

Chapter 1

Architecture of Contemporary Strategic Studies on Security from Disciplinary to Multi-Inter-Transdisciplinary Approaches*

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Abstract: This chapter aims to analyze and conceptualize the evolution of strategic studies, exploring the transition from disciplinary, multidisciplinary, interdisciplinary, and transdisciplinary approaches in response to the growing complexity of threats that impact global security. Additionally, it presents an architecture model of contemporary strategic studies on security based on their epistemological analysis, taking into account modern challenges, the state-of-the-art approach to constructing strategic studies, and the breakdown of research topics. Thus, the chapter highlights the inadequacy of traditional security strategies in addressing challenges such as cyberterrorism, hybrid wars, and climate change. It also emphasizes the need for a holistic, integrative, and multidimensional approach that facilitates the understanding and management of contemporary threats by integrating economic, political, technological, and social factors, thereby providing a solid basis for future research and policymaking in the twenty-first century.

Keywords: architecture; strategic studies; disciplinary; interdisciplinary; multidisciplinary; security; transdisciplinary

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Introduction

The contemporary world is characterized by being increasingly interconnected, as well as undergoing constant technological evolution. This abundance of options presents both great challenges and transformative opportunities for the development of contemporary strategic studies on security (CSSS). One of the main reasons why investigating this issue requires an increasingly rigorous, multidimensional approach is the inevitable mutation and transnationality that global threats have acquired, ranging from cyberterrorism to human trafficking, hybrid wars, and regional conflicts.

In this context, CSSS addresses the growing complexity and multifaceted nature of contemporary security threats, as well as the strategic challenges faced by supranational organizations and nations, to provide concrete and definitive answers that enable them to counteract these threats. Likewise, CSSS takes into account the rapid technological evolution and the proliferation not only of weapons of mass destruction, but also of hybrid threats, which, together with the global interdependence and interconnection, have created a very dynamic security environment that is complex to understand and challenging to manage.

Traditional defense strategies, focused on conventional threats, have proven insufficient to address the challenges of modern warfare, including cyberattacks, misinformation, cognitive warfare, and the impact of climate change on national security. Additionally, the security and defense of the twenty-first century do not focus solely on military capacity or border protection to contain threats, but also involve the economic, political, social, and technological aspects that enable a holistic understanding of the challenges facing human society.

In this regard, it is essential to contribute to efforts to theorize and develop conceptual frameworks that integrate various elements, enabling leaders worldwide

to formulate more effective and adaptive strategies for modern reality. For this purpose, this chapter explores the dynamics of CSSS from an approach that starts in the disciplinary field, advances along the complex line of multidisciplinary and interdisciplinarity, and culminates in the transdisciplinarity of current global scenarios. Thus, it seeks to gain a better understanding of the problem and allows for addressing the different conflictive relationships among human beings.

Specifically, we examine the disciplinary, multidisciplinary, interdisciplinarity, and transdisciplinary (DMIT) factors—or, as Bernard Choi and Anita Pak (2007) refer to them, “multiple disciplinary efforts” or “multiple disciplines” (p. 225)—as epistemological foundations. From this perspective, these foundations are integrated into, linked to, and interdependent with security and defense sciences, as well as with their complex environment, to illustrate the application of contemporary strategic theories to the real situations of the twenty-first century, which allows for a critical analysis of the changing evolution of global security and defense. This analysis reveals the actions that have been carried out and highlights the imperative need for adaptability and strategic anticipation in a rapidly changing international environment, from the influence of technology on military strategy to the geopolitical impact on national security.

From a qualitative, multidisciplinary approach, the study used analog hermeneutics to propose a CSSS architecture as a case study. In this way, the chapter not only offers a theoretical analysis but also a new format of rational understanding of DMIT studies on both contemporary security and global security and defense management. Thus, this chapter paves the way for future research and the development and implementation of comprehensive policies, among others.

With this purpose, the text is divided into three sections: the first one proposes the definition and epistemology of CSSS and its relationship with *multiple disciplinary efforts*. The second describes the epistemological evolution of CSSS and DMIT environments from World War II to the era of terrorism and contemporary challenges. The third suggests a CSSS architecture model is proposed based on the state of the art and the disaggregation of themes. Ultimately, some conclusions are drawn that leave the discussion open to new research on the complex evolution of global security and defense.

Definition and Epistemology of CSSS and Its Relationship with Multiple Disciplinary Efforts

Definition of CSSS

For Kane and Lonsdale (as cited in Bueno, 2018), strategic studies represent the field most closely linked to the study of war as the object of social research, with strategy at its conceptual base (p. 238). Thus, strategic studies (SS) enable the analysis of conflicts, threats, and policies aimed at protecting and defending nations, integrating multiple disciplines and strategies. Concerning the corporate purpose of war, this refers to its origin, development, and resolution, aspects that are addressed by disciplines such as politics, economics, cultural studies, and sociology. Strategy constitutes the theoretical and methodological framework for analyzing and understanding conflicts in SS.

On the one hand, strategy refers to the configuration of war plans and objectives. On the other hand, SS not only analyzes these elements to make them available for planning and decision-making, among many other actions, but also reveals their *multi-, inter-, and transdisciplinary* relationships with other areas that, in the contemporary world, have affected the course of wars and, in general, security threats.

