Dangerous Confidence?

Chinese Views on Nuclear Escalation

Fiona S. Cunningham and M. Taylor Fravel

Amid the shifting balance of power in Asia, the potential for nuclear escalation in a crisis or an armed conflict between the United States and China has attracted increasing attention among scholars and policymakers alike. If a crisis or war occurred between these two states, nuclear escalation could be intentional and could include the use of nuclear weapons to "escalate to de-escalate" the conflict or to destroy the opponent's military assets;[1] they could also be used as a large-scale response to an opponent's limited nuclear strikes. Nuclear escalation could also be inadvertent if an opponent's actions created a belief that one's own nuclear forces were being attacked or degraded. Finally, it could be accidental or unauthorized, if leaders or commanders act on incorrect information or on their own initiative.

Whatever the pathway, understanding the views of China's strategic community toward nuclear escalation is critical for both scholars and policymakers. Our previous research suggested that Chinese experts were relatively confident about crisis stability, defined as a situation in which neither country has an incentive to use nuclear weapons first, in a U.S.-China crisis.[2] This

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1. Some Russian strategists have suggested that limited nuclear strikes could be used to coerce an opponent to end a conventional conflict, although Russia scholars dispute whether this concept of escalate to de-escalate has been incorporated into Russia's nuclear doctrine. See Kristin Ven Bruusgaard, "Russia's Nuclear Strategy of Survival," Stanford University, March 2019; and Olga Oliker, "Moscow's Nuclear Enigma: What Is Russia's Arsenal Really For?" *Foreign Affairs*, Vol. 97, No. 6 (November/December 2018), pp. 52, 54.
2. Fiona S. Cunningham and M. Taylor Fravel, "Assuring Assured Retaliation: China's Nuclear Strategy and U.S.-China Strategic Stability," *International Security*, Vol. 40, No. 2 (Fall 2015), pp. 7–50, doi.org/10.1162/ISEC_a_00215. By "Chinese experts," we refer to the members of China's stra-

International Security, Vol. 44, No. 2 (Fall 2019), pp. 61–109, https://doi.org/10.1162/ISEC_a_00359

article examines the origins and consequences of this confidence. Why are most Chinese experts confident that a U.S.-China conventional war would not escalate to a nuclear war? How consistent are these views with China's operational doctrine and force structure? How much control does China think it would have over nuclear escalation in a conflict? What are the implications of these views?

Understanding Chinese views of nuclear escalation is important for several reasons. To start, the dynamics of limited nuclear war are receiving renewed attention among U.S. policymakers. Their concerns that Russia's nuclear doctrine envisages the use of limited nuclear strikes to escalate to de-escalate a conventional conflict has focused U.S. attention on how to deter limited nuclear strikes.[3] In addition, as the conventional military superiority of the United States fades,[4] some former U.S. policymakers have suggested it might need to threaten limited nuclear strikes to maintain the credibility of its commitments to deter nuclear attacks on allies in Europe and East Asia.[5] Finally, the 2018 U.S. *Nuclear Posture Review* warns that China might believe that it could secure advantages through the limited use of nuclear weapons.[6]

Second, understanding Chinese views about nuclear escalation can help illuminate the potential for inadvertent escalation in a U.S.-China conflict. Most arguments about inadvertent escalation are based on assumptions about how

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tegic community, including scholars, arms control specialists, military analysts, and other individuals associated with China's nuclear weapons strategy, production, and operations. Some key institutions in China's strategic community include the Academy of Military Science, the National Defense University, the China Institutes of Contemporary International Relations, the China Arms Control and Disarmament Association, the Chinese Academy of Social Sciences, the Chinese Academy of Engineering Physics, and Tsinghua University.

3. Elbridge Colby, "If You Want Peace, Prepare for Nuclear War: A Strategy for the New Great-Power Rivalry," *Foreign Affairs*, Vol. 97, No. 6 (November/December 2018), pp. 25–32; Vincent A. Manzo and John K. Warden, "After Nuclear First Use, What?" *Survival*, Vol. 60, No. 3 (June–July 2018), pp. 133–160, doi.org/10.1080/00396338.2018.1470770; and John K. Warden, "Limited Nuclear War: The 21st Century Challenge for the United States," Livermore Papers on Global Security No. 4 (Livermore, Calif.: Center for Global Security Research, Lawrence Livermore National Laboratory, July 2018).

