of Artificial Intelligence’ at the United Nations General Conference on Education, Science and Culture (UNESCO), which was the first global normative document in this field, whose purpose is to adopt rules for the use of AI for the benefit of humanity, individuals, societies, environment and ecosystems and prevent harm to them, as well as encourage the use of AI-based systems for peaceful purposes (Clause 5). The practical significance of the document lies in specifying specific policy decisions and actions to implement the basic values and ethical principles of human interaction with the AI created by people themselves. First of all, it states

the significant and dynamic positive and negative impact of artificial intelligence (AI) on social systems, the environment, ecosystems and human life, including intellectual activity, partly due to the emergence of new opportunities that allow the use of AI to influence the processes of thinking, interaction and decision-making.’ human decisions, as well as in the field of education, humanities, social sciences and natural sciences, culture and information and communication technologies.

The ethical application of AI is understood as *a systematic normative understanding of the ethical aspects of AI based on an evolving inte-*

*grated, comprehensive and multicultural system of interrelated values, principles and procedures that can guide societies in responsibly considering the known and unknown consequences of AI technologies for people, communities, the environment and ecosystems, as well as serve as a basis for making decisions regarding the use or rejection of the use of AI-based technologies.*

In the Recommendation, the ethical principles act as a flexible basis for normative assessment, as well as a methodological guidance in the application of AI-based technologies, considering human dignity, well-being and the prevention of harm which is a target, rooted in the ethics of science and technology (Clause 1). It is specifically clarified (Clause 2b) that the ethical component of AI is inherent in all stages of the *life cycle* of an artificial intelligent system (*i.e.* research, design, creation, use, dismantling and disposal – so it is obvious that system engineers participated in drafting the document). *In the long term, AI systems will be able to compete with humans in their unique ability to evaluate their experience and act independently, which raises new questions concerning, among other things, human self-awareness and self-knowledge, their interaction with society, cultural environment and nature, as well as issues of autonomy, freedom of action, human values and dignity* (Clause 2c). We should pay attention to a number of other Recommendations that are thematically close to the topic of our discussion.

In addition to the ethical standards in the field of AI that already exist around the world, the above-mentioned Recommendation proposes a globally agreed regulatory tool that will help not only to clearly formulate values and principles of activity, but will also facilitate their practical implementation based on specific fundamentally significant recommendations.

The Recommendation even suggests actions in situations when, for the reasons of efficiency, people choose to trust AI systems. However, the decision to delegate control functions in a limited number of cases still remains with a person, because, unlike a person who can use AI systems to make decisions and perform certain functions, an AI system can never replace a person as the ultimate subject of responsibility and accountability. *As a rule, matters of life and death should not be passed on to AI systems* (Clause 36).

One of the articles in the document makes a direct recommendation to the UN member states to provide justification for any future

innovations related to the use of AI technologies, in-depth and independent scientific research, as well as to encourage interdisciplinary research in the field of AI, providing for the inclusion of other disciplines in addition to natural science, engineering, technical and mathematical components such as cultural studies, education, ethics, international relations, law, linguistics, philosophy, political science, sociology and psychology (Clause 110). By the way, such recommendations were presented in 2023 in one of the reports prepared by a group of military experts for the NATO military and political leadership (Masakowski and Blatny 2023), not to mention the publication of textbooks ‘Introduction to Digital Humanism’ (Werthner 2024) and ‘Cognitive Security’ (Linan Huang, Quanyan Zhu 2023). Several articles in the UNESCO Recommendation address the need to counter cognitive operations and the malicious use of AI systems for manipulating cognitive distortions in human psychology (Clause 125) and, at the same time, support joint research on the effects of long-term human interaction with AI systems, paying special attention to the psychological and cognitive effects that such systems can have on children and youth (Clause 129) (Recommendation 2022).

