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ABSTRACT

Contemporary debates on Russian nuclear strategy focus on making sense of Russia's nuclear capabilities, signalling and nuclear declarations. This paper argues that understanding how nuclear capabilities and strategy interact with conventional capabilities is fundamental to understanding nuclear strategy. It offers the Conventional Balance of Forces thesis for explaining change in Russia's nuclear strategy after the Cold War. It shows how Russian nuclear debates and strategy decisions have been affected by perceived conventional vulnerabilities, and how the orthodox Western interpretation of Russian nuclear strategy today as one of 'escalating to de-escalate' comes short of explaining when Russia would go nuclear in conflict, and why.

KEYWORDS Russia; nuclear weapons; strategy; deterrence; conventional forces

Introduction

For Russia and other potential military adversaries, it is US conventional superiority, rather than its nuclear preponderance, that produces the most severe security dilemma. Russia, the largest nuclear weapons state in the world, perceives US conventional capabilities as a potential security threat that could jeopardize its very existence. Russia has in the entire post-Cold War period explicitly threatened nuclear first use in response to large-scale conventional aggression. But the nature of the Russian first use threat has changed over time. As Russia has improved its conventional capabilities, its reliance response options to conventional regional threats have receded.

Despite this close link between conventional and nuclear strategy, the nuclear strategy literature tends to focus on nuclear posturing, and particularly on nuclear capabilities, without considering the other military and non-military capabilities states use to enhance their security. Theories about the relationship between conventional forces and nuclear strategy outcomes remain scant. The most prominent thesis has been that conventional

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inferiority produces increased reliance on nuclear threats.¹ But this thesis does not address whether or why states would seek to overcome nuclear dependency by improving conventional capabilities, nor how improved conventional capabilities impact nuclear strategy. This paper offers a Conventional Balance of Forces thesis of nuclear strategy, to explain how perceived conventional vulnerabilities and evolving conventional response options have affected Russian nuclear strategy over time. Russia is not a unique nuclear actor who, unlike all other nuclear states, perceives of nuclear weapons as uniquely suited for pursuing revisionist ambitions. Russian nuclear strategy resembles that of other states who have sought to compensate for conventional shortcomings with nuclear tools.

Predominant Western analysis has paid insufficient attention to how improved conventional capabilities have affected Russian strategy for using nuclear weapons to influence conventional regional conflicts. In the early 2000s, Russian conventional capabilities were so inferior, compared to NATO's military capabilities, that Russia deemed it necessary to threaten the early and limited use of nuclear weapons in the face of conventional threats. Since then, Russia has acquired conventional precision strike and improved air and missile defence capabilities, and its need to convey a low threshold for nuclear use has receded. Russia now has more credible conventional options that it can use for deterring and managing escalation in regional conflicts of scale that do not threaten state existence.

This does not mean that nuclear options are no longer relevant for Russian responses to conventional aggression. Russia continues to rely on nuclear weapons to deter and manage escalation in regional conflicts that threaten its existence. Russian strategists are still concerned about conventional inferiority in a large-scale or regional conflict with an adversary such as NATO. Nuclear threats or use are relevant escalation management tools if Russia had exhausted available conventional escalation tools, and was unwilling to back down, even at the risk of nuclear conflict. Russian nuclear threats or nuclear weapons use would convey a willingness to risk further escalation, rather than confidence that such escalation can be avoided.

This article makes three key contributions to the debate on nuclear strategy and the case of Russia. First, it explains how and why Russian nuclear strategy has changed in the past two decades, something existing works pay insufficient attention to. Some scholars suggest a link between Russian conventional and nuclear strategy, but do not examine how one affects the other.² Some argue that strategic culture explains Russian strategy choices, but do not posit a causal

¹For an updated take on this, see Keir A. Lieber and Daryl G. Press, *The Myth of the Nuclear Revolution. Power politics in the atomic age* (Ithaca: Cornell University Press, 2020). Chapter 4

²Olga Oliker, 'Moscow's Nuclear Enigma. What is Russias arsenal really for?,' *Foreign Affairs* November/December, Special Issue: Do Nuclear weapons matter? (2018).

relationship that predicts future strategy change.³ Accounts of Russian strategy deliberations describe, rather than explain, why strategy has changed over time.⁴ The predominant interpretation of Russian nuclear strategy today assumes that changes in Russian political intentions have produced a strategy of 'de-escalation', an assumption that has not been tested and that cannot be proved empirically.⁵

Second, it adds detail and nuance to existing theories about how conventional and nuclear forces and strategy interact. In a period when Western strategists, too, advocate integrating nuclear and conventional options, in part because of a realisation that actors such as China and Russia do so, we need detailed theoretical explorations of the conventional-nuclear nexus.⁶ This article builds upon existing theories about nuclear compensation of conventional inferiority.⁷ It produces novel insights into how change in the conventional balance of forces may produce change in nuclear strategy.

Third, this article engages the debate on the impact of emerging technologies on nuclear strategy,⁸ albeit with a focus on a technology that is relatively old: conventional precision strike. Russian strategists have sought to capitalise on the strategic utility of dual-capable missiles in a way that challenges traditional understandings of the relationship between conventional and nuclear forces. This suggests that mirror imaging Western concepts and thinking when seeking to understand non-Western states nuclear strategy may produce misguided deterrent policies. Such policies can increase the likelihood of inadvertent escalation and the chance that Russia or the West resorts to nuclear weapons as a result of misguided fear of the other's proclivity to do so.⁹

The paper seeks to avoid this trap of mirror imaging and instead to understand Russian nuclear strategy on Russian terms. It uses Russian-language sources to trace debates on how the conventional and nuclear

³Dmitry (Dima) Adamsky, 'From Moscow with coercion: Russian deterrence theory and strategic culture', *Journal of Strategic Studies* 41/1–2 (2018).

⁴Anya Fink Michael Kofman, Jeffrey Edmonds, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', *CNA Report* April (2020); Dave Johnson, 'Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds' *Livermore Papers on Global Security* 3, February (2017).

⁵Mark B. Schneider, 'Russian nuclear "de-escalation" of future war', *Comparative Strategy* 37, 5 (2018).

⁶Vincent A. Manzo and Aaron R. Miles, 'The Logic of Integrating Conventional and Nuclear Planning', *Arms Control Today* 46/9 (November 2016). Justin Anderson Robert Peters, and Harrison Menke, 'Deterrence in the 21st Century: Integrating Nuclear and Conventional Force', *Strategic Studies Quarterly* Winter (2018). Fiona Cunningham, 'Maximizing Leverage: Chinas Strategic Force Posture Choices in the Information Age', *Manuscript presented at the Nuclear Scholars Research Initiative (NSRI) Seminar, Hamburg, December* (2019).

⁷Vipin Narang, *Nuclear Strategy in the Modern Era. Regional powers and International Conflict* (Princeton and Oxford: Princeton University Press, 2014). Press, *The Myth of the Nuclear Revolution. Power politics in the atomic age*, 112–13.

⁸Todd S. Sechser, Neil Narang & Caitlin Talmadge (Eds.) 'Special Issue: Emerging Technologies and Strategic Stability', *Journal of Strategic Studies* 42, 6 (2019).

⁹Konstantin Bogdanov, 'Not-so-Nuclear War', *Russian International Affairs Council Article*, 10 March (2020).

balance of forces affects military strategy. It consults debates on what problems the Russian military believes it must solve, to understand the logic underlying its strategy. Although strategic debates, capabilities and military doctrines cannot authoritatively predict what leaders will do in crisis, they constrain and shape what it may be possible for leaders to do. When it comes to nuclear strategy, such insights are crucial in seeking to ensure that leaders' theories about the utility of nuclear weapons in war will never be tested.¹⁰

The article first reviews contemporary debates about Russian nuclear strategy and makes the case for a Conventional Balance of Forces thesis to explain nuclear strategy choices. It then uses this thesis as an explanatory framework to examine Russian nuclear strategy as exhibited in three cases: 2000, 2010 and the period 2014–2020. Finally, it discusses the findings and their implications.

The debate about Russian nuclear strategy

Western debates on Russian nuclear strategy picked up significantly after the invasion of Crimea in 2014.¹¹ The perception of changed Russian foreign policy intentions, a modernised nuclear arsenal, and a reduced Russian interest in preserving arms control produced renewed debate on the content of Russian nuclear strategy. Contemporary debates revolve around whether Russia has a strategy that involves the early and limited use of sub-strategic nuclear weapons: a doctrine that has been called 'escalating to de-escalate'.¹² US nuclear policy officially diagnoses Russian nuclear strategy according to this thesis.¹³ The key proposition is that Russia's threshold of nuclear weapons use is low and that it would use nuclear weapons early and in a limited manner in conflict in order to 'de-escalate' it and bring it to an early and decisive end.¹⁴ The potentially coercive utility of nuclear weapons may provide a temptation for Russian policymakers to pursue aggressive or revisionist ambitions against NATO states.¹⁵ According to this school, Russia believes the West is risk-averse

¹⁰I am grateful to Brendan Rittenhouse Green for elucidating this point.

¹¹Brad Roberts, *The Case for US Nuclear Weapons in the 21st Century*, Stanford Security Studies, (Stanford, CA: Stanford University Press, 2016); Stephen J. Cimbala & Roger N. McDermott, 'Putin and the Nuclear Dimension to Russian Strategy', *The Journal of Slavic Military Studies* 29/4 (October 2016); Anya Loukianova Fink & Olga Oliker, 'Russias Nuclear Weapons in a Multipolar World: Guarantors of Sovereignty, Great Power Status & More', *Daedalus* 149/2 (2020).

