

MILITARY APPLICATIONS OF COGNITIVE SCIENCES: COGNITIVE WARFARE, A MATTER OF PERCEPTION AND MISPERCEPTION

Olga R. CHIRIAC

Associated Researcher, Center for Strategic Studies, SNSPA
olga.r.chiriac@gmail.com

Abstract: *The concept of cognitive warfare is steadily gaining more and more attention in security and defense discourse. By employing a cognitive psychology perspective, the article is examining how perception and/or misperception factor into cognitive mapping of strategic and operational concepts. The central aim of the paper is to outline that the approach to the human domain is deeply rooted in nationally conditioned perception. The article is looking to achieve this academic goal by comparing the NATO conceptualization of cognitive warfare to the Russian Federations'. The structure is as follows: first there is a brief review of the cognitive psychology paradigm, especially key concepts as they relate to the scope of the paper. The subsequent sections compare the NATO cognitive warfare approach to the opposing view, namely the one of the Russian security and defense apparatus. The "special military operation" in Ukraine initiated by the Kremlin in 2022 confirmed that in the event of a territorial aggression against a NATO member state, the alliance as a whole remains the basis of European security and defense posture. It is for this very reason that the alliance ought to objectively analyze how Russian decision makers perceive Western perspective in the cognitive realm.*

Keywords: *cognitive psychology; cognitive warfare; joint operations; military art; NATO; Russian Federation.*

Introduction

“A dangerous gap has emerged between the realities of the nuclear age and the understanding of the challenges facing the world” declared Communist Party of the Soviet Union (CPSU) Secretary-General Mikhail Gorbachev at the 27th Party Congress in 1986 (Rand Corporation, 1986). The article starts from this particular acknowledgment that there is indeed a severe gap between how the Euro-Atlantic security community sees the current European security architecture and how the Russian Federation (RF) perceives said structure. The different world views are colliding and one theater where this takes place in is the European continent. The same report by then Secretary-General Gorbachev continued to assert that a “fundamental revision and a decisive rejection of outdated philosophies and obsolete doctrines” were of utmost importance primary and “vital necessity”. Current Russian leadership presented similar views, only now they morphed into concrete demands. Just like at the end of the 80s when the world was unaware that the USSR will soon dismantle, that the Berlin Wall will fall and the Cold War will end, today we are at the auspice of major structural changes within the world order. Secretary-General Gorbachev concluded by also pointing out that new “economic, scientific and technological factors are forming an integral interdependent world, in which reality imposes more stringent demands on the leaders of each state and requires utmost responsibility in behavior and decision-making”(Rand Corporation , 1986). At present, the Russian Federation is engaged in direct military confrontation with Ukraine and indirect security competition with the West. It is in this overarching context that the North Atlantic Treaty Organization (NATO) is considering the concept of cognitive warfare as a means to engage more effectively and to ensure preparedness and in doing so maintaining credibility and deterrence capability against adversaries across the spectrum. The article proposes an analysis of how NATO conceptualizes cognitive warfare and in turn, it discusses the Russian perception of it. NATO was chosen for the analysis because the Alliance remains the foundation of European security, without the alliance and especially

without the US security guarantee/nuclear umbrella, Europe would be most vulnerable to Russian direct, military aggression. Furthermore, because of its role in the European security architecture, NATO is mentioned by the Kremlin as one of the reasons for Russian aggression, or as it is framed by the Kremlin: military special operation in Ukraine. The entire analysis is filtered through a cognitive psychology lens. The motivation behind said approach is the fundamental contention of the author that at the center of all military operations and strategic-political decision making are people. It is in the human domain that these decisions are reached and therefore it necessary to analyze the concept in this paradigm.

The Cognitive Approach

The overarching argumentation is constructed in the framework of cognitive psychology in general, with a focus on perception and information in particular. What this means is that effectively, the context within which we place and evaluate the NATO construct of cognitive warfare as well as the Russian interpretation, the umbrella under which we group the two, is the cognitive psychology paradigm.

