The Technological Revolution in 21st-Century NATO: The New Frontiers of Space and Mind

Sarah da Mota
University of Coimbra, School of Economics.

Abstract

In the context of the current technological revolution, this article approaches specifically Space and Mind as two realms that are key strategic domains and areas of operation that have developed within NATO in the last 15 years mostly. While maintaining a scientific and technological edge has always been part of NATO's strategy to remain relevant and successful, we argue that the dimensions of Space and Mind are suggestive of a sharp contrast between a material and an immaterial dimension, whose interplay is at the centre of NATO's smart power, which is emblematic of 21st-century development and practice of power. As a result, relations with peer competitors are renewed in a way that is essentially dematerialized and discursively confrontational, making the use of conventional physical force increasingly obsolete, while at the same time reminding us of what the subjectivity of the North Atlantic is or should be.

Keywords: NATO; Technological Revolution; Space Policy; Cognitive Warfare; Disinformation; Smart Power.

Resumo

A Revolução Tecnológica na NATO do Século XXI: as Novas Fronteiras do Espaço e da Mente

No contexto da atual revolução tecnológica, este artigo aborda especificamente o Espaço e a Mente como dois domínios estratégicos e áreas de operação fundamentais que se desenvolveram no seio da NATO, sobretudo, nos últimos 15 anos. Embora a manutenção de uma vantagem científica e tecnológica tenha sempre feito parte da estratégia da NATO para se manter relevante e bem-sucedida, defendemos neste artigo que as dimensões do Espaço e da Mente sugerem um contraste acentuado entre uma dimensão material e uma dimensão imaterial, cuja interação está no centro do smart power *da NATO, que é emblemático do desenvolvimento e da prática do poder do século XXI. Assim, as relações com os seus concorrentes são renovadas de uma forma essencialmente desmaterializada e discursivamente conflituosa, tornando cada vez mais obsoleto o uso da força física convencional, ao mesmo tempo que nos recorda o que é ou deve ser a subjetividade do Atlântico Norte.*

***Palavras-chave**: NATO; Revolução Tecnológica; Política Espacial; Guerra Cognitiva; Desinformação; Smart Power.*

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Introduction

NATO's evolution in the 21st century has been somewhat tumultuous. After striving to consolidate its new post-bipolar *raison d'être* throughout the 1990s (cf. Bosnia-Herzegovina and Kosovo), the 2000s have brought multidimensional strategic and political challenges: out-of-area mandates; the accession of new members who have extended the sphere of influence eastwards, though precariously; internal disagreements that continually test the unity of the Allies (cf. Afghanistan and Libya); new Strategic Concepts (2010 and 2022); the creation and extinction of the NATO-Russia Council (2002-2022); progressively strengthened cooperation with the EU; among others.

One prominent aspect of NATO's contemporary evolution, which has gained increasing importance over the last decade in particular, and that this article wishes to address, is the technological dimension of the Alliance's strategic adaptation. Technologies like artificial intelligence, quantum technologies, space technologies, biotechnology and human enhancement, among others, are the protagonists of the current seventh-generation military revolution and have been occupying an ever-increasing significance in this adaptation (NATO, 2020b; NATO STO, 2020). In fact, over the last 75 years, NATO has maintained a "strategy of technology" that is at the core of the Alliance's successful durability. This strategy of technology has notably enabled the organisation's military and political framework to carry out its core activities of consultation, cooperation, coordination, interoperability, deterrence and united action, which critically depend on leveraging decision-making and a scientific and technological edge (NATO STO, 2020: pp. 1-2).

This should not be surprising, for over the centuries science and technology have decisively influenced not only the way wars are fought, but also determined strategic advantage and superiority (McNeill, 1982), so much so that individual scientists such as Archimedes, Leonardo da Vinci, Galileo, Newton or Descartes dedicated themselves to solving military problems (Smit, 2006: pp. 723-724). In fact, contemporary political theory has been dominated by a paradigm of technological determinism, which tends to favour a positive image of technology, essential for solving various problems, and whose most negative effects come mainly from harmful use (Bijker, 2006: p. 683). In the system of modern democracy, it is even assumed that technology produces a visible and unsuspected concept of power, insofar as it is used responsibly in the eyes of the general public (idem: p. 690).