Simply put, SS is an academic discipline and a field of research that, in the twenty-first century, has been integrated by various disciplines, such as military and political sciences, economics, history, philosophy, and sociology. Precisely, this disciplinary convergence has led to SS evolving into CSSS. In particular, CSSS focus on analyzing war and peace, international security, and the security and defense strategy. In addition, they cover the theorization and evolution of strategy, the analysis of security, the relationship between politics and military strategy, and the geopolitical context to inform strategic decisions.

Multiple Disciplinary Efforts of CSSS

As detailed above, the terms "multiple disciplinary efforts" or "multiple disciplines" (Choi & Pak, 2007, p. 225) are used to abbreviate the DMIT approaches that SS has developed since the end of World War II, which have evolved into CSSS.

Etymologically, the word *discipline* comes from the Latin *discere*, which translates to "to learn." From there emerges the word *discipulus* ("disciple"), that is, "the one who learns" (Quintanar, 2011). Therefore, CSSS learning stems from the

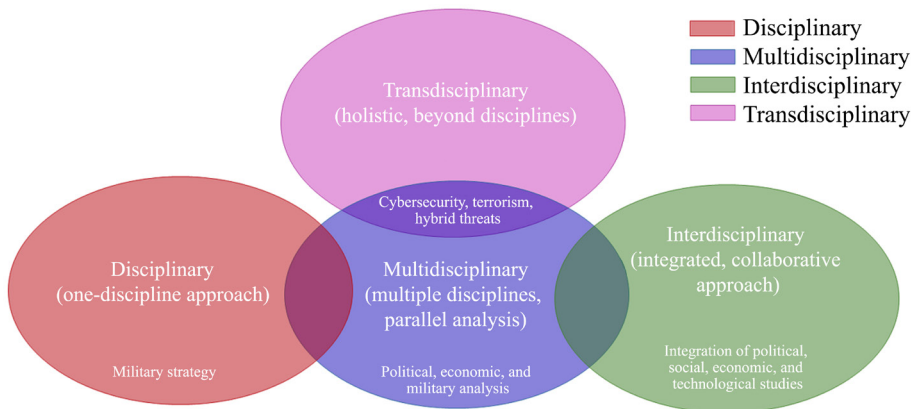
approaches of *multiple disciplinary efforts*, which enable the characterization of a complex global security issue through a detailed and analytical breakdown. The latter will be explained in the third section of this chapter.

Moreover, the disciplines—within multiple disciplinary environments—are sets of scientific knowledge organized to analyze specific areas of reality and continually update knowledge on those particular topics (Tamariz & Espinosa, 2006). Based on this definition, four rules were set to formulate the CSSS architecture:

- Understanding the complexity of problems related to safety threats and defense requires a combination of different disciplinary knowledge.
- The evolution of threats, such as cybersecurity and the emergence of hybrid wars, calls for approaches from *multiple disciplines*.
- Politics and society are made up of the economy, society, and culture, factors that influence the multidimensionality of security.
- Innovation and adaptation of technologies are found in other scientific studies. They are not exclusive to military sciences.

From the above, Figure 1 synthesizes the *multiple disciplinary efforts* made by CSSS, which support the analyses carried out in the following sections of the chapter.

Figure 1. Multiple CSSS Disciplines



Source: Own elaboration.

The Disciplinary Approach as the Basis of CSSS

SS started the development of specific disciplines such as military history, political science, economics, and international politics. Each of them approached and

analyzed particular aspects of national security, which was the dominant science of SS during the long period between World War II and the Cold War, as has since been the theory of deterrence, geopolitics, and conflict analysis and resolution.

The disciplinary transition to *multiple disciplines* of SS brought about a broader and deeper understanding of contemporary security problems, without losing rigor concerning the different disciplinary approaches in which security has transcended. In this regard, for example, political science analyzes state strategies and power dynamics and relations, while military history is permanently nourished by the lessons of the past to study current strategies.

In a broader framework, it should be taken into account that in the twenty-first century, unconventional threats impact international politics and the economy, so that delving into this phenomenon also involves reviewing global impacts and the implications that economic sanctions and international relations may have. In addition, there is a need to anticipate emerging threats and incorporate both technologies and prospective methods and models to make a more precise assessment of safety risks, especially when essential elements have been added to this SS, such as human security.

The First Step to the Multidisciplinary Approach

The "multidisciplinary" concept emerged in 1975 and means composed or made of several specialized branches of knowledge, in the search for a common goal (The Random House College Dictionary, 1975, as cited in Henao et al., 2017, p. 182). To expand it, Paoli (2019) states that this form of disciplinary collaboration or concurrence implies the participation of more than two disciplines in a study or research, without losing their characterization or abandoning their own methodologies (p. 349).

Thus, in SS, the multidisciplinary approach consists of applying knowledge and methods of various disciplines to address security problems from multiple perspectives. However, this does not necessarily mean that the approaches of the different disciplines are integrated into a common theoretical framework.

In this regard and over time, it was recognized that security challenges were complex and required multiple perspectives, beyond disciplinary boundaries. For this reason, SS brings together various disciplines that address the issue in parallel, but without integrating their methods or theories, such as political science, political economics, and sociology, so that each contributes its own set of knowledge to the study of security.

The Interdisciplinary Approach

The interdisciplinary approach emerged in 1974, when the convenience of combining or covering two or more academic disciplines or fields of study was understood, or two or more professions, technologies, or departments (The Random House College Dictionary, 1997, as cited in Henao et al., 2017, p. 183). From this point, interdisciplinarity took a step further in SS, as it promoted the collaboration and participation among disciplines in a more integrated way, without this being understood as a juxtaposition of disciplines (Paoli, 2019, p. 251). The interdisciplinary approach demands an integration of the theory or elements of the scientific theory of various disciplines (Paoli, 2019, p. 251), which implies that the methodology must be managed to integrate it with other disciplines.

