

Crisis Stability and the Impact of the Information Ecosystem

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“Loss of control,” writes political scientist Richard Ned Lebow, “is a principal theme . . . of crisis management.”¹ Yet crisis stability presumes that control can be retained in war and that conditions can be construed so as to ensure that nuclear weapons are not used. The Cold War debate on crisis stability deliberated how particular military capabilities, military doctrines, and misperceived communication were sources of instability in a crisis that could trigger escalation. The current information environment presents additional challenges for retaining stability in crisis. New tools of misinformation and disinformation and the abundance of data available to decision makers via the global information ecosystem (a significant proportion of which may be unverified) enhance the problem of understanding the capabilities, doctrines, and intentions of the adversary. The risk of misperception during a crisis may increase significantly as a result, contributing to risks of escalation and inadvertent war. The deliberate manipulation of information may be used to influence decision makers as well as public opinion before or during a crisis. Such manipulation of the political process may also significantly affect crisis decision making. This chapter addresses what the sources of crisis instability are given this new information ecosystem.

Traditionally, crisis stability was defined as a situation where no party has an incentive for nuclear first strike or preemption. Its focus was on the size of the gap between the payoffs for striking first and striking second with nuclear weapons.² This stemmed from the central

concern that nuclear war could result from “the reciprocal fear of surprise attack.”³ This delineation is important, as the central concern of crisis stability is *not* to avert or deter or stabilize conflict per se but to avert the escalation of a *nuclear* crisis.⁴

The relationship between crisis stability and deterrence is intimate but complex. Deterrent relationships determine whether crises arise and leaders’ perceptions of their opportunities to influence a crisis once it is a fact. Effective deterrence depends on the credibility of nuclear threats, which suggests a contradiction between deterrence and crisis stability: efforts to preserve crisis stability could undermine the credibility of deterrence. If there were ever to be perfect crisis stability—and thus a perfect absence of risk of a crisis resulting in nuclear use—then nuclear weapons would serve no useful purpose as a deterrent and, in the absence of other forms of deterrence, aggressive states would have no reason to fear undertaking aggressive subnuclear military action.⁵ Uncertainty as to whether lower-level actions might trigger nuclear escalation is meant to exert a deterrent force prompting aggressive states to avoid aggression.

But assurance of and transparency with adversaries can also be critical to avoiding or stabilizing crises. Incorrectly gauging the motivations of another state—whether assuming these to be more or less aggressive than in fact intended—can lead to unintended escalation. While appeasing a revisionist state can invite further aggression, threats and punishment of a state that is fearful for its own security can trigger a security-dilemma-fueled escalatory spiral. Strategic relationships between potential adversary states require a balanced awareness of both escalatory dynamics. They also require continuous insight and feedback as to the more appropriate understanding of the other state’s motivations and potential next actions.

Information about capabilities and intentions and its correct interpretation thus plays a critical role in all strategic decision making: from the slow-moving calculations of arms development and deployment to the faster timescales of alerts and nuclear-weapons-use decisions during crises.⁶ Information is vital to assess the actions, motives, and

likely responses of other states and provides available options for decision makers. Flows of information affect decision-making dynamics, reinforce or undermine biases, confuse or clarify analysis, and dampen or amplify pressures through public feedback or panic. The accurate relaying of undistorted information is likewise critical to command and control, and its failure can lead to breakdowns in the chain of command with catastrophic consequences. Changes in the information ecosystem thus directly affect the sources and potential of instability in a crisis.

Traditional Sources of Instability in a Crisis

Nuclear strategy expert Colin S. Gray describes the very concept of crisis stability as “far more often advanced and cited than defined.”⁷ The debate on crisis stability traditionally has been largely focused on seeking to reduce incentives for capabilities or doctrines associated with nuclear preemption. A range of capabilities associated with such incentives, such as vulnerable silo-based ICBMs, was deemed more unstable than more survivable forces due to the temptation to use them preemptively and avoid decapitation. Although the emergence of full American and Soviet nuclear triads was considered “stabilizing,” the potential for further cuts kept the debate on arsenal composition and crisis stability alive.⁸