Classic IR theories such as Realism and Neorealism see technology as one component among others in defining the material power of states, as well as a channel for developing strategies for their survival. Nevertheless, there is a reflection on the rationality of nuclear war, for example, arising from a sensitivity to mutual destruction and the systemic transformations driven by technology (Morgenthau, 1961; Waltz, 1979; Fritsch, 2014: p. 121). In Liberalism, technology is identified as

the main driver of globalisation and its complex interdependence, thus assuming a central role in debates about the current state of the global system, the search for global governance solutions and democratic control over them (Risse-Kappen, 1995; Keohane & Nye, 1998; Fritsch, 2014: p. 122). It is also possible to find a concern from the English School with how international society shapes technology, to show how a civilisational dimension was attributed to the role of high technology that differentiated the "society of civilised states" from non-European societies in the 19th century, with a special focus on China and India (Stroikos, 2020: p. 2). One may definitely infer from this broad yet brief theoretical spectrum that technology plays a decisive material and strategic role in international relations, with the power to transform relationships, whether by exerting domination, solving global problems, bringing nations closer together, or creating new dynamics of competition between them.

In this regard, to the Alliance, one important development regarding technology has to do with how the democratization of technology has diversified the range of players involved – peer competitors, terrorists, and irregular forces. By investing in science and technology, these players have reduced the advantages that exist for NATO, with many strategic, economic, social and technical challenges having arisen from such reduction. That is why concerns about losing the technological edge have been so critical to the Alliance (NATO STO, 2020: p. 2, 38). Indeed, the very literature on NATO has been dominated by aspects related to its strategic and operational adaptation to the evolution of threats, in particular hybrid threats, from which cybersecurity has emerged as the Alliance's most prominent area of specialisation (Aaronson *et al.*, 2011; Ducaru, 2016; Fidler *et al.*, 2013; Mälksoo, 2018; Oren, 2016).

In that context of technological revolution, this article draws on the need to further explore the implications of two important and rather novel areas of technological action by NATO, namely Space and Mind. In the light of the above-mentioned technological and intellectual edge that is considered to have sustained NATO's success and longevity so far (NATO STO, 2020: p. 1), the choice of this binomial is intended to emphasise the distinction between a dimension that is essentially material and one that is immaterial, for their interplay, it is argued, lies at the centre of NATO's smart power that is emblematic of 21st-century development and practice of power. As a consequence, the conceptualisations, perceptions and representations of where and how defence is to be carried out have come to dematerialise into new frontiers, where interrelations with peer competitors suffer new dynamics that are mostly discursively confrontational. Security is thus dematerialised, making the use of conventional physical force increasingly obsolete, while at the same time reminding us of what the subjectivity of the North Atlantic should be for both the Alliance and its security subjects.

The notion of smart power is hereby understood as a combination of hard and soft power that relevant military organisations may pursue in the context of interventions

and operations other than war, so that military force is only to be employed under extreme circumstances (Chong, 2015: pp. 233-234). Smart power is thus multifunctional, as it entails the right combination of ideational and material tools and is fairly interwoven with society as to the need to win hearts and minds, achieve a "common vision, or at best, an ideological solidarity akin to an alliance relationship" (idem: p. 234). Of course, Space and Mind do not represent the sole innovations occurring within NATO in this century that can be related to smart power. But in a defence and security environment driven by "chaos, complexity and competition" (NATO STO, 2020: p. 37), and a threat environment that is increasingly and irremediably hybrid, Space and Mind fundamentally highlight how strategic requirements of this era have demanded an extended, widespread, and comprehensive adaptation by the Alliance to contemporary technological revolutions both at the material and ideational levels. To understand this, this article first focuses on the main steps, developments and features that characterize the NATO Space Policy. We will see how space has become critical for the Allies' strategic superiority, with a multidimensional impact both on their daily routine operations and on the more decisive and tactical ones to respond to imminent challenges on the ground. Furthermore, it will be interesting to note how, although NATO does not possess its own autonomous space capabilities and assets, it still manages to pool the Allies' resources through the creation of various operational centres that optimise the collective action of the security community. For clarification purposes, it should be noted from this point on that when referring to "space technologies" it is assumed that space begins around 90 to 100km above sea level, which makes them rely on a unique operational environment that is defined by features such as freedom of action and access, speed, near-vacuum, micro-gravity, isolation and extreme conditions in terms of temperature, vibration, sound and pressure (NATO STO, 2020: p. 75).