At the most basic level, cognitive psychology could be looked at as the science of how humans think. Cognitive psychology is defined as the study of individual-level mental processes such as information processing, attention, language use, memory, perception, problem solving, decision-making, and thinking (Gerrig, Richard J.; Zimbardo, Philip G. 2002). As a discipline it became more predominant between the 1950s and 1970s. Prior to this time, behaviorism had been the main perspective in psychology. The advent of cognitive psychology is in large part due to the fact that researchers became more interested in the internal processes that affect behavior instead of just the behavior itself. Specifically, in 1967, professor Ulric Richard Gustav Neisser introduced the term cognitive psychology to scientific literature, which he defined as the study of the processes behind the perception, transformation, storage, and recovery of information. Neisser also introduced two fundamental features of the cognitive paradigm: information processing and constructive processing (Neisser 1976) (Neisser, 1986; Neisser, 1988). As previously stated, the defining change was contained in taking the focus away from the stimuli and placing it on the actual flow of information. In this paradigm, cognitive researchers follow information through the human processing systems, seeing the human mind as “a complex type of computer engaged in a set of processes that could be specified and modeled” (Neisser&Hyman 2014, xvi). For the article, this means that focus will be placed on how perception influences both how NATO is building the cognitive warfare approach and, conversely, how the Russian Federation perceives this. Essentially, the article discusses how both sides translate information into a cognitive map, actions relating to the security and defense posture and military applications.

The cognitive psychology approach pivots the discussion around the human mind, the brain and human nature in itself. In order to understand human nature, one has to understand, or at the very least try to understand mental processes such as perception, attention, memory, thinking, decision-making, problem solving, or language. The foundation of this approach lies in the assumption “every psychological phenomenon is a cognitive phenomenon” (Neisser &Hyman, 2014). Professor Neisser organized his approach in terms of visual information processing and then auditory information processing. The present article focuses on perception: “the process or result of becoming aware of objects, relationships, and events by means of the senses, which includes such activities as recognizing, observing, and discriminating. These activities enable organisms to organize and interpret the stimuli received into meaningful knowledge and to act in a coordinated manner”(APA, 2015). Perception in itself can be visual or auditory, and in the article perception will include both.

Due to its security studies focus, perception shall be understood as the strategic choice made by NATO, respectively the Russian Federation.

The human processing systems essentially receives stimuli from the environment it exists in and processes it. One major stimuli is information. When referencing information, the present article employs the definition put forth by Claude E. Shannon and Warren Weaver in 1948. Information, in the sense first clearly defined by Shannon (1948), is in-essence choice, the narrowing down of alternatives. They developed the mathematical theory of communication in order to deal quantitatively with the transmission of messages over “channels” (Shannon, Claude E. and Weaver, Warren 1998). A channel, similarly to a telephone line, transmits information to the extent that the choices made at one end determine those made at the other. The same way, the human processing system, the decision maker, transmits information as it perceives it: NATO defines cognitive warfare as a particular concept, the Russian Federation perceives it filtered through its own decision makers’ choices. Finally, the way that the stimuli are perceived and interpreted, the human mind draws a cognitive map, a strategic response that will deal with the stimuli. A cognitive map is “a mental understanding of an environment, formed through trial and error as well as observation. The concept is based on the assumption that an individual seeks and collects contextual clues, such as environmental relationships, rather than acting as a passive receptor of information needed to achieve a goal” (APA, 2015). In the context of the article, the conceptualization of cognitive warfare is the cognitive map, the construct built with western perception of threats and vulnerabilities.

To sum up, the article is looking to unpack the NATO cognitive warfare concept and to analyze the Russian perception of said concept through a cognitive psychology lens. It is important to not only understand a concept, but also to understand how competitors and adversaries perceive it. In military applications this enables for more accurate operational concepts and at the strategic level this translates into more informed decision making. Even at the tactical level, being familiar with the perception of the adversary can aid in decisions made by military leaders in theaters of operations or in preparing the battlefield. The framework used is limited to perception and information, nonetheless, cognitive psychology and cognitive sciences in general are very complex disciplines. To this point, for example, neuroscientists have estimated that the areas of our brain responsible for visual processing occupy up to half of the total cortex space (Tarr, M. J. and Gauthier, I. 2000). The article is very limited in scope and therefore narrow in its observations. Nevertheless, the ideas brought forth herein contribute to a very contemporary discussion with deep strategic implications.

