



Universiteit
Leiden
The Netherlands

**From chemical weapons prohibition to avenues in AI arms control:
What are the implications of great power dynamics and armament
characteristics on international cooperation?**

Szegedi, Elena

Citation

Szegedi, E. (2024). *From chemical weapons prohibition to avenues in AI arms control: What are the implications of great power dynamics and armament characteristics on international cooperation?*.

Version: Not Applicable (or Unknown)

License: [License to inclusion and publication of a Bachelor or Master Thesis, 2023](#)

Downloaded from: <https://hdl.handle.net/1887/3765530>

Note: To cite this publication please use the final published version (if applicable).

Bachelor Thesis

Elena Szegedi

S2960397

Leiden University

B.Sc. Political Science: International Relations and Organisations

Bachelor Project: Grand Strategy in the 21st Century

Supervisor: Dr. Paul van Hooft

The Hague, Netherlands

Spring 2024

Word count: 7991

**From chemical weapons prohibition to avenues in AI arms control:
What are the implications of great power dynamics and armament characteristics on
international cooperation?**



**Universiteit
Leiden**

Table of Contents

1. Introduction	3
1.1 Literature Review	4
1.2. Theoretical framework	6
1.3 Methodology	7
2. Analysis	9
2.1 Cold War	9
2.1.1 International cooperation during bipolarity	10
2.1.2 Chemical weapons regulation	12
2. 2. 21st century	14
3.1 International cooperation during multipolarity	15
3.2 Regulation attempts for military AI	17
4. Discussion	20
5. Conclusion	21
6. References	23

1. Introduction

New technology has been proven to be a game-changer in warfare (Brimley, Fitzgerald & Saylor, 2013, p. 4). Particularly, governing the military-use of artificial intelligence (AI) systems proves demanding. AI enables an advanced future warfare by modernizing military in multiple ways such as improvements in accuracy of strikes, remote warfare through unmanned aerial vehicles (UAV) to dual-use weapons via drone swarms as well as AI enabled autonomous decision-making weapons (Johnson, 2020; Rossiter, 2021; Akiyama, 2021). While this revolution is ongoing, implications are still uncertain. Hereby, literature warns of an age of global instability and even a potential nuclear escalation. The concern evolves particularly around AI's critical infrastructure for arms control, as it can be used for both civilian and military ends (Ingersleben-Seip, 2022, p. 782). Respectively, scholars have highlighted the hardship of monitoring compliance due to the dual-use nature of the technology. Still, experiencing this phenomenon is not a recent development. Over the course of history, humankind faced comparable discrepancies with indistinguishability and commercial integration of chemical weapons during the Cold War (Volpe and Vaynman, 2023, pp. 599-601). Therefore, the urgency to derive knowledge from these past lessons to tackle this challenge of the 21st century is pronounced.

Simultaneously to these challenges generated by the new military revolution and the characteristics of this modern technology, scholars increasingly pay attention to contemporary global power dynamics. China's rise and investments in military capabilities as well as Russia and the United States (U.S.) presence winds up geopolitical tensions in a multipolar world order (Johnson, 2020, p. 433). Competition surrounding the modern technology tremendously enhancing one's military may have considerable implications for the creation of AI arms control (Depp, 2023).

Due to the lack of research on the combined political and technological context as well as showcasing the latter with a comparative case study, this paper will delve into both by analyzing the subsequent research question: *From chemical weapon prohibition to avenues in AI arms control: What are the implications of great power dynamics and weapon characteristics on international cooperation?* In answering this question, the analysis will reveal how great power structures and armament characteristics influence cooperation by deriving lessons from chemical weapons prohibition to the contemporary challenge to regulate military AI. Thus, the following sections will follow a comparative case study to analyze the past approach and

highlight intricacies for prospective AI regulations. Therefore, the polarity concept and the security-transparency trade-off will generate this paper's hypotheses. The results of the research yield that great power dynamics exhibit a significantly higher effect on cooperation than technology characteristics do.

1.1 Literature Review

Multiple scholars raise awareness to the current security concerns the world faces due to the revolution of AI and their application in military systems (Johnson, 2020; Akiyama, 2021; Geist & Lohn, 2018). Therefore, the following literature review will provide an overview about 1) the intricacies involved with AI characteristics, 2) the urgency for arms control as well as 3) the complex geopolitical dynamics involved.

Firstly, there is a specific complexity about the nature of the AI technology disclosed, namely its dual-use deception. Its features of distinguishability and integration pose the most considerable obstacle to cooperation. The former describes the ability to distinguish between civil and military use. It proves relevant for the ability of monitoring states and verifying compliance with arms control measures involved. The latter explains the level of integration of the technology within the civilian economy and military spectrum. The more ubiquitous the technology, the greater the complexity to prevent information disclosure (Volpe & Vaynman, 2023, pp. 601, 627). Respectively, image recognition, process automation, speech translation as well as machine and deep learning fall under the umbrella of the widespread AI technology (Garcia, 2023, p. 275). Thus, the issue of sharing this ubiquitous technology with the enemy is greatly apparent. Through exports of the commercial version and the intricacy of differentiating the dyad, especially concerning economic effects, ignited a fierce debate only post-World War II (Reppy, 2006, p. 2). Particularly, as this wide-ranging technology continues to be developed to enhance military weapon systems too. This rapid proliferation of military AI is counted as one of the few major global risks humanity is facing (Garcia, 2023, p. 276).

Secondly, determination for arms control derives from the machines' ability to act autonomously and in real time which affirms alarming. A wider risk of AI system's military-use is undermining nuclear stability and the likelihood of a nuclear escalation (Johnson, 2020, p. 422). The extreme speeds and autonomous ability of AI generate a compressed decision-making timeframe (p. 427). As AI capabilities evoke this tremendous pressure among decision makers midst a crisis, this spirals into a rising possibility of accidental warfare (Geist and Lohn, 2018, p. 11). Moreover, the unlawful war of aggression against Ukraine is currently at display

and is said to constitute the test base of AI autonomous weapons. This exemplifies the necessity for a global regulation, as those have been proven to have a pacifying effect by inter alia limiting human costs (Garcia, 2023, p. 276). Other scholars have also identified the high priority to govern military AI via international cooperation. Creating frameworks or prohibitions proves essential and pivotal to counter potential conflicts and escalations (Von Ingersleben-Seip, 2022, p. 785; Johnson, 2020, p. 439). Still, the complexity to tangibly assess the capabilities of the software-based technology, ergo control or govern its military application as well as monitor and verify compliance proves demanding, particularly considering its duality attribute (Akiyama, 2021, p. 167). An illustration for the complexity to reach cooperation is the AI advancements in combination with satellites, which may allow effective verification of treaties compliance. However, the inclusion of this new capability again raises the unlikelihood of entering into new agreements as it may entail a potential exploitation of yet unknown security vulnerabilities (Vaynman, 2021, pp. 36-37).