Afterwards, the second section will approach the role of Mind as a theatre of operations of its own, by looking into how the notion of "Cognitive Warfare" has developed within the Organisation. Here, it will be revealed how the Mind occupies a prominent place in the Alliance's mission and in contemporary international relations. Behaviours, knowledge, perceptions and beliefs thus play a central role in the way NATO relates to peer competitors, positions itself geopolitically and defends its own existence. Hence, the importance of information, disinformation and propaganda and of technological intervention in their control and management.

1. NATO Space Policy

When compared to the EU, ESA or EDA, the development of space policy within NATO had a rather late take-off. Space was first referred to in NATO's Strategic Concept of

2010 as a realm whose access can be impeded by technological factors such as laser weapons and electronic warfare, which was ultimately seen as having major impacts on the Alliance's military planning and operations (NATO 2010: par. 14). Prior to that, not even the term "space" was present in any previous strategic concept. However brief, that first reference established, for the first time, the importance of space as a yet sensitive strategic and operational area, vulnerable to technological attacks.

Despite this, it is possible to find considerations for a NATO space policy prior to 2010, which recommended the development of a space strategy and doctrine. USAF Major Thomas Single (2008: p. 1), for instance, identified space as a critical enabler for security and defence, by elaborating on how it could contribute to NATO's identity and cohesiveness, and how, militarily, its strategic importance was justified given that NATO forces had become "expeditionary", relying increasingly on space systems for their ongoing operations. Single (2008: pp. 2-5) thus suggested concepts and guiding principles to be included in the development of said space policy, such as the peaceful uses of space, the development of space power and an industrial base, and the need for assured access to space, among others.

After the 2010 Strategic Concept, the framework for a NATO space policy was gradually advanced. Within the organisation, some reports progressively worked on identifying existing capabilities – and comparing them with those of the EU or the US -, challenges, and future tasks. At the time, there was a clear asymmetry of power between the US and European nations. In a long-standing disparity, the US had a more pronounced perception of the risk of conflict in space than the EU, and invested three times as much as the next 11 nations combined in the area of Space, possessing a robust, assertive and mature space policy, which is understandable as it has been developed since the 1950s (NATO, 2012: p. 10). Therefore, retrospectively, each security and defence goal present in the 2010 Strategic Concept could be connected to some specific space-related requirement or capability. For example, regarding the core task of safeguarding "the freedom and security of all its members by political and military means" (NATO, 2010: par. 1), the implied space requirement was to "provide strategic intelligence, missile warning, satellite navigation, satellite communication" (NATO, 2012: p. 8).

Only in November 2019 was space formally recognized as a new operational domain, alongside air, land, sea and cyber, in preparation for the meeting of the North Atlantic Council (NAC) taking place the following month in London (NATO, 2019a; 2019b). The London Declaration issued from that meeting officially initiated NATO's Space Policy. The Allies thereby justified space's importance in tackling security challenges in connection with the need to maintain their technological edge, and increase the resilience of societies, energy security and critical infrastructure (NATO, 2019b: par. 6). This acknowledgement was enshrined in the 2022 Strategic Concept, in which space is now part of the current "strategic environment", namely as a stage for the conduct of

