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Security Politics and Artificial Intelligence: Key Trends and Debates[1]

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Abstract:

This article delves into the academic discourse surrounding the security implications of artificial intelligence (AI). It highlights the lack of consensus on what AI truly encompasses, which poses challenges for regulating the technology. While some express concerns about the security risks of AI, there are proponents of ethical AI who believe in the possibility of programming the technology to operate ethically, and supporters of AI for Good (or AI for Social Good) who see potential for AI to address sustainable development challenges. Scholars agree that AI will have a significant impact on global security, but they disagree on the specific mechanisms and dimensions of this impact. Some focus on changes in the balance of power and the effectiveness of autonomous weapons, while others highlight the tactical advantages, defensive and offensive capabilities, and even national differences in AI development and deployment. Overall, the article concludes that more critical studies are needed to explore how AI is already affecting security in a broad sense.

Keywords: Defining AI, AI for Good, geopolitics of AI, autonomous weapons

Artificial Intelligence (AI) has become one of the buzzwords of our time. From AI-powered text generators like ChatGPT to proliferation of "National AI Strategies" (69 at the time of writing), it has impinged upon a broad array of security concerns including fake news and missile defense. Unlike others, such as development, empowerment, or gamification, AI has attracted the attention of experts from different disciplinary backgrounds and has become part of our daily lives. This Trends in International Political Science article focuses on the security politics of AI by delving into insights and discussions from different corners of social science. Relying on a pre-selected set of articles, it seeks to capture the main trends in recent scholarship rather than

[1] I thank the reviewers for their comments on previous versions of the paper. The errors remain mine.

provide a systematic literature review. Amidst a steady increase of work on AI, this study aims to present a snapshot of emerging tendencies in the literature.

The article first treats the problem of defining AI and its implications. It then explores discussions on so-called "Good AI" and the impact of AI on global security. These sections are followed by an overview of studies focusing on AI policies among the major powers in world politics. The discussion then shifts to the geopolitics of AI.

Defining AI

The term AI emerged from computer science in the 1950s (Noël, 2018; Thibout, 2019). As the term became more widespread, it tended to lose its technical specificity, leading to different and, at times, contradictory definitions. The recent literature variously defines AI as "a general mental capability that… involves the ability to reason, plan, solve problems, think and perceive abstractly" (Gottfredson as cited in Ahmad, 2018, p. 59), "a computational system designed to automate decisions, with the appearance of intelligence" (Lin & Allhoff, 2019, p. 196), "autonomous and intelligence systems" (Gill, 2019, p. 169), "encompass[ing] big data, machine learning and multiple related technologies that allow machines to act in ways humans describe as 'intelligent'" (Allison & Y, 2020, p. 12) or a "subfield of machine learning, which describes a set of algorithms that rely on statistical learning" (Kohler & Scharte, 2020, p. 1).

The term has become so widespread that some scholars prefer not to provide any definition at all, assuming it is part of the general knowledge. Scholars often use terms such as automation, autonomy and AI interchangeably in discussing the security implications. Payne associates AI with ability to make independent decisions and warns about weapons' "automatic capacity for escalation" (2018, p. 18). In the United Nations (UN) context, the preferred term is Lethal Autonomous Weapons Systems (LAWS) but the US Department of Defense and civil society actors distinguish between semi- and fully autonomous weapons (Akimoto, 2019). A leading UN report by the Special Rapporteur on extrajudicial, summary or arbitrary executions Christof Heyns distinguished between automatic and autonomous with reference to ability to operate in structured vs open environments respectively (Heyns, 2013). Gill (2019), who adheres to the Institute of Electrical and Electronics Engineers' definition, sees AI as a combination of autonomy and intelligence, which entails the capacity to adjust to diverse settings, and consequently, shares similarities with Heyns' definition. Heather M. Roff shows the significance of disagreements on the meaning of AI (Roff, 2019). First, she emphasizes the distinction between automation and autonomy. Automation, understood as the ability to complete a task without deviation, has been around for a long time. Roff refers to mechanized systems as trains that transport things on a given path. The definition of autonomy is more challenging; it can include symbolic logic systems like commercial computer programs, machine learning algorithms operating in a narrow domain, and systems that work without human intervention. To differentiate between the different types of AI, Roff highlights these systems' ability to learn, their deployment at different scales and nodes, the diversity of tasks that a single system can be used for, and the role of human operators. Other ways of defining autonomy and AI are important because they affect social and political claims about their impact. If AI is defined as automation, we are already quite used to living with mechanized systems, so there may be no