Thirdly, all great powers recognize the relevance and opportunities military artificial intelligence facilitates. Vladimir Putin, the President of Russia declared that “whichever country becomes the leader in AI will become the ruler of the world” (Petrella, Miller & Cooper, 2020, p. 75). Not only the Russian military aims to capitalize on military AI systems, but also China is ambitious to become world leader in AI technology by 2030 (Churchill, 2018, p. 10). Still, the military-technological superiority of the United States persists undeterred by the information and communication technology revolution and globalization. Even though the U.S. is considered superior, historical progress around the central competition for the most advanced military systems has ultimately caused weaponry to look much the same globally (Gilli & Gilli, 2019, pp. 143-147). The fast pace of technologies to spread internationally is particularly the case for those which are driven by commercial incentives rather than solely for military purposes. As AI features the former, competition is more wide-ranged (Horowitz, 2018, pp. 46, 51). An arms race for the most advanced military AI between China and the United States has prospects of undermining cooperation. Thereby, it is argued that managing AI is impossible with international institutions (Volpe and Vaynman, 2023, pp. 627-628).

Although the arguments proposed showcase the difficulty to control military AI, there are examples for successful cooperation. These include the Chemical Weapons Convention (CWC), the Biological Weapons Convention and the Montreal or Ozone Protocol (Garcia, 2023, p. 296). Thus, historical developments elucidate the pursuit of such global frameworks on dual use technologies (Reppy, 2006, pp. 1-2). In respect to the CWC, the nature of the technology

demonstrated the intricacy to differentiate production facilities from civilian and military utilization. The latter ultimately led to negotiation issues for monitoring compliance (Dunn, 1989, p. 212). Still, the high industrial integration of the technology – a feature it shares with AI - was overcome amidst state actors vying for supremacy in several revolutionary technologies such as chemicals (Horowitz, 2018, p. 51). This implies that a regulation for military AI is possible despite the difficulties faced due to the nature of the technology and geopolitical rivalries (Garcia, 2023, p. 281).

Therefore, the challenge to regulate military AI, a field which continues to advance, is demonstrated in the delay by great powers U.S., Russia and China. A responsive framework to account for the speed of AI tech development and counter possible hazardous consequences is needed to spur on global conversation (Depp, 2023). Respectively, the influence of the geostrategic balance for potential future conflicts and crises shall not be disregarded. (Johnson, 2020, p. 424). Contrastingly, research predominantly presents the unease about how AI may impact the geopolitical situation but barely on how the current emerging power dynamics influence the future of AI (Horowitz, 2018, p. 38; Johnson, 2021, p. 352). Notwithstanding, the application of AI in military systems proves to be an influential factor in international relations.

As showcased, scholars primarily concentrate on the complexity to handle the intricacy to monitor new arms and limited on the influence of the global political situation, which may hinder or reinforce the goal to establish respective arms control. While these aspects are being considered separately, they generally occur simultaneously. Hence, the following research paper will take both into account, the nature of the political situation as well as the nature of the technology and aims to answer this question: *From chemical weapon prohibition to avenues in AI arms control: What are the implications of great power dynamics and armament characteristics on international cooperation?*

1.1 Theoretical Framework

In order to analyze the impact of geopolitical dynamics and weapon characteristics on arms control measures, the polarity concept derived from international relations (IR) theory and the security-transparency concept will provide the basis for hypotheses and thus need further elaboration.

The concept of polarity explains the international order by demonstrating the distribution of power. From unipolarity, bipolarity to multipolarity, scholars highlight different dynamics and possibilities for cooperation depending on the number of superpowers in the world. If one state

is superior with no significant rivals it is said to be the most stable system, thus providing an ideal premise for cooperation. When two major powers compete for hegemony, these form a bipolar system in respect to these dynamics. Multipolarity describes a power distribution among more than two superpowers and is characterized as less stable than the previous ones, thereby exhibiting less ease to cooperate. The power of a global actor is measured according to its material capabilities such as economic and military levels (Wardhani, 2021, pp. 106-108). As this polarity concept facilitates comprehension about the underlying power structures which shape possibilities and limitations for cooperation and arms control respectively, the cases examined in the following research will be investigated under this concept.

Furthermore, in navigating the intricacy of the dual nature of artificial intelligence as well as chemical weapons, Vaynman (2021) elucidates a states' strategy through the security-transparency trade-off. In terms of arms control agreements, this concept describes the exchange between transparency and security, as the degree of transparency creates security costs and may outweigh the benefits. One influential factor is the ability to monitor compliance which affects the prospect for norm creation (p. 35). In regard to AI, it plays a significant role for inter alia nuclear security. By means of incorporating the technology, crucial improvements in remote sensing for reconnaissance as well as the ability to track and monitor enemy nuclear capabilities facilitate more risks and security challenges (Futter & Zala, 2021, p. 266). In an earlier piece, Coe and Vaynman (2020) argue that this security-transparency trade-off has significantly undermined attempts to control arms internationally (p. 343). In light of great power competition over the economic and military sector, AI as a fundamental advancement to those spheres plays a crucial role. As discussed, AI impacts the feasibility of monitoring and is thus significant for the creation of arm control measures, which in turn is relevant to maintain strategic stability.

1.2 Methodology

As already indicated above, lessons from history will be applied alongside comparative methods to enable the generalization of findings from this single case to another similar case (Halperin & Heath, 2020, p. 168). The Most Similar Systems Design (MSSD) is applied as the selected technologies share the issue with the security-transparency tradeoff, but the crucial differing aspect constitutes the varying polarity system of the two time periods (p. 239).

The case selection for this comparative study is build on the shared dual-use features of the selected armaments. There is a persistent uncertainty about the future military use of AI as its

indistinguishability and high integration within military and civilian realms require tremendous detection ability for arms control (Volpe & Vaynman, 2023, p. 628). Drafting new rules for AI would address imprecisions in the area, particularly human-machine interaction is in dire need to be confronted via international law (Garcia, 2023, p. 294). Various papers utilize the history of nuclear arms control as a case study to compare and draw lessons for military AI governance (Baker, 2023, p. 6; Maas, 2019, p. 285). However, Volpe and Vaynman (2023) go into depth with those technologies sharing the crucial duality feature. Visualized in their table about dual use attributes and outcomes as well as analyzed later in their paper, the authors scope down to the high integration of chemical weapons in civilian use contrastingly to the apparent other potential comparative case of nuclear technology (p. 615). While both nuclear and chemical weapons occupy a niche role in the military, the latter shares the civilian integration characteristic with AI technology which proves pivotal for the comparison on the discrepancy of monitoring these technologies (p. 628). While chemical technology is heavily connected to the economic industry, nuclear technology is considered isolated from other infrastructure systems. Additionally, the development of nuclear weapons is costly, and its latency is physically observable, which excludes them as a fitting comparative case to AI for this paper's purpose and ultimately strengthens the suitability of chemical weapons. Respectively, successful agreements such as the 1925 Geneva Protocol and particularly the negotiations along for the Chemical Weapons Conventions constitute decisive parts for the upcoming analysis (p. 622). The objective is to identify fruitful avenues or potential building blocks through an analysis in great power dynamics and weapon characteristics which led and may lead to international cooperation and potentially a prohibition act customized to military AI.