malicious activities by authoritarian actors in particular, with the potential to disrupt the openness, interconnectedness and digitalization of Allied nations (NATO, 2022b: par 7). In it, the People's Republic of China is specifically referred to as one of the strategic competitors that seeks to control key technological and industrial sectors and critical infrastructure, and attempts to subvert the rules-based international order, including in the space domain, among others (idem: par. 13). In this sense, space appears as a high-stakes domain, where such strategic competitors and potential adversaries may degrade Allied capabilities, but also restrict their "access and freedom to operate in space" and target civilian and military infrastructure (idem: par. 16). Regarding NATO's core tasks of deterrence and defence, space capabilities surge as complementary to other capabilities such as nuclear, conventional, missile defence, and cyber, all to be employed in a proportionate, coherent, and integrated manner (idem: par. 20). It is also specified that malicious cyber activities, for instance, or hostile operations to, from or within space could reach the level of armed attack and lead the NAC to invoke Article 5 (idem: par. 25).

Although neither the Policy nor the 2022 Strategic Concept explicitly define or elaborate on what NATO's space capabilities are, the Joint Air Power Competence Centre has previously indicated that they consist of "orbital and non-orbital capabilities whose primary function is to deliver products and applications supporting NATO operations in the doctrinal mission areas of: space force enhancement; space control; space support; and space force application" (NATO, 2012: p. 15). This definition includes, for example, crafts or vehicles that operate at altitude in the absence of any aerodynamic control; electromagnetic links used to monitor, command, control and communicate with crafts or vehicles; and the personnel trained to do everything mentioned so far (ibid.).

Now, NATO's Space Policy offers a very comprehensive appraisal of that complex strategic domain, referring to space's multiple benefits, opportunities, risks and vulnerabilities, such as crisis management, threat anticipation, its dual-use nature, counter-space threats by potential adversaries, and even challenges to the "Allies' traditional perceptions of time, distance and geography" (NATO, 2022a: par. 2). In fact, the uses of space technologies include both civilian and military activities, ranging from weather monitoring, environment and agriculture, to transport, science, and communication (idem: par. 1). Actually, the key roles of space systems identified by the Policy refer to the Alliance's core tasks in collective defence, deterrence and crisis management, which concretely implies "informing the Alliance's situational awareness, decision-making, readiness and posture management across the spectrum of conflict" (idem: par. 6). Indeed, space-based tasks such as weather monitoring, satellite communications, positioning and navigation are transversal to the reading of the operational environment, tactical assessment, as well as to activities of intelligence, surveillance, reconnaissance, planning and execution (idem: par. 7) – basically any

kind of typical NATO operation. In practice, the addition of a strategic space domain essentially allows NATO planners to request space capabilities and services from the Allies, such as hours of satellite communication (NATO, 2019a). Figure 1 below summarises the operational use and effects of different space capabilities.

Figure 1
NATO Space Capabilities and Usage

Space Capability	NATO Use and Effects
Position, Navigation Time (PTN) & Velocity	Precision Strike Force Navigation Support to Personnel Recovery (PR)/ Combat Search and Rescue (CSAR) Network Timing
Integrated Tactical Warning and Threat Assessment	Force Protection Attribution Missile Warning
Enviromental Monitoring	Mission Planning Munitions Selection Weather Forecasting
Communications	Command and Control Unmanned Aerial Vehicle Ops Beyond-the-Horizon communications
Intelligence, Surveillance and Reconnaissance	Coverage of Operation Execution (in the operations centre) Battle Damage Assessment (BDA) Intelligence Targeting

Source: NATO STO (2020) *Science and Technology Trends 2020-2040. Exploring the S&T edge.* Brussels: NATO Science & Technology Organization, p. 76.

Besides the adoption of the Space Policy, a NATO Space Centre was established in 2020 at Allied Air Command in Ramstein, Germany. Acting as NATO's central coordinating entity in the space domain, this centre helps the Allies share information about potential threats, supporting their activities and operations, and works closely with the Allies' national space agencies to fuse data, products and services, such as imagery, navigation and early-warning.[1] In February 2023, the Alliance Persistent Surveillance from Space (APSS) was launched as the first global Intelligence Surveillance and Reconnaissance (ISR) space initiative. The APSS allows optimizing