real cause for concern. If AI is defined in relation to intelligence, we must consider how this may exclude other types of intelligence. If AI is about learning, what kind of data will it be based on? Hence, defining the system is essential as attempts to regulate it will ultimately need to be based on a specific understanding of AI.

Although some authors do not define AI, many still seek to distinguish between artificial general intelligence (AGI) and narrow AI, also known as "weak AI." Narrow AI is often understood as AI applied to limited domains such as unmanned aerial vehicle navigation (Rossiter, 2021) or the calculation of missile trajectories (Roff, 2019). Narrow AI is currently employed, whereas AGI is seen as a more futuristic model that may someday match human agency (Johnson, 2019). Scholars with a more positive view of AI applications in security and defense quickly acknowledge the distinction between narrow and general AI (Allison & Y, 2020; Johnson, 2019; Payne, 2018). This may, in part, be a response to the emphasis in civil society on autonomous weapons and the characterization of such weapons as uncontrollable or potentially dangerous "killer robots." Civil society activism and discussions around autonomous weapons have focused on the future risks of using AI-powered arms by using apocalyptic imagery of the Terminator and warned of a "slippery slope" (Bahçecik, 2019; Bode & Huelss, 2022; PAX, 2019). Thus, the distinction is sometimes employed to implicitly or explicitly label critics as "alarmists" and signal a "saner" approach toward AI, underlining the need to adapt to reality and invest in AI to maintain national security and international rank. Authors emphasizing the risks rather than national security benefits, however, acknowledge AI's future possibilities but caution us to be vigilant and reflective about its possible drawbacks, including human-machine mergers (Gill, 2019; Livingston & Risse, 2019; Phillips & Mian, 2019; Roff, 2019).

AI for Good

One of the initial ways AI came to the international community's agenda was through discussion of its implication for global security and authoritarianism. These discussions framed AI as risky and dangerous—if not outright illegal—as in the case of LAWS. The launch of the Stop Killer Robots coalition in 2013 by international NGOs was a significant turning point for these critical voices (Stop Killer Robots, 2021). The objective of this campaign was a preemptive prohibition of autonomous weaponry. Still further critical approaches described AI as inherently imperial and a colonial project (Smith, 2022). AI for Good represents an alternative paradigm that highlights how advanced technology can be put to the service of humanity. Examples range from using AI to improve communication and emergency services in the Arctic (Lin & Allhoff, 2019) to helping respond to epidemics (Davies, 2019), fighting wildfires (Kohler & Scharte, 2020), and identifying conflict zones (Kikuta, 2022). The International Telecommunication Union (ITU)-led UN global summit has brought a level of formality and acknowledgement to this paradigm, as it was discussed as a means to attain the Sustainable Development Goals (Kohler & Scharte, 2020, p. 1). While pitching the notion of AI for Good, some authors also highlight possible harms of AI when applied to social problems. A common concern among those emphasizing the risks of AI for Good is the data problem. For instance, Davies (2019) warns that if global health applications are not adequately regulated, AI can lead to abuse and discrimination between individuals and communities. Since AI learns from data fed by humans or existing social practices, its