The Frame of Reference: Cognitive Warfare, the Concept

“Cognitive warfare” the concept means different things to NATO and different things to the Russian Security and Defense specialist community. Within the frame of cognitive psychology, naturally, emphasis will be placed on information and perception. How does NATO conceptualize “cognitive warfare” and how is this perceived by Russia? In order to build a scientific answer, the article reviewed both NATO literature and Russian military scientific journals, as well as Russian public opinions voiced by specialists. The limited scope of the article as well as the very targeted thesis, did not permit the analysis of media and social media.

NATO literature defines cognitive warfare as an operational space where the human mind becomes the battlefield (NATO, 2021). The aim of cognitive warfare as understood by the Alliance is to change not only what people think, but how they think and act. Cognitive warfare is often considered “the New Third Operational Dimension” in addition to the physical and the cyber one, “its own domain in modern warfare” (Claverie, Bernard; du

Cluzel, François 2022)(1). Cognitive warfare could also be defined as “maneuvers in the cognitive domain to establish a predetermined perception among a target audience in order to gain advantage over another party. (Ottewell 2020)”. Another declared definition of cognitive warfare is “the art of using technological tools to alter the cognition of human targets, who are often unaware of any such attempt – as are those entrusted with countering, minimizing, or managing its consequences, whose institutional and bureaucratic reactions are too slow or inadequate” (Claverie, du Cluzel, 2022, 2). The same report equates it to “psychological-social-technical warfare” on the one hand and of a form of “influence warfare” on the other, and this by “using cyber means. In the military context specifically, it involves the use of a strategy intended to carry out a combat, surveillance and/or security actions” (Claverie, du Cluzel, 2022, 2). In NATO literature, the relation between the concept of cyber warfare and cognitive warfare are very closely linked, if not interchangeable. Similarly, in the reviewed Russian literature, cognitive warfare and cyber operations are linked, however, the major difference is that in Russian military art per se, cognitive warfare does not exist as a concept. As it happened with the now infamous Gerasimov Doctrine (Adamsky 2015) (Galeotti 2018) (Gerasimov 2013), cognitive warfare is a Western term. This is not to say that in Russia cognitive sciences are not applied in security and defense, quite the contrary.

Indeed modern wars are waged in several “spaces” simultaneously and are conceptualized differently by each combatant. In Russian analysis, modern wars waged by the West are accompanied by unconventional weapons such as support for political/civil protests, and economic coercion. NATO is “credited” as inventor of the cognitive warfare concept, NATO in turn being considered the US tool for threatening/destroying the Russian Federation. (интерфакс, 2022) Afghanistan is quite often presented as an example as it is considered a failed cognitive campaign where “NATO has failed in the struggle for the minds of Afghans” and Ukraine as an example of indoctrination with Western values (Институт РУССТРАТ, 2021). Several Russian academics and experts consider “the introduction of new educational standards and technologies” a key area of modern cognitive warfare, or the war of knowledge and meaning. In April 2013, President Barack Obama announced the launch of the BRAIN (Brain Research through Advancing Innovative Neurotechnologies) Initiative. The initiative focused on “revolutionizing our understanding of the human brain” and represented one of the Administration’s “Grand Challenges”: “ambitious but achievable goals that require advances in science and technology”(Obama White House Archives, 2013). What was intended to built upon innovation and research, was in fact perceived by Russian specialists and commentators as an endeavor to “hack the human brain” at the highest levels of US government, respectively, the office of the president.

Another Russian article mentions a 2021 report released by the NATO Innovation Center as saying: "When the entire civilian population is under NATO's gun, Western armed forces should work more closely with academia to use social sciences and humanities as weapons and help the alliance develop its cognitive warfare potential.”(Независимой газеты, 2021) Naturally, this is inconsistent with what the actual report says, nevertheless, for the Russian audience it reads as a threat, it amplifies insecurity and it exacerbates feelings of anger and resentment towards the West, the US, NATO. In military scientific circles close to NATO, mechanisms and tools for organizing Cognitive Warfare are actively discussed. In this concept, experts include methods of influencing a person's consciousness without forceful intervention.

In line with the same theme, head of the Department of Information and Mass Communications of the Russian Ministry of Defense, Major General Igor Konashenkov, reported at one of the forums of the military department back in 2015, the establishment of NATO Center of Excellence in Strategic Communications. In his presentation, which we cannot confirm or deny if it merely intended to manipulate Russian audiences or if it was

indeed Russian official position, general Konashenkov portrayed the NATO center as a hub which performs the “task of forming anti-Russian sentiments among the population of NATO member states and partners”(Независимой газеты, 2021).