1 Information on NATO Space Centre consulted and available at: https://ac.nato.int/missions/we-coordinate-nato-space-matters

space data collection for improved intelligence and surveillance activities, in close support of military missions and operations. Thus, it enhances NATO's situational awareness and decision-making, through the establishment of a virtual constellation called "Aquila". Aquila is a data-centric initiative that connects both national and commercial space assets, such as satellites, so the APSS actually draws on existing and future space assets in Allied countries (NATO 2023a). As a step further, NATO's Space Centre of Excellence was also officially accredited in July 2023 and established in Toulouse, France, aimed at providing knowledge, analysis and support on space-related matters.[2]

Furthermore, it is important to stress that the idea of the weaponisation of space – so criticised in the literature on space policy in general – has been explicitly referred to as not being an objective nor an intention of the Alliance (NATO, 2019a; 2023b). A significant distinction is made when referring, for example, that the use of satellite navigation to aid weapons delivery is not to be considered as "weaponisation", because it is an accepted legitimate use of space capabilities (NATO, 2012: p. 12). Since the war in Ukraine started, the distinction has been made increasingly difficult. NATO's support of Ukraine has implicated the use of space-based data and assets that are made available by the Allies, along with the international private industry's contribution to create a Ukrainian space coalition (Maurin, 2023: p. 33). As a reaction, the Russian head of the non-proliferation and arms control department of the Ministry of Foreign Affairs, Konstantin Vorontsov, stated in October 2022 that the space infrastructure, even civilian and commercial, that was used by the US and its allies for military purposes might become a legitimate target for retaliation (cit. in Maurin, 2023: p. 30). Prior to that, the Alliance had considered Russia's anti-satellite missile test of 15 November 2021 to cause orbital debris that could threaten the peaceful access to space for all, which directly contradicted Russia's claims to oppose the weaponisation of space (NATO, 2023b).

Between 2010 and 2023, the evolution of space policy within NATO has been remarkable, as space went from being a sensitive and vulnerable area to an omnipresent and omniscient dimension, a multifunctional operational domain with links to any of the Alliance's tasks and objectives. Of course, technological development is as remarkable as the acceleration of time it brings about, so it is fairly understandable that this trajectory has undergone such appreciable changes. In general, the trend towards a gradual hardening of the security environment in space seems clear and raises the question of whether the peaceful use of space is truly feasible and for how long.

2 Information on NATO Space Centre of Excellence consulted and available at: https://www.space-coe.org/

2. NATO's "Cognitive Warfare"

The notion of "Cognitive Warfare" has been developed as part of NATO's research and concept development activities and has been made public since 2021. In 2013, a collaboration began between General Denis Mercier, NATO's Supreme Allied Command Transformation (ACT), and Professor Bernard Claverie, director of the National School of Cognitive Science (ENSC), about cyberpsychology and the weaponisation of neurosciences. This cooperation gave rise in 2017 to a collaboration agreement between ENSC and ACT, under which the NATO-ACT Innovation Centre began to develop the topic of "Cognitive Warfare". Given the recent outburst of psychological manipulation processes for fraudulent purposes, knowledge of human behaviour and the ability to influence it have become the focus of a "battle of perceptions" that affects all sectors of society and, in particular, the security and defence sectors, constituting a major new strategic issue (Claverie *et al.*, 2021: p. xii).
In the main and only public document that addresses, explores and explains Cognitive Warfare, it is possible to find the following definition:

> [c]onvergence of "Cyber-Psychology," "Weaponization of Neurosciences," and "Cyber-Influence" for a provoked alteration of the perception of the world and its rational analysis in the military, politicians, and other actors and decision makers, for the purpose of altering their decision or action, for a strategic superiority at all levels of tactical intervention concerning individual or collective natural intelligence, as well as artificial or augmented intelligence in hybrid systems (Claverie *et al.*, 2021: p. xiv).