Another global problem has emerged on the horizon that UNESCO was initially involved in addressing. We are talking about the development of the first global standard for ethical aspects of neurotechnology. The report of the UNESCO International Committee on Bioethics ‘Ethical Problems of Neurotechnology’ (2021) pointed to the threats posed by neurotechnology to rights and fundamental freedoms, such as the integrity of the cerebral system and personal identity. In the next report (2023), the acceleration of innovation in this area was explained by the capabilities of generative AI, which was integrated into research in the field of neurotechnology. Given the lack of an ethical framework, UNESCO Director-General Audrey Azoulay, proposed to the 194 member states of the organization to develop the first normative document ensuring the protection of human rights and fundamental freedoms in this area. In November 2023, during the 42<sup>nd</sup> session of the UNESCO General Conference, Member States approved the launch of this initiative (Unveiling 2023).

And so it happened: on November 6, 2025, the Director General of UNESCO announced the completion of work on the global regulatory document called ‘Draft Recommendation on the Ethics of Neurotechnology’, recognizing the advent of a new technological revolution

that provides access to a qualitatively new stage in understanding brain function. Neurotechnologies have the potential to define a new frontier for human progress, but they also come with risks. Through the adoption of this new normative document, UNESCO has established a clear framework and consolidated the principle of inviolability of human mind. This document reflects the firm conviction that technological progress is valuable only when guided by ethical principles, respect for human dignity and responsibility towards future generations. A fairly clear formulation of these principles is fixed in Clause 13 of the Recommendations:

The ethics of neurotechnology is] a systematic understanding of a holistic, multicultural, interdisciplinary, pluralistic system of interdependent values, principles and actions based on human rights and aimed at promoting responsible attitudes towards the impact of neurotechnology on people, society, the environment and the ecosystem. The ethics of neurotechnology should be based on a wide range of scientific research not only in neuroscience itself, but also in medicine, engineering, computer science, psychology, ethics, human rights, law, sociology, anthropology and other disciplines (Draft 2025).

## CONCLUSION

So the issue of a Cognitive Turn which is claimed by the authors to be a new stage in the solution of global problems of humanity has led to the recognition of global ethical frameworks, ‘red lines’ in the development and application of neurotechnologies, logically continuing the assertion of the canons of ethics of artificial intelligence. Neurotechnologies themselves should be considered as hybrid large systems that combine the human brain (*biological system*), AI platforms (*computing system*) and brain–computer interfaces (*control system*) as subsystems. Moreover, each of them constructively relies on a security system that prevents destructive interference in the cognitive space of a person or a social group. The timeliness of the adoption of the considered Recommendations should also be explained by the fact that the cognitive turn is ‘completed’ by the Brain-Computer Interfaces (BCI) control system. It is believed that these two Recommendations will be of great help in improving national legislative, legal and terminologi-

cal documents. Summarizing the problems discussed above and requiring specific decisions, we will focus on the following judgments.

First, the current stage of the ‘age of globalization’ is characterized by the fact that *the global problems of humanity*, as they were recognized in the second half of the twentieth century as natural and socioeconomic phenomena (ecology, population, natural resources, *etc.*), have been supplemented by qualitatively different phenomena – the global information space and the digital world – during the cognitive turn. This ‘noospheric leap’ has led not only to the emergence of new sciences (including cognitive science) and technologies (NBICS technologies), but also to new global problems caused by the widespread spread of generative AI, robotics, biotechnology, and machine learning, which, taken together, are displacing traditional values and national identity from the human spiritual world.

Secondly, since the beginning of the twenty-first century, humanity's global challenges have been supplemented by equally pressing issues related to the prospects for the intensive development of AI, neurotechnology, and the accumulation of big data in the information space, with their consequences being less than clearly predictable. It is no coincidence that, as early as 2020, the US government began developing technologies for predicting future geopolitical events (Ratner 2020; Morstatter *et al.* 2019).

Third, the time has come to conduct interdisciplinary research in the field of cognitive science and to provide targeted training for specialists in the same format traditionally used to train philosophers, psychologists, linguists, and representatives of other disciplines. This requires the publication of textbooks and teaching aids, such as ‘Cognitive Security of a Person in the Media Space,’ intended for students studying in the fields of ‘Public Communications, Media, and Journalism,’ Psychology, and other specialties (Human 2025), which will make it possible to fully address the problem posed by the cognitive turn and the principle of the inviolability of the human mind, enshrined in the UNESCO ‘Draft Recommendation on the Ethics of Neurotechnologies.’

## NOTES

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\*\* For more details about Cognitive wars see Kefeli *et al.* 2025.

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