After careful review of numerous articles in Russian military science journals published over a period of over a decade, a few things stand out from an operational/tactical perspective. Many practitioners name the war in Iraq in the 90s as the first time a country fought “new generation warfare”(“война нового поколения”). What caught the attention of the Russian military establishment was the way the US conducted joint force operations and how they prepared the battlefield for the ground forces by means of electronic warfare, electromagnetic, information, infrasound weapons and use of Sig Int, especially permanent intelligence collection through satellites and space based systems. Another point that is often mentioned is the targeted attacks on military and civilian critical infrastructure. The difference worth noting is that the US and the Russian Federation arsenal of prediction weapons are nowhere near similar. This is in fact a narrative that keeps getting promoted, and eventually, with carefully targeted cognitive campaigns, it materialized in the “whataboutist” narrative of “we are only doing what the US did before us” (Gorenburg 2019) (TASS 2019). A narrative that resurfaced with a vengeance during the Russian intervention in Syria and later in Ukraine. In Russian public discourse by leadership, practitioners of security or academics it is often mentioned that there is no coincidence that in the United States: the National Institutes of Health (NIH), the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA) of the Pentagon, as well as the Advanced Research Projects Agency in the field of intelligence (IARPA) are subordinates of the Director of National Intelligence (DNI). In an article published in Security and Safety, authors point out that the “most active neuroscience research and development for military purposes is carried out by the US Department of Defense, the Defense Advanced Research Projects Agency (DARPA) and the Intelligence Advanced Research Projects Agency (IARPA)”(Охрана и безопасность, 2022). Nonetheless, the central point for cognitive research with military applications is once again deemed the “NATO-sponsored and controlled Innovation Center (iHub), created in 2013 in Norfolk, Virginia, USA, which deals with the transition from information to cognitive warfare” described as a facility task to find “ways to harm the brain.”(Охрана и безопасность, 2022).

To sum up, NATO has increasingly focused on defining and developing an approach to cognitive warfare and in response, the Russian perception has been fundamentally through a negative vantage point. In Russian conception, NATO is a US tool to influence allies and partners and cognitive warfare a means to achieve this goal. Such perceptions could easily lead to escalations, especially in the age of internet.

Rise of the Internet, Ultimate Force Multiplier

One major turning point in the human domain was the birth of the internet. For intelligence, information warfare, cognitive and psychological operations this meant that the speed and efficiency of one single operation/campaign could increase exponentially while significantly decreasing costs. The internet was the ultimate force multiplier in cognitive warfare. For most people the internet meant information readily available at all times, interconnectivity across the world, being in touch with friends, making new ones, reading articles or books which normally would only be available at the library, just to name a few advantages. For Russian President Vladimir Putin the internet was an American intelligence operation originated as a CIA project (The Guardian; NBC News; Time Magazine 2014) one that he believes, remains under the agency's influence to this day, the gold standard surveillance meta-project. This meant that the Russian Security Apparatus would deal with

the internet as such. Of course, at the dawn of the internet, nobody except maybe the PRC, nevertheless, this is another conversation all on its own, have properly “managed” the emergence of the world wide web. For the Russian security establishment, it was a progressive evolution in building a blueprint for how to leverage and simultaneously protect from the perceived dangers of the internet. The 2007 attack on Estonia was probably one of the first times the international community realized how complex the situation could become, yet for the alleged perpetrators, this was nothing new. In 2000 during the Chechen War, a group of patriot cyber warriors, students in the Siberian city of Tomsk, had taken it upon themselves to defend what they perceived their information homeland (US Government Publishing House, 2018). Russian Security apparatus observed and learned from this occurrence, filtered the facts through its own perception, consequently concentrated on outsourcing hacking and trolling. Even before the Siberian cyber patriots, there was Hunter, a hacker who attempted to conduct a cyber espionage operation engineered by Moscow in cooperation with East Germany, against the US military in order to extract information about the Redstone Rocket test site for US missiles of President Ronald Reagan’s flagship Strategic Defense Initiative, Star Wars (European Union Institute for Security Studies, 2018). The Siberian students hack is different in that it was not initiated by state agents, but a civil response triggered by feelings of patriotism, carefully cultivated emotional responses. This perfectly illustrated the effectiveness of long term cognitive operations. It turned out the students were members of Nashi, a youth organization sponsored by the Russian government (Guardian 2014). The cognitive dimension is obvious: the internet is the technological advance that altered our day to day lives for the better, but to the Russian power structures, the perception was that it is a CIA meta project meant, to survey, control and subvert. By “managing perceptions” and maximizing cognitive biases and historical memory, the Russian leadership managed to motivate non state actors to conduct irregular warfare on their behalf. Furthermore, historical traumas such as the 1998 economic crisis in Russia, which many Russians blame on the West, the abrupt dismantling of the USSR, the bloody attempted coups in the early 90s, the trauma of the Great Patriotic War or of the Stalin purges, all inflamed feelings that were used in said perception management and eventually influencing the decision making process.