In a cognitive war, the battlefield lies in the mind itself. Its aim is to manipulate the psychological, social and informational environment, to shape what people think individually and as a group, and to influence how they act and interact collectively. At its peak, cognitive war is said to have the potential to destabilise societies and military organisations and fracture alliances (idem: p. 1). Through cyber, psychological, informational and social engineering capabilities, Cognitive Warfare seeks to create confusion, doubt, false narratives and false representations through an overabundance of information and disinformation, which saturates the mind, causes distraction, and can radicalise individuals and amplify social polarisation (ibid.).
Although attempts to manipulate the enemy and citizens in order to weaken, influence, subjugate or destroy them are dated elements of warfare, Cognitive Warfare refers to a new discipline that combines new communication tools, new methods and objectives, and generally involves a biased presentation of reality that is digitally altered. It is a combination of two operational fields that used to be managed separately: on the one hand, PSYOPS and influence operations (soft power), and on the other, cyber operations (cyberdefence) aimed at degrading or destroying physical information

assets (idem: pp. 22-23). Cognitive Warfare thus constitutes an interdisciplinary field in which the means, targets and objectives converge in the mental field. It is a war against what the enemy thinks, values or believes; it is a war waged by altering the enemy's representation of reality in order to affect their certainties, assumptions, beliefs and competitiveness; it is a war whose declared aim is "to attack, exploit, degrade or even destroy how someone constructs their own reality, their mental self-confidence, their trust in processes and approaches necessary for the efficient functioning of groups, societies or even nations" (idem: 23).

On a more practical level, NATO has indeed shown great concern about hybrid threats, and the need to prevent and guard against such attacks. But the main protagonist in this field is disinformation, which ends up being the most empirical and daily manifestation of Cognitive Warfare. NATO (2020a) defines disinformation as "the deliberate creation and dissemination of false and/or manipulated information with the intent to deceive and/or mislead […] to deepen divisions within and between Allied nations, and to undermine people's confidence in elected governments". It is interesting to note that, while NATO (2020a) has identified the annexation of Crimea by Russia in 2014 as a turning point in the increase and intensification of disinformation and propaganda, the actual beginning of an "incessant process of distorting the historical record" by Vladimir Putin may be traced back to the 2007 Munich Security Conference (Schuette, 2023: p. 51). In any case, the phenomena of disinformation, propaganda and misinformation really intensified during the COVID-19 pandemic, and especially during the lockdown period between March and June 2020. By then, the most notorious cases involved, for example, a fake letter supposedly from NATO Secretary General Jens Stoltenberg to Lithuanian Defence Minister Raimundas Karoblis stating NATO's intention to withdraw troops from the country; a forged letter in which a Polish military leader criticizes US troops; and a fake interview accusing Canadian troops in Latvia to have brought the virus to the country (NATO, 2020a).

Even more decisively, since the invasion of Ukraine by Russia in early 2022, a cognitive war has been ongoing. Here, the Alliance is faced with one of Russia's most prominent disinformation narratives, that is, that NATO broke a pledge made at the end of the Cold War not to expand eastwards, used to justify its invasion of Ukraine (Schuette, 2023: p. 34).The notion of "cognitive weapon" has in fact been discussed in Russia to designate the introduction of false theories and concepts into an enemy's intellectual environment as a way of influencing its state administration and decision-making, but also mass consciousness, in order to deflect loyalties and weaken national defence (Thomas, 2015: p. 18). To Ioana Leucea (2022: p. 83), the kind of politics of identity that is being practiced in wars, such as in Ukraine, can be seen as a warfare strategy that uses culture, theories and philosophies that ultimately shape or change people's perceptions about what is just action and what is not.

In this sense, the Cognitive Warfare hereby discussed has a critical impact on the very rules and structures that sustain international society. This form of hybrid war is one that "destabilises the traditional cognitive security environment of states and international organisations, and consequently, renders their identity insecure" (Mälksoo, 2018: p. 379). That is why NATO cares about disinformation; it cares because disinformation "tears at the fabric that holds our societies together"; because it undermines people's trust in governments, feeds their fears and prejudices, inflames extremism, and degrades the feelings of belonging to a community, all in order to divide and conquer (NATO, 2023c). NATO cares because, for 75 years, its success as a collective defence alliance has relied on the strength and assertiveness of its discourse about Atlantic unity and democracy, a discourse that feeds on the civilised habitus and on NATO's ability to defend and maintain it over time, regardless of the systemic changes that may arise (da Mota, 2018). That is why it does not hesitate to point to China and Russia as the "malicious actors" who seek to diminish public trust and undermine the Alliance's solidarity (NATO, 2023c).