4. Eric Edelman and Gary Roughead, *Providing for the Common Defense: The Assessment and Recommendations of the National Defense Strategy Commission* (Washington, D.C.: United States Institute of Peace, 2018), https://www.usip.org/sites/default/files/2018-11/providing-for-the-common-defense.pdf.

5. Elbridge Colby, "Against the Great Powers: Reflections on Balancing Nuclear and Conventional Power," *Texas National Security Review*, Vol. 2, No. 1 (November 2018), pp. 145–152, doi.org/10.26153/tsw/864.

6. U.S. Department of Defense, *2018 Nuclear Posture Review* (Washington, D.C.: U.S. Department of Defense, February 2018), p. 32.

Chinese leaders would respond if U.S. conventional attacks on China's conventional missile forces also degraded China's nuclear capabilities by destroying some command and control infrastructure or even some nuclear-armed missiles. Chinese leaders would then face the choice of whether to use China's nuclear weapons before they lost the ability to do so.[7] Nevertheless, uncertainty remains regarding how China's leaders would respond under these circumstances.[8] Understanding Chinese views about nuclear escalation may help scholars and policymakers anticipate both how Chinese leaders might respond and the risks of such U.S. conventional attacks.

Third, no previous work has comprehensively examined Chinese views of nuclear escalation, a gap this article seeks to fill. Existing studies of Chinese views of escalation examine only conventional escalation in a crisis or war, not nuclear escalation.[9] China's views of nuclear escalation are likely to be distinct from those of conventional escalation, given the differences between nuclear and conventional weapons.[10] A recent book chapter by Chinese experts Zhao Tong and Li Bin analyzing the entanglement of U.S. and Chinese conventional and nuclear capabilities and inadvertent escalation is a partial exception, but it investigates only one of multiple pathways to nuclear escalation.[11]

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7. Thomas J. Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and U.S.-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4 (August 2012), pp. 447–487, doi.org/10.1080/01402390.2012.714710; Avery Goldstein, "First Things First: The Pressing Danger of Crisis Instability in U.S.-China Relations," *International Security*, Vol. 37, No. 4 (Spring 2013), pp. 49–89, doi.org/10.1162/ISEC_a_00114; and Caitlin Talmadge, "Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States," *International Security*, Vol. 41, No. 4 (Spring 2017), pp. 50–92, doi.org/10.1162/ISEC_a_00274.

8. Dennis C. Blair and Caitlin Talmadge, "Would China Go Nuclear?" *Foreign Affairs*, Vol. 98, No. 1 (January/February 2019), p. 217.

9. Forrest E. Morgan et al., *Dangerous Thresholds: Managing Escalation in the 21st Century* (Santa Monica, Calif.: RAND Corporation, 2008); Lonnie D. Henley, "War Control: Chinese Concepts of Escalation Management," in Andrew Scobell and Larry M. Wortzel, eds., *Shaping China's Security Environment: The Role of the People's Liberation Army* (Carlisle, Pa.: Strategic Studies Institute, U.S. Army War College, 2006), pp. 81–104; Alison A. Kaufman and Daniel M. Hartnett, "Managing Conflict: Examining Recent PLA Writings on Escalation Control" (Washington, D.C.: CNA, February 2016); Alastair Iain Johnston, "The Evolution of Interstate Security Crisis-Management Theory and Practice in China," *Naval War College Review*, Vol. 69, No. 1 (Winter 2016), pp. 28–71, https://digital-commons.usnwc.edu/nwc-review/vol69/iss1/4; and Burgess Laird, "War Control: Chinese Writings on the Control of Escalation in Crisis and Conflict" (Washington, D.C.: Center for a New American Security, April 2017).

10. A RAND report from 2008 extrapolates the views of China's missile force about nuclear escalation from its nuclear operational concepts, but does not examine views of nuclear escalation outside of the missile force. See Morgan et al., *Dangerous Thresholds*.