¹²Nikolai Sokov, 'Why Russia calls a limited nuclear strike "de-escalation"', *Bulletin of the Atomic Scientists* 13 (March 2014).

¹³Department of Defense, *Nuclear Posture Review Report*, (2018).

¹⁴Dmitry (Dima) Adamsky, 'If war comes tomorrow: Russian thinking about "Regional Nuclear Deterrence"', *The Journal of Slavic Military Studies* 27/1 (2014). See also Roberts, *The Case for US Nuclear Weapons in the 21st Century*, 131.

¹⁵Paul K. Davis, J. Michael Gilmore David R. Frelinger, Edward Geist, Christopher K. Gilmore, Jenny Oberholtzer, Danielle C. Tarraf, 'Exploring the Role Nuclear Weapons Could Play in Deterring Russian Threats to the Baltics', *RAND Corporation Research Report* (2019).

and would be unable to remain united in a severe crisis.¹⁶ Russia could use nuclear weapons to uphold a changed status quo and to force a Western surrender.¹⁷

Although this interpretation has gained prominence in Western policy circles, a closer examination of its logic and assumptions demonstrates three key shortcomings. First, it mirrors Western Cold War theories about the coercive utility of rapid nuclear escalation onto Russian strategy. It assumes that Russian leaders believe that it is possible to control escalation because the adversary would be unwilling or incapable of matching it. Yet, a closer examination of the evidence conveys a sustained Russian debate on the problem of controlling escalation. Russian strategists debate the utility and credibility of a lowered nuclear threshold and the appropriate criteria for when to use nuclear weapons in conflict.¹⁸ This debate has produced a push for improved conventional options as a supplement to limited nuclear options. This debate about how conventional and nuclear capabilities combined convey deterrent credibility is crucial to understanding Russian nuclear strategy today.

Second, this Western interpretation of Russian strategy fails to reflect how Russian planners conceptualise the utility of nuclear weapons differently based on different conflict types.¹⁹ The interpretation takes cues from limited war scenarios and limited objectives, derived from Russia's 2008 war with Georgia and 2014 war in Ukraine. The coercive *fait accompli* model from the Crimean annexation is taken as key evidence of Russian ambitions to coerce NATO.²⁰ However, this model of potential nuclear weapons use disregards the context in which Russian strategists debated early and limited nuclear weapons use: a regional war in which Russia was threatened by large-scale conventional aggression.²¹ Russian strategists never argued that Russia should employ nuclear de-escalation in limited wars that were about limited objectives. Yet, Western debates have fixated on Russian limited nuclear use in limited war.²²

Third, this interpretation of Russian nuclear strategy applies a static and potentially outdated model of how nuclear weapons compensate for conventional inferiority. It fails to account for the significant evolution in Russian

¹⁶Matthew Kroenig, *A Strategy for Deterring Russian Nuclear De-Escalation Strikes*, Atlantic Council (Scowcroft Center for Strategy and Security, 2018).

¹⁷Vince A. Manzo & John K. Warden, 'After Nuclear First Use, What?', *Survival* 60/3 (2018).

¹⁸Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts.'

¹⁹Fiona Cunningham and Kristin Ven Bruusgaard, 'Why go first? Distinguishing Strategies of Nuclear First-Use in Great Power Conflict', *George Washington University/University of Oslo* Manuscript (2020).

²⁰Kroenig, *A Strategy for Deterring Russian Nuclear De-Escalation Strikes*.

²¹S. V. Kreidin, 'Global'noye i regional'noye yadernoye sderzhivaniye: K sisteme printsipov i kriteriev', *Voennaya Mysl'* 4 (1999); A. V. Nedelin V.I. Levshin, M. E. Sosnovsky, 'O primeneni i ladernogo Oruzhiia Dlia Deeskalatsii Voennikh Deistvii', *Voyennaya Mysl'* 3 (1999).

²²Kroenig, *A Strategy for Deterring Russian Nuclear De-Escalation Strikes*. Paul K. Davis, 'Exploring the Role Nuclear Weapons Could Play in Deterring Russian Threats to the Baltics.'

conventional capabilities in the post-Cold War period and for how this has affected Russia's reliance on nuclear threats. Much of the evidence used to back up the predominant Western interpretation of Russian strategy is from strategy debates and official statements of the late 1990s and early 2000s.²³ In this period, Russia did signal a reduced nuclear threshold, due to its lack of conventional response options.

But even then, Russian strategists identified the key vulnerability in nuclear de-escalation, that of credibility and escalation management, and sought improved conventional capabilities to remedy for this vulnerability.²⁴ In the twenty years since, Russian strategy has evolved conceptually in how conventional and nuclear tools can influence an adversary, and materially in the balance of nuclear and conventional capabilities. States that face a conventionally superior adversary do not necessarily lean back and rest on their nuclear laurels: some seek to rectify their conventional inferiority. This suggests a need to re-examine existing theories about how conventional and nuclear forces and strategy affect each other.

A conventional balance of forces thesis of nuclear strategy

The strategic problem of deterring conventional aggression with nuclear weapons is as old as nuclear weapons themselves. Threatening a nuclear response to a conventional attack was fundamental to early nuclear strategising.²⁵ A nuclear threat could be used to manipulate the adversary, as the risk of a horrific nuclear war would influence its behaviour, given the unprecedented 'threat value' of nuclear weapons.²⁶ Nuclear weapons offered novel tools for deterring conventional aggression and for influencing the course of war. During the early Cold War, both the US and USSR warned of massive nuclear retaliation in response to conventional strikes. US war plans in the 1940s included of an 'atomic blitz' to halt a Soviet advance.²⁷

However, with the advent of the hydrogen bomb and the growth of secure second-strike capabilities, strategies of massive retaliation seemed increasingly suicidal. The threat of a more limited nuclear response seemed more credible.²⁸ Some speculated that nuclear weapons could produce coercive and controllable bargaining power in conventional wars if nuclear

²³Schneider, 'Russian nuclear "de-escalation" of future war.'

²⁴Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 54–55. Citing for example V. N. Tsygichko and A. A. Piontkovskiy, 'Vozmozhnye vyzovy natsionalnoy bezopasnosti Rossii v nachale XXI veka', *Voennaia Mysl* 2 (2001).

²⁵Bernard Brodie, *Strategy in the Missile Age* (Princeton: Princeton University Press, 1959).

²⁶Marc Trachtenberg, *History & Strategy*, Princeton Studies in International History and Politics, (Princeton, NJ: Princeton University Press, 1991), 7. Thomas C. Schelling, *Arms and Influence* (New Haven and London: Yale University Press, 1966).

²⁷Lawrence Freedman, *The Evolution of Nuclear Strategy*, Third ed. ed. (Basingstoke: Palgrave Macmillan, 2003), 52–53.

²⁸Trachtenberg, *History & Strategy*, 7.

escalation could be contained at different rungs of an 'escalation ladder'.²⁹ Such ideas remain controversial and subject to debate,³⁰ but continue to influence nuclear strategy.³¹

While a stronger conventional power may find conventional deterrence sufficient,³² deterring conventional aggression with nuclear weapons remains a pressing concern for conventionally inferior states.³³ There exists a range of views about what type of nuclear strategy most efficiently deters conventional wars.³⁴ An elementary claim is that *conventional inferiority produces nuclear compensation*, creating incentives for conveying a credible nuclear threat in response to conventional aggression. This can offer (1) a deterrent purpose, reducing the likelihood that an adversary will risk conflict; (2) an escalation management tool, as threat or use of nuclear weapons should force the adversary to rethink its aggressive ambitions; and (3) a warfighting purpose, by creating favourable military outcomes.

The US strategy called 'flexible response' is often cited as the first example of a nuclear policy designed to capitalise on the deterrent power of limited nuclear use in the face of conventional inferiority. It proposed a limited nuclear response to Soviet conventional aggression in order to offset US/NATO conventional inferiority.³⁵ A leader who knew he could fight a nuclear war would be in a more credible bargaining position.³⁶ Limited nuclear options could substitute for inferior manpower and firepower.³⁷ Scholars later demonstrated that truly limited nuclear responses were not available to the United States at the time of 'flexible response'.³⁸ Still, the theory of threatening limited nuclear escalation in response to conventional attack remains influential among nuclear strategists.³⁹ Pakistan's 'asymmetric escalation' strategy is a prominent example of this today threatening rapid nuclear retaliation in response to any Indian conventional attack.⁴⁰

²⁹Herman Kahn, *On escalation: Metaphors and scenarios* (London: Pall Mall, 1965).

³⁰Todd S. Sechser and Matthew Fuhrmann, *Nuclear Weapons and Coercive Diplomacy* (Cambridge: Cambridge University Press, 2017).

³¹Nuclear Operations, (Chairman of the Joint Chiefs of Staff, 2019).

³²Joshua Rovner, 'ISSF Article Review 6 on 'No First Use: The Next Step for U.S. Nuclear Policy', *H-Diplo* 4 February (2011).

³³Nina Tannenwald, 'Its Time for a U.S. No-First-Use Nuclear Policy', *Texas National Security Review* 2/3 (May 2019).

³⁴Lieber and Press distinguish between optimistic views, where nuclear weapons existence or the manipulation of risk will be sufficient to deter conventional aggression, and pessimistic views, where expansive nuclear options are needed to make nuclear threats credible. Press, *The Myth of the Nuclear Revolution. Power politics in the atomic age*, 97–101.