This interrelation with other disciplines—now mostly integrated—entailed the combination of knowledge and the development of new theoretical and methodological frameworks. This was the case of the emergence of human security, which, since then, incorporated human rights and public health (United Nations Development Program [UNDP], 1994).

The Transdisciplinary Approach

The term *transdisciplinary* emerged in 1979 with the meaning of a “group research whereby individuals from different disciplines work as a team within a mutually accepted systems organization with an overall set of systems goals” (Gosmann, 1979). Therefore, the concept of *transdisciplinary* means traversing a field of knowledge through several disciplines (Paoli, 2019, p. 251). An example of the above from the perspective of SS is the result of the contemporary integration of a new and wide field of knowledge called science, technology, and society (Paoli, 2019, p. 251). The deep integration of multiple disciplines, beyond the conventional, allows for the expansion of the holistic understanding of contemporary global security problems.

In this respect, the transdisciplinary approach transcends and is distinguished from others because it identifies an ecosystem in which other knowledge and perspectives outside the academic field can be integrated more deeply (Paoli, 2019), such as non-traditional stakeholders, non-governmental organizations (NGOs), and affected communities. Precisely, in Article 6 of the Charter of Transdisciplinarity, signed in 1994, scientists stated: “In comparison with interdisciplinarity and multidisciplinary, transdisciplinarity is multireferential and multidimensional. While taking account of the various approaches to time and

history, transdisciplinarity does not exclude a transhistorical horizon" (International Center for Transdisciplinary Research and Studies, n.d.).

An example of this is the integration of studies on human security, the risks of climate change, and the impact of military technology on humanity, as with artificial intelligence and the development of drones.

Finally, Table 1 presents the differences and distinctions of the multiple disciplinary approaches that have been part of the evolution of the CSSS. In the next lines, this information will give shape to the state of the art in the section on the CSSS architecture model.

Table 1. *Comparison of Approaches*

Disciplinary	Multidisciplinary	Interdisciplinary	Transdisciplinary
Works with one discipline	Works with various disciplines	Works between disciplines	Works through and beyond disciplines
Involves one discipline	Involves more than two disciplines	Involves two disciplines (e.g., focuses on the reciprocal action of disciplines)	Involves scientists of relevant disciplines, as well as non-scientific stakeholders and non-scientific participants
Particular goals	Individual goals in different disciplines	Shared goals	Common objectives and shared skills
Maintains the disciplinary boundary	Does not question disciplinary boundaries	Disciplinary boundaries disappear	Transcends disciplinary boundaries
Individual methods	Separate methods	Shared methods	

Source: Adapted from Henao (2017, p. 185).

Epistemological Evolution of CSSS and DMIT Environments

The origin of SS dates back to the beginning of the 1950s in parallel to the break out of the Cold War (Bueno, 2018, pp. 240–245), although there are writings that place it between 1920 and 1930, when issues such as the “the harnessing of technology, and the recruitment of the best [...] the twin demons of communism and fascism” (McArdle, 2016, pp. 92, 94) were addressed. The truth is that SS appears to overcome the theoretical fragmentation and the conceptual deficit of the previous

stages (Bueno, 2018, p. 240), as well as to provide a scientific knowledge strategy in the heat of the positivist advance of those decades.

Following this perspective, CSSS discusses and formulates strategies to manage international security complexities. Thus, they spread worldwide through the different security responses of each region and country, as well as the necessary responses in terms of diplomacy and the balance of power (Acharya & He, 2022).

In this regard, contemporary security is related to other disciplines to ensure a place in the national interests of a country (e.g., the economy, politics, science, history, sociology, psychology, and technology) that, historically and with the evolution of strategic thinking (thinking + strategy), have precisely mold studies on threats and defense formulation. However, SS "cannot be regarded as a discipline in its own right" (Baylis & Wirtz, 2002, p. 5), since their central approach is to study the role that military power and the adequacy of States' armed capacities in guaranteeing survival and defending national interests (Jordan, 2013).

In a broad and complex sense, CSSS, in addition to the cyber and spatial domains, fit the following areas of analysis, research, and policymaking, which will be integrated into the DMIT perspectives, as elaborated later on: a) strategic theory; b) causes of war and conditions for peace; c) military technology, innovation, and transformation; d) irregular war, insurgency and terrorism; e) competition among great powers; f) geography and strategy; g) nuclear power; h) airpower; i) maritime power; j) landpower; k) control of weapons of mass destruction; l) strategic culture; m) civil-military relations; n) strategic defense and planning policy (Bueno, 2018, p. 248).

Moreover, Bueno (2018) states that SS provides epistemological tools to analyze the use of military force, considering internal and external dynamics of conflicts, their political effects, and how stakeholders use the force to meet their objectives. Therefore, it is important to highlight the epistemological strength that its emphasis on the study of the use or threatened use of force represents as an instrument of politics and its effects (Bueno, 2018, p. 249). So, in their epistemology, SS can be traced through several currents of thought, events, and theories that have influenced their development.

Specifically, the distinction between SS and CSSS is evident in the twenty-first century, with cybersecurity trends, terrorism, and new conflicts, as well as hybrid wars and the use of extraterrestrial space as a new scenario of confrontation, aspects that complicate security studies. Besides, over time, SS has generally evolved from the traditional military approach to a broader understanding, which integrates and collects the various security dimensions through the multiple

disciplinary efforts previously analyzed. This evolution reflects the different changes in the context and global order, as well as the new challenges that require more flexible and collaborative approaches in this century, given the assigned name of CSSS.