Strategic defensive systems were also traditionally perceived as destabilizing, offering the possibility of blocking retaliatory action.⁹ In particular, the interaction of vulnerable forces on one side with counterforce and defensive capabilities on the other was seen by experts as contributing to crisis instability.¹⁰ In such situations, the incentives for preemption would be strong: the only thing worse than starting a counterforce war would be having to fight one after receiving the first blow. Western academics entertained the idea of a Soviet preemptive doctrine and Soviets entertained the same idea with regard to US strategy.¹¹ Khrushchev’s decision to place Soviet missiles in Cuba in 1962—helping to precipitate the Cuban Missile Crisis—was in part a reaction

to intelligence reports that the Kennedy administration had considered a preemptive strike plan during the Berlin Crisis the previous year.¹²

Doctrines of nuclear first use for limited objectives were also traditionally deemed highly destabilizing. Limited nuclear strikes could offer opportunities for a quick end to conflict or more favorable accord than to continue the conventional fight. Strategists deliberated potential benefits associated with nuclear escalation, such as enhancing credibility for subsequent nuclear strikes or instilling fear in a target audience.¹³ It was (and still is) possible to envisage a range of operational or tactical incentives for nuclear first strikes that could produce an operational benefit. If an actor believes that the benefit of aggression outweighs the cost or that retaliation is uncertain, secure retaliation is no deterrent.

Today, we are seeing a proliferation of destabilizing capabilities and doctrines. Both Russia and the United States are currently reinvesting in new subnuclear weapons and dual-capable platforms. The vulnerabilities of command, control, and communications (C₃) systems have been partially overcome by technological solutions such as permissive action links.¹⁴ But other challenges linked to the entanglement of nuclear and conventional C₃ systems have emerged.¹⁵ Many analysts claim that Russia and North Korea (and possibly China) could consider the limited use of nuclear weapons in order to try to stem the escalation of a conflict to a level they cannot handle conventionally.¹⁶ Russia's military doctrine explicitly states it would consider a nuclear response to large-scale conventional military aggression.¹⁷ First-use doctrines contradict the ideal of crisis stability: that there is some way of ensuring that conventional conflict between nuclear-armed adversaries remains conventional.

In addition to potentially destabilizing nuclear capabilities and doctrines, other aspects of nuclear crisis may induce instability. Nuclear crisis stability, like deterrence theory, presumes rational actors capable of "understanding their environment and coordinating their policy instruments" in a legible way through the fog of war.¹⁸ And yet, several academics point out how "most statesmen realize that whenever vio-

lence is set in motion, no one can be sure where it will end up. Because events can readily escape control, limited responses carry with them some probability that the final, although unintended, consequence will be all-out war.¹⁹ Absence or misinterpretation of information, failures of communication, accidents, and emotion can all play potentially catastrophic roles setting off cascades of events. During the Cuban Missile Crisis, US military leaders learned how difficult it was to control military activity with the aim of preventing gratuitous provocations of the Soviet Union.²⁰ Soviet submarines that the US Navy tried to signal to surface during the Cuban crisis were armed with nuclear defensive systems and misinterpreted the depth charges used by the US vessels as a possible attack. Only the persistent opposition of a single Soviet officer on board one of the submarines precluded a Soviet nuclear response to these depth charges at the height of the crisis. Such use of a defensive nuclear weapon would very likely have triggered a substantial US response.²¹

The decisions made by leaders in crisis will be based on their interpretations and perceptions of their adversaries' capabilities, doctrines, and perceived intentions—all of which are products of the information ecosystem they are a part of. Deterrence is a psychological theory about manipulating the behavior of others, which means that leaders' personalities and preferred modes of decision making play a role.²² Their willingness to go to the brink of war will differ based on knowledge, information, cognition, and perception of what is at stake. If an actor perceives the consequences of not going to war as intolerable, no capability, doctrine, or communication may preserve crisis stability.²³ On the other hand, if a viable off-ramp is available, escalation may be avoided.

Other factors such as time pressure, internal government politics, relationships with allies and partners, media attention, and public feedback can further complicate the decision-making process. During the Cuban Missile Crisis, both President Kennedy and Premier Khrushchev had aggressive initial reactions but came to prefer more cautious approaches. Both faced intense pushback from significantly

more hawkish advisers or partners. In spite of, and even because of, the slowness of direct communication, each leader faced enormous time pressure: for fear of public (over)reaction should the news become widely known, at the risk of further unintended escalation or of losing the opportunity for a way out. Neither leader, however, faced the early media scrutiny that might have been possible in an age of social media. The White House was able to convince the *New York Times* and the *Washington Post* to delay publication on the crisis until after Kennedy's address—dynamics that would be unlikely today.²⁴ Today's information ecosystems constitute a radically different environment for policy deliberation, public debate, and decision making.