Military Applications: “New Domain” or “Multi-Domain”

How do cognitive sciences in the current global and/or regional(European) strategic contexts translate to military applications that can increase alliance operational reach, so much so that it effectively counters provocations and neutralize threats coming from strategic adversities, in this case, the Russian Federation? This is a very important question and the answer is too complex to be given within one single article. Nonetheless, the thesis of the article and the arguments discussed thus far allow for a few possible and plausible avenues.

First, NATO must achieve more clarity as to what cognitive warfare, the concept, means for military applications. Calling for a 6th war-fighting domain might not be ideal, instead the “human/cognitive dimension of the information environment, termed the cognitive domain” is far better applicable (Ottewell, *The Disinformation Age: Toward a Net Assessment of the United Kingdom’s Cognitive Domain* 2022). At the core of every single strategic decisions or military operation are people, it is people who are the target population regardless if it is military or civilian, therefore, all military operations, conventional as well as special are cognitive by excellence. The two prong priority for NATO ought to be clarifying the cognitive warfare concept as well as understanding it through an adversarial perspective.

Second, multi domain operations and special operations already address a portion of the NATO conception of cognitive space. NATO literature tends to move towards cognitive

warfare being addressed as a new domain, yet the Russian perception and the Russian approach to military art would be better engaged through targeted multi-domain operations, special operations prepared and conducted through “means of the superior command, control, communications, intelligence, surveillance, and reconnaissance systems, that is, C4ISR” (Diaz de Leon 2021) (92). In order for military operations to render effective, information must be filtered through an objective assessment of how adversaries view the world: the strategic and inherently its information environment “comprises and aggregates numerous social, cultural, cognitive, technical, and physical attributes that act upon and impact knowledge, understanding, beliefs, world views, and, ultimately, actions of an individual, group, system, community, or organization.” (Ehlers, Robert S. and Blannin, Patrick 2020).

Finally, in cognitive warfare terms any approach will render effective or ineffective, we do not know because it is contingent on many variables that are not factored into the construct. NATO has the technological advantage over Russia, yet, in the human domain there are virtually no one size fits all solutions for the white noise produced by years of trauma based perception management and bias leveraging (Chiriac 2022). The situation in Ukraine is a very good example: innocent civilians have been killed. The satellite imagery is tangible proof that in this conflict, children, non military human targets have paid the ultimate price, yet there are elements of society, both in Russia and outside of Russia, who believe there is a justification for this, or worse, that these things are deep fakes. Instead of critical thinking, the decision making was driven to the emotional level, where cognitive biases fuel narratives such as “NATO expansion was a betrayal” or “NATO is an aggressive alliance” or “the US has been conducting wars of aggression for decades and the West just went along”. The fact is that one sovereign nation state violated the borders of another sovereign nation state, international law was broken and intelligence produced irrefutable evidence that civilians have been killed. Nonetheless, in spite of hard evidence, there are people who choose to believe the Kremlin. In addition to fighting to defend the territorial integrity and sovereignty of Ukraine, the Ukrainians conduct a very nimble information war: the information operations are effective in that they rally the world behind the Ukrainian forces and this materialized in military support and volunteer fighters. Another result is the magnifying lens it sheds on allies who hesitate to help. This is important in warfare, one has to know who will fight alongside and who will hesitate. It also adds to prestige and a sense of unity. At long last, information operations with cognitive affinity target the adversaries prestige and this in turn affects their deterrence credibility. For example when Ukraine announced it will register the Moskva shipwreck as “underwater cultural heritage” it succeeded in a maneuver to troll the attacker. Long term this affects the mind and opinion of the Ukrainians as well as of the international community, regardless of whether there is true legal basis for this move or not. Trolls have been a weapon of choice in great power cognitive warfare, Ukrainian leadership elevated the cognitive game to the official level, they pass on the information to the target audiences: Ukrainian people the nation rallies behind them and fights. Cognitive warfare is about morale and without high morale, there can be no victory: “cognitive superiority among forces stems from the morale of the fighters; the fighting spirit; the confidence in commanders, their strength, and their ability; and belief in the justness of the cause.” (Kuperwasser, Yossi and Siman-TovInss, David 2019) (13). Finally, thanks to the internet, the “attribution problem” is no longer as important due to cognitive operations: it is no longer necessary for state actors to actively “manage perceptions” because the cognitive chatter automatically produces a segment of society who will promote conspiracy theories, distribute disinformation and misinformation and even take matters into their own hands, as it happened for instance January 6 in the United States.