World War II (1939–1945)

World War II marked a crucial point in SS, as it not only redefined military doctrines and global geopolitics but also introduced new technological advances. Likewise, this period of world conflict gave rise to subject matters such as total war, the use of new technologies for war—particularly aviation and radars, new strategies such as massive bombing—even at night, naval battle with battleships and aircraft carriers, and naval aviation. Similarly, it enabled the transformation of twentieth-century war strategies since the war approach focused on military planning and logistics to meet military objectives. The development of theories such as conventional warfare and nuclear deterrence that arose at the end of the war would impact strategic analysis and military decision-making.

In this context, the rivalry between the United States and the Union of Soviet Socialist Republics (USSR) significantly strengthened the development of SS, which has since focused on national security and deterrence. This gave way to the emergence of the first supranational organizations, such as the United Nations, the World Bank, the International Monetary Fund, and the General Agreement on Tariffs and Trade (GATT), which would later become the World Trade Organization (WTO), to name a few of the first organizations that laid the basis of international relations.

It should be noted that these relationships took place amid the nuclear threat of both powers, given the clear situation of mutual destruction based on reciprocated distrust. This situation necessitated a deep and systematic analysis of global defense strategies—as an integrative multidisciplinary domain—and military strategy—a disciplinary domain. Precisely, the latter was consolidated as an academic field within the framework of international politics.

Emergence of Deterrence Theory

During this period, the theory of nuclear deterrence became a fundamental pillar that, through interdisciplinarity, integrated other disciplines and, through multidisciplinary, was nourished by international law, politics, and physics, among other aspects involved. However, it should be noted that SS theorists have always sought to establish connections between the culture and political and military behavior of States (Carter, 2015, p. 137) through power relations based on nuclear

deterrence or the classical deterrence theory to justify the need for a State to use its power to influence the decisions of other States.

Deterrence, due to a new nuclear threat, produced such an impact on the planet that it motivated a real intellectual revolution in the way of understanding the strategy and the already classic relationship between war and politics (Bueno, 2018, p. 240). Since then, deterrence has consisted in the threat of resorting to force, in proportion capable of causing harmful damage, in order to avoid an attack (Sodupe, 1991, p. 55). The foregoing, as part of the new way in which international relations occurred, involved other ways to act under deterrence, in addition to duress, coercion, and containment as strategies to use power (Álvarez et al., 2019).

Cold War (1947–1991)

The First Part of the Cold War

Alberto Bueno (2018) identifies two periods that mark the start of this Cold War phase: the first spans from the end of World War II to the mid-1950s, when SS began. The second, referred to by Colin Gray (1982, as cited in Bueno, 2018) as the “Golden Age” (p. 246), extends from the end of 1950 to 1965. Due to the rivalry between the United States and the USSR, the focus was on developing strategic theories such as deterrence and balance of power through increasing arsenals, which influenced international relations, national security, and nuclear strategies from the outset. In this context, the emerging space race between the two nations must also be considered.

RAND and the Academic Interest in SS

In 1948, RAND was established in the United States as a research organization aimed at developing solutions for public policy challenges. Since then, it has addressed the “issues that impact people everywhere, including security, health, education, sustainability, growth, and development” (RAND, 2024), and its publications are widely circulated without classification (McArdle, 2016). With its findings and interest in the academic community, RAND paved the way and generated interest in SS centers to form worldwide.

RAND’s initial focus was on the nuclear vulnerabilities of battleships and land armies against airpower, a concern raised by General Billy Mitchell and revisited at RAND by Arnold Atwood (Kaplan, 1991). It also examined proxy wars fought by

third parties influenced by the two nuclear powers, among other Cold War strategic issues, analyzed by both civilian and veteran analysts (McArdle, 2016).

Additionally, RAND incorporated in its initial research and analysis the technology that has developed through *multiple disciplinary efforts*, including inventions from World War II such as “radars, infrared detection devices, bomber aircraft, long-range rockets, torpedoes with depth charges, as well as the atomic bomb” (Kaplan, 1991, p. 52). It also includes communication and navigation satellites, unmanned vehicles (now with the potential for autonomous targeting), antimissile defense systems, cyber warfare, anti-satellite weapons (ASAT), hypersonic weapons, and a broad range of technological innovations for the modern warfare industry.

The Collective Defense of NATO and Proxy Wars

In 1949, the organization of the North Atlantic Treaty (NATO) was established, which has persisted—despite the challenge it faced at the time from the Warsaw Pact—with the interdisciplinary motto of collective defense: “The parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all” (NATO, 2023).

However, years later, SS reached a stalemate (Freedman as cited in Bueno, 2018, p. 246) due to the United States' failure in Vietnam. This situation revived Clausewitzian thought of the Trinity, which not only attracted attention in social science research but also made it necessary to rethink study horizons with new topics like guerrilla warfare and counterinsurgency, amidst technological advances such as electronic warfare (EW), second-generation aircraft in the jet age, and the moon landing.

Furthermore, proxy wars, that is, armed clashes conducted indirectly through an intermediary or third party, have emerged (Jordan, 2020; Pérez, 2022; Shipley, 2017). The appeal of proxy wars is that they have not exhausted the main actors involved, as happened, for example, in the wars of Korea (1950–1953) and Vietnam (1955–1975), the Arab-Israeli conflict—the Suez Crisis (1956), the Six-Day War (1967), and the Yom Kippur War (1973), the wars of independence in Africa and Asia—Algeria (1954–1962) and Angola (1961–1974), and the conflicts in El Salvador (1979–1992) and Afghanistan (1979–1989).