³⁵The strategy also served other purposes, such as handling the NATO Alliance and the German question in Europe. See Francis J. Gavin, 'The Myth of Flexible Response: United States Strategy in Europe during the 1960s', *The International History Review* 23/4 (2001).

³⁶Freedman, *The Evolution of Nuclear Strategy*, 357.

³⁷Henry A. Kissinger, 'Limited War: Conventional or Nuclear? A Reappraisal', *Daedalus* 89/4 (Fall 1960).

³⁸Gavin, 'The Myth of Flexible Response: United States Strategy in Europe during the 1960s.'

³⁹John K. Warden, 'Limited Nuclear War: The 21st Century Challenge for the United States', *Livermore Papers on Global Security* 4 (July 2018).

⁴⁰Vipin Narang, 'Posturing for Peace? Pakistan's Nuclear Postures and South Asian Stability', *International Security* 34/3 (Winter 2009/10).

The conventional inferiority thesis rests on two implicit assumptions that can be questioned. First, it assumes that nuclear weapons provide a more attractive deterrent option than conventional military options.⁴¹ Conventional inferiority is treated as a given rather than as a variable, and states will prioritise nuclear over conventional capability improvements. This channels resources away from improving conventional capabilities, through competition for finance, hardware and doctrinal supremacy.⁴² But domestic or bureaucratic politics and intra-alliance bargaining may affect how or whether nuclear or conventional capabilities are improved.⁴³ The thesis does not explicitly address why states would choose to improve nuclear over conventional forces or examine how a changed balance of conventional forces would affect the compensatory role of nuclear weapons. When seeking to deter conventional threats, different states will make different decisions regarding whether to remain dependent on nuclear options or to improve conventional options, considering, among other things, the types of threats they face.

Second, the conventional inferiority thesis assumes that states are confident in their ability to control escalation. NATO's 'flexible response' strategy and Pakistani nuclear strategy are both cases where states promise rapid and, some would argue, irrational escalation of any conventional conflict. And yet, states who rely on nuclear compensation may view the coercive utility of nuclear weapons differently. If states presume that escalation can be controlled, then limited nuclear aggression may seem an attractive foreign policy option. But states with less confidence in escalatory dynamics may believe that below certain thresholds, conventional forces pose a more credible deterrent.⁴⁴ They may choose to abandon limited nuclear war strategies,⁴⁵ for example by improving their conventional capabilities for dealing with conventional contingencies. Such decisions influence how nuclear weapons compensate for conventional inferiority.

To examine these dynamics that the conventional inferiority thesis leaves unexplored, I offer the *Conventional Balance of Forces thesis of nuclear strategy*, positing that conventional capabilities provide an alternative, more flexible or more credible tool for escalation management. It questions the claim that the deterrent value of nuclear weapons cannot be substituted by conventional arms.⁴⁶ Conventional inferiority may produce nuclear

⁴¹Press, *The Myth of the Nuclear Revolution. Power politics in the atomic age*, 94.

⁴²Christopher J. Watterson, 'Nuclear weapons and limited war: A return to the nuclear battlefield?', *Comparative Strategy* 39, 1 (2020).

⁴³Elizabeth N. Saunders, 'The Domestic Politics of Nuclear Choices: A Review Essay', *International Security* 44/2 (Fall 2019).

⁴⁴Gary L. Guertner, 'Deterrence and conventional military forces', *Small Wars & Insurgencies* 11, 2 (2000).

⁴⁵Watterson, 'Nuclear weapons and limited war: A return to the nuclear battlefield?.'

⁴⁶Samuel P. Huntington, 'Conventional Deterrence and Conventional Retaliation in Europe', *International Security* 8/3 (Winter 1983–1984).

compensation, but this is not a static choice. Changes in conventional threats and capabilities can produce change in nuclear strategy, reducing reliance on limited nuclear options. Some states may seek to reduce their reliance on nuclear responses, precisely because of a concern with the possibility of controlling escalation.

If such a thesis were true, we would expect to see: (i) Perceived conventional inferiority correlating with enhanced nuclear threats and focus on limited nuclear options, and (ii) Conventional improvements correlating with reduced nuclear threats and a reduced focus on limited nuclear options. Several examples suggest that this may ring true. NATO's flexible response strategy re-emphasised conventional options by the late 1960s, in part due to concerns about escalation control.⁴⁷ China continues to reject limited nuclear options for handling conventional threats, relying instead on improving other military capabilities.⁴⁸ Pakistan remains an outlier, living comfortably with nuclear compensation. But Russian nuclear strategy suggests a reduced reliance on nuclear options as conventional capabilities have improved.⁴⁹ Below, I examine this case in detail, exploring the impact of conventional inferiority and conventional modernisation on Russian nuclear strategy since 2000.

The conventional balance of forces and Russian nuclear strategy 2000–2020

Ample Russian sources shed light on strategy deliberations in Russia. There is an active strategy debate in expert military and civilian outlets and substantial reporting on military developments. Western publications provide annual estimates on Russian nuclear and conventional military capabilities that are comparable over time. Russian and English language sources report on nuclear signalling. Publicly available military doctrines from 1993, 2000, 2010, 2014 contain declarations about potential nuclear weapons use, as does a new official 2020 nuclear deterrence strategy. I use three official military doctrines as starting points for examining three cases of Russian nuclear strategy. I examine the 2000 case, when Russian conventional military capabilities were inferior, and we would expect a nuclear strategy of compensation. I study the 2010 case, when conventional modernisation was slowly starting, and end with an examination of the doctrine from 2014 and the period after, up to the 2020 Nuclear Deterrence Strategy, when conventional capabilities improved and when we would expect reduced nuclear compensation.

⁴⁷Watterson, 'Nuclear weapons and limited war: A return to the nuclear battlefield?.'

⁴⁸Cunningham, 'Maximizing Leverage: Chinas Strategic Force Posture Choices in the Information Age.'

⁴⁹Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts.:' Kristin Ven Bruusgaard, 'Russian Strategic Deterrence', *Survival* 58/4 (2016); Adamsky, 'From Moscow with coercion: Russian deterrence theory and strategic culture.'

For each case, I examine Russian perceived vulnerability to adversary conventional capabilities as expressed in strategy debates and official documents. The description of such threats in official documents suggests that perceived vulnerability has taken hold among Russian military and civilian leaders and affects strategy formulation. I describe available conventional response options to such threats. I then examine how conventional inferiority affects nuclear strategy, defined as nuclear capabilities, nuclear signalling, and declaratory strategy. I focus on non-strategic nuclear capabilities, as these are best suited to enhance the credibility of the threat to use nuclear weapons first in response to conventional attack.⁵⁰ I do not explore in detail the evolution of the strategic nuclear arsenal. I examine training, exercises, and displays of nuclear capabilities that are likely to affect the credibility of nuclear threats,⁵¹ and examine official declarations about potential nuclear weapons use. Although some argue that nuclear declarations are unimportant, most nuclear states spend time and resources crafting declarations about when they would use nuclear weapons. Changes in such messaging may convey change in nuclear intentions and seem worthy of examination.

2000: Russian conventional inferiority produces emphasis on early nuclear use

Soviet strategists were among the first to identify the revolutionary effect of conventional precision strike capabilities on modern warfare.⁵² The first Gulf War demonstrated how 'smart' conventional weapons could carry out missions that previously called for nuclear forces.⁵³ This led the Russian General Staff to model scenarios displaying the country's vulnerability to large-scale conventional strikes. In one scenario, an adversary carried out conventional strategic strikes against Russia's strategic forces in the Far East and destroyed 25% of the force in three days.⁵⁴ The increasingly unfavourable correlation of conventional forces resulted in Russia dropping Soviet declaratory strategy of no first use of nuclear weapons.⁵⁵

By the late 1990s, Western conventional military capabilities had evolved far above and beyond Russian capabilities. Western precision strike

⁵⁰Fiona S. Cunningham and M. Taylor Fravel, 'Dangerous Confidence? Chinese Views on Nuclear Escalation', *International Security* 44/2 (Fall 2019).

⁵¹Evan Braden Montgomery, 'Signals of strength: Capability demonstrations and perceptions of military power', *Journal of Strategic Studies* 43/2 (2020).

⁵²Roger N. McDermott and Tor Bukkvoll, 'Russia in the Precision-Strike regime – military theory, procurement and operational impact', *FFI-Rapport (Norwegian Defence Research Establishment)* 17/00979 (2017).

⁵³Guertner, 'Deterrence and conventional military forces.'; Michael S. Gerson, 'No First Use: The Next Step for U.S. Nuclear Policy', *International Security* 35/2 (Fall 2010).

⁵⁴A. G. Savelyev, *Politicheskie i voenno-strategicheskie aspekty dogovor SNV-1 i SNV-2* (Moskva: Rossiiskaya Akademiya Nauk Institut Mirovoi Ekonomiki i Mezhdunarodnykh Otnoshenii, 2000).