The similar discrepancies to govern the two cases of dual-use technologies introduced above are experienced between three periods marked by different great power dynamics. As the IR concept is used as a lens to compare these struggles, they are being adjusted according to the comparison between chemical weapons and military AI. Essentially the analysis will hold bipolarity and the beginnings of unipolarity on the one hand and multipolarity on the other. Respectively, the well-acknowledged bipolarity during the Cold War serves as the first case. During that time the application of chemical weapons as well as united effort to prohibit these arms is apparent by the U.S. and the Union of Soviet Socialist Republics (USSR). They were considered the major powers at the time as both had substantial economic and military capabilities (Johnson, 2021, p. 371; Thies, 2013, p. 269; Mansfield, 1993, p. 110). Unipolarity directly succeeds the Cold War but is only discussed to the extent in which it covers the process

of chemical weapon arms control. Thus, it will be integrated in the section with the previously mentioned era. Moreover, the emerging multipolar world system amidst the challenge to govern AI will constitute the second case. As highlighted in the previous literature review Russia, China and the United States represent the main powers in this contemporary power structure.

Thus, the analysis will compare the avenues to chemical weapon prohibition to the ongoing military AI revolution based on weapon characteristics as well as the polarity power dynamics. Based on the theories introduced above, the following hypotheses emerge:

H1: In a bipolar system, international arms control is less complicated to achieve than during multipolarity.

H2: The possibility to trace a military application of dual-use technology creates security and thus has a positive effect on arms control.

Primary and secondary data will be gathered to test the hypotheses identified above and further investigate the research question. The aim is to delve into academic scholarship, official government statements, speeches and documents which are concerned about the process from chemical weapon application leading to international cooperation and respective arms control as well as the contemporary difficulty to regulate military AI and the impact of power structures within both cases. By analyzing these scholarly contributions and official publications in detail, this paper attempts to answer the research question and the hypotheses.

2 Analysis

The subsequent section is structured to answer the research question and the hypotheses in two parts. The first will give insights from the past, while the second will dive into contemporary dynamics. Both will cover existent power structures as well as regulation endeavors. Overall, the analysis will provide the findings which will be jointly discussed later.

2.1 Cold War

The Cold War era is marked by complex but productive negotiations among decision-makers. Those ultimately paved the way for the “golden times for arms control” which immediately followed the Cold War (Galbraith, 2021, p. 86). Still, the period is viewed as a “weak two-power concert” as the Soviet Union and the United States engaged in competitive behavior in which their security priorities worked for cooperation (Wohlforth, 2009, p. 48).

Based on the polarity of great powers and the dual-nature technology, the following section will first take into account the political situation and secondly the intricacy of creating arms control for chemical weapons that exhibit the same dual-use characteristics as AI. The former is analyzed in respect to how the bipolar superpower system shaped cooperation efforts, particularly in civilian and military spheres. The latter will delve into the historical process and the specific maneuver of monitoring and verifying past agreements as well as the Chemical Weapons Convention.

2.1.1 International cooperation during bipolarity

After World War II ended, the Soviet Union and the United States experienced disagreements. While Stalin aimed to advance communism across Europe, the U.S. committed to liberal principles and capitalism. This contention paved the way for enduring mistrust on both ends. (Lightbody, 1999, pp. 5-6). Respectively, the Supreme Soviet election address in 1946 was interpreted by U.S. officials as a Soviet threat and was called “the declaration of World War Three” (Lightbody, 1999, p. 22). Following President Truman’s announcement of a necessity to prevent the prevalence of communism is seen as a critical juncture towards steadily increasing hostility and estrangement. Thereupon, security efforts were reviewed in the West and resulted in the formation of the US-led NATO (North Atlantic Treaty Organization) alliance in 1949. The counter response was the creation of the Soviet-led Warsaw Pact in 1954, which emphasized the division of the East Block to the West (p. 23). Thus, the bipolar power formation began in 1949 with the obtainment of nuclear arms by the USSR as well as the split of West and East Germany (Thies, 2013, p. 272). The latter was engrained as a symbol of the Cold War confrontation and lasted until the reunification of Germany in 1990 (Lightbody, 1999, p. 28). At that, bipolarity prevailed until 1989, but throughout the years polarization declined via *détentes* after tension climaxes such as the Cuba crisis and the Vietnam war (Thies, 2013, p. 282).

The fundamental approach of the Soviet-US relationship was “strategic stability” (Kuklinski, Mitchell & Sands, 2020, p. 83). The end of American nuclear superiority initiated instability inducing relentless advancements in military systems. The competition in military capabilities culminated during the Cuban Missile Crisis in 1962, when the Soviet Union and the United States were on the verge of besetting into nuclear war. The bipolar states evolved their relationship through phases of competition, coexistence and cooperation which was marked by a new arms race and political turmoil. Respectively, this race brought stability via the threat of potential surprise attacks and fear of applying weapons of mass destruction (WMD) which

could cause an annihilation of both parties. This approach is known as the strategy of mutual assured destruction (MAD), which led to reciprocal deterrence and influenced decision-making on both sides (pp. 83-84). While the complexity to analyze USSR machinery purchases which demonstrates wide ranges of Soviet military expenditure, a conducted analysis indicates a tremendous increase (Central Intelligence Agency [CIA], 1986). Another source states that military spending roared to an unprecedented high level between the two superpowers. It even excelled economic expenses by becoming 10 times higher than during the World War II period (Omitoogun & Sköns, 2006, p. 272). In particular, both countries obtained the largest nuclear arsenals during the Cold War, which not only comprised sophisticated early-warning and detection systems of a potential adversary nuclear attack, but also land-based intercontinental ballistic missiles (ICBMs) and air-launched nuclear-tipped missiles (Boulanin, 2019, pp. 43-44).

The USSR-US relationship matured over time as the interest of reducing the likelihood of war facilitated further exchange, collaborative action and an exercise of mutual restraint. This phase triggered several meetings and summits which created treaties such as the Test Ban Treaty of 1963, Non-Proliferation Treaty (NPT) of 1968, Strategic Arms Limitation Treaty (SALT) of 1972, Intermediate Range Nuclear Forces (INF) Treaty in 1987, Strategic Arms Reduction Treaty (START) in 1991 and so forth (Kuklinski, Mitchell & Sands, 2020, p. 84). The Soviet Union-United States statements report that meetings are considered useful although contrasting views remain apparent. The necessity to engage in continued discussions was voiced as well as the priority to prevent any conventional or nuclear war between the USSR and the U.S. (National Archives, 1985). Three years later, the report provided more elaborate information about the progressive developments achieved. The summit is described as satisfactory in terms of concrete understandings, emphasizes a determination to intensify these endeavors and reaffirms the agreement to undermine any potential war between the two major powers. The aim is to promote international stability and security via equal commitment and work to build arms control measures (National Archives, 1988). Respectively, the Soviet Union had been experiencing economic pressure, which Shifrinson (2018) identifies as U.S. strategy by limiting their flow of goods and services via multiple channels to the USSR (p. 121). The Soviet Union's condition of economic and political stagnation led Soviet officials to attend umbrella talks and negotiate on the basis of United States proposals. The scholar highlights arms control talks as they set the pace for the relationship of the two, before the Cold War came to an end (p. 125).