11. Zhao Tong and Li Bin, "The Underappreciated Risks of Entanglement: A Chinese Perspective,"

We argue that Chinese experts are skeptical that nuclear escalation would be controlled in a crisis or armed conflict between the United States and China. But if nuclear weapons are used in a conflict—however limited that initial use—they believe that subsequent escalation would not be controlled, which restrains leaders from pursuing even limited use. By contrast, U.S. strategists have generally viewed the difficulty of controlling further escalation once nuclear weapons are used as a feature of nuclear conflict that states could exploit to coerce each other. In potential conflicts involving the United States, Chinese experts believe that U.S. influence over its allies allows the United States to resolve disputes or end crises involving its allies and China before nuclear escalation can occur. China's skepticism about controlling nuclear escalation is reflected in its nuclear doctrine, and force structure, which is not optimized for conducting limited strikes.

Skepticism about controlling nuclear escalation once nuclear weapons are used may reinforce crisis stability between two nuclear-armed states. Nevertheless, the United States does not share China's skepticism and, moreover, assumes that nuclear escalation could be controlled in its planning for nuclear operations.[12] Thus, in a crisis or conflict with China, the United States might overestimate the likelihood that China would use nuclear weapons and underestimate the scale of a Chinese retaliatory nuclear strike. Paradoxically, then, Chinese views about nuclear escalation may be suboptimal from the perspective of China's ability to deter either nuclear attacks or conventional attacks on its nuclear arsenal by the United States and create greater instability during a crisis.

Our findings are based on interviews with members of China's strategic community and an examination of print sources. The question of nuclear escalation is a sensitive topic in China that has not received the same degree of attention among Chinese experts that it has among Russian or U.S. strategists. To understand Chinese views, we interviewed two dozen individuals from Chinese think tanks, military research organizations, weapons lab-

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in James M. Acton, ed., *Entanglement: Russian and Chinese Perspectives on Non-Nuclear Weapons and Nuclear Risks* (Washington, D.C.: Carnegie Endowment for International Peace, 2017), pp. 47–76. On the escalation risks associated with U.S. entanglement of conventional and nuclear capabilities, see James M. Acton, "Escalation through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War," *International Security*, Vol. 43, No. 1 (Summer 2018), pp. 56–99, doi.org/10.1162/isec_a_00320.

12. See, for example, "Nuclear Operations," Joint Publication 3-72 (Washington, D.C.: Joint Chiefs of Staff, U.S. Department of Defense, June 2019), pp. I-2, V-2.

oratories, and academia from mid-2016 to early 2017.[13] We also reviewed Chinese military teaching and research texts, missile force campaign manuals, the writings of military and defense industry decisionmakers, and research publications authored by civilians and military officers for insights into Chinese views of nuclear escalation, including on topics that could not be covered in interviews.

This article unfolds as follows. The first section reviews the Cold War debate over whether nuclear escalation could be controlled and provides a framework for analyzing Chinese views. The second section examines Chinese views of nuclear escalation to explain why Chinese experts are confident that nuclear escalation can be avoided. The third and fourth sections examine the operational doctrine of the People's Liberation Army (PLA) and Chinese discussions about nuclear force structure to assess the robustness of Chinese views of nuclear escalation. The fifth section explains the sources of Chinese views about escalation, focusing on the historic decoupling of conventional and nuclear weapons in China, and China's development of nonnuclear strategic weapons that could be used in a crisis or conflict and organizational biases. The sixth section examines whether Chinese experts overstate China's ability to control escalation below the threshold of nuclear weapons use. The conclusion considers the implications of this analysis for a U.S.-China crisis scenario.

Can Nuclear Escalation Be Controlled?