All of the above are part of an interdisciplinary, multidisciplinary, and transdisciplinary interest in SS, encompassing military strategy, international relations, economics, and a broad, holistic perspective.

Space and Regional Conflicts

The orbit of the Russian Yuri Alekséyevich Gagarin on April 12, 1961, made him the first human to reach outer space (Rodríguez, 2023). However, it should be noted that beyond this, space has always been a geostrategic arena for the balance of power, including the confrontation scenarios of the twenty-first century.

SS also included works on the “Third World, the non-aligned movement, nationalism, and terrorism” (McArdle, 2016, p. 95). In this context, it should be remembered that the first Conference of Heads of State was held in Bandung, Indonesia, in 1961, which started the Non-Aligned Movement (NAM) focused on defending its neutrality and interests against the capitalist and communist hegemonic blocs (Delgado, 2022, para. 1). However, its influence has declined over the past few decades, due in part to the emergence of blocs such as BRICS, the EAGLES, and the G77, which have overshadowed NAM (para. 7).

Intercontinental Missiles

The German V-2 rockets fired from 1942 were guided by radio signals and accelerometers, in addition to using an inertial LEV-3-guided system with two gyroscopes that helped stabilize it (Escrig, 2010). Since then, many countries have developed various types of missiles and rockets, whose effectiveness has been observed in the Russian-Ukrainian war, as seen with *BM-30 Smerch*, *2A36 Giatsint-B*, and *D-30 Howitzer*.

In 1947, the United States adapted and launched one of the requisitioned rockets from the Germans after World War II ended, which resulted in the first photographs of Planet Earth (Rodríguez, 2024). The truth is that intercontinental ballistic missiles (ICBMs) originated with the Atlas D, whose circular error probable (CEP)¹ was 3.3 km. From that point on, SS has focused on developing ICBMs and the crisis caused by the proliferation of these weapons.

Afterwards, Colin Gray (1978, as cited in Bueno, 2018) introduced the triad of ICBMs launched from the ground, submarines (SLBMs), and long-range bombers. Gray argued that this triad offered a complementary mix of strategic capabilities that enhanced the effectiveness and resilience of a nuclear deterrence strategy.

The combination of these three elements not only ensured a strong and reliable deterrence capability but also enabled an effective response to any nuclear threat. Similarly, the triad reflected the complexity and interdependence of nuclear strategies during the Cold War, highlighting the balance between different

¹ Distance and measure of the accuracy of a weapon with respect to the center of an intended target.

platforms and capabilities to maintain stability and prevent large-scale nuclear conflict.

New Global Stakeholders

In the 1980s, international relations and the rise of new world leaders, such as Ronald Reagan (United States), Mikhail Gorbachev (USSR), François Mitterrand (France), Helmut Kohl (German Federal Republic), and Margaret Thatcher (United Kingdom), led to a new relationship dynamic, where politics, international relations, and geopolitics were based on the difference between what the leaders believed, claimed they were doing, and what they were actually doing to justify the use of violence against potential enemies (Carter, 2015, p. 137).

The New World Order with the End of Bipolarity and the Post-Cold War (1990)

Some authors believe that the end of the Cold War was due to the collapse of the Soviet Union and the decline of nuclear threat (Bueno, 2018, p. 247). However, since then, other events have kept the Cold War-like atmosphere in international relations fluctuating. Examples include the annexation of Crimea in 2014 and, later, the so-called *Spetsial'Naya Voyennaya Operatsiya*, or "Special Military Operation," as Vladimir Putin called it (Troianovski, 2022). The latter occurred with the invasion of Ukraine on February 23, 2022, which displayed all the traits of a hybrid war, along with the threat of tactical nuclear weapons being used by Russia (Troianovski, 2022).

This era requires careful analysis because, since then, it has been suggested that at some point "the nuclear threshold will be crossed" (Freedman, 2003, p. 387), alongside the collapse of ideological blocs and the end of the bipolar era. The "paradigm change" (Brown as cited in Bueno, 2028, p. 247) concentrates on studies of regional conflicts, humanitarian crises, new non-military dimensions, and the debate over the concept of security—as cooperative or collective defense—redefining the international agenda, the role of international organizations in conflict mediation, and the development of human security, as discussed in the previous section.

These new paradigms extend into the transdisciplinary field, as they generate interest in emerging issues related to security, such as climate change, resource scarcity, international terrorism, the proliferation of weapons of mass destruction (WMD), and gender-related problems.

The Gulf War and Revolution in Military Affairs (RMA)

The 1991 Gulf War demonstrated the significant influence of modern technology on warfare, exemplified by the Stealth² F-117, the use of spatial capabilities for military advantage, air superiority, and the importance of Clausewitz's Trinity after the failures in Vietnam. Additionally, the development of the Revolution in Military Affairs (RMA) concept was advanced, emphasizing technological innovation in military strategies within this new modern war paradigm (Colom, 2014).

Era of Terrorism and Contemporary Challenges (2001–Present)

The attacks of September 11 marked a radical shift in global strategic thinking against the new threat that increased the deterritorialization of terrorism, which brought with it a definition of enemy (Bueno, 2018, p. 248), the urgent need for new global security policies, and security doctrines such as the so-called "preventive war." The Global War on Terrorism (GWOT) (Record, 2003, p. v) reshaped security strategies towards a modern approach to understanding the future of the twenty-first century, in which intelligence, cybersecurity, and unconventional military operations will play a strategic role based on the necessary technology, because access to it is no longer exclusive to the military.