applications can be biased toward already vulnerable populations. Governments can initiate AI disease surveillance to impose quarantine on high-risk populations, and government-collected data can also be abused for “social control” (Davies, 2019, p. 188). Schopmans and Cupać (2021, p. 332) remind that data is not the only problem. Bias of AI developers also affect how applications function. Moreover, Livingston and Risse (2019, p. 152) argue that the development of implantable brain-computer interfaces, exemplified by Elon Musk's "neural link," is warranted by the need to safeguard humanity from the rapid progress of AI. However, this raises significant ethical concerns regarding the accessibility of brain enhancement and the dynamics between the enhanced and unenhanced groups. Another dimension is data sharing; experts point out that data is the oil of Machine Learning and that better and greater amounts of data help AI with improved learning. However, various authorities collect and store different types of data, which are often kept in “data silos” (Kohler & Scharte, 2020, p. 3), preventing access and sharing.

The AI for Good agenda is different from but related to the discussion on ethical AI. The latter refers to how entities and individuals can program AI to make ethical decisions. Contrary to civil society’s concerns about the dangers of autonomous weapons, some believe these weapons would be of better use than humans in warfare because they would never willingly violate international humanitarian law. The extent to which AI can be ethical or moral is disputed (Chen, 2021). The AI for Good paradigm does not argue that algorithms can be intrinsically designed to be good but, instead, that they can be put to good use.

A third normative approach to AI is in the Montreal Declaration for a Responsible Development of Artificial Intelligence of 2018. An initiative of Université de Montréal, the declaration seeks three main objectives: “develop an ethical framework for the development and deployment of AI,” “guide the digital transition” and initiative a public forum to “achieve equitable, inclusive and ecologically sustainable AI development” (Université de Montréal, 2018). Addressing individuals, public and private authorities, the document contains eight principles for socially responsible development of AI: well-being, respect for autonomy, protection of privacy and intimacy, solidarity, democratic participation, equity, diversity inclusion, responsibility and sustainable development. While there have been various frameworks and declarations for ethical AI, Ménissier (2020) argues that the Montreal Declaration goes beyond these with its republican approach and emphasis on human well-being. According to this declaration, which admittedly contains articles contrary to each other, AI may pose a risk to the fundamental capacities of humans as moral, sentient, and intellectual beings. The declaration promotes the participatory and democratic development of AI and, unlike previous frameworks, emphasizes the unequal relations between advanced and developing countries. For Ménissier (2020), one of the most significant aspects of the declaration is its republican spirit. This means that the challenges and risks surrounding AI are not only issues computer scientists need to consider from a consequentialist/legal perspective or as an extension of their professional ethics but public problems and concerns that require political reflection from all members of society.

AI and Global Security

The impact on global security constitutes a significant part of the discussions. There is broad agreement among security studies scholars that AI is bringing and will continue to bring

significant transformations to the way wars are being fought (Allison & Y, 2020; Gill, 2019; Goldfarb & Lindsay, 2022; Hoffman, 2019; Johnson, 2019; Payne, 2018; Rossiter, 2021). This consensus is coupled with a significant degree of skepticism toward "futuristic" and "alarmist" discussions about a pending takeover of war by robots and distrust of unequivocal statements on the future of warfare. Payne refers to "great uncertainty about the implications of AI," Gill mentions the difficulty of predicting the shape of war, and Allison and his anonymous co-author Y pose questions rather than provide definitive answers. Hoffman relies on theory to predict the future. Authors also admit greater indeterminacy when estimating the impact of AGI and often limit discussion to the existing, narrow applications of AI. Rossiter is the most skeptical, arguing that AI's immediate contributions are overestimated and emphasizing the significance of the perceptions of AI rather than whether it actually affects the balance of power.