⁵⁵'Osnovnye polozheniya voennoy doktriny Rossiiskoy Federatsii', *Krasnaia Zvezda* 19 November (1993).

capabilities were perceived as a growing threat to Russian security, with an ability to define future war.⁵⁶ Conventional capabilities could be used in what Russian strategists started calling strategic first strikes, potentially inflicting critical or unacceptable damage on an adversary. This notion that advanced conventional precision weapons could have a destructive potential like nuclear weapons would have severe repercussions for how Russian strategists sought to influence adversary intentions.⁵⁷

NATO's 1999 Kosovo intervention produced a significant wake-up call in Moscow. Politically, Moscow was shocked at NATO's willingness to intervene in a sovereign country without a UN Security Council mandate and despite vehement Russian protests. Militarily, the operation scripted a worst-case scenario for Russian planners. They feared the potential damage of a Western conventional surgical air strike campaign, for example as a punitive response to Russia's war in Chechnya:

Such strikes would target industrial, infrastructure and military targets, against nuclear forces and C3I sites, be sufficiently selective not to provoke a nuclear response, but enough to destroy Russia's nuclear deterrent capability within days or weeks.⁵⁸

In addition to the increasing technological gap between Western and Russian military capabilities for waging modern wars, NATO expansion and out-of-area operations was increasingly perceived as a potential threat in Moscow.⁵⁹ In sum, military-technological and military-political developments were seen as potentially undermining Russian security.

Russian conventional response options in 2000

Russian conventional military capabilities in the late 1990s reflected a limited ability to respond to advanced conventional threats. Two military campaigns in Chechnya revealed significant shortcomings in Russian capabilities for waging modern war. The range of military challenges produced intense debates in Moscow about whether to prioritise conventional or nuclear modernisation.⁶⁰ Defence Minister Igor Sergeev clashed publicly with his General Staff Chief, Anatoly Kvashnin, over these prioritisations.⁶¹ General

⁵⁶Yevgenii A. Fedosov and Igor D. Spasskiy, 'Vysokotochnoye oruzhie zanyalo mesto boga voyny', *Nezavisimoye Voyennoye Obozrenie* 23 July, no. 28 (1999).

⁵⁷Roger N. McDermott & Tor Bukkvoll, 'Tools of Future Wars – Russia is Entering the Precision-Strike Regime', *The Journal of Slavic Military Studies* 31/2 (2018).

⁵⁸Alexei G. Arbatov, *The transformation of Russian Military Doctrine: Lessons learned from Kosovo and Chechnya*, George C. Marshall European Center for Security Studies (2000). p. 18.

⁵⁹Arbatov, *The transformation of Russian Military Doctrine: Lessons learned from Kosovo and Chechnya*.

⁶⁰Alexandr Golts, *Military Reform and Militarism in Russia*, Uppsala Studies in Eastern Europe 7, (Uppsala: Uppsala Universitet, 2017).

⁶¹Ivan Safronov, Ilya Bulavinov, 'Yaderniy Sintez Pod Upravleniem Marshala Sergeeva', *Kommersant Vlast'*, 11 May 1999.

Kvashnin, whose formative military experience had been Afghanistan and Chechnya, argued that Russia needed a modernised conventional force better suited to fight wars such as counterinsurgencies. Sergeyev, a former commander of the Russian Strategic Rocket Forces, argued that Russia needed an enhanced capability for strategic deterrence of large-scale conventional attack by a technologically superior adversary.⁶²

Russia's ability to defend against advanced conventional military technology was severely limited. Russian early warning capabilities were geared toward detecting a massive ballistic missile attack: it was never set up to detect individual missile launches, let alone cruise missiles.⁶³ Several former Soviet early warning sites were now located beyond Russian borders and no longer operational.⁶⁴ Russia's warning capability remained insufficient and plagued by bureaucratic struggles.⁶⁵ Russian air and missile defence systems covered Moscow but relied on nuclear munitions, and its ability to protect command and control facilities against conventional precision strike munitions was insufficient.⁶⁶

Russian conventional options for pre-empting or responding to an adversary's advanced conventional strike campaign were also lagging. Russia had started developing a successor to the Scud short-range land-based ballistic missile, the *Iskander*.⁶⁷ Medium-range, land-based missiles were outlawed by the INF Treaty. Conventionally armed sea- and air-based cruise missiles with longer ranges were still largely on the drawing board. Still, Russian strategists had started debating non-nuclear or pre-nuclear deterrence and the need for conventional precision strike capabilities that could effectively contribute to deterring conventional threats.⁶⁸ The acquisition of such capabilities was still a distant ambition.

Nuclear response options and Russian nuclear strategy in 2000

The Russian debate about the utility of nuclear weapons starts from a distinct conceptual framework distinguishing different conflict types with different roles for nuclear weapons.⁶⁹ The Soviet and Russian military lexicon differentiates local, regional, and large-scale wars. Nuclear weapons traditionally played a limited role in local wars,⁷⁰ but were instrumental to deterring and

⁶²Jacob W. Kipp, 'Russia's Nonstrategic Nuclear Weapons', *Military Review* May-June (2001).

⁶³Pavel Podvig, 'History and the Current Status of the Russian Early-Warning System', *Science & Global Security* 10 (2002).

⁶⁴'Russia', *Military Balance* 100/1 (2000).

⁶⁵Podvig, 'History and the Current Status of the Russian Early-Warning System.'

⁶⁶Spasskiy, 'Vysokotochnoye oruzhie zanyalo mesto boga voyny.'

⁶⁷'Russia.'

⁶⁸Bukkvoll, 'Tools of Future Wars – Russia is Entering the Precision-Strike Regime.'

⁶⁹Bruusgaard, 'Why go first? Distinguishing Strategies of Nuclear First-Use in Great Power Conflict.'

⁷⁰Ghulam Dastagir Wardak, *The Voroshilov Lectures Materials from the Soviet General Staff Academy Vol 1 Issues of Soviet Military Strategy*, ed. Jr. Graham Hall Turbiville (Washington, DC: National Defense University Press, 1989).

influencing large-scale wars. Large-scale, nuclear wars have set the requirements for Russia's strategic nuclear forces. Regional wars, the conflict category between these two, would involve two or more states, and could involve conventional or nuclear weapons.⁷¹ The Soviets had wanted to develop an ability to sustain such a conflict for an extended period without employing nuclear weapons.⁷² By the 1990s, Russian theorists had started debating whether Russia would have to choose between defeat and all-out nuclear war in regional conflicts because of the degraded state of Russian conventional forces.⁷³ They argued sub-strategic nuclear weapons offered a potential way to defeat an adversary in the theatre of military operations. The threat of early nuclear escalation and an ability to inflict 'deterrent damage' on an adversary using limited nuclear means could influence the adversary's perception of the balance between the advantages and the costs of aggression.⁷⁴

Russia's existing non-strategic [nuclear] capabilities can compensate for the disrupted balance of conventional forces, and their use during military hostilities can contribute to prevent the adversary's superiority in given strategic (operational) directions.⁷⁵

Other strategists pushed back against this idea, arguing that a lowered nuclear threshold would not enhance credibility, and worrying that nuclear escalation could not be controlled.⁷⁶ Some argued that strategic nuclear weapons could do the job of deterring also these types of wars. But the idea that sub-strategic nuclear weapons could help manage the escalation of regional war was established in the Russian strategic discourse.

Vulnerability to conventional strikes produced an increased Russian reliance on non-strategic nuclear capabilities in the early 2000s. An intergovernmental Security Council group was reformulating nuclear strategy in this period.⁷⁷ They decided to preserve and upgrade both strategic and nonstrategic nuclear forces,⁷⁸ and to develop a new low-yield nuclear warhead.⁷⁹ They discussed the

⁷¹ Kremlin, *Voennaia Doktrina Rossiiskoi Federatsii*, (Moscow: Kreml: Prezident Rossiiskoi Federatsii, 2014).

⁷² Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 53.

⁷³ S. V. Kreidin, 'Problemy Yadernogo sderzhivaniya: Boyevaya ustoichivost', *Voennaia Mysl'* 3 (2000). V.I. Levshin, 'O primeneni iadernogo Oruzhiia Dlia Deeskalatsii Voennikh Deistvii.'

⁷⁴ Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 37.

⁷⁵ A. S. Pis'yakov and A. I. Khryapin V. A. Ivasik, 'Yadernye oruzhie i voennaia bezopasnost Rossii', *Voennaia Mysl'* 4 (1999).

⁷⁶ Jacob W. Kipp, 'Russian military forecasting and the revolution in military affairs: a case of the oracle of Delphi or Cassandra?', *Journal of Slavic Military Studies* 9/1s (1996). Aleksandr Golts, 'Sderzhivaniye', *Itogi* 18/20 (May 1999).

⁷⁷ Oleg Falichev, 'General-Polkovnik Manilov: Novaya Voyennaya doktrina Rossii – adekvatniy otvet na vyzov vremeni', *Krasniy Voin* 13/80 (October 1999).

⁷⁸ Andrei A. Kokoshin, *Strategicheskoye upravleniye: Teoriya, istoricheskii opit, sravnitelniy analiz, zadachi dlya Rossii* (Moskovskiy Gosudarstvenniy Institut Mezhdunarodnykh Otnosheniyyakh: ROSSPEN, 2003). p. 313; Yuri Golotyuk, 'Rossiya peresmatrivayet svoyo "yadernuo argumentatsiyo"', *Izvestia* 27 April, (1999).

