**Cognitive warfare is the battle for the brain in global digital communications**

Source: China Social Sciences Network - China Social Sciences Daily

Author: Zeng Qingxiang

Editor: Liu Juan

Date: 2023-07-28

<https://www.cssn.cn/skgz/202307/t20230728_5671058.shtml>

The concept of cognitive warfare quickly became a hot word in the global academic, journalistic, and political circles during the 2022 Russia-Ukraine conflict. Some people believe that future wars will extend from the five combat domains of land, sea, air, space, and cyber to the cognitive domain. However, there is no consensus on the definition of cognitive warfare, and it is often confused with propaganda warfare, psychological warfare, public opinion warfare, information warfare, and cyber warfare.



The emergence and evolution of the concept of cognitive warfare is the product of the rise, development and improvement of cognitive science. Image source: CFP

**The emergence and spread of cognitive warfare**

　　According to the search results of Google Scholar, cognitive warfare appeared in the master's thesis "Attacking Infrastructure: Exploring the Potential Uses of Offensive Information Warfare" by Donald E. Elan, a master's student at the U.S. Naval Academy, as early as 1996. However, cognitive warfare only appears as an alias for information warfare in this article. In the same year, cognitive warfare appeared as a title in the graduation thesis "Command Dysfunction: Thinking about Cognitive Warfare" by Arden B. Dahl of the U.S. School of Advanced Air Force Studies, and constructed a cognitive warfare framework based on the "Observe-Orient-Decide-Action" (OODA) theory proposed by Captain John Boyd of the U.S. Air Force. The framework includes three categories: command baseline, stressor, and deception. Command baseline refers to the cognitive characteristics that lead to the opponent's decision-making, stressor refers to the physical and mental pressure on the opponent to limit his decision-making ability, and deception refers to the use of different types of techniques to mislead the opponent to make a decision. The "cognitive warfare" described by Dahl has two characteristics: one is auxiliary, that is, to assist military warfare in the physical domain (including land, sea, air, and space); the other is short-term, that is, mainly resorting to short-term cognitive effects.

　　After 2005, the number of articles with cognitive warfare as titles gradually increased. For example, the article "Knowledge-based Warfare: Cognitive Warfare" in the third issue of Strategic Impact in 2007 pointed out that cognitive warfare is a war based on knowledge, a war in the knowledge field with knowledge as a weapon. Although war has always relied on information, that is, knowledge, knowledge warfare is not based on information technology that transforms information into weapons, but rather on the formation of knowledge as a strategy, that is, manipulating knowledge and incorporating it into a chaotic system. Cognitive warfare is also the research interest of American universities, and military and political strategic research particularly emphasizes the decisive role of knowledge. In his 2008 dissertation "Cognitive Warfare", Stuart Green, a US naval officer, believes that cognitive warfare includes both short-term psychological warfare and information warfare means such as military deception, media propaganda, indoctrination and censorship, as well as long-term consciousness infiltration and discourse change means such as cultivating concepts, culture, religion, and ideology. Its goal is to undermine the enemy's will to fight and even gain the enemy's support for the war, rather than destroy its war capabilities.

　　On August 14, 2017, Vincent Stewart, then director of the U.S. Defense Intelligence Agency, pointed out in his speech at the 2017 Global Conference on Intelligence Information Systems of the Department of Defense that "the fifth generation of warfare is cognitive warfare". On August 15, 2017, Kimberly Underwood, digital news media director of the U.S. magazine "Signal", published an article titled "Cognitive warfare will become a decisive factor in combat". On September 17, 2017, David Goldfein, then Chief of Staff of the U.S. Air Force, declared at the Air Force Association's "Air, Space and Network" conference that "we are transitioning from a war of attrition to cognitive warfare". The U.S. military's assertion on the strategic position of cognitive warfare has promoted a series of studies by NATO. In March 2020, NATO released a cognitive warfare project book, "Operation 2040: How NATO will compete in the future", which pointed out that information and cognitive warfare will play an important role in future conflicts. In the fall of 2020, NATO released a report: "Cognitive Warfare: An Attack on Truth and Ideas". In June of the same year, NATO's Allied Transformation Command commissioned former French official François Ducruzel as the manager of the NATO Innovation Center and sponsored him to conduct a six-month study on cognitive warfare. In January 2021, Ducruzel released a report titled "Cognitive Warfare". On June 21, 2021, NATO held its first scientific conference on cognitive warfare and released a conference report titled "Cognitive Warfare: A Cognitively Dominated Future". On March 16, 2023, NATO released another report titled "Mitigation and Response to Cognitive Warfare".

　　In short, the United States was the first to study cognitive warfare, and it has promoted NATO's high attention to cognitive warfare. Their understanding of the strategic position of cognitive warfare has gone through a process from auxiliary to dominant; the objects of its application have also gone through a process from soldiers to citizens; the understanding of its essence has gone through a process from information interference, that is, using false information to interfere with the opponent's decision-making, to information control, that is, using a large amount of true and false information to influence the opponent's cognitive results, and then to technical control, that is, using cutting-edge achievements such as neurotechnology and nanotechnology to control and change the entire cognitive process. In short, in the technical control stage, the research on cognitive warfare focuses on opening the cognitive "black box" to achieve the goal of using the brain as a battlefield and nerves as weapons.