Characteristics of Contemporary Information Ecosystems

In recent years, the national and international information ecosystems have undergone significant changes and continue to develop at a rapid pace. The information and media environment today bears little resemblance to that during the Cuban Missile Crisis. In the early 1960s, earth-orbiting satellites were a new phenomenon and U-2 planes were still used for aerial photographic intelligence gathering. Televised presidential addresses and debates had been gradually redefining the relations between politicians and publics. Emerging information technologies had yet to significantly affect the velocity of information flows for the purposes of political or diplomatic communication, media coverage, or intelligence gathering. American warships enforcing the blockade in Cuba were able to “bounce messages off the moon,” but it took “many hours to decipher a top secret communication” and “high-priority traffic between the Pentagon and the warships . . . routinely [was] delayed.”²⁵

The rapid technological changes that have taken place in the period since the Cuban Missile Crisis have transformed the information ecosystem within which political crises today might unfold. Each new

technology has brought new affordances; enabled distinct mechanisms for communication and for the sharing of information or its gathering and organizing; and altered the overall environment for media, public discourse, collective action, intelligence, and diplomatic and political communications. The digitization of information, lowered costs, and increased resilience of high-speed information sharing, disintermediation of information flows on the national and transnational levels, and the emergence of tools for searching, filtering, and sorting information flows have had profound effects on forms of civic engagement, state-society relations, and the media and public spheres of most countries.

In the 2000s and early 2010s, new information technologies played a critical role in events such as the Occupy Wall Street protests that sprang up in the United States in the wake of the 2008 global financial crisis, the 2009 Iranian Green Movement that protested what was widely regarded as a fraudulent presidential election, and the Arab Spring, beginning in 2011, that toppled autocratic governments across the Middle East. Some observers hailed information communication technologies as “liberation technologies” strengthening the hand of collective action against stronger state organizations, pointing to the ease and low cost of asynchronous communications across great distances, the ability to aggregate small inputs rapidly, and the ways that individuals could leverage these tools without the need for hierarchical organizations and centralized leadership.²⁶ The internet’s ability to facilitate mass levels of rapid preference revelation and information cascades was credited for undermining authoritarian regime types with their enforced silence of dissenting views.²⁷ Blogs, online media outlets, “citizen journalism,” and social media emerged as alternatives to the mainstream press and challenged the information monopolies of highly censored or propagandistic government media outlets. The anonymity of online speech, for a while, permitted less risky forms of hard-to-attribute engagement or self-expression.

Over time, states have learned to leverage the new information environment to their advantage. While the use of information and communication technologies (ICT) by terrorist networks and illicit businesses

bolstered the case for increased digital surveillance within democracies, authoritarian states struggling to address “regime security” dilemmas developed techniques to maintain political control despite *and through* online flows of information. China developed technically sophisticated forms of nearly ubiquitous censorship for online content.²⁸ Russia experimented with tailored content production for the purpose of manipulating public opinion and narratives—techniques now increasingly utilized as tools of foreign policy and aggression as well.²⁹ New techniques and laws for control have been shared and emulated across regimes and technologies.

Meanwhile, the changes in the information environment have had profound effects on the public spheres and commercial cultures of even the most robust democracies. Mechanisms of “homophily” and “sorting” online (emerging from search- and user-centered design paradigms) combined with the low cost of “digital shelf space” permitted individuals to easily find others with unusual tastes or views and for content producers to cater to the “long tail” of diverse interests rather than steering everyone toward the most popular topics or cultural products.³⁰ Public discourse has become increasingly fragmented, no longer dominated by a few trusted mainstream sources or a single authoritative narrative as had mostly been the case in the heyday of television broadcast news.