⁷⁹ Nikolai Sokov, 'The April 1999 Russian Federation Security Council Meeting on Nuclear Weapons', *NTI Analysis* 1 June (1999).

role of sub-strategic nuclear weapons in deterring regional wars.⁸⁰ The air leg of the triad was identified as a particularly flexible tool for limited nuclear strikes in regional wars.⁸¹ Existing and new ALCMs would be particularly relevant for this mission.⁸²

The overhaul of nuclear strategy also resulted in increased nuclear signaling. In the late 1990s, Russian strategic nuclear forces were in a poor state.⁸³ Russia had no operational strategic submarines on patrol for several months in early 1998, due to safety concerns.⁸⁴ Russian leaders became determined to change this balance. In 1998, Yeltsin announced that Russian strategic and attack submarines had re-established the Northern strategic bastion, patrolling of a defensive perimeter in the North Atlantic out to the Greenland-Iceland-UK (GIUK) gap.⁸⁵ Russia demonstrated the survivability of its nuclear retaliatory capability. Russia also signalled that it would consider limited nuclear strikes as a response to aggression. The first large strategic exercise since the Cold War, *Zapad-1999*, simulated an attack with a nuclear-armed air-launched cruise missile, the Kh-55, against targets in Norway and the United States.⁸⁶ Defence Minister Sergeev explained the purpose of the display:

The exercise rehearses one provision of Russian military doctrine: the use of nuclear forces when all measures of conventional defences against aggression have failed.⁸⁷

Perceived conventional inferiority also produced changed declaratory strategy. Russian theorists argued that lowering the nuclear threshold would increase the danger of nuclear use and thus constitute more effective deterrence of less intense conflicts.⁸⁸ The 1993 military doctrine had said nothing about potential nuclear use. The 2000 doctrine provided more specificity:

The Russian Federation retains the right to use nuclear weapons in response to the use of nuclear and other weapons of mass destruction against it or its allies, as well as in response to large-scale aggression with conventional weapons *in situations critical to the national security of the Russian Federation.*⁸⁹

⁸⁰Yaderniye sily – garant natsional'noy bezopasnosti Rossii, (Vestnik Voennoy Informatsii, 1999). Kipp, 'Russia's Nonstrategic Nuclear Weapons.'

⁸¹Nikolai Sokov, *Russian Strategic Modernization Past and Future* (Lanham, MD: Rowman and Littlefield Publishers, Inc., 2000), 145.

⁸²'Russian Nuclear Forces, 2000', *Bulletin of the Atomic Scientists* 56/4 (2000). V. P. Sinitsyn, 'Voenno-Vosdushniye sily: itogi preobrazovaniya i napravleniya razvitiya', *Voennaia Mysl'* 1 (1999).

⁸³'Russian Nuclear Forces, 2000.'

⁸⁴'Russia', *Military Balance* 100/1 (2000), pp. 109–26.

⁸⁵Kristian Åtland, 'The introduction, adoption and implementation of Russia's "Northern Strategic Bastion" Concept, 1992–1999', *Journal of Slavic Military Studies* 20/4 (2007).

⁸⁶Sokov, *Russian Strategic Modernization Past and Future*. p. 171; See also Sergei Sokut, 'Krug pocheta nad Islandiei', *Nezavisimoye Voennoye Obozrenie* 02 July (1999).

⁸⁷'Russia.'

⁸⁸Spasskiy, 'Vysokotochnoye oruzhie zanyalo mesto boga voiny.'

⁸⁹Kremlin, *Voennaia Doktrina Rossiiskoi Federatsii*, (Moscow: Kreml: Prezident Rossiiskoi Federatsii, 2000). Section 8.

The doctrine defined such threats as 'Actions designed to undermine global and regional stability (. . .), to disrupt the operation of strategic nuclear forces, missile attack warning systems, ballistic missile defences and space control systems and systems ensuring their combat stability'.⁹⁰ In 2000, Russia faced significant conventional inferiority and enhanced its non-strategic nuclear capabilities, signalling and declaratory strategy to offset this inferiority. At the same time, military strategists and leaders pointed to the need to modernise conventional military capabilities to reduce this dependency on limited nuclear responses in a broad range of scenarios.

2010: Conventional modernisation reduces Russian emphasis on early nuclear use

By 2010, conventional vulnerabilities and political developments still caused concern for Russian strategic planners. The military doctrine officially described high-precision conventional systems as military dangers that could become direct military threats.⁹¹ A group of former officials argued that the increasing number of US conventional sea- and air-launched cruise missiles warranted a further lowering of Russia's nuclear threshold.⁹² Russia remained committed to reducing the numbers of strategic nuclear weapons, as agreed to in the SORT Treaty in 2002 and in New START in 2010. But Russia would discuss reductions in non-strategic nuclear weapons only if the West would limit its conventional capabilities.⁹³ The conventional and nuclear balance of forces remained intimately linked.

Although Russia's reaction to the US withdrawal from the Anti-Ballistic Missile (ABM) Treaty in 2002 had been muted, its concerns about a European missile defence system were growing.⁹⁴ Western interlocutors played down this Russian concern, as missile defence capabilities in Europe could not defend against Russian ICBMs. But the Russian deterrence concepts as conceived in 2000 made limited nuclear strikes relevant for deterring or managing a NATO conventional strike, and missile defence could potentially degrade such options.⁹⁵ The combined threat of Western precision-guided

⁹⁰Ibid., Part I, Section 5

⁹¹Kremlin, *Voennaia Doktrina Rossiiskoi Federatsii*, Section 8, point G (Moscow: Kreml: Prezident Rossiiskoi Federatsii, 2010).

⁹²S. Rogov, Zolotaryev, P., Yesin, V., Yarynich, V., 'Sud'ba Strategicheskikh Vooruzheniiy posle Pragi', *Nezavisimoye Voennoye Obozrenie* 32: 27 August (2010).

⁹³Roger N. McDermott, 'Russias Conventional Military Weakness and Substrategic Nuclear Policy', *U.S. Army Foreign Military Studies Office Report* (2011).

⁹⁴Mikhail Tsypkin, 'Russian politics, policy-making and American missile defence', *International Affairs* 85/4 (2009).

⁹⁵For a translated Russian theorist's chart describing how missile defence diminishes the utility of demonstration strikes, see Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 26.

munitions and an enhanced missile defence capability that could mop up any scattered nuclear retaliation caused concern in Russia.⁹⁶

Russian conventional response options in 2010

The utility of nuclear weapons for deterrence or escalation management was determined not only by the scale or type of conflict, but also by the nature and type of threat. Some Russian strategists were increasingly worried that nuclear weapons were not sufficient to deter all the threats Russia was facing. Nuclear weapons could not effectively deter 'colour revolutions', public calls for democratic change, or military interventions producing regime change.⁹⁷ Deterring modern military threats would require credible responses to such informational, political, and economic threats, and nuclear responses were not necessarily a credible solution to such challenges.⁹⁸ The landscape of political threats was becoming more complex, and Russia needed more effective deterrence to hold off such threats.

By 2010, Russian theorists were developing a more comprehensive concept of non-nuclear deterrence.⁹⁹ Some of Russia's leading theorists argued that in modern (sixth-generation) warfare, conventional weapons could replace nuclear weapons, given the higher credibility of their use.¹⁰⁰ Victory would pivot on the destruction of the enemy's economic infrastructure, and operational and strategic objectives could be met by massive precision bombings, rendering nuclear weapons obsolete.¹⁰¹ Neither nuclear weapons nor people would do the brunt of the fighting, according to General Staff Chief Makarov: 'The focus is on conventional high-precision weapons, and other weapons based on new physical principles'.¹⁰²

Improved economic prospects combined with poor military performance in the 2008 Georgia war produced a decisive push to modernise Russia's armed forces.¹⁰³ By 2010, a comprehensive overhaul

⁹⁶ Andrei A. Kokoshin, *Ensuring Strategic Stability in the Past and Present: Theoretical and Applied Questions* (Cambridge, MA: Belfer Center for Science and International Affairs, Harvard Kennedy School, 2011).

⁹⁷ M.A. Gareev, 'Problemy strategicheskogo sderzhivaniya v sovremennykh usloviyakh', *Voennaia Mysl'* 4 (2009); A. S. Rukshin, 'Doktrinalnye vzglyady po voprosam primeneniya i stroitelstva vooruzhennykh sil Rossiiskoi Federatsii', *Voennaia Mysl'* 3 (2007).

⁹⁸ V. M. Burenok and O. B. Achasov, 'Neyadernoye Sderzhivaniye', *Voennaia Mysl'* 12 (2007).

⁹⁹ "Strategicheskoye sderzhivanie" – Novaya konseptsiya voennoi bezopasnosti Rossii', *Regnum* 2008, A. A. Kokoshin, *O sisteme neyadernogo (predyadenogo) sderzhivaniya v oboronnoy politike Rossii* (Moscow: Isdatelstvo Moskovskogo Universiteta, 2012).

¹⁰⁰ Tor Bukkvoll, 'Iron Cannot Fight – The Role of Technology in Current Russian Military Theory', *Journal of Strategic Studies* 34/5 (2011).

¹⁰¹ Roger N. McDermott, 'Russian Perspective on Network-Centric Warfare: The Key Aim of Serdyukovs Reform', *Foreign Military Studies Office Report* (2011): 8.

¹⁰² Bukkvoll, 'Iron Cannot Fight – The Role of Technology in Current Russian Military Theory.'