In the twenty-first century, humans are confronted with new interdisciplinary approaches to social, economic, and environmental issues, as well as technology management, within the framework of globalization and efforts to combat the transnational nature of terrorism and crime.

Contemporary Challenges (2010–Present)

The evolution and complexity of globalization, the climate crisis affecting the entire planet, and the occurrence of pandemics are the main contemporary risks and threats. Analyzing these phenomena requires moving from interdisciplinary to transdisciplinary thinking, as they influence security dynamics on a global scale differently. In this context, SS incorporates social, economic, and environmental factors, which must be addressed through collaboration and participation among governments, academia, and communities.

² Invisible.

Cybersecurity, Hybrid Threats, and Competition among Great Powers for Influence and World Leadership in the Twenty-First Century

Contemporary technological advances have made cybersecurity a central focus in CSSS, especially as the constellation of satellites in the three orbits around the planet has significantly increased and become permanent. This underscores the importance of protecting global networks with cybersecurity and cyber defense capabilities necessary to counter cyber threats (Poole et al., 2022).

In addition to what has been mentioned, hybrid threats have become a significant concern because of new conventional and unconventional methods of warfare, which have complicated conflicts in the twenty-first century. An example of this is Russia's approach in the conflict against Ukraine, as it has systematically employed cyber warfare even before the invasion began, along with proxy militias through the Wagner group. It is important to recognize that all of this falls under the same hybrid doctrine outlined by General Vladimir Gerasimov, in which he describes the new form of Russian warfare (Gerasimov, 2016).

The Competition among Great Powers for Influence and World Leadership

The competition among great powers for influence and global leadership is a phenomenon that underpins all world orders. In this context, geopolitics depends on new strategies beyond military strength, as economics, technology, and culture shape the complex rivalry in international relations.

Finally, in recent decades, SS has had to adapt to a reality where conflicts among States continue. However, regional threats are compounded by nuclear weapons, increasingly sophisticated terrorist tactics, issues stemming from globalization, religious and ideological extremism, and severe economic inequalities. As a result, SS aims to understand and address a broad range of threats, continually adjusting its strategies to meet new challenges and ensure adequate protection in an increasingly interconnected and dynamic world.

CSSS Architecture Model

The CSSS architecture describes the structure and organization of knowledge that examines and analyzes a wide range of security-related topics. Generally, it is focused on the global and national levels, where the planet's development involves creating new studies within the DMIT environments.

Thus, one of the first findings of this study is that architecture includes several interrelated elements:

1. The study perspectives and approaches that arise and develop in all disciplinary areas, such as military science, economics, technology, and environmental science.
2. In multidisciplinary and interdisciplinary approaches, disciplines are combined to address problematic issues, while in transdisciplinary approaches, methods are integrated beyond disciplinary boundaries to address complexities (Figure 1).
3. The topics and areas of study evolve constantly and are associated with CSSS.
4. The approaches, which have a global and local nature, start from events and study issues that have emerged from World War II. However, this does not mean that Sun Tzu's, Clausewitz's, Jomini's, and other approaches to the theories of war and strategy are left out.

State of the Art to Build the CSSS Architecture

The current state of CSSS is based on the idea that they continuously evolve from simpler, more specialized (disciplinary) approaches toward the most complex and holistic (transdisciplinary) ones. Like the universe in motion and expansion, CSSS will keep developing, evolving, and encountering new sciences, theories, and disciplines. Specifically, space as a new arena for confrontation, along with the development of kinetic and non-kinetic weapons, now plays a key role in the deconstruction of CSSS, which differs from the process at the end of the last century. In particular, technological advances, the military strategies of major powers, international relations, global geopolitics, and ongoing conflicts are reshaping the global landscape, even if futurology were to be included in SS.