As individuals self-segregate across disparate and often polarized echo chambers, this has allowed previously fringe viewpoints—from hateful extremism to conspiracy theories—to gain wider audiences and a more visible public representation. This fragmentation of the public sphere and the loss of universally trusted media outlets coincided with a period of profound political polarization, leaving many democratic populations vulnerable to intentional information operations.³¹ Meanwhile, decision makers are subject to the accelerating minute-by-minute news cycle and the changing pressures of public opinion, often facing political pressure to respond to events before accounts can be confirmed or fact-checked.³²

While significant attention has been paid to the role of these new dynamics in mass protest movements or efforts to influence foreign elections, there has been less scrutiny of the potential impact of the changes in the information environment on events that could precipitate nuclear crises today and the dynamics of such crises as they would unfold.

Potential Impact of Current Information Environment on Crisis Stability

Could a crisis similar to the 1962 Cuban Missile Crisis emerge today? The placement of vulnerable, first-strike-capable missiles, first in Italy and Turkey by the United States, then in Cuba by the Soviet Union, prompted a global nuclear crisis once existence of the latter was uncovered by US intelligence. This discovery, combined with each side's inadequate intelligence concerning the other's intentions and some indications of preemptive-strike plans, played roles in the crisis as each leader grappled with pressures from within their own governments and the prospect of public scrutiny once the discovery of Soviet missiles in Cuba was announced.

Today, a nuclear crisis scenario similar to the emergence of the Cuban Missile Crisis seems less likely given the vastly increased availability of satellite imagery that would allow each side to detect the deployment of significant military assets abroad at an earlier stage. But despite vast increases in some forms of intelligence, other types of intelligence failures can still be significant concerns.³³ The significant possibility for misinterpreting adversary intention remains, as do risks of destabilizing nuclear or conventional capabilities, doctrines, plans, and procedures. Indeed, Russian officials are currently warning of the potential for a standoff comparable to the 1962 Cuban Missile Crisis if the United States deploys land-based missile systems near Russia's borders.³⁴

The inherent characteristics of the current information environment and the forms of deliberate manipulation that it enables contribute to an environment in which miscalculation and misperception is likely, despite improved capabilities for information and communications. Whether these are characteristics of the current information ecosystem or have resulted from the convergence with other economic, social, and political conditions, many contemporary dynamics in democratic societies—including the polarization of public opinion, the increased role of fringe groups in public life, and the increasing role of populism—encourage destabilizing dynamics before or during a crisis.

The Impact of Information on Crisis Emergence

Information and its interpretation have always been vital to preventing crisis and maintaining stable deterrent relationships. The greater the shortage of correctly interpreted intelligence or trustworthy channels of communication, the greater the potential for misperceiving an adversary's motives and miscalculating the balance between threatening and conciliatory postures. One might assume that the current abundance of intelligence sources and communication channels would limit such risks, but this would mistake the speed and abundance of information with the likelihood of its correct interpretation. While it is difficult to assess the likelihood of correct interpretation, it is possible to identify dynamics in the current information environment that can affect decision making.

Within government, emerging information ecosystems have spurred the politicization of policy. While there have always been hawks and doves on matters of national security, policy decisions that were traditionally relatively apolitical have become less so. Political positions are increasingly subject to real-time scrutiny, and diminished trust in media institutions makes it increasingly hard to find national consensus even on topics of grave security concern. Relationships with other countries are also subject to more turbulent domestic political forces. In such an

environment of politicization, unbiased analysis and agreement on an adversary's motives may be harder to generate. Polarization and politicization risk a perpetual shifting of strategic postures toward potential adversaries and allies, undercutting the ability of governments to form lasting and stable relationships and binding agreements on matters of importance to strategic stability. This produces less predictability in the eyes of adversaries, who may in turn respond with destabilizing actions of their own.

The direct one-to-one and one-to-many communication channels available to contemporary populist leaders further risk subjecting significant strategic decisions to real-time public opinion pressures and interpersonal dynamics without the input of expert intelligence and strategic communities. As we have seen in 2017 with US presidential tweets directed at North Korean leader Kim Jong Un, such technology, while offering a seemingly rapid and transparent communication channel between leaders, can also encourage an extreme approach to the balance between threats and conciliation.