¹⁰³ Bettina Renz, 'Why Russia is Reviving its Conventional Military Power', *U.S. Army War College Parameters* 46/2 (Summer 2016).

was taking shape, restructuring the entire military organisation.¹⁰⁴ Russia launched a State Armaments Program for spending an unprecedented 20 trillion RUR on upgrading up to 70% of the military inventory.¹⁰⁵ This included procurement plans for advanced conventional precision-strike capabilities, which were only slowly improving by 2010. Russia had deployed its new land-based short-range ballistic and cruise missile that could carry both conventional and nuclear warheads, the *Iskander*. In 2008, President Dmitry Medvedev threatened to deploy it to Kaliningrad to offset the threat posed by NATO's ballistic missile defence.¹⁰⁶ Russia was probably also developing a land-based intermediate-range missile, the 9M729: US authorities accused Russia of the violation publicly in 2014.¹⁰⁷ Russia was (still) producing the new air-based cruise missile, the *Kh-101*, and a new sea-launched cruise missile, the *Kalibr*.¹⁰⁸ This suite of conventional capabilities would be optimal holding targets across the European and American theatres at risk, and for responses to Western conventional precision strikes. However, despite explicit ambitions and aspirational concepts, only the *Iskander* missile was part of the operational Russian inventory in 2010.

The State Armaments Program made evident the central role that air and missile defences would play in defeating modern threats. Such capabilities could deter adversaries from provocative actions in peacetime and facilitate the effectiveness of the general-purpose forces and decrease losses in war.¹⁰⁹ A future Russian reconnaissance-strike complex would integrate air and space defence forces and assets for Command, Control, Intelligence, Surveillance and Reconnaissance (C4ISR).¹¹⁰ In 2010, Russian air and space defence forces were merged into one service, and some short- and medium-range air defence systems were coming online, including the *Pantsir* and the *S-400*.¹¹¹ The Russian ambition for a strategic network of radars, integrated air defence, tactical aviation and missile defence was becoming apparent,¹¹² but the shape of an integrated force was only nascent.

¹⁰⁴Greg Whisler, 'Strategic Command and Control in the Russian Armed Forces: Untangling the General Staff, Military Districts, and Service Main Commands (Part Two)', *The Journal of Slavic Military Studies* 33/1 (2020).

¹⁰⁵Susanne Oxenstierna & Fredrik Westerlund, 'Arms Procurement and the Russian Defense Industry: Challenges Up to 2020', *The Journal of Slavic Military Studies* 26/1 (2013).

¹⁰⁶President Dmitry Medvedev, Address to the Federal Assembly of the Russian Federation, (2008).

¹⁰⁷Ulrich Kühn and Anna Péczei, 'Russia, NATO and the INF Treaty', *Strategic Studies Quarterly* 11/1 (Spring 2017).

¹⁰⁸Office of Naval Intelligence, *The Russian Navy A historic transition* (2015).

¹⁰⁹O. B. Achasov, 'Challenges with providing support for a balanced developments of components of VKO system', *Strategic Stability* 1 (2012). Cited in Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 17.

¹¹⁰McDermott, 'Russian Perspective on Network-Centric Warfare: The Key Aim of Serdyukovs Reform', 17.

¹¹¹Bukkvoll, 'Iron Cannot Fight – The Role of Technology in Current Russian Military Theory.'

¹¹²Michael Kofman, 'Russian A2/AD: Its is not overrated, just poorly understood', 1 March (2020).

Nuclear response options and Russian nuclear strategy in 2010

Conventional military capabilities would not yet have a decisive impact on all aspects of Russian nuclear strategy, and military observers continued to emphasise nuclear compensation for conventional weakness.¹¹³ Russia had reduced its tactical nuclear weapons arsenal by 30–60%, in accordance with the Presidential Nuclear Initiatives of the early 1990s.¹¹⁴ The remaining Russian arsenal of nonstrategic nuclear weapons was still plentiful, at around 2000 warheads.¹¹⁵ Most of Russia's new conventional land-, sea- and air-launched missiles would be based on existing platforms designed for nuclear payloads. The development of new platforms for conventional munitions would thus entail a modernisation of the nuclear sub-strategic arsenal as well. Russian bombers were being equipped to carry both nuclear and conventional missiles.¹¹⁶

As part of its military modernisation, Russia engaged in increased nuclear signalling. Strategic nuclear signalling was revitalised to demonstrate a sustained secure second-strike capability. Russian strategic bombers resumed Cold War strategic flights patterns from 2007. In 2009, two Russian *Akula* attack submarines patrolled off the US Eastern seaboard, demonstrating an ability to hold US targets at risk with existing sea-based nuclear cruise missiles.¹¹⁷ But Russia also demonstrated an improved operational ability to carry out theatre nuclear strikes, in the face of conventional regional inferiority. The strategic exercise *Zapad-2009* was premised on a war against a 'technologically superior adversary'.¹¹⁸ A Polish source claimed that the exercise included simulated nuclear strikes against Poland.¹¹⁹ In contrast to *Zapad-1999*, Russia did not officially convey such messaging, and internal NATO reporting describes the use of 'nuclear-capable' ballistic missiles.¹²⁰ Dual-use capabilities such as the *Iskander* conveyed an implicit nuclear threat, but also an improved conventional capability to strike critical targets in Europe.

Impending improvements in conventional capabilities did produce change in Russian declaratory nuclear strategy. Then chief of the General Staff Yuri Baluyevskii explained: 'The 2000 military doctrine focused on preventing war with the means available to the state at that point in time. A new

¹¹³Dale R. Herspring, 'Russian Nuclear and Conventional Weapons: The Broken Relationship', in *Russias Nuclear Weapons: Past, Present, and Future*, ed. Stephen J. Blank (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2011), 25.

¹¹⁴Russia determined to keep tactical nuclear arms for potential aggressors', *Pravda*, 31 October 2007.

¹¹⁵McDermott, 'Russias Conventional Military Weakness and Substrategic Nuclear Policy.'

¹¹⁶Kristensen, 'Russian Nuclear Forces, 2010'.

¹¹⁷Kristensen, 'Russian Nuclear Forces, 2010'.

¹¹⁸Markus Ekstrom, 'Rysk operativ-strategisk ovringsverksamhet under 2009 och 2010/Russian military operational-strategic exercises, 2009–2010', *FOI (Swedish Defence Research Agency) Report FOI-R-3022-SE* (2010).

¹¹⁹Bruno Tertrais, 'Russia's Nuclear Policy: Worrying for the Wrong Reasons', *Survival* 60, 2 (2018).

¹²⁰23.11.2009: NATO-RUSSIA: NAC discusses Russian Military Exercises', *Aftenposten* (2011).

doctrine should take account of changed internal and external conditions and [Russia's] normalised conventional capabilities'.¹²¹ It introduced stricter requirements for nuclear use:

Russia reserves the right to use nuclear weapons in response to nuclear or weapons of mass destruction use against it or its allies, and against conventional attack on the Russian Federation *when the very existence of the state is under threat* (my italics).¹²²

Although this formulation entailed some ambiguity, it was narrower than the 2000 formulation which opened for nuclear responses to 'threats to national security'. Many threats to national security would not threaten 'the very existence of the state'. A non-trivial contemporary example was defending ethnic Russians in the former Soviet space. In 2009, Russia had passed new legislation allowing for the deployment of military forces abroad, without parliamentary approval, to protect such citizens.¹²³ This caused concern in the Baltic States about potential Russian aggression under the guise of protecting the Russian minority. However, the violation of the rights of Russian citizens in the Baltics could in no way be described as threats to 'the very existence of the Russian state', the new doctrinal requirement for Russian nuclear weapons use.

The formulation 'threats to the very existence of the state' produced significant Western debate. What would constitute such threats? Did they include, for example, threats to regime survival? As with most declaratory strategy, this formulation contained ambiguity, leaving adversaries uncertain about the precise nuclear threshold. The military doctrine stated that attacks against the Russian state and its military command and control systems, strategic nuclear forces, warning systems for missile attack, and space forces, would be seen as military threats.¹²⁴ Western analysts concluded that threats to state existence would include, at minimum, conventional strikes on critical targets in Russia, critical loss levels across forces or key systems, or an inability to repel an invasion into its interior.¹²⁵ From 2010, attacks on Russian territory were thus a prerequisite for a Russian nuclear first strike.

There had been disagreement within the Russian elite regarding this doctrine. Security Council Secretary Nikolai Patrushev announced that the 2010 military doctrine would contain provisions for nuclear pre-emption,¹²⁶

¹²¹Yuri Baluyevskiy, 'Kakoy byt' novoy Voyennoy Doktrine Rossii?', *Rossiskoye Voyennoye Obozreniye* No.2, (February 2007).

¹²²Kremlin, Voennaia Doktrina Rossiiskoy Federatsii. (2010) Section 22

¹²³*Opinion on the amendments to the Federal law on defence of the Russian Federation*, Council of Europe, 21 December (2010).

¹²⁴Kremlin, *Voennaia Doktrina Rossiiskoy Federatsii*. Section 10, Point B

¹²⁵Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 51.

¹²⁶Nikolai Patrushev, 'O novoy voyennoy doktrine', *Zaschita i Bezopasnost'* 4 (2009); A. Yashlavskiy, L. Panchenko, 'Rossiya skoro smozhet bit' pyervoy', *Moskovskiy Komsomolets* (Moscow), 15 October 2009.

but the published version did not do so. This sparked speculation in the West about the classified version of the doctrine.¹²⁷ Authoritative sources indicate that neither version contained a pre-emption clause, and that a public military doctrine would not be contradicted by a classified one.¹²⁸

By 2010, the Russian Ministry of Defence had concluded that theoretically, conventional strike options could contribute to deter regional conflicts and manage escalation.¹²⁹ The 2010 military doctrine reflected this, stating: 'In implementing strategic deterrence, provision is made for using conventional precision weapons'.¹³⁰ Russian conventional capabilities were not yet adequate to this plan; however, and modernisation of nuclear capabilities and nuclear signalling continued. But Russian declaratory policy conveyed a changing Russian conventional ambition. The nuclear compensation for Russian conventional inferiority was changing by 2010: with a reduced emphasis on a low declaratory threshold for limited nuclear use, and with more subdued signalling that focused primarily on strategic nuclear forces.