Conclusions

The central aim of the article was to ask pertinent questions as to how the cognitive sciences are and can be further applied to military applications. In order to achieve answers, the paper employed a cognitive psychology framework focused on perception and information and compared the NATO conceptualization, and respectively, how the Russian perception of cognitive warfare. Conclusions are many and the academic discussion is certainly only at its start, yet, one central conclusion is that perceptions and misperceptions do play a significant role in strategy building. NATO is actively looking to consolidate an approach to what it deems cognitive warfare, meanwhile, the Russian Federation perceives this endeavor as an affront, even an attack.

The Western focus on Russian influence campaigns and Russian approach to information operations in general is valid, however, all policies and doctrinal documents ought to be built from a realistic starting point which acknowledges that the Russian leadership and a large portion of the population simply conceptualize/perceive the world in a fundamentally different way than the “collective west”. Instead of viewing Russian influence/information operations exclusively as tools of great power competition, they need to be approached as ways and means for a different kind, mostly incompatible, strategic end. In this, the cognitive dimension is key, arguably a game changer in any conflict, especially in near peer strategic competition where nuclear powers engage each other in a quest for global influence and military advantage. This assertion changes everything because strategic great power competition and great power conflict are two very different realities.

Bibliography

- Adamsky, (Dima) Dmitry. 2022. “Cross-Domain Coercion: The Current Art of Russian Strategy”, IFRI Security Studies Center, Proliferation Papers 54/November 2015, Accessed May 7, 2022. Available at https://www.ifri.org/sites/default/files/atoms/files/pp54_adamsky.pdf
- American Psychological Association. 2015. “Cognitive Map.” In American Psychological Association Dictionary of Psychology. Washington, D.C.: American Psychological Association. Accessed May 2, 2022. Available at: <https://dictionary.apa.org/cognitive-map>
- American Psychological Association. 2015. “Perception.” In American Psychological Association Dictionary of Psychology. Washington, D.C.: American Psychological Association. Accessed May 2, 2022. Available at: <https://dictionary.apa.org/perception>
- Balanovsky, Vladimir; Podyakov, Vladimir.”От информационной безопасности к когнитивной – от неблагонадежности к созиданию”, Охрана и безопасность (Security and Safety) March 3, 2022. Accessed May 2, 2022. Available at: <https://www.secuteck.ru/articles/ot-informacionnoj-bezopasnosti-k-kognitivnoj-ot-neblagonadezhnosti-k-sozidaniyu>
- Becker, Abraham S., Arnold L. Horelick, Robert Legvold, Mark Shulman, and Seweryn Bialer, The 27th Congress of the Communist Party of the Soviet Union : a report from the Airlie House conference. Santa Monica, CA: RAND Corporation, 1986. Accessed May 12, 2022. Available at: https://www.rand.org/pubs/joint_notes-soviet/JNS01.html.
- Chiriac, Olga. R, “Cognitive Warfare in 21st Century Great Power Competition: Framing of Military Activity in the Black Sea”. Romanian Military Thinking Journal. pp.54 -71, Accessed May 12, 2022. Available at [https://en-gmr.mapn.ro/app/webroot/fileslib/upload/files/conferinta/2021/CHIRIAC\(1\).pdf](https://en-gmr.mapn.ro/app/webroot/fileslib/upload/files/conferinta/2021/CHIRIAC(1).pdf)