In that context, although the response to countering Russian disinformation has been led by the US and the EU, through their respective official websites and entities that raise public awareness regarding the Kremlin's disinformation operations (Schuette, 2023: p. 49), NATO has adopted an "Understand and Engage approach". Accordingly, *understanding* means continuously analysing the information environment to keep track of what people are saying, hearing and reading about NATO, to then *engage* with the public audiences through various channels, providing accurate information in its public communications (NATO, 2023c). Since the war in Ukraine has started, it is possible to find on the Alliance's website a section dedicated to "Setting the record straight" and "de-bunking Russian disinformation on NATO" that is frequently updated with the latest myths that are then fact-checked (NATO, 2024). Some examples of these debunked myths include for example "NATO is encircling Russia", "Ukraine will not join NATO", and "NATO is aggressive".

As both a means and an objective of war, cognitive warfare raises rather deep questions about the meaning of war, its deeper implications, motivations, and possible paths. What is at stake in a cognitive war, the power to define the prevailing episteme, or the power to think freely? Can a cognitive war be regulated? And how can a cognitive war be won? Trying to answer these questions opens the way not only to new conceptions of war but also to new theorisations of International Relations, in which the role of neuroscience is critical.

Conclusion

The point of this article was to give particular prominence to Space and Mind, as two emblematic components of the technological revolution that NATO has both led and responded to in this century. By exploring how these two elements have evolved conceptually, strategically and institutionally, it was possible to portray a smart form of power, in which the material dimension of the technologies that sustain the functioning of the Alliance has become increasingly intertwined with the immaterial dimension of the ideas and values it stands for. In this symbiotic relationship, what is rather new are the objects and what they allow to do and achieve, namely in a faster, more effective and cleaner way.

With regard to the immaterial dimension, it proves to be timeless; disinformation and propaganda are not new issues. In fact, they are reminiscent of the Cold War and take us back to the classic operations that pitted the US against the USSR. What was at stake in the past has not changed – neither or very little have the players; democratic values in democratic societies are what is to be defended against authoritarian regimes. The novelty here probably lies in the acknowledgement that the fight for unsuspected knowledge, and the validity of its claims, is worth fighting for in a Cognitive Warfare that has unprecedented technological and scientific means at its disposal. A curious aspect of Cognitive Warfare is that it still does not allow us to say that NATO is formally at war with Russia, for instance, in a conventional and classic sense of international law.

So far, the literature has approached different aspects of the technological revolution with a mainly strategic concern, because the dynamics of competition are clear, as are the objectives of strategic advantage and superiority over Russia and China. However, it is worth taking on the idea that a technological and scientific edge is now compulsory for the Alliance's permanence, to reflect on what the implications of this requirement are for societies of NATO countries at large. Technological developments are not independent or dissociated from societal developments; on the contrary, they are closely linked, relating to each other in a process of "co-evolution" or "co-production", bringing together material and immaterial elements, that is, material infrastructures, cultures and political coalitions, social values, worldviews and paradigms (Smit, 2006: pp. 733-734). In this sense, the impact of these technologies on so-called psychological and social realities requires in-depth questioning. So, what is required from NATO populations in order to accompany, legitimise, and empower the political and military framework of an Alliance willing to maintain a technological edge and win the hearts and minds in a cognitive battlespace? What are the concrete effects and consequences of practicing smart power in this century? In a world increasingly dominated by technology, in which the material and immaterial dimensions are increasingly blurred, the role played by military organisations such as

NATO is critical. By adopting strategic concepts and policies, NATO defines security concepts and practices, identifies adversaries and potential enemies, as well as states the needs for defence and battlefields. Moreover, by doing that, NATO defines and conveys meanings about what is valid knowledge, controlling thought structures, perceptions and understandings of the world – and all this based on non-human means, henceforth. Nevertheless, what one cannot overlook is that the technological revolution cannot happen at the expense of the ethics of security.

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