2014–2020: Substantial conventional advances influence Russian nuclear threats

From 2014 onwards, the conventional balance of forces changed between Russia and the West. The Russian invasion of Ukraine in 2014 demonstrated modernised Russian conventional capabilities and prompted a NATO conventional military reinforcement from the Barents Sea to the Baltic and the Black Sea. Russian strategists voiced concern about NATO encroachment from all strategic directions, still perceiving a capability disadvantage in a protracted conventional war.¹³¹ Russia remained concerned about NATO's missile defence sites close to Russian borders, including their potential for reinforcements. Russian strategy documents continued to list NATO capabilities and US Prompt Global Strike as military threats.¹³² The dissolution of the INF Treaty, ironically, produced Russian concern about future NATO deployment of offensive strike assets in Europe.¹³³

¹²⁷Alex Velez-Green, 'Why Moscow Might Not Reveal an "Escalate to De-Escalate" Strategy', *CSIS PONI Next Generation Nuclear Network* 8 (May 2018).

¹²⁸Author's Interview with General (Ret.) Pavel Zolotarev, 7 December 2017; Dmitry Litovkin, 'Iz Soveta Bezopasnosti. Voennaya doktrina Rossii stala zhestche', *Krasnaia Zvezda* 5/22 (February 2010). In 2020, Russia made a version of the 'classified' military doctrine public, an apparent attempt to reduce such confusion.

¹²⁹Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 13–14.

¹³⁰Kremlin, *Voennaia Doktrina Rossiiskoy Federatsii*. Part II, Section 12B

¹³¹Dara Massicot, Scott Boston, 'The Russian Way of Warfare: A Primer', *RAND Corporation* (2017).

¹³²Kremlin, *Short Voennaia Doktrina Rossiiskoy Federatsii*. Part II

¹³³'Rakety srednei i menshei mirnosti', *Kommersant* 174, 25 September (2019).

Improved Russian conventional response options

Russia's conventional means for defending against and responding to conventional threats improved markedly by 2014 and would continue to improve. Significant hardware upgrades and organisational changes had transformed Russian conventional forces, as the invasion of Ukraine and subsequent operations demonstrated.¹³⁴ Russia tested new organisational concepts such as smaller Battalion Tactical Groups, and intensified training and exercising that improved Russian fighting power and ability to conduct large-scale military operations.¹³⁵ The intervention in Syria from 2015 provided valuable operational experience, including through conducting sustained air operations.

The Russian conventional capability for holding targets at risk and for conventional responses was improved by 2014, significantly so by 2020. By 2012, Russia had deployed the new dual-capable ALCM Kh-101, and in 2015, the new *Kalibr* sea-launched cruise missile (SLCM) was launched from a new attack submarine, the *Severodvinsk*.¹³⁶ Russia revealed a new hypersonic air-launched ballistic missile, the *Kinzhal*, in 2018, and expanded its land-based strike assets with an INF-violating intermediate-range missile, the 9M729. Expanded conventional capabilities could be used to fulfil the functions previously assigned to nuclear weapons.¹³⁷ Still, in quantitative terms, Russia continued to lag behind the West and the United States.

The integrated Aerospace Forces were further developed to enhance a layered defence and a capability to strike targets at increasing ranges. The Russian ability to deflect Western conventional strikes have intensified Western debates about Russia's A2AD capability.¹³⁸ These conventional improvements have, according to Russian strategists, improved Russia's ability to deter conventional aggressors. The Western debate on Russian A2AD displays this notion that an attack against Russia is being perceived as increasingly costly.

Nuclear response options and nuclear strategy 2014–2020

The Conventional Balance of Forces thesis of nuclear strategy would predict that improved conventional capabilities should produce a reduced emphasis on limited nuclear options. By the mid-2010s, Russian conventional precision

¹³⁴Bettina Renz, *Russia's Military Revival* (Cambridge: Wiley, 2018).

¹³⁵Johan Norberg, 'Training for War. Russias Strategic-level Military Exercises 2009–2017', *FOI Report FOI-R-4627-R*, no. October (2018).

¹³⁶Kristensen and Norris, 'Russian Nuclear Forces, 2014'.

¹³⁷Johnson, 'Russia's Conventional Precision Strike Capabilities, Regional Crises, and Nuclear Thresholds' 48.

¹³⁸Michael Kofman, 'It's time to talk about A2/AD: Rethinking the Russian Military Challenge', *War on the Rocks* 5 September (2019); Alexander Lanoszka and Luis Simon, 'The Post-INF European Missile Balance: Thinking About NATO's Deterrence Strategy', *Texas National Security Review* Summer 2020.

strike capabilities had started to fill a role in the Russian strategic deterrence concept. But although overall numbers of Russian nonstrategic nuclear weapons declined, several new nonstrategic nuclear systems had become operational.¹³⁹ All the new sea-, air- and land-based cruise and ballistic missiles were nuclear (and dual-) capable. Russia also developed new nuclear gravity bombs.¹⁴⁰ In other words, a reduced Russian emphasis on nuclear capabilities because of emerging conventional assets was not apparent.

Dual-capable systems pose a challenge for the conventional balance of forces thesis of nuclear strategy. Russia has developed its conventional precision strike capabilities by building on an area of strength: producing nuclear-capable missiles. In part, this is a result of the legacy of the Russian nuclear and missile industry. Russian design bureaus command resources to develop systems to the state of flight test or advanced demonstration even without funding from the Ministry of Defence.¹⁴¹ Decisions to produce some of the dual-capable systems may have been driven by a need for modernised nuclear missiles. The air-launched cruise missile was first developed in the period around 2000 when Russian strategists emphasised sub-strategic nuclear response options. Other capabilities, such as the *Kalibr*, may have been attractive in terms of both conventional and nuclear versions. A sea-based conventional precision strike capability is an evident asset for the Russian navy. At the same time, this branch is habitually presented as a keen proponent of nonstrategic nuclear options, as nuclear weapons balance US naval superiority.¹⁴² Current Russian calls for a moratorium on nuclear-armed land-based intermediate-range missiles in Europe indicates either that the nuclear version of the 9M729 is not Russia's key focus, or that the nuclear version of this missile was not intended for Europe.¹⁴³

Russian strategists still seek a range of capabilities for escalation management because of a sustained perception of conventional inferiority, even if that inferiority is reduced compared to previously. The number of available conventional strike assets is likely one factor influencing this; the deteriorating political relations with the West another. Russian strategists now deem a potential conflict with NATO more, not less likely. Russian official strategy now states that the time, place, and capability chosen for Russian nuclear escalation of conflict should be unpredictable.¹⁴⁴ A suite of non-strategic nuclear options ensure such flexibility.

¹³⁹Hans M. Kristensen and Matt Korda, 'Russian Nuclear Forces 2020', *Bulletin of the Atomic Scientists* 76, Nuclear Notebook, no. 2 (2020).

¹⁴⁰Pavel Podvig, 'Russia's Current Nuclear Modernization and Arms Control', *Journal for Peace and Nuclear Disarmament* 1/2 (2018).

¹⁴¹Podvig, 'Russia's Current Nuclear Modernization and Arms Control.'

¹⁴²Osnovy gosudarstvennoi politiki Rossiiskoi Federatsii v oblasti voenno-morsokoi deyatel'nosti na period do 2030 goda, (Moscow: Kremlin, 2017). See also Michael Kofman, 'The Role of Nuclear Forces in Russian Maritime Strategy', *Russian Military Analysis Blog* 12 March (2020).

¹⁴³Rakety srednei i menshei mirmnosti.'

¹⁴⁴Kremlin, Osnovy gosudarstvennoy politiki Rossiiskoi Federatsii v oblasti yadernogo sderzhivaniya, (Moscow: Prezident Rossiiskoi Federatsii, 2020).

In Russian strategy, conventional capabilities do not supplant nuclear capabilities or vice versa: rather one augments the utility of the other. Russian deterrence concepts adjusted to capitalise on the military utility and deterrent effect of interchangeable conventional and nuclear options.¹⁴⁵ Russian theorists discuss how conventional capabilities with nuclear potential can inflict enough damage on an adversary to a level it would deem unacceptable.¹⁴⁶ Improved conventional capabilities provide Russia with more options before it would face whether to go nuclear:

If nonnuclear means are unsuccessful in deterring him from initiating or continuing aggression, the transition to nuclear weapons use will be lawful and unavoidable.¹⁴⁷

Russian strategic nuclear signalling has continued at high levels, conveying a sustained and improved secure second-strike capability. Continuous Russian nuclear submarine deterrent patrols resumed by mid-2012.¹⁴⁸ Since 2014, 'Russia has continued long-range bomber training with sorties flown over the Arctic, North Atlantic, and North Pacific, intercepted by NATO and Japanese fighter aircraft in "scenarios reminiscent of the Cold War"'.¹⁴⁹ An unprecedented 2019 naval exercise in the Norwegian Sea demonstrated Russia's ability to protect the Northern Strategic Bastion.¹⁵⁰ But the emphasis on non-strategic nuclear options has been influenced by the integration of conventional and nuclear assets, such as in the strategic nuclear exercise *Grom-2019*.¹⁵¹ The strategic exercises *Zapad-2017* had a reduced nuclear 'tone' compared to previous exercises, and resulted in no reports on simulated strikes against Western targets.¹⁵² After 2014, Russian nuclear signalling of strategic forces has remained at high levels. But a willingness for rapid and limited nuclear escalation in the face of non-existential conflict, as conveyed in 2000, has been supplanted by integrated conventional and nuclear response options.