**The Connotation and Characteristics of Cognitive Warfare**

　　The emergence and evolution of the concept of cognitive warfare is the product of the rise, development and improvement of cognitive science. Cognitive science began in the 1950s and is an interdisciplinary scientific study that aims to study the working principles of the human brain and mind, including mental abilities such as language, perception, memory, attention, reasoning and emotion. It focuses on how the nervous system represents, processes and converts information, involving knowledge in the fields of linguistics, psychology, artificial intelligence, philosophy, neuroscience and anthropology. The influence of cognitive psychology, neuropsychology, cognitive neuroscience, brain science and artificial intelligence under cognitive science on the cognition and practice of cognitive warfare is particularly prominent. Cognition is the psychological behavior or process of acquiring knowledge and understanding through thoughts, experiences and senses. In short, cognition is the acquisition of knowledge, including perception, attention, thinking, imagination, memory, judgment and evaluation, reasoning and calculation, problem solving and decision-making, understanding and producing language, etc. Therefore, cognitive warfare is also called knowledge warfare. Based on this, cognitive warfare refers to the use of various means to interfere with and change the enemy's cognitive process and control the enemy's knowledge acquisition based on cognitive principles, so as to distort the enemy's cultural values ​​and way of thinking, and ultimately affect decision-making and hinder actions that are beneficial to the enemy.

　　Before the concept of cognitive warfare emerged or became popular, the war for the enemy's mind was named propaganda warfare, psychological warfare, public opinion warfare, electronic warfare, information warfare, and cyber warfare. Among them, propaganda warfare, information warfare, and cyber warfare emphasize methods, weapons, and fields respectively, while public opinion warfare and psychological warfare emphasize targets.

　　Specifically, propaganda warfare and information warfare only control the flow of information, and their targets are mainly soldiers. The content is mainly about battlefields and tactics; while cognitive warfare also regulates people's interpretation and reaction to information, and its targets also include the public. The information content is mainly cultural values ​​and ways of thinking. Cyber ​​warfare mainly refers to the use of social media networks to spread malware, that is, viruses to attack computer network systems, while cognitive warfare uses social media networks to spread malicious information, such as using zombie accounts generated by artificial intelligence to spread a large amount of false or misleading information for a long time to construct or reshape people's cognition. Psychological warfare mainly changes and disintegrates the psychology of soldiers, while cognitive warfare seeks to change the cognition of everyone in the country. Public opinion warfare focuses more on guiding public opinion through mass communication, while cognitive warfare also focuses on shaping cognition through interpersonal communication and group communication. At the same time, due to the different formation mechanisms of public opinion and cognition, public opinion is prone to reversal and public opinion warfare is short-term; while cognition is not easy to change, cognitive warfare is long-term. Therefore, cognitive warfare attempts to make the enemy psychologically resist, prevent, or deviate from its own goals, that is, to destroy the enemy from the inside out. In addition, since cognitive warfare is the application of cognitive mechanisms, it is basically invisible, and only its impact can be seen.

**Cutting-edge technologies in cognitive warfare**

　　Cognitive warfare not only integrates all the elements emphasized by the above concepts, but also adds new content, mainly manifested in various cutting-edge technologies. These include nanotechnology, such as nanorobotics, nanosensors, nanostructures, etc.; biotechnology, such as biogenomics, bioengineering, neuropharmacology, etc.; information technology, such as artificial intelligence, microelectronics, wearable or embedded electronics, etc. Therefore, cognitive warfare is also considered to be the art of using technology to change others' cognition.

　　James Giordano, an American neuroethicist, described the brain as a battlefield in the 21st century and studied the weaponization of neuroscience. Since the biological manifestation of cognition is the connection of neurons and the formation of neural circuits, theories about the inertia or weakness of neural encoded information, the formation of cognitive biases, the possibility of cognitive errors, the manipulation of perception, the drowning or manipulation of attention span, the induction of cognitive stress, and the use of cognitive fluency have all become tactics of cognitive warfare. For example, nanotechnology, embedded or wearable electronic devices, neuroscience technology, and chemical cognitive enhancers are used to enhance soldiers' cognitive abilities, repair neural damage, quickly eliminate fatigue, expand the limits of athletic ability, and create "super soldiers." Brain-computer interface technology is used to read the brain information of prisoners, or to erase the memory of prisoners to make them spies, or even to transfer position memory, combat skills, and combat information from the brains of injured officers and soldiers to the brains of other teammates to enhance the cognitive abilities of teammates.

　　The Internet and the social media, big data, automated algorithms, and artificial intelligence it has spawned can not only manipulate the release of online information, but also manipulate every aspect of netizens' cognition. First, artificial intelligence is used to generate photos as avatars, impersonating fake "independent" news organizations and fake individuals to register accounts. These accounts copy and paste the same content, hype it up in a cycle, and then create hot tags to arouse topic discussions. Secondly, social media and big data are used to profile users, including their habits, beliefs, preferences, and relationships, to find those users among the enemy who are weak-willed, have weak values, and are most likely to be broken by their own values ​​or intentions. Thirdly, algorithms are used to accurately push information and to directional sort network search results, thus forming filter bubbles, information cocoons, and echo walls, causing netizens' cognition to deviate, leading to the division of social consciousness, triggering anti-social emotions, and detonating social contradictions. Finally, long-term and cyclical reporting and information push are carried out through mass communication, interpersonal communication, and group communication, thereby changing the opponent's cognitive structure, values, and way of thinking.

　　Therefore, in the digital context, cognitive warfare uses high-tech to try to erode every trust that supports the enemy society. It is an ideological war whose potential target is a country's entire human capital. Therefore, it is also called "psychological-social-technological warfare" and "the battle for the brain."

**(This article is a phased result of the National Social Science Fund Major Project "Study on the Strategy, Process and Effect of Accelerating the Construction of International Communication Capacity" (22ZDA088))**

**(The author is a researcher at the Institute of Journalism and Communication, Chinese Academy of Social Sciences)**