During the Cold War, U.S. nuclear strategists debated whether it was possible to control nuclear escalation after the limited use of nuclear weapons. The limited use of nuclear weapons refers to a state's use of some of its nuclear weapons on a subset of all possible nuclear targets or in a local geographical area, or both. Typically, strategists envisaged the use of either low-yield, short-range nuclear weapons in a local war or only a few theater or strategic weapons.[14] The goal of limited use would be to gain either a coercive advantage in political bargaining (by displaying resolve) or a military advantage on the battlefield (such as using tactical weapons to attack an enemy's conventional

13. These individuals have expertise in nuclear strategy, conventional military strategy, and China's relationship with the United States and its East Asian allies. Interviewees are identified by randomly assigned numbers, not by name or institution.
14. See, for example, Morton H. Halperin, *Limited War in the Nuclear Age* (New York: John Wiley and Sons, 1963), p. 64; and Warden, "Limited Nuclear War," pp. 6–8.

forces), or possibly both, while withholding other nuclear weapons for use later in a conflict.

One group in this debate, which we call the "proponents," believed that, during the Cold War, nuclear escalation could be controlled, and thus limited nuclear war was possible. By contrast, another group, the "skeptics," were pessimistic about the prospects for controlling nuclear escalation and thus believed that limited nuclear war would not stay limited. Although the views of individual strategists were nuanced and often evolved over time, this section reviews the core arguments for or against the ability to control nuclear escalation. These arguments provide a baseline for assessing the Chinese views. As the Cold War proponents and skeptics demonstrate, states may hold different assumptions about whether nuclear escalation could be controlled or if further escalation to an all-out nuclear war would occur.

Proponents of controlling nuclear escalation

Cold War proponents were relatively confident that nuclear escalation could be controlled, because they identified ways to surmount any obstacles to limited nuclear use. Proponents assumed that both the United States and the Soviet Union wanted to avoid an all-out nuclear war under any circumstances.[15] They also assumed that this shared preference would not change even after an adversary conducted limited nuclear strikes.[16] The proponents believed that, as rational actors, the United States and the Soviet Union would not start an unlimited nuclear war unless they possessed nuclear escalation dominance, defined as the ability to dominate an opponent at every level of conflict, including the ability to limit damage to one's own nuclear forces in an all-out nuclear war.[17] "Damage limitation" refers to using preemptive strikes or missile defenses to reduce the number of an adversary's nuclear weapons that could strike a state's territory and thus limit the damage that a state

15. Henry A. Kissinger, *Nuclear Weapons and Foreign Policy* (New York: W.W. Norton, 1969), pp. 12, 123, 154, 156; and Anthony W. Buzzard, "Massive Retaliation and Graduated Deterrence," *World Politics*, Vol. 8, No. 2 (January 1956), pp. 228, 234–235, doi.org/10.2307/2008972.

16. Buzzard, "Massive Retaliation and Graduated Deterrence," pp. 234–235; Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 139–142, 154; and Paul H. Nitze, "Atoms, Strategy, and Policy," *Foreign Affairs*, Vol. 34, No. 2 (January 1956), p. 197. Nitze argued that a damage limitation capability could serve as an insurance policy in case an adversary did "lash out" after a limited first strike.

17. Robert Endicott Osgood, *Limited War: The Challenge to American Strategy* (Chicago: University of Chicago Press, 1957), pp. 125–134, 265; Nitze, "Atoms, Strategy, and Policy," pp. 192–193; Paul H. Nitze, "Deterring Our Deterrent," *Foreign Policy*, Winter 1976/77, p. 196; and Kissinger, *Nuclear Weapons and Foreign Policy*, p. 1.

would suffer in an all-out nuclear war.[18] Moreover, the proponents believed that the losing side in a limited nuclear exchange could be dissuaded from escalating to the use of strategic nuclear weapons through a negotiated settlement that did not threaten its survival or vital interests.[19]

The proponents rejected the view that the use of any nuclear weapon would signal a willingness to fight an unlimited nuclear war in which all of a state's nuclear weapons would be used. They argued that U.S. declaratory policy could communicate the distinction between tactical nuclear weapons and targets, on the one hand, and strategic nuclear weapons and targets, on the other, to the Soviet Union.[20] They also disputed the view that nuclear weapons should be treated as a distinctive class of weapons from conventional weapons.[21] As Robert Osgood explained, "Nothing inherent in a wide range of atomic weapons renders them incompatible with limited war, apart from the targets toward which they are directed and the political context in which they are deployed."[22]