While the studies under consideration here generally agree on the significance of AI's impact on global security, they differ significantly in their historical horizons, analytical frameworks, and the affected dimensions they identify. The analogies used for AI can provide insight into how the authors of these studies conceive AI's security implications. Payne compares AI to nuclear weapons, outlining similarities and differences, while Hoffman places it in the long history of revolutions in military affairs, identifying AI as a seventh military revolution.[2] Payne views AI in the long durée, setting a high bar for a revolution in strategy. Considering the role of human psychology as the criterion of strategic revolutions, he argues that the first revolution was the proliferation of homo sapiens' cognitive abilities and the second one that moves "strategy beyond… human intelligence" (Payne, 2018, p. 11) is currently unfolding. The psychological impact of war has been the enduring feature of conflict, including nuclear strategy. AI is truly revolutionary because it is set to take "the emotion out of strategy via game theory, with its cool calculus of escalation dominance" (Payne, 2018, p. 29). According to Payne, this also makes the security implications of AI more dangerous and unpredictable. It is unclear how the principal agent relationship between human commanders and AI will develop as the algorithms cannot understand the notion of "good enough" (Payne, 2018, p. 19). Hoffman, on the other hand, focuses his attention on how war is conducted. The historical horizon that he adopts is theSecond Machine Age or the "Age of Autonomy" (Hoffman, 2019, p. 55). The Age of Autonomy is characterized by the machine's ability to "compose and select among different courses of action" (Defense Science Board, 2016 as cited in Hoffman, 2019, p. 48). While we are not there yet, we are experiencing aspects of the Age of Autonomy according to Hoffman.

The studies focused on in this paper use different and, at times, overlapping analytical frameworks to assess the impact of AI on global security. Payne refers to AI's impact on tactics and strategy, Gill and Johnson on stability, and Hoffman uses the Clausewitzian distinction between war's essence and character and the trinity (irrational, non-rational, and rational forces). Rossiter and Goldfarb employ less conventional frameworks. While Rossiter refers to a Western "paradigm" of war based on remote warfare and precision strikes, Goldfarb uses an economic model and assesses the impact of AI on global security in terms of data and judgments in war.

[2] The full list of revolutions according to Hoffman are: "Westphalian System, French Revolution, Industrial Revolution, World Wars I & II, Nuclear Revolution and missiles, Information Revolution and Autonomous Revolution" (Hoffman, 2017, p. 20)

Payne's analysis, in terms of tactics and war strategy, argues that AI will impact both levels. AI will enable tactical advantages characterized by quick maneuvering and precision, the indicators of which are already apparent in air combat simulations (Payne, 2018, p. 9). Payne further argues that AI will influence logistics and data-based activities like intelligence and surveillance. He predicts that these AI-related impacts will cover all three domains: land, sea, and air. However, Rossiter believes that it will be difficult to deploy AI-powered weapons on land due to "human interaction and physical challenges" (Rossiter, 2021, p. 8) that do not exist in sea and air (for a different view see Noël, 2018). Since Payne sees psychology as the central characteristic of modern warfare, the most significant impact he identifies is at the strategic decision-making level. AI could function as a sort of "oracle" to "test accepted wisdom" (Payne, 2018, p. 10). This Strategic AI will be indifferent to the well-known psychological processes of bias, groupthink, etc. According to Payne, this beneficial side of Strategic AI leads to significant uncertainty about its implications.

Both Gill and Johnson have concerns about the impact of AI on stability. Gill argues that the impact of weaponized AI on stability is not clear. We do not yet know whether autonomous weapons will make armies more likely to see an advantage in first-strike against an adversary. The use of these weapons will be decided by the how they will be integrated into defense policies of nations. What is certain is that conventional arms control needs to adapt. Even if the impact on stability is unclear, AI is likely to shape the balance of power between major powers. The public and the political elite are already viewing AI development in starkly competitive terms, preparing the ground for mutual suspicion. Gill argues that "to build mutual confidence and trust" (p.175) AI needs to become part of the international discussion. There is a need for new forms of expertise, more flexible normative frameworks that can keep up with new technologies, and the cooperation of the private sector, the main engine of innovation and holder of intellectual property rights (Gill, 2019, p. 174). However, other scholars, such as Akimoto (2019), insist that the UN framework remains relevant and that its Convention on Certain Conventional Weapons can provide the platform for a binding treaty on LAWS.