- Claverie, Bernard, du Cluzel, François. “The Cognitive Warfare Concept”. Innovation Hub Sponsored by NATO Allied Command Transformation. 2022. Accessed May 2, 2022, Available at https://www.innovationhub-act.org/sites/default/files/2022-02/CW%20article%20Claverie%20du%20Cluzel%20final_0.pdf
- Committee on Foreign Relations US Senate One Hundred Fifteenth Congress Second Session, Minority Staff Report. “Putin's Asymmetric Assault on Democracy in Russia and Europe: Implications for US NATO Security.” US Government Publishing Office Washington DC, January 10, 2018. Accessed May 13, 2022. Available at: <https://www.govinfo.gov/content/pkg/CPRT-115SPRT28110/html/CPRT-115SPRT28110.htm>
- Congressional Research Service. “Defense Primer: Army Multi-Domain Operations (MDO)”, Updated October 22, 2021. Accessed May 9, 2022. Available at <https://sgp.fas.org/crs/natsec/IF11409.pdf>
- Diaz de Leon, Jose Lieutenant Colonel. “Understanding Multi-Domain Operations in NATO”, The Three Swords Magazine 37/2021, pp. 91-94. Accessed May 9, 2022. Available at https://www.jwc.nato.int/application/files/1516/3281/0425/issue37_21.pdf.
- Ehlers, Robert S, and Patrick Blannin. “Making Sense of the Information Environment.” Small Wars Journal. Small Wars Foundation, March 3, 2020. Accessed May 13, 2022. Available at: <https://smallwarsjournal.com/jrnl/art/making-sense-information-environment>
- Elder, Miriam. “Hacked Emails Alleged Russian Youth Group Nashi Paying Bloggers.” The Guardian. Guardian News and Media, February 7, 2012. <https://www.theguardian.com/world/2012/feb/07/hacked-emails-nashi-putin-bloggers>
- Galeotti, Mark. “I’m Sorry for Creating the ‘Gerasimov Doctrine’”. Foreign Policy/March 5, 2018. Accessed May 2, 2022. Available at <https://foreignpolicy.com/2018/03/05/im-sorry-for-creating-the-gerasimov-doctrine/>
- Gerasimov, Valery. “The value of science in foresight”. Originally published in Military-Industrial Kurier Issue No. 8 (476) on February 27, 2013. Translated from Russian 21 June 2014 by Robert Coalson, editor, Central News, Radio Free Europe/Radio Liberty. Translation available at https://www.armyupress.army.mil/portals/7/military-review/archives/english/militaryreview_20160228_art008.pdf
- Gerrig, Richard J.; Philip G. Zimbardo. 2002. “Psychology and Life”, Boston, MA: Allyn and Bacon, Guardian. “Putin Calls Internet a 'CIA Project' Renewing Fears of Web Breakup.” The Guardian. Guardian News and Media, April 24, 2014. Accessed May 13, 2014. Available at: <https://www.theguardian.com/world/2014/apr/24/vladimir-putin-web-breakup-internet-cia>
- Gorenburg, Dmitry “Russian Foreign Policy Narratives,” Marshall Center Security Insight, no. 42, November 2019. Accessed May 2, 2022. Available at: <https://www.marshallcenter.org/de/node/1302>
- Hemment, Julie. “Nashi, Youth Voluntarism, and Potemkin NGOs: Making Sense of Civil Society in Post-Soviet Russia.” Slavic Review 71, no. 2 (2012): 234–60. <https://doi.org/10.5612/slavicreview.71.2.0234>
- Institute for International and Economic Strategies (институт международных и экономических стратегий). “Когнитивная война: война нового поколения”. December 2021. Accessed May 2, 2022. Available at <https://russtrat.ru/analytics/24-dekabrya-2021-0010-7763>
- Interfax (интерфакс). “Путин рассказал, как спросил Клинтона о возможности РФ вступить в НАТО”. February 2022. Accessed May 2, 2022. Available at: <https://www.interfax.ru/russia/823529>