These instances demonstrate that cooperation was still possible notwithstanding that ideological misunderstanding, the existence of nuclear weapons and a tremendous arms race influencing the relationship between the great powers. However, it must be noted that more agreement is seen at the end of the Cold War which was found to be part of a degrading phase of bipolarity or rising time for essentially unipolarity.

2.1.2 Chemical weapons regulation

The application of chemical weapons during World War I marked violations of a prohibition norm included in The Hague Declaration (Dunn, 1989, pp. 209-210). The battlefield served as testing ground for several new weapons which caused significant catastrophes. This destructive ability of gas shed light to the tremendous violence of modern warfare. Still, the experiences from the First World War were decisive in the creation of the following Geneva Protocol in 1925 (Price, 2007, p. 166). A respective lack of confidence in such treaties was inscribed at the time, thus the belief in effectiveness of the ban on applying chemical weapons was apparent by the international community laid down in Geneva (p. 167). Serving as an extension and reaffirmation of the Versailles Peace Treaty of 1919, the Conference officially prohibited the use of poisonous gases such as chlorine, mustard and phosgene. Several parties ratified the agreement shortly after their signing, yet with substantial gaps involving the internally debated approach of the United States which only did so in 1975. The report about further approximation to adhere to the prohibition laid out in the Protocol emphasizes concerns about the distinguishability of peaceful chemical utilizations contrasting to lethal purposes (U.S. Department of State, 2002).

The respective weakness of the Geneva settlement laid out by Price (2007) is further demonstrated by the application of the lethal weapon during the Ethiopian War, the use during the Second World War in Nazi concentration camps, the Vietnam War, Egypt against Yemen as well as in the Iran-Iraq war (“A Brief History of Chemical War”, 2015). Moreover, the arms race between the Soviet Union and the United States did not halt with lethal chemical agents and munitions. By 1990 the Soviets possessed a larger arsenal than the U.S. stockpile comprising 31,500 tons (Arms Control Association, 2024).

Throughout the Cold War and the continued application of chemical weapons, awareness between the great powers to counteract destructive arms including both chemical and nuclear weapons grew. Both the U.S. and the Soviet Union affirmed the necessity to not only prevent the use, but also destruct existing arsenal. Experts on those arms have emphasized the need to

address the question of verification for an effective international prohibition (National Archives, 1985). Later negotiations raised awareness and relevance on transparency about the dual-capable chemicals and their respective purpose. It was intended to act as confidence-building measure and thereby foster a strong basis to further enhance multilateral cooperation (National Archives, 1988). In that regard, Dunn (1989) emphasizes the reluctance of the two superpowers to share the relevant information due to security risks (p. 212). Particularly the high integration of chemical technology in the civilian economy constrains cooperation as permission to inspect particular weapons or facilities – hence an increase in transparency - increases security concerns (Volpe & Vaynman, 2023, p. 609). Thus, regulations surrounding chemicals within civilian industry remain to be resolved. The complexity to address the issue of monitoring compliance via a complete prohibition is set as one of the most fundamental drawbacks (Dunn, 1989, p. 212).

Nevertheless, the international community did not discard the matter, but created an international Organization for the Prohibition of Chemical Weapons (OPCW) in 1993. The convention incorporates the obligation of every state party to destroy its own stockpile, a disengagement to use the weapon as well as a prohibition on the production of it. Article II of the Convention delves into the definition of chemical weapons and emphasizes the exclusion of toxic chemicals which intention for purpose are not prohibited alias those “designed to cause death or other harm” (Organization for the Prohibition of Chemical Weapons [OPCW], 1994). Moreover, Article IX about “consultations, cooperation and fact-finding” demonstrates the ability of state parties to request a clarification of a matter as well as an on-site challenge inspection in case of ambiguous doubts or concerns at any time (OPCW, 1994). Respective verification for investigations of alleged use, Part IX reveals the obligation of parties to list their chemical production facilities, transparency on the amount of PSF-chemicals – phosphorus, sulfur or fluorine – per year (OPCW, 1994).

193 member states are committed to eliminate this entire category of WMD via this convention. It is the most successful confidence-building measure to prevent proliferation by universally creating a verifiable prohibition on chemical weapons (OPCW, 2024). Nonetheless, years after the agreement sarin gas was applied during the Syrian civil war in 2013 (“A Brief History of Chemical War”, 2015). Most recently, Russia is said to use poison gas against Ukrainian forces, which would constitute a violation of the international agreement (Méheut & Santora, 2024). Overall, demonstrating the favorable outcome of an elimination of existing stockpile and the

curtailment of the acquisition, but also showcasing the limitation in maintaining a complete nihility of the weapon.

In the case of Syria, the OPCW responded in unison with the United Nations (UN) via fact-finding missions and resolutions to pressure the destruction of their chemical stockpile. Respectively, emphasising the united effort of Russia and the U.S. to counteract Syria's arsenal. Subsequently, Syria reported the amount of precursor chemicals which the OPCW declared to have eliminated by 2016 (Arms Control Association, 2019). As uncertainties about the completion remain and to ensure Syria's compliance to the convention it subjected to, active mandates on OPCW missions to investigate the status continue. (OPCW, 2024b). In regard to the recent reciprocal allegations by both the Russian Federation and Ukraine, the OPCW has not received a request for investigation and resumes to monitoring (OPCW, 2024a). Hence, Syria's commission of perjury on the reported chemicals represents the cause for the convention's pitfall. In midsts inconstancy about current utilizations in Ukraine, causes for a potential breach deem insignificant.

The presented findings showcase the possibility to adapt regulations to dual-use technologies, particularly as the CWC covers dynamic parts to counter the intricacy of monitoring. While outliers certainly exist, the CWC still deems successful which in turn may affect future regulations concerned with similar issues such as military AI.

2.2 21st century

Contemporary geopolitics are experiencing the effects of a rising China, a more belligerent Russia and the United States as defender of liberal rights and democracy. Coming to an understanding of military-political and military-technical cooperation to minimize perceived threats and mistrust, thus averting conflict is considered crucial (Kuklinski, Mitchell & Sands, 2020, pp. 82-83). However, cooperation has faded between the U.S. and its authoritarian counterparts as technological military advancements initiate sophisticated tools for monitoring as well as concealment (Galbraith, 2021, p. 86)

First, the contemporary multipolar tendencies in global politics will be laid out. Existing literature, official statements as well as speeches and news publication will provide insights into the respective power dynamics. Second and last, the intricacy of establishing arms control measures for the military use of artificial intelligence is analyzed as well as present attempts thereto.