Russian declaratory strategy also emphasised non-nuclear options after 2014. The 2014 military doctrine introduced the concept *non-nuclear deterrence*, 'a complex of foreign policy, military and military-technical measures

¹⁴⁵V. V. Alferov V. I. Polegayev, 'O Neyadernom Sderzhivanii, ego roli i meste v sisteme Strategicheskogo Sderzhivaniya', *Voennaia Mysl* 7 (2015); Viktor Saksonov, 'Neyadernoe sderzhivanie', *Nezavisimoye Voyennoye Obozrenie* 12 August (2016).

¹⁴⁶Y. N. Tret'yakov O. Y. Aksienov, E. N. Filin, 'Osnovnye printsipy sozdaniia sistemy otsenki tekushogo i prognoznogo ushcherba vazhneishim ob'ektam sistemy strategicheskogo sderzhivaniya', *Voennaia Mysl* 2 (2015).

¹⁴⁷Achasov, 'Neyadernoye Sderzhivaniye.'

¹⁴⁸Kristensen and Norris, 'Russian Nuclear Forces, 2014'.

¹⁴⁹Norwegian Intelligence Service, *Focus 2017* (Forsvaret, 2017).

¹⁵⁰Tormod Strand, 'Secret submarine operation: "The goal is to demonstrate a Russian ability to strike the United States"', *NRK*, 29 October (2019)

¹⁵¹Norwegian Intelligence Service, *Focus 2020*,(Forsvaret, 2020).

¹⁵²Michael Kofman, 'What actually happened during Zapad 2017', *Russian Military Analysis Blog* 22 December (2017).

directed at the prevention of non-nuclear aggression against Russia'.¹⁵³ This novel concept was a direct translation of new conventional and non-conventional capabilities into deterrent potential, as described by Russian strategists.¹⁵⁴ Defence Minister Sergei Shoigu stated, 'The role of nuclear weapons in deterring a potential aggressor will diminish, primarily thanks to the development of precision weapons'.¹⁵⁵ In 2020, Russia published a nuclear deterrence doctrine, which again reiterated nuclear weapons being weapons of last resort.¹⁵⁶ Putin has warned of the dangers of lowering thresholds for nuclear use and of the difficulty of distinguishing dual-use systems.¹⁵⁷ He rejected nuclear pre-emption:

We are prepared ... [to] use nuclear weapons only when we know, for certain, that some potential aggressor is attacking Russia, our territory. Our concept is based on a reciprocal counter strike. Such a counter strike would amount to a global catastrophe. We cannot be the initiators of such catastrophe because we have no provision for pre-emptive strike.¹⁵⁸

Conventional capability improvements after 2014 have contributed to a high Russian declaratory nuclear threshold and to reduced signalling of early nuclear escalation with the limited use of sub-strategic nuclear weapons. But Russia retains an emphasis on nuclear weapons as an escalation management tool in regional wars where conventional options cannot ensure state survival. This promise of nuclear first use in the face of grave conventional threats was reaffirmed in the 2020 nuclear deterrence strategy. Russia's retains a range of nuclear capabilities for their complimentary rather than alternative effect to conventional capabilities.

To sum up, the Conventional Balance of Forces thesis demonstrates that Russian sub-strategic nuclear weapons compensated for conventional inferiority, some 20 years ago. This strategy was a product of a lack of a conventional response option to a strategic conundrum identified by Russian strategists. It was not the product of increasing Russian foreign policy ambitions, but rather a response to a perceived growing threat. It was also a response conceived within a specific context: a regional conflict with a large-scale conventional air strike that could threaten Russian retaliatory nuclear capability. It was never a strategy associated with expansionist ambitions, nor one designed to achieve limited goals by way of limited wars.

¹⁵³*Voennaia Doktrina Rossiiskoi Federatsii*. Section 8, point N.

¹⁵⁴V. I. Polegayev, 'O Neyadernom Sderzhivanii, ego roli i meste v sisteme Strategicheskogo Sderzhivaniya.'

¹⁵⁵Vladimir Isachenkov, 'Russia to rely increasingly on non-nuclear deterrent', *AP* 21 February (2017); Russian Ministry of Defence, 'Ministr oborony Rossii provel ustanovochnyuyu lektskiyu kursa "Armiya i obshchestvo"', (2017).

¹⁵⁶Kremlin, *Osnovy goudarstvennoy politiki Rossiiskoi Federatsii v oblasti yadernogo sderzhivaniya*.

¹⁵⁷Vladimir Putin's annual news conference, (Moscow: Kremlin, 2018).

¹⁵⁸Vladimir Putin Meets with Members of the Valdai Discussion Club. Full Transcript of the Plenary Session of the 15th Annual Meeting', *Valdai Club*, no. 18 October (2018).

Russian officials continue to reject this Western interpretation of Russian strategy.¹⁵⁹ It misrepresents both the context and the purpose of potential Russian nuclear weapons use.

Russian strategists have continued to grapple with two elementary nuclear strategy problems. They debate the credibility and utility of nuclear threats and the difficulty of predicting adversary responses to limited nuclear strikes.¹⁶⁰ This has produced a Russian nuclear strategy that emphasises non-nuclear options to enhance the credibility of nuclear threats. The strategy now exhibits a novel interrelationship between nuclear and conventional forces, where improved conventional capabilities do not lead directly to a reduction of nuclear emphasis, but neither does it leave the role of nuclear weapons unchanged. It reduces Russian dependency on nuclear options for handling local and regional wars that do not threaten state existence. Conventional capabilities have been instrumental to how Russian planners formulated nuclear strategy.

The fact that Russia retains a broad range of nonstrategic nuclear capabilities indicates that military and civilian leaders believe such weapons could influence the course of conflict or help terminate it. However, this option does not reflect an interest in using nuclear weapons as a coercive tool to hold an adversary hostage to Russian revisionist goals. Russian leaders convey that they would use nuclear weapons only when Russia had exhausted available conventional escalation tools and was unwilling to back down in the face of existential threats. Russian nuclear use would convey a Russian willingness to risk further nuclear escalation, not confidence that it thinks it can avoid or control escalation.

Conclusion

To nuclear strategists, understanding when and under what circumstances an adversary would resort to nuclear weapons has always been a central challenge. When a nuclear weapons state reaches that point depends on the balance of nuclear forces, as well as on conventional threats and response options. This article demonstrates how studying the conventional balance of forces produces insights into nuclear strategy deliberations and outcomes. The interrelationship between conventional forces and nuclear strategy is not static but dynamic. Conventional inferiority can produce increased reliance on nuclear threats, but some states seek to improve conventional capabilities to overcome this dependency. Russia is one such state: its preferred escalation management option is not, by default, nuclear weapons.

¹⁵⁹Sergei Lavrov, 'Statement at the Conference of Disarmament, Geneva', (28 February 2018).

¹⁶⁰Michael Kofman, 'Russian Strategy for Escalation Management: Evolution of Key Concepts', 15.

This finding highlights the need for more theoretical and empirical explorations of the relationship between conventional and nuclear forces and strategy. Russian strategists expanded on Cold War concepts of nuclear compensation for conventional inferiority. Their concepts are now tailored to deter the types of security challenges Russia faces. Other nuclear weapons states may assess the impact of conventional threats and capabilities on nuclear strategy differently. States with more advanced conventional capabilities may draw different conclusions regarding their need to rely on nuclear compensation. Prospective nuclear weapons states will value the utility of potential nuclear capabilities depending on conventional options. Comparing and contrasting how Western and non-Western states approach this conventional/nuclear nexus will produce additional insights into how different states formulate nuclear strategy to face conventional threats.

The Russian case highlights the need to examine the technical, military, and strategic implications of dual-use capabilities more closely.¹⁶¹ Existing scholarship explores some effects of these capabilities, such as the potential for inadvertent escalation.¹⁶² But it does not examine the strategic utility of such capabilities, a utility that Russian strategists have sought to exploit. Dual-use capabilities may serve different military, political, or bureaucratic purposes in different political systems, in turn determining their relative strategic value. Understanding such differences will be crucially important to stymie conventional and nuclear arms racing, and to achieve arms control agreements among old and new rivals.

Finally, the conclusions drawn here highlight the need to examine the iterative dynamics that the nuclear and conventional balance of forces produce between adversaries. Russian strategy is a product of perceptions of its conventional and nuclear capability compared to the potential adversary. That perception changed over time, in part because of the adversary's changing behaviour. Scholars and policymakers should acknowledge that both conventional *and* nuclear forces affect their own position and military options, as well as those of the adversary. Understanding such dynamics will be central to gauging when, in conflict, an adversary might use nuclear weapons and what might deter such escalation.

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¹⁶¹One interesting examination of the impact of missile technology bar their nuclear characteristic is Robert Ayson & Christine M. Leah, 'Missile Strategy in a Post-Nuclear Age', *Journal of Strategic Studies* 38/1–2 (2014).

¹⁶²James M. Acton, *Is it a Nuke? Pre-Launch Ambiguity and Inadvertent Escalation*, Carnegie Endowment for International Peace (Washington, DC, 2020).

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