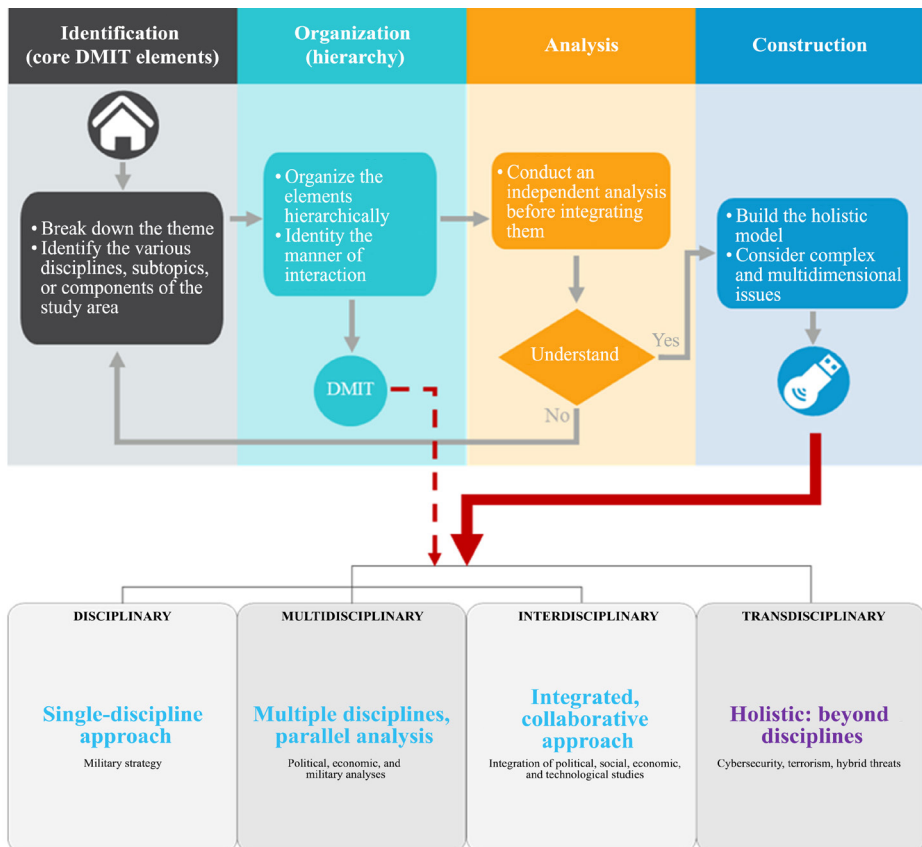
In this scenario, each of the four disciplinary environments (DMIT) represents a different level of analysis and complexity, illustrating how various disciplines and fields of study can interact and combine to address security challenges in today's world. Therefore, although quite complex, it is possible to develop a unified structured approach to CSSS that enables decision makers, academics, analysts, and policymakers to craft more effective strategies for tackling global threats in an increasingly interconnected and multifaceted environment.

Breaking Down the Topic of a Strategic Study

When proposing an architecture model, *breaking down the topic of a strategic study* involves simplifying complex ideas into their basic elements to analyze and understand them. It also requires doing so as accurately and thoroughly as possible. This is crucial for building a CSSS architecture model of a specific topic, allowing for the identification and organization of its components within the DMIT structure.

Figure 2 outlines four key steps to develop a strategic study model. It involves identifying the core elements used in CSSS and the final architecture, as well as organizing all elements hierarchically to show how they interact within disciplinary, multidisciplinary, interdisciplinary, and transdisciplinary settings. Next, individual analysis is performed to integrate these elements, ultimately creating a holistic model that addresses complex and multidimensional issues.

Figure 2. Model for Breaking Down the Topic of a Strategic Study

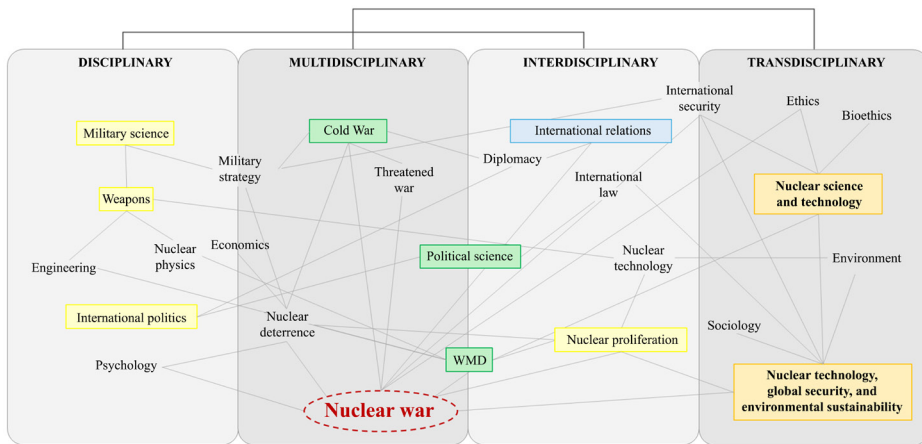


Source: Own elaboration.

CSSS Architecture Approach as a Case Study

To build on what has been previously examined, the nuclear war problem is used as an example. Figure 3 shows the fields, sciences, or theories related to the nuclear issue, and then, the development of the nuclear problem across all these fields is discussed in an analogical³ and empirical⁴ way.

Figure 3. Architecture of a Strategic Study on Nuclear War from DMIT



Source: Own elaboration.

Figure 3 shows a nuclear war architecture organized at DMIT levels. Specifically, it illustrates the development of CSSS, which tackle the complex issue of nuclear war using a multidisciplinary approach.

In the disciplinary field, studies focus on specific issues such as military science, nuclear physics, and international politics, providing the necessary knowledge to understand nuclear weapons, including their initial development, policies, and strategies. In the multidisciplinary field, it combines elements of the Cold War, nuclear deterrence, and political science, while maintaining interdependent relationships with military strategy, economics, psychology, and international politics as disciplines.

³ From the hermeneutics developed in this chapter, our own approaches are made, without departing from the primary sources highlighted herein.

⁴ As stated, to reach a single process, it is necessary to take into account a multiplicity of associated topics and factors. Figure 3 summarizes many of these elements mentioned.

Furthermore, the interdisciplinary approach combines international relations, international law, and nuclear technology to establish agreements like the Nuclear Non-Proliferation Treaty (NPT), which influences international security policies and strategies. Lastly, complexity is addressed in military science and technology from ethical, bioethical, environmental, and sociological perspectives caused by nuclear war as a factor in CSSS. This analysis, in turn, opens up other research angles: global security, climate change, and environmental sustainability.

Based on the previous example, Figure 4 shows a diagram of nuclear war architecture from DMIT. From a broader and more holistic perspective, the proposed architecture outlines some of the topics, sciences, and disciplines that, from *multiple disciplines*, analyze the strategic environments affecting security on the planet.