2.2.1 International cooperation during multipolarity

The multipolar international system in the 21st century indicates that America as a dominant superpower in geopolitical matters is not permanent (Dalby, 2011, p. 40). Still, cooperating with China and Russia is crucial for security and stability among the global community (Bolt & Cross, 2018, p. 299). However, the Russian attack on Ukraine has deteriorated the fragile, historically marked relationship between the United States and Russia (Sokolshchik & Sokolshchik, 2023, p. 469). Concerning this matter, the U.S. president sheds light on the relationship with Russia by urging “we have to stand up to Putin” referring to the Ukraine invasion (The White House, 2024). Contrastingly, the cooperation between Russia and China represents mutual respect and equality as both global powers concentrate on enhancing a united strategic stability (Bolt & Cross, 2018, p. 291). When Russian President Vladimir Putin and Xi Jinping convened in talks during the Third Belt and Road Forum for International Cooperation (BRF) in China, the presence of Putin was seen as supportive towards Chinese goals. As members of the Eurasian Economic Union (EEU) as well as BRICS (Brazil, Russia, India, China, South Africa) they strive to strengthen their cooperation during an era of contemporary geopolitical changes. Particularly, the recognition of China’s sovereignty including Taiwan as their territory is pivotal to further expand the “comprehensive strategic partnership” (FMPRC, 2023a). In addition, they share an opposition to democratization which demonstrates the key notion of a deepening rivalry among the multipolar powers (Sokolshchik & Sokolshchik, 2023, p. 478). Although, the two authoritarian powers are partners who have been accelerating their ties, they are not considered allies (Bolt & Cross, 2018, p. 298).

Further analysis on the economic competition in respect to modern technology demonstrates the interaction between the United States and the PRC. The decisive capability of a great power is displayed by their financial performance. According to the data derived from the International Monetary Fund (IMF), the Chinese growth has been persistent and is seen as main contributor to the world’s economic development, 8% more than the U.S. (Prasad, 2023, p. 54). Investments to advance the economy are mainly state driven which minimizes the likelihood of financial crisis as the government maintains stability (pp. 57-58). However, a need to improve productivity has been articulated which is set to be done via global trade such as with the United States. Foreign technology in particular would upgrade Chinese industry, but the geopolitical rift could limit their access to those external markets (p. 56). Thereupon, a state of the union address President Biden states that not Chinas but American economy is on the rise. China is unable to use U.S. technologies and Biden expresses his wish to win the competition

rather than engage in conflict with the PRC – indicating an interest for international stability (The White House, 2024). In comparison, a Chinese perspective via a speech by ambassador to the U.S. Xie Feng sheds light on the relevance to work on their relationship and not mess it up. He emphasizes common interests as focal points, to let continuous dialogue dictate the way forward and actively remove obstacles to further spark a “new boom in people-to-people exchanges” (FMPRC, 2024).

These three major powers constitute a so-called “strategic triangle”, in which their focus is to maintain stability by managing the interests of the respective nations (Bolt & Cross, 2018, p. 298). In this regard, the national defense strategy of the United States of America entails information on geopolitical dynamics and highlights the essential improvement of American deterrence abilities towards the People’s Republic of China (PRC) and Russia. The document refers to Russia as an “acute threat” due to the escalation of its war against Ukraine. Russia as well as the PRC are seen to pose “dangerous challenges” to American homeland. Regional hotspots for competing influence with U.S. rivals are the Taiwan Strait, South China Sea as well as the Middle East comprising vital national interest. The strategy also emphasizes a need to strengthen cooperation with NATO Allies and other partners to maintain stability (U.S. Department of Defense, 2022). Contrastingly, Xi Jinping addresses “friendly Americans” in a speech in the United States. The President of the PRC first delves into past partnership developments marked by differences and estrangement. He calls for the necessity to “forge a closer bond between our people and to open our hearts to each other” and emphasizes the Chinese interest for stability, but still recognizes the contemporary era of challenges. The question “are we adversaries, or partners?” showcases the intricate position of the two states. His following answer “China is ready to be a partner and friend of the United States” indicates the PRC’s intention to ease tensions but can also be understood as spotlighting on a missing American initiative thereto (Ministry of Foreign Affairs of the People’s Republic of China [FMPRC], 2023b).

Moreover, an exacerbation can be observed in recent news publications. Biden’s remark on Chinese leader Xi Jinping being a “dictator” is considered a political provocation (Hawkins, 2023). The statement came as response to a Chinese spy balloon flying over the United States resulting in an aggravation of US-China tensions (Hawkins, 2023). In addition, the US president magnified the strained relationship with Russia by calling President Putin a “crazy SOB” (Waldenberg, 2024). In addition, Biden discloses his consistent worry about a potential

nuclear war and receives Russian feedback as being a “huge disgrace” for the U.S. (Waldenberg, 2024).

Based on this analysis, economic interests, ideology as well as state leaders significantly impact the relationship among all three powers. Thus, this observation illustrates that multipolarity itself seems less vital to study great power dynamics.

2.2.2 Regulation attempts for military AI

The multifaceted applicability of artificial intelligence in both the civilian and military sector has facilitated a contemporary challenge to utilize the potential the modern technology provides for our societies but simultaneously tackle the security risks it entails. Superpowers have disclosed their intentions to lead AI governance (Cheng & Zeng, 2023, p. 794). Semiconductors and the respective companies to develop these AI capabilities are of strategic importance, particularly in the economic US-China competition (Connolly, 2023, p. 5). However, not only technology cooperation is considered crucial. Especially in the military domain the demand to regulate AI is highly apparent, particularly due to an increased risk of nuclear escalation enabled by automated decision making (Akiyama, 2021, p. 167; Johnson, 2021, p. 430).

The forthcoming paragraphs offer a comprehensive overview about attempts and strategies employed at governing AI. Dialogue between experts and leaders highlights the intricacy of the technology to be controlled on a military level in regard to ongoing tensions among the pivotal great powers.

The United Nations has introduced a Group of Governmental Experts (GGE) on Lethal Autonomous Weapon Systems (LAWS) as part of the Convention on Certain Conventional Weapons (CCW) which aims for global arms control measures (United Nations [UN], 2023a). However, the definition and characterizations for this technology still varies with different approaches specified (UN, 2023b). Already in 2013, UN Special Rapporteurs have called for a global prohibition on lethal autonomous weapons. Moreover, the Secretary-General António Guterres has recommended to involve this weapon to belong to legally binding instrument part of international humanitarian law as its function without human control poses an immense security threat (UN, 2023a).

The International Security Advisory Board (ISAB) analyzed the impact of AI on arms control. The document recognizes the danger this modern technology poses and provides possible steps for drafting policies. One recommendation towards LAWS includes to “aggressively pursue

agreement on the Political Declaration”, thus ensuring the endorsement by a large number of states to proceed with a regulation implementation (International Security Advisory Board [ISAB], 2023). The latter refers to the U.S. Declaration on the Responsible Military Use of AI and Autonomy, which constitutes a normative framework aiming to address the application of AI military capabilities. Respectively, the annual Responsible AI in the Military Domain Summit (REAIM) facilitates knowledge exchange, cooperation and consensus about the use of military AI. While several states have demonstrated their commitment, the great powers Russia and China are not participatory (U.S. Department of State, 2024). The Political Declaration demonstrates a unilateral approach from the U.S. and its allies, however there is a persistent necessity to expand these military AI norms to a multilateral statement. Particularly the involvement of Russia and China are required to implement an international prohibition on AI weapons. However, negotiations directed towards a united framework have yet been impeded (Depp, 2023). In that regard, the U.S. has urged the two great powers to join its declaration that AI will never make automated decision on detonating nuclear weapons. As to the application of nuclear weapons, China first demands to reach an agreement on a no-first-use treaty among nuclear power states. Meanwhile bilateral discussions on AI, respective risk management as well as arms control negotiations on nuclear weapons continue (Torode, 2024)