The proponents were confident that there were ways to mitigate the various challenges of controlling nuclear escalation that could arise in a war. Proponents argued that collateral damage to civilian targets, and mistakes or accidents that made limited nuclear strikes more destructive than intended, would not be misperceived by the target state as initiating an unlimited nuclear war. Instead, the United States or the Soviet Union would tolerate those missteps because of their overwhelming shared interest in avoiding nuclear strikes on cities, and because collateral damage was "wholly different" from in-

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18. Charles L. Glaser and Steve Fetter, "Should the United States Reject MAD? Damage Limitation and U.S. Nuclear Strategy toward China," *International Security*, Vol. 41, No. 1 (Summer 2016), p. 49, doi.org/10.1162/ISEC_a_00248.

19. Kissinger, *Nuclear Weapons and Foreign Policy*, p. 157; and Herman Kahn, *On Escalation: Metaphors and Scenarios* (New York: Praeger, 1965), p. 110. This same set of assumptions underpinned Glenn H. Snyder's concept of a "stability-instability paradox," in which states could be more tempted to engage in conventional wars and limited nuclear wars using tactical nuclear weapons, because they were confident that their adversary did not want to fight a strategic nuclear war. Snyder also acknowledged the possibility that the fear of strategic nuclear war could induce states to be cautious and not emboldened to fight limited conventional and tactical nuclear wars. See Snyder, "The Balance of Power and the Balance of Terror," in Paul Seabury, ed., *The Balance of Power* (San Francisco, Calif.: Chandler, 1965), p. 199.

20. Buzzard, "Massive Retaliation and Graduated Deterrence," pp. 234–235; Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 154–155, 168; and Osgood, *Limited War*, pp. 255–257.

21. For arguments that nuclear wepons should be viewed as distinctive, see Bernard Brodie, *The Absolute Weapon* (New York: Harcourt, Brace and Company, 1946), pp. 21–69.

22. Osgood, *Limited War*, p. 248. See also Kissinger, *Nuclear Weapons and Foreign Policy*, p. 160; and Kahn, *On Escalation*, pp. 97–98.

tentional attacks on civilian targets.[23] Proponents were also confident that command and control systems could be made reliable enough to survive a limited nuclear exchange and thus prevent immediate and total escalation from what Herman Kahn described as "slow-motion exchanges that are limited and deliberate."[24] Finally, if nuclear weapons were used in a limited manner, military commanders would not be blinded by the fog of war and would be able to show enough restraint in decisionmaking to keep a limited nuclear war limited.[25]

Based on their view that nuclear escalation could be controlled, the proponents recommended that the United States adopt a nuclear doctrine and force structure optimized for conducting limited nuclear strikes. Preparing to fight a limited nuclear war would allow the United States to make more credible threats to use nuclear weapons first, because it would face lower costs for carrying out those threats, assuming that Soviet retaliation for limited U.S. first use of nuclear weapons would be equally limited.[26] In addition, if the Soviet Union used nuclear weapons first in a limited manner, the United States could avoid the unpalatable choice between "suicide or surrender" by threatening to carry out a limited retaliatory strike. The ability to retaliate in a limited manner would help to maintain the credibility of its extended deterrence commitments in Europe and Asia.[27]

To control nuclear escalation, the United States needed to plan for limited nuclear campaigns. These limited campaigns envisioned using only a small number of nuclear weapons, confining their use geographically or striking only military targets.[28] This task fell primarily to nonstrategic nuclear weapons, that is, tactical and theater-range nuclear weapons deployed to countries in the North Atlantic Treaty Organization (NATO).[29] Tactical nuclear weapons

23. Buzzard, "Massive Retaliation and Graduated Deterrence," pp. 234–235; Nitze, "Atoms, Strategy, and Policy," p. 197; and Osgood, *Limited War*, p. 255. See also Kissinger, *Nuclear Weapons and Foreign Policy*, p. 154.
24. Kahn, *On Escalation*, pp. 99, 147.
25. Ibid., pp. 211–213.
26. Buzzard, "Massive Retaliation and Graduated Deterrence," p. 233; and Osgood, *Limited War*, p. 242.
27. Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 7–12, 158; and J. Michael Legge, "Theater Nuclear Weapons and the NATO Strategy of