- Jack, Victor. "Trolling Russia, Ukraine registers Moskva shipwreck as 'underwater cultural heritage'". Politico, April 22, 2022. Accessed May 12, 2022. Available at: <https://www.politico.eu/article/trolling-russia-ukraine-registers-moskva-shipwreck-underwater-cultural-heritage/>
- Joint Air Power Competence Center. "All-Domain Operations in a Combined Environment". September, 2021. Accessed May 9, 2022. Available at <https://www.japcc.org/flyers/all-domain-operations-in-a-combined-environment/>
- Johns Hopkins University & Imperial College London. "Countering Cognitive Warfare: Awareness and Resilience". NATO Review. Nato Review, May 20, 2021. Accessed May 2, 2022. Available at <https://www.nato.int/docu/review/articles/2021/05/20/countering-cognitive-warfare-awareness-and-resilience/index.html>
- Kuperwasser, Yossi, and David Siman-Tov. "The Cognitive Campaign: Strategic and Intelligence Perspectives." Inss.org.il, Memorandum No. 197, INSS, October 2019. The Institute for National Security Studies, Tel Aviv, Israel. Accessed May 13, 2022 Available at: <https://www.inss.org.il/publication/the-cognitive-campaign-strategic-and-intelligence-perspectives/>
- Mukhin, Vladimir, "НАТО переходит от гибридной к когнитивной войне" (NATO moves from Hybrid to Cognitive warfare), Независимой газеты, October, 2021, Accessed May 9, 2022, Available at https://www.ng.ru/armies/2021-10-14/2_8278_nato.html.
- NBC News. "Vladimir Putin Claims the Internet Is 'a CIA Project'." NBCNews.com. NBCUniversal News Group, April 24, 2014 Accessed May 13, 2014. Available at: <https://www.nbcnews.com/storyline/ukraine-crisis/vladimir-putin-claims-internet-cia-project-n88766>
- Neisser, Ulric. 1976. "Cognition and Reality: Principles and Implications of Cognitive Psychology". New York: WH Freeman and Company.
- Neisser, Ulric. 1986. "Nested structure in autobiographical memory". In D. C. Rubin (Ed.), *Autobiographical memory* (pp. 71–81). Cambridge University Press. <https://doi.org/10.1017/CBO9780511558313.009>
- Neisser, Ulric. 1988. "Five kinds of self-knowledge. _Philosophical Psychology" _1 (1):35 – 59. DOI: 10.1080/09515088808572924
- Obama White House Archives, The BRAIN Initiative, Brain Research through Advancing Innovative Neurotechnologies, April 2013. Accessed May 2, 2022. Available at <https://obamawhitehouse.archives.gov/BRAIN>
- Ottewell, Paul. 2020. "Defining the Cognitive Domain". Over the Horizon Journal. December 7, Accessed May 2, 2022. Available at: <https://othjournal.com/2020/12/07/defining-the-cognitive-domain/>
- Ottewell, Paul. 2022. "The Disinformation Age: Toward a Net Assessment of the United Kingdom's Cognitive Domain", Marine Corps University Press, 2022. Accessed May 9, Available at <https://doi.org/10.36304/ExpwMCUP.2022.03>
- Popescu, Nicu, and Stanislav Secieru, eds. 2018. "Hacks, Leaks and Disruptions - Euiss Homepage European Union ..." Chaillot Papers. European Union Institute for Security Studies, October. Accessed May 2, 2022. Available at: https://www.iss.europa.eu/sites/default/files/EUISSFiles/CP_148.pdf
- Rayman, Noah. "Russian President Vladimir Putin: The Internet Is a 'CIA Project.'" Time. Time Magazine, April 24, 2014. Accessed May 13, 2022. Available at: <https://time.com/75484/putin-the-internet-is-a-cia-project/>

- Shannon, Claude E., and Warren Weaver. 1998. *The Mathematical Theory of Communication*. Urbana, Illinois: University of Illinois Press, Sternberg RJ, Sternberg K. "Cognitive Psychology", Wadsworth/Cengage Learning; 2011.
- Tarr, M. J., & Gauthier, I. 2000. "FFA: A flexible fusiform area for subordinate-level visual processing automatized by expertise". *Nature Neuroscience*, 3(8), 764-769.
- Tarr, M. J. 2003. "Visual object recognition: Can a single mechanism suffice?" In M. A. Peterson & G. Rhodes (Eds.), *Perception of faces, objects, and scenes: Analytic and holistic processes* (pp. 177-211). Oxford, UK: Oxford University Press. TASS. "Russia's Lavrov Labels US Demands for Russia to Get Out of Western Hemisphere as Insolent," TASS, April 3, 2019. Accessed May 2, 2022. Available at: <https://tass.com/world/1051990>.