The previous section shed light on the apparent difficulties reaching consensus amidst diverging interests between the multipolar powers. In addition, the duality feature of AI application in military systems proves challenging for monitoring and verifying the compliance of states for arms control arrangements (Volpe & Vaynman, 2023, p. 601). AI is highly integrated in the industry and the distinguishability to its military counterparts is not easily discernible, thus creating loopholes for espionage and potentially disclosing economic or military confidential information (p. 610). Respectively, the ISAB report elaborates on those challenges involved in terms of trade and global supply chains. The critical infrastructure constitutes an intricacy over the association as defense good, and thus the option to append to the U.S. Military List (USML) for the International Traffic in Arms Regulations (ITAR) (ISAB, 2023, p. 30). Hereby, Baker (2023) provides a way to approach AI treaty hardware-based verification. A built-in mechanism in those computer chips which enable this computer-intensive AI-use facilitates a possibility to verify compliance (p. 23). Further, he raises the possibility of AI specialized chips to possess a unique identifier in order to allocate them to a certain state actor as well as to create an accounting mechanism for international organizations to keep track about the existence and location (p. 37). Additionally, the ISAB discloses a

possibility of AI forming the solution itself for issues with arms control and verification. As detection is facilitated by machine learning algorithms it could assist trade control on dual-use goods as well as reveal nuclear and other weapon proliferation activities (ISAB, 2023, p. 54).

Combining the difficulties posed by the political situation and the technological intricacies to control AI arms, the ISAB covers the upcoming approach on U.S. – PRC as well as U.S. – Russia relations. For China, it showcases the common interests in AI safety as well as the complexity to collaborate without enhancing their military capabilities (ISAB, 2023, p. 12). While the national interest comprises the preservation of national industrial competitiveness, the necessity to adjust technology competition strategy with the PRC is presented. The dual-use nature of the technology determines the strategy for collective engagement as well as a strong collaboration with experts in the field (p. 51). They recognize the high demand for international cooperation to be “an opportunity to negotiate with potential hostile powers” (ISAB, 2023, p. 39). A previous statement by the PRC acknowledges the concerns about an abuse of AI technologies as well as the enclosed benefits for society. A list of recommendations about regulation, research and development, utilization and international cooperation highlights awareness to unite for an international AI governance framework. While China calls on the international community to collaborate, it expresses its respect to different approaches by other countries (FMPRC, 2022). With regard to the latter, the PRC currently leads as top producer in the main fields of AI research. However, the race to lead in AI is ongoing with the U.S. and to set standards on how to utilize it globally. Still, “China is absolutely a world leader in AI research” (Snyder, 2024).

The ensuing illustration of the war in Ukraine demonstrates the application of LAWS in warfare as well as the advantage involved, such high speed decision-making which may exceed potentially undesirable repercussions by automated decision making (ISAB, 2023). In Ukraine the current testing ground of AI warfare is afoot (Garcia, 2023, p. 275). The state is currently relying on machine learning for their military drones to identify enemy forces and strike autonomously. Prior to the war, the Saker company produced civilian-use crop protection drones but then switched to military application. Through this technology, Ukraine is able to map out Russian positions in real time, rather than taking several hours when attempted by humans (Hambling, 2023). Multiple home-made UAVs were able to damage Russian forces, assists in identifying war criminals as well as mined areas. Contrastingly, Russia applies the modern technology to generate and distribute disinformation narratives (Tokariuk, 2023).

Altogether, the findings indicate several attempts to regulate military AI and suggestions to counter the dual nature of AI. As regards, the main obstacle for cooperation present the great powers themselves.

3 Discussion

Based on the research conducted in the previous chapters, this section aims to apply the knowledge acquired to answer the hypotheses.

Firstly, the polarity theory has demonstrated the discrepancies of geopolitical dynamics on arms control. The controversy surrounding the above recognized unipolar system embarking directly after the Cold War and in which the creation of the chemical weapons prohibition took place, poses a constraint to answer *H1*. Respectively, the analysis demonstrated that foundations for the latter were laid during a degrading phase of the bipolar power dynamics which undermines the hypothesis further. Despite the acknowledged misperception, it deems questionable whether the concept itself is influential at all for international cooperation or just the manner in which the one, two or three polar powers engage with. As showcased, during the Cold War a tremendous arms race alias high competition, an ideology battle, state leadership as well as the domestic economic distress influenced the way the Soviet Union and the United States acted towards each other, ultimately paving the way for the CWC. Primarily the application of lethal weapons seemed pivotal for the nations interests for an increased cooperation. Moreover, in the case of multipolarity during the ongoing contemporary geopolitical situation similar factors shape the dynamics for international cooperation. High economic competition in the technological sphere, the ideological confrontation between the United States and its allies versus authoritarianism represented via Russia and China as well as influential statements made by the head of states. Comparing the essentially two cases, a difference of economic prosperity and the similarity of constrain via nuclear deterrence as well as the tripartite relationship being bound by state leadership is apparent. Due to this great number of crucial confounders to this research, the polarity concept does not deem significant for this research. Thus, the *First Hypothesis* is not answerable.

Secondly, as showcased throughout the analysis on chemical weapons, the prohibition of the dual-use nature of the technology has been successfully established. Armament characteristics have proven to be challenging in creating a treaty, but the convention also demonstrates that accounting for those characteristics is possible, by means of specific investigation missions and fact-finding missions. Moreover, Baker (2023) as well as the ISAB (2023) have made

suggestions on how to detect artificial intelligence in general and a way to yield its benefits for dual-use military activity. While there is no certain pathway to trace the military use of AI itself yet, the historical example of chemical weapons suggests its possibility. Therefore, the *Second Hypothesis* is being supported.

Lastly, this research has yielded broader noteworthy findings. While weapon characteristics are considered influential, global power dynamics have a significant impact to a much greater extent. This does not lie in contrast to the previous statement made about the impact of AI on geopolitical tensions, but rather adds that these great power relations steer the tendency for arms control as well. As history suggests: If a united international interest for arms control persists, then the hindrance of armament characteristics can be overcome. The latter is however seemingly used as an excuse to divert from the unwillingness to cooperate due to other diverging interests or tensions which has been proven to be apparent in the contemporary geopolitical dynamics. If armament characteristics are not pivotal for arms control, which factors in great power relationships are? Respectively, more research is needed to analyze and detect the influential consideration for decision-making on armament control such as the role of ideology, political actors, economic situation, technological competition. Drawing on common interests between great powers, can the requirements for a united security cooperation be unveiled?

4 Conclusion

The comparison of the two case studies from the Cold War in combination with chemical weapon prohibition in contrast to the complexity for arms control on military AI in the 21st century has revealed insights into the multifaceted dynamics of great power politics as well as the impact of armament characteristics. Drawing on those lessons from the past, a detailed answer has been obtained for this paper's research question. While the dual-use nature of technologies presents an efficacy in contrast to the polarity concept, the dynamics between great powers have been demonstrated as most influential for international cooperation. Thus, the first hypothesis is demonstrated to be unanswerable due to several other influential causes listed before. The second hypothesis has been strengthened as transparency about technology use has a positive effect on arms control, if only to a certain extent.