Johnson identifies AI as a significant source of instability with tactical and strategic impacts. AI is highly likely to affect the balance of power between major powers as a potential force multiplier. On the battlefield, its benefits include remote sensing, situational awareness, maneuvering, and compressed decision-making loops. At the strategic level, Johnson sides with Payne and argues that AI helps avoid biases in human decision-making. Developing technology in robotics and swarming technology pose a significant challenge to stability by creating new capabilities or improving existing ones. AI-powered unmanned systems could be used in reconnaissance and strike missions. These capabilities may be used to overcome air defense systems and reduce the effectiveness of area denial systems. Autonomous systems can help clear mines in seas or oceans and aid in locating submarines. AI-powered electronic warfare can also disrupt information from radars and GPS, thereby undermining defensive and offensive capabilities. Early warning systems using AI could also accelerate the decision-making process by providing additional information and could create significant risks in nuclear strategy. As Johnson indicates, the precise effects of these technological advances are not very clear. However, they are likely to undermine stability because states may think these capabilities are

effective even when the opposite is true—and thus lead to riskier decision-making. Johnson presents a situation in which Russia and China suspect the US's increased ability to locate their nuclear weapons with the help of AI analytics and therefore prefer to use their weapons rather than lose them. Although the ability of AI to locate nuclear weapons is not certain, if such a belief emerges, it could profoundly affect the calculations of the nuclear powers. While Gill and Johnson highlight the dual impact of AI on both offensive and defensive capabilities, Hoffman refers to the "claims" of defense enhancing features of AI without mentioning how they benefit the offense. These defensive advantages include the improved ability to collect indicators for cyber-attacks (for a similar view see Sarker et al., 2021) and the enhanced capability to process intelligence and detect naval mines.

Another analytical framework used to investigate the impact of AI is Clausewitz's. Hoffman first discusses the impact of AI on the nature versus the character of war and then argues that Clausewitz's trinity concept can be updated to include a technological dimension. The debate on nature versus the character of warfare is about the immutable and changing aspects of warfare. According to Hoffman, many believe that war has an unchanging nature: it is violent, interactive, and driven by politics. What changes is the subjective character of war—that is, how war is fought. After reviewing the claims in this literature, Hoffman settles on his preference for a more flexible analysis based on Clausewitz's trinity. He argues that "the age of autonomy poses major discontinuities" (Hoffman, 2019, p. 55) for the trinity. The non-rational aspect of passion/emotion is affected by AI in various ways. AI-powered cyber capabilities may be deployed to manipulate the sentiments of the population. But a reverse tendency is also apparent: a war between robots would hardly impact public opinion; it would lead to disengagement between government, the military, and society during a conflict. Regarding the non-rational dimension of chance/friction, Hoffman argues that AI would not eliminate friction because robots and software can still fail. Moreover, since autonomous warfare will rely on data, adversaries could attack databases, leading to a malfunction of AI systems. Finally, the rational dimension of policy/politics is also potentially affected by AI (for a similar view see Gautier, 2019). The Second Machine Age reduces the decision-making time and costs of war. Drones could provide stability by providing additional, useful information and a sense of security; a loss of robot soldiers would hardly lead to escalation as no human soldiers would be killed. Hoffman suggests that material factors and technology be added to the trinity; the trinity will be squared by adding the dimension of calculation/genius, which brings together aspects of the rational and non-rational dimensions. This means that at the strategic level, the classical features identified by Clausewitz remain intact, especially friction and chance. However, military commanders will benefit from AI-sourced calculations at the tactical level.