The role of and emphasis on different sources of information is further compounded in the contemporary information environment. While intelligence may be more plentiful than before, intelligence analysis may be the subject of politicization as described above or may suffer from competing with the myriad of other information sources, such as social media. Leadership style may directly affect the role and relevance of intelligence assessments in leadership decision making. Whereas the current US president's appetite for intelligence is seemingly low, the Russian president allegedly absorbs little other information than that provided by his intelligence agencies.³⁵ While information ecosystems may affect national leaders differently, the impact on dynamics between states may still be significant.

Adding to this is the potential for manipulating the current information environment and new forms of low-level interstate conflict using such methods. Russia's utilization of hard-to-attribute forms of "cross-domain coercion" was exhibited by the advanced use of cyber,

information, and kinetic military tools in the 2014 war in Ukraine.³⁶ Russia's use of "cyber-enabled information conflict" was demonstrated through Russia's interference in the 2016 US presidential election.³⁷ Together, these have prompted significant discussion of ways to increase Western deterrence posture, while diminishing trust in Russian claims of (potentially real) security concerns. At the same time, the use of these techniques—which leverage precisely the forms of ambiguity, division, and extreme views just described to influence the internal situation in other countries—has potential for significant miscalculation and potentially undesired effects. These could take the form of escalation from an ongoing conflict or slower tectonic effects in public opinion that might affect strategic posture or crisis decision making.

The Impact of Information on Crisis (In)Stability

While the current information environment poses serious risks for overall stability of deterrent relationships, the risks resulting from the new information environment may be even more intense during crises. Both unintended effects of the current information ecosystem and the intended and unintended effects of intentional manipulation of that ecosystem can affect decision making.

While Cold War decision makers also faced intense pressure to rapidly and correctly gauge the intention and likely reactions of adversaries, the current information environment may tighten the time window and increase audience costs for decision making during crises. At the same time, political and cognitive pressures may be larger than before due to the potential overflow of information from classified and open sources. The rapid flows of information combined with lowered reliability of many information sources and polarization mean that individuals faced with crisis decisions may be more likely to fall victim to misperceptions caused by cognitive biases and heuristics at work. This risk increases when individuals rapidly process large quantities of material under stressful conditions.³⁸ This can affect primary decision makers, but it can also influence analysts, journalists, military officers,

and others involved in processing the information that will ultimately inform decision making. The overall tone of such biases may be affected by the slower processes of politicization discussed previously.

The leakiness of digital information and politicization of radical transparency combine with the disintermediation of news reporting, twenty-four-hour news cycles, and the social media environment to limit decision makers' ability to handle crises in the relative calm of closed-door sessions and diplomatic channels. As opposed to the six days of deliberation and maneuvering by the Kennedy administration in 1962 prior to the president's public address, the public today might know about a crisis as soon as—or before—decision makers. Leaders might never get the chance to introduce a crisis with a framing or agenda-setting narrative but would instead be chasing an already politicized and fragmented cascade of rumors, fears, and conspiracy theories. Increasingly politicized media coverage further reduces the possibility of unified public support.³⁹ Such dynamics add pressure and subject decision makers to constant real-time public opinion feedback and second-guessing. This could have particularly deleterious repercussions for thin-skinned leaders who are incapable of mounting internal buffers against the emotional sting and urge to respond to criticism. It poses a serious challenge for leaders whose electoral legitimacy depends on the popularity of their actions.⁴⁰ Increased public scrutiny of, or conspiracies about, a crisis may complicate issues that can affect crisis outcomes, such as saving face, preserving credibility, and taking revenge.⁴¹ Decision makers must deal simultaneously with the nuclear crisis itself and potential secondary domestic or international crises resulting from public panic or the cascades of false information or extremist reactions.

Another dynamic that might further exacerbate public relations problems and constrain decision makers' freedom to maneuver and negotiate is the many-to-many transparency of public discourse between countries. In the past, decision makers have had some ability to represent a unified position on behalf of their country during moments of tense diplomacy. The greater external visibility of internal divisions in the current information environment could undermine the negotiating

power of unpopular or polarizing leaders. What is more, the publics in each country involved in a crisis would have greater ability to see into the internal events and discourse of the other countries in real time, although this would not necessarily be paired with greater understanding. While this might serve to humanize the adversary, it could also further exacerbate tensions and serve to empower marginalized voices within or across borders.⁴² Furthermore, each of these dynamics could be manipulated and used for advantage by foreign actors.