To conclude, this research has filled a fraction of the gap in the literature by taking both geopolitical situation and weapon attributes into account simultaneously and in unison with a comparative case study on chemical weapons for AI. As discussed before, this study entails

limitations in regard to the clear distinction of the polarity periods, but also finds other aspects to be more meaningful. Respectively future research should explore these persuasive factors for agreement on arms control mechanisms, which include political actors, ideological elements, potential economic difficulties as well as competition surrounding influential technologies. Still, this paper has provided a clear foundation for prospective research in the field and underscores the relevance for continued academic analysis. Thus, the societal relevance lies with fostering an understanding about great power decision-making. Particularly, as recent AI developments in the military realm prove alarming. Another step towards the comprehension of great power decision-making in terms of AI arms control agreements is pivotal for global stability.

6. References

- Akiyama, N. (2021). AI nuclear winter or AI that saves humanity? AI and nuclear deterrence. In Von Braun, J. S., Archer, M., Reichberg, G. M., Sanchez Sorondo, M. (Eds) *Robotics, AI and Humanity* (pp. 161-170). Tokyo, Japan: Springer.
- Arms Control Association. (2019, March 14). *What You Need to Know About Chemical Weapons Use in Syria*. Retrieved from <https://www.armscontrol.org/blog/2018-09-23/what-you-need-know-about-chemical-weapons-use-syria>
- Arms Control Association. (2024, January 25). *The U.S. Cold War-Era Chemical Weapons Stockpile*. Retrieved from <https://www.armscontrol.org/factsheets/us-chemical-weapons-stockpile>
- Brimley, S., Fitzgerald, B. & Saylor, K. (2013). *Game changers: Disruptive technology and U.S. defense strategy*. Washington, DC: Center for a New American Security.
- Bolt, P. J. & Cross, S. N. (2018). *China, Russia, and twenty-first century global geopolitics*. Oxford, United Kingdom: Oxford University Press.
- Boulanin, V. (2019). *The impact of artificial intelligence on strategic stability and nuclear risk: Euro-Atlantic perspectives*. Stockholm, Sweden: Stockholm International Peace Research Institute.
- Cheng, J. & Zeng, J. (2023). Shaping AI's future? China in global AI governance. *Journal of contemporary China*. 32(143). 794-810.
- Churchill, O. (2018). China's AI dreams. *Nature Publishing Group*, 553(7688). 10-12.
- Central Intelligence Agency. (1986, May 19). *Estimating Soviet Military Hardware Purchases: The "Residual" Approach*. Retrieved from <https://www.cia.gov/readingroom/docs/CIA-RDP87T01145R000200280017-8.pdf>
- Coe, A. J. & Vaynman, J. (2020). Why arms control is so rare. *American Political Science Review*, 114(2). 342-355.
- Dalby, S. (2011). Critical geopolitics and the control of arms in the 21st century. *Contemporary Security Policy*, 32(1). 40-56.
- Depp, M. (2023). Making unilateral norms for military AI multilateral. *The Lawfare Institute*, <https://www.lawfaremedia.org/article/making-unilateral-norms-military-ai-multilateral#site-main>.
- Dunn, L. A. (1989). Chemical weapons arms control: Hard choices for the Bush administration. *Survival*, 31(3). 209-224.
- Everts, S. (2015). *A brief history of chemical war*. Retrieved from <https://www.sciencehistory.org/stories/magazine/a-brief-history-of-chemical-war/>.

- Futter, A. & Zala, B. (2021). Strategic non-nuclear weapons and the onset of a third nuclear age. *European Journal of International Security*, 6(3). 257-277. doi: 10.1017/eis.2021.2
- Galbraith, J. (2021). Introduction to the Symposium on new challenges in weapons inspection. *Cambridge University Press*, 115(1). 86-88. doi: 10.1017/aju.2021.1
- Garcia, D. (2023). *The AI military race: Common good governance in the age of artificial intelligence*. Oxford, United Kingdom: Oxford University Press.
- Geist, E. & Lohn, A. J. (2018). *How might artificial intelligence affect the risk of nuclear war?* Santa Monica: RAND Corporation.
- Gilli, A & Gilli, M. (2019). Why China has not caught up yet: Military-technological superiority and the limits of imitation, reverse engineering and cyber espionage. *International Security*, 43(3). 141-189.
- Glaser, C. L. (2000). The causes and consequences of arms race. *Annual Review of Political Science*, 3(1). 251-276.
- Halperin, S. & Heath, O. (2020). *Political research: Methods and practical skills*. United Kingdom: Oxford University Press.
- Hambling, D. (2023, October 17). Ukraine's AI drones seek and attack Russian forces without human oversight. *Forbes*, <https://www.forbes.com/sites/davidhambling/2023/10/17/ukraines-ai-drones-seek-and-attack-russian-forces-without-human-oversight/>.
- Hawkins, A. (2023, June 21). Political provocation: China hits back as Biden calls Xi 'dictator'. *The Guardian*, <https://www.theguardian.com/us-news/2023/jun/21/joe-biden-calls-chinese-president-xi-jinping-dictator-antony-blinken-china-visit>.
- Horowitz, M. C. (2018). Artificial intelligence, international competition and the balance of power. *Texas National Security Review*, 1(3). 36-57.
- International Security Advisory Board. (2023, October 31). *Report on the Impact of Artificial Intelligence and Associated Technologies on Arms Control, Nonproliferation, and Verification*. Retrieved from https://www.state.gov/wp-content/uploads/2023/11/ISAB-Report-on-AI-and-Associated-Technologies_11172023-Accessible.pdf
- Johnson, J. (2020). Deterrence in the age of artificial intelligence & autonomy: A paradigm shift in nuclear deterrence theory and practice? *Defense & Security Analysis*, 36(4). 422-448.
- Kuklinksy, C. T., Mitchell, J. & Sands, T. (2020). Bipolar strategic stability in a multipolar world. *Journal of Politics and Law*, 13(1). 82-88.
- Lightbody, B. (1999). *The Cold War*. London and New York: Routledge.