Geopolitics of AI

Another emerging trend in the literature on AI can be framed as the geopolitics of AI (Allison & Y, 2020; Mori, 2019; Petrella et al., 2021; Thibout, 2019; Zeng, 2021). These studies focus on the impact of balance of power considerations on the politics and policies of AI and include mainstream and critical approaches to security. Geopolitical readings of AI focus on the major powers simultaneously pushing for its development and militarization. Allison and Y (2020)

summarize the recent sentiment by describing the situation as a race and expressing concerns about pacing advances made by China. The authors call for a decisive effort by the US to maintain its edge, but China possesses significant advantages in this contest; it can strategically direct the private sector and transfer innovation from companies to the military, a structure that Thibout (2019, p. 138) calls the "Chinese Techno-Party Complex." China also has a very large population that produces significant amounts of data. This data can be used to perfect the authoritarian system, an advantage not available to its liberal competitors. According to Allison and Y, the US must recognize that it cannot be the biggest but can be the smartest AI power (2020, p. 23). Mori (2019) contextualizes the AI issue within the broader competition between the US and China. According to him, US efforts in AI and other technological developments, such as digitalization and industrial technology, are motivated by a search for supremacy and dominance (Mori, 2019, p. 108). While tensions have existed between China and the US before, under Trump, a government effort receiving bipartisan support from Congress and a policy that shifted toward utilizing counter-measures against China has emerged. Thibout's (2019) perspective differs from this in that he emphasizes the role of large companies like Google and their former top-level managers—many of whom have become US officials—in vigorously pushing for competition in AI. This means that non-state actors have a significant but overlooked role. Concerning the situation in China and Russia, Zeng (2021), looking at the issue from a critical securitization perspective, provides a different picture of Chinese efforts to mobilize private and public actors. While many see this as China's greatest advantage in its competition with the US, Zeng argues that the securitization of AI by the Chinese government leads to excessive techno-nationalism and an inward-looking approach. This could create problems for the Chinese AI effort by undermining necessary cooperation with other advanced countries in AI and driving the in-country AI talent away that the country desperately needs. Petrella (2021) and her co-authors depict a lethargic and lagging Russia in the AI race. Although President Putin declared AI as the new geopolitical heartland in 2017, he failed to replicate the Chinese model of strategic direction and funding for AI companies. Yandex, the natural candidate designated as the AI champion due to its capabilities and data resources, was not trusted by Putin. The task was instead given to state owned banks such as Sberbank. Therefore, the cases of the US, China, and Russia indicate that the political economy of the major powers mediates geopolitical competition for AI.

Conclusion

Analysis of the studies focusing on the security politics of AI shows a near-universal acceptance of the significance of AI and a relative certainty that it will have a significant impact on security. The extent of this impact and the analytical frameworks necessary to assess it are still up for debate. While long-standing concepts of strategic analysis, such as tactics versus strategy and crisis versus strategic stability, are being resuscitated, other scholars borrow from management and economic theories to question whether this technology is a complement or a substitute, sustainable or disruptive, and the degree to which it can be integrated into military organization. Emerging areas of the debate seem to be discussions on the proper way to regulate AI, the distinction between automation and autonomy, the role of human judgment in AI, and the interfaces of human and machine intelligence, including brain augmentation.

One significant aspect of the literature on the security politics of AI is the disconnect between critical scholars and the current literature on its security impacts. Critical approaches toward AI are not lacking; good AI and ethical AI frameworks seek to regulate AI or direct it toward a path that will benefit humanity. What seems to be often missing is the insight of a growing number of scholars focusing on the politics and social construction of technology (Dunn Cavelty & Hagmann, 2021) and what this means for AI. What Dunn Cavelty and Hagmann call "reflexive approaches" (2021, p. 130) could provide a deeper understanding of not only how AI impacts security politics but also how security politics shapes the development of AI. Future research on security implications of AI may go beyond discussions on potential dangers of the technology and focus on how it is already shaping military organizations and doctrines as well as the broader human security including democratic governance, privacy, and provision of global public goods. Finally, it is worth noting in conclusion that the literature on AI has started to include a political economy approach that pays attention to the role of economic interests in shaping the geopolitical competition.

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