Of perhaps greatest concern in the current information environment is the lack of reliable signals or channels of trusted communication through which to defuse crises. Of course, the problems of communication during the Cuban Missile Crisis were of a different nature. It took hours or days for private communications between national leaders to be relayed and translated. Events on the ground could easily outpace the speed of such communications. Today, with very few exceptions, channels of communication exist or can be quickly established. But the prior politicization of strategic relationships and the recent increase in the use of misinformation as a tool of aggression between strategic adversaries could undermine or hinder such communication. While information and psychological operations played a role during the Cold War as well, the increased use of such techniques in the new digital environment and as a tool of conflict is a dynamic with characteristics that are not yet well understood.⁴³ The increased strategic use of (sometimes implausible) denial has potential to undercut trust in diplomatic communications, even during crises. Such trust will be vital to retain stability in any conventional crisis that had best not escalate.

Finally, the contemporary information environment offers unprecedented opportunity for manipulating the adversary during crisis. Such manipulation can be targeted at politicians and the process that informs their decision making, and also at the adversary country's public at large. Traditional deception methods could be used to, for example, skew the intelligence collection and analysis of the adversary, through utilizing what is known about the other side's patterns and

sources of intelligence collection. Information operations could be aimed at making one's own retaliatory capability more credible in the eyes of the adversary through disinformation or through real information regarding actual capabilities. Reports of Russian inflatable fighter jets demonstrate how state actors continue to see value in traditional and unsophisticated deception.⁴⁴ Information operations could also be used to reduce the confidence of the adversary in its own systems or retaliatory capability by targeting individuals or systems that form part of that capability.⁴⁵ Social media offer new opportunities to target the individuals who make up the systems an adversary relies on. This was demonstrated during the Ukraine crisis, when individual cell phones were subject to targeted information operations.⁴⁶ These types of information operations are a novel aspect of modern war and would add a fog of war that remains untested in severe nuclear crises.

An adversary could seek to influence the political preferences or biases of individual decision makers through long-running campaigns to alter personal preferences or through targeted operations to sway or coerce individuals during crisis. An adversary could also seek to affect decision making by influencing the public debate and reactions of the target state in order to foment pressures to sue for peace or delegitimize war means or goals. Russia has engaged in targeted public diplomacy campaigns in several NATO countries regarding the destabilizing impact of NATO's missile defense in Europe in order to influence both public discourse and individual policy makers.⁴⁷

Any large-scale conflict between major powers today would entail active information campaigns from the warring parties to legitimize their own war aims and military actions as well as efforts to delegitimize the goals and methods of the adversary. In a nuclear conflict, one could, for example, envisage a propaganda war where accurate or inaccurate information regarding war methods and consequences would be used actively to legitimize or delegitimize use of force or indeed nuclear weapons use. Unverified reporting of a nuclear detonation in contested territory could be one example of information that could affect leadership decision making and public opinion in rapid

and direct ways, which consequently could have severe repercussions for crisis dynamics. Third-party actors (be they associated with state actors or not) could instigate information operations to foment nuclear crisis or use by spreading false information regarding issues related to the conflict. This could create political, military, or public pressures on state leaders to take actions they would otherwise not have taken.

Conclusion

The sources of crisis instability are inexorably linked to the interpretation and processing of information by decision makers. The contemporary information environment has exacerbated several of the cognitive challenges connected with processing information and created some entirely new ones for any decision maker faced with a nuclear crisis in the modern era.

The changed information ecosystem does not alter the basic premise that most decision making in crisis and war is characterized by uncertainty, incomplete information, and risk. The information available to policy makers today may be more plentiful and, at times, of better quality than before. Although this could reduce uncertainty regarding certain technical facts, the increased availability of information may also enhance the cognitive challenges of decision making. For some leaders, the immediate availability of information and the social media feedback loop augments the information they acquire via other channels. Alternate sources of information may supplant the critical role intelligence information has had in crisis decision making. A more complex information environment places greater demands on identifying clear signals from noise, a process made more difficult when the signals may contain noise deceptively orchestrated by an adversary.

The changed information ecosystem does entail some relatively new dynamics that may place novel pressures on decision makers in nuclear crises. Individual leaders and collectives responsible for decision making are likely to be affected by unprecedented exposure to new and

potentially disparate sources of information. The public is likely to play a larger part in nuclear crises through access to information and outlets to let its voices be heard. The preferences of both decision makers and the public may be influenced by the shaping efforts of several actors, including the warring parties as well as other benign or malign actors with agendas of their own. This will potentially introduce unprecedented public deliberation of crisis dynamic and policy options and might affect decision making.