- Maas, M. M. (2019). How viable is international arms control for military artificial intelligence? Three lessons from nuclear weapons. *Contemporary Security Policy*, 40(3). 285-311.
- Mansfield, E. D. (1993). Concentration, polarity and the distribution of power. *International Studies Quarterly*, 37(1). 105-128.
- Méheut, C. & Santora, M. (2024, May 2). U.S. accuses Russia of using chemical weapons in Ukraine. *The New York Times*, <https://www.nytimes.com/2024/05/02/world/europe/us-russia-chemical-weapons-ukraine.html>
- Ministry of Foreign Affairs of the People's Republic of China. (2022, November 17). *Position Paper of the People's Republic of China on Strengthening Ethical Governance of Artificial Intelligence (AI)*. Retrieved from https://www.fmprc.gov.cn/eng/wjdt_665385/wjzcs/202211/t20221117_10976730.html
- Ministry of Foreign Affairs of the People's Republic of China. (2023a, October 18). *Xi Jinping Holds Talks with Russian President Vladimir Putin*. Retrieved from https://www.mfa.gov.cn/eng/zxxx_662805/202310/t20231018_11163382.html
- Ministry of Foreign Affairs of the People's Republic of China. (2023b, November 16). *Galvanizing Our Peoples into a Strong Force For the Cause of China-U.S. Friendship*. Retrieved from https://www.mfa.gov.cn/eng/topics_665678/xjpfmgjxzmyshwtscxapec/202311/t20231116_11181557.html
- Ministry of Foreign Affairs of the People's Republic of China. (2024, January 9). *Speech by Chinese Ambassador to the United States Xie Feng at the Carter Center Forum commemorating the 45th anniversary of the establishment of China-U.S. Relations*. Retrieved from https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zwjg_665342/zwbd_665378/202401/t20240111_11221867.html
- National Archives. (1985, November 21). *Joint Soviet-United States Statement on the Summit Meeting in Geneva*. Retrieved from <https://www.reaganlibrary.gov/archives/speech/joint-soviet-united-states-statement-summit-meeting-geneva>
- National Archives. (1988, June 1). *Joint Soviet-United States Statement on the Summit Meeting in Moscow*. Retrieved from <https://www.reaganlibrary.gov/archives/speech/joint-statement-following-soviet-united-states-summit-meeting-moscow>
- Omitoogun, W. & Sköns, E. (2006). Military expenditure data: a 40-year overview. *Stockholm International Peace Research Institute, SIPRI Yearbook*.
- Organisation for the Prohibition of Chemical Weapons. (1994, August 31). *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical*

- Weapons and on their Destruction*. Retrieved from https://www.opcw.org/sites/default/files/documents/CWC/CWC_en.pdf
- Organisation for the Prohibition of Chemical Weapons. (2024a, May 7). *Statement on Ukraine from the OPCW Spokesperson*. Retrieved from <https://www.opcw.org/media-centre/news/2024/05/statement-ukraine-opcw-spokesperson#:~:text=Both%20the%20Russian%20Federation%20and,website%20and%20is%20regularly%20updated>.
- Organisation for the Prohibition of Chemical Weapons. (2024b, April 24). *Syria and the OPCW*. Retrieved from <https://www.opcw.org/media-centre/featured-topics/opcw-and-syria>
- Petrella, S., Miller, C. & Cooper, B. (2020). Russia's artificial intelligence strategy: The role of state-owned firms. *Foreign Policy Research Institute*, 65(1). 75-100. Doi: 10.1016/j.orbis.2020.11.005
- Prasad, E. (2023, December). China's bumpy path. *International Monetary Fund*, pp. 54-58 <https://www.imf.org/-/media/Files/Publications/Fandd/Article/2023/December/54-58-Prasad-final.ashx>.
- Price, R. (2007). *The Chemical Weapons Taboo*. Ithaca, NY: Cornell University Press.
- Reppy, J. (2006). Managing dual-use technology in an age of uncertainty. *Managing National Security*, 4(1). 1-10
- Rossiter, A. (2021). AI-enabled remote warfare: Sustaining the western warfare paradigm? *International Politics*. 60(1). 818-833.
- Sell, L. (2016). *From Washington to Moscow: US-Soviet Relations and the Collapse of the USSR*. New York, USA: Duke University Press.
- Shiffrinson, J. R. I. (2018). *Rising Titans, Falling Giants: How Great Powers Exploit Power Shifts*. Ithaca, NY: Cornell University Press.
- Snyder, A. (2024, May 3). Exclusive: Inside the AI research boom. *Axios Science*, <https://www.axios.com/2024/05/03/ai-race-china-us-research>.
- Sokolshchik, L. & Sokolshchik, Y. (2023). Why U.S. – Russia relations failed: An analysis of competing national security narratives. *Russian Politics*, 8(4).468-492. doi: 10.30965/24518921-00803009
- The White House. (2022, February 24). *Remarks by President Biden on Russia's Unprovoked and Unjustified Attack on Ukraine*. Retrieved from <https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/02/24/remarks-by-president-biden-on-russias-unprovoked-and-unjustified-attack-on-ukraine/>
- The White House. (2024, March 7). *Remarks by President Biden in State of the Union Address*. Retrieved from <https://www.whitehouse.gov/briefing-room/speeches-remarks/2024/03/08/remarks-by-president-biden-in-state-of-the-union-address-3/>

- Thies, C. G. (2013). The roles of bipolarity: A role theoretic understanding of the effects of ideas and material factors on the Cold War. *International Studies Perspectives*, 14(3), 269-288. doi: 10.1111/j.1528-3585.2012.00486
- Tokariuk, O. (2023, November 20). Ukraine's Secret Weapon – Artificial Intelligence. *CEPA*, <https://cepa.org/article/ukraines-secret-weapon-artificial-intelligence/>.
- Torode, G. (2024, May 2). US official urges China, Russia to declare only humans, not AI, control nuclear weapons. *Reuters*, <https://www.reuters.com/world/us-official-urges-china-russia-declare-only-humans-not-ai-control-nuclear-2024-05-02/>.
- United Nations. (2023a). *Lethal Autonomous Weapon Systems (LAWS)*. Retrieved from <https://disarmament.unoda.org/the-convention-on-certain-conventional-weapons/background-on-laws-in-the-ccw/>
- United Nations. (2023b, March 10). *Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects*. Retrieved from [https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_\(2023\)/CCW_GGE1_2023_CRP.1_0.pdf](https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2023)/CCW_GGE1_2023_CRP.1_0.pdf)
- U.S. Department of Defense. (2022, October 27). *National Defense Strategy of The United States of America*. Retrieved from <https://apps.dtic.mil/sti/trecms/pdf/AD1183514.pdf>
- U.S. Department of State. (2002, September 25). *Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare (Geneva Protocol)*. Retrieved from <https://2009-2017.state.gov/t/isn/4784.htm#states>
- U.S. Department of State. (2024, February 12). *Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy*. Retrieved from <https://www.state.gov/political-declaration-on-responsible-military-use-of-artificial-intelligence-and-autonomy/>
- Vaynman, J. (2021). Better monitoring and better spying: The implications of emerging technology for arms control. *Texas National Security Review*, 4(4). 33-56.
- Vaynman, J. & Volpe, T. A. (2023). Dual use deception: How technology shapes cooperation in international relations. *International Organisation*, 77(3). 599-632.
- Von Ingersleben-Seip, N. (2023). Competition and cooperation in artificial intelligence standard setting: Explaining emergent patterns. *Review of policy research*. 40(1). 781-810.
- Waldenberg, S. (2024, February 22). Biden calls Putting a 'crazy SOB' and criticizes Trump's Navalny comments during fundraiser. *CNN Politics*, <https://edition.cnn.com/2024/02/21/politics/biden-putin-crazy-sob/index.html>

Wardhani, N. F. (2021). The concept of polarity and centers of power in international relations. *Journal Politik Indonesia*, 7(2). 106-111.

Wohlforth, W. C. (2009). Unipolarity, status competition, and great power war. *World Politics*, 61(1). 28-57.