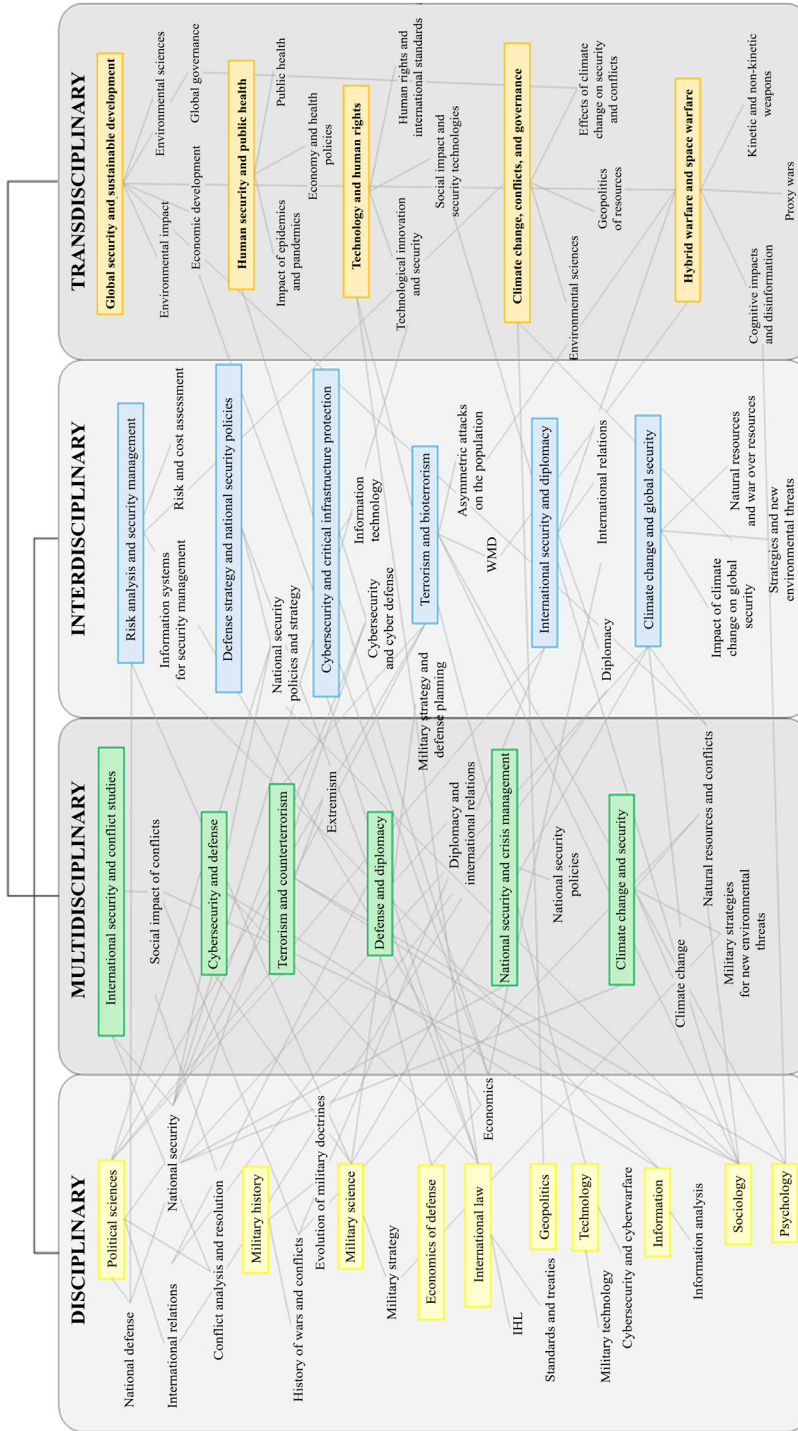
Holistic View of Security from CSSS as a Product of the Architecture

Figure 4 shows how CSSS has developed to address the increasing complexity of global challenges. From a basic understanding of core principles to the full integration of multiple knowledge fields, this structure enables a more comprehensive and detailed view of security. By grasping how these levels are connected and reinforced, policymakers, scholars, and strategists can create more effective and flexible responses to threats and opportunities in today's world.

In summary, the epistemological approach of SS enables analyzing the use of military and armed force by considering both the internal and external dynamics of conflict, and assessing how these actions generate political effects and allow stakeholders to achieve their objectives (Bueno, 2018).

In this regard, a pathway is proposed to develop SS in security issues that simplify the complexity of the challenges related to the emergence of global security. As Bueno (2018) states, SS serves as an epistemological tool to analyze the use of force with military or armed means and methods, considering both internal and external elements and dynamics of conflict, as well as the political effects it creates and how stakeholders may use it to reach their goals (p. 241).

Figure 4. CSSS Architecture



Source: Own elaboration.

Conclusion

The chapter reflected the conceptual and methodological evolution of CSSS, emphasizing the importance of addressing current challenges and using DMIT approaches—integrators of study topics—to gain a comprehensive understanding of global security. These CSSS should be developed as an architecture that enables interconnection and cooperation among multiple disciplinary approaches. They should also begin with the traditional view of military strategy and adapt to modern complex issues such as cybersecurity, the multidimensionality of security threats, hybrid threats, and climate change impacts, to provide tools for anticipation and adaptability. Lastly, the significance of the conceptual framework must be highlighted, as it helps structure policies and strategies at all levels, allowing for effective responses to twenty-first-century threats and establishing a foundation for research on global security.

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