In such a changed information ecosystem, it seems prudent to raise questions regarding how or whether nuclear war will remain “special” or “different” in the public or policy domain and how public pressures will affect decision making. To more fully answer questions regarding how the contemporary information ecosystem will affect crisis stability, we need more information about, and research on, how the emerging information environment affects decisions regarding war and peace and how it may affect preference formation and alteration before as well as during a crisis. Finally, we need to understand how the information ecosystem affects decision making in different political systems. Such insight will be critical to assessing more fully whether and how crisis stability can be achieved in a conventional war between nuclear powers and what measures must be taken to foster such stability.

Notes

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37. Herbert Lin and Jaclyn Kerr, “On Cyber-Enabled Information Warfare and Information Operations,” in *Oxford Handbook of Cybersecurity* (Oxford: Oxford University Press, forthcoming), <https://papers.ssrn.com/abstract=3015680>; Alicia Wanless and Michael Berk, “Participatory Propaganda: The Engagement of Audiences in the Spread of Persuasive Communications,” *Proceedings of the Social Media and Social Order*, Cultural Conflict 2.0 Conference, Oslo, December 1, 2018; Samuel C. Woolley and Philip N. Howard, “Computational Propaganda Worldwide: Executive Summary,” Working Paper 2017.11, Project on Computational Propaganda, Oxford University, June 2017.

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39. Christopher Gelpi, “Democracies in Conflict: The Role of Public Opinion, Political Parties, and the Press in Shaping Security Policy,” *Journal of Conflict Resolution* 61, no. 9 (2017): 1925–49.

40. As the digital and social media environment makes more of the words and deeds of leaders searchable in real time, such dynamics also can subject leaders to increased “rhetorical entrapment” pressures—possibly foreclosing some policy alternatives. For earlier development of this concept, see Frank Schimmelfennig,

“The Community Trap: Liberal Norms, Rhetorical Action, and the Eastern Enlargement of the European Union,” *International Organization* 55, no. 1 (Winter 2001): 47–80.

41. Rose McDermott, Anthony C. Lopez, and Peter K. Hatemi, “Blunt Not the Heart, Enrage It’: The Psychology of Revenge and Deterrence,” *Texas National Security Review* 1, no. 1 (November 2017): 68–89.

42. How would public opinion react to images of flag-burning protesters or cheering crowds following escalatory events? How would internal social media debates concerning crisis risks influence the faith of ally populations in extended deterrence assurances during crisis? How would such dynamics constrain the political options for the leaders of allied countries?

43. Richard H. Shultz and Roy Godson, *Dezinformatsia: Active Measures in Soviet Strategy* (Oxford, UK: Pergamon Press, 1984); Brian D. Dailey and Patrick J. Parker, eds., *Soviet Strategic Deception* (Lanham, MD: Lexington Books, 1987).

44. Andrew E. Kramer, “A New Weapon in Russia’s Arsenal, and It’s Inflatable,” *New York Times*, October 12, 2016, <https://www.nytimes.com/2016/10/13/world/europe/russia-decoy-weapon.html>.

45. Here the use of (dis)information campaigns could clearly be combined with utilization of cyberweapon systems, seeking to undermine opponents’ confidence in their technological preparedness. Elements of such an approach (though not during crisis) are evident, for example, in US efforts with regard to Iranian nuclear capabilities and North Korean missile systems. See David E. Sanger, *The Perfect Weapon: War, Sabotage, and Fear in the Cyber Age* (New York: Broadway Books, 2019).

46. Vladimir Sazonov, Kristiina Müür, and Holger Mölder, eds., *Russian Information Campaign Against the Ukrainian State and Defence Forces*, NATO Strategic Communications Centre for Excellence, 2016.

47. See, for example, Hege Eilertsen, “Russia’s Ambassador Warns: Missile Shield Will Endanger Norway’s Borders,” *High North News*, Feb. 22, 2017, <https://www.highnorthnews.com/en/russias-ambassador-warns-missile-shield-will-endanger-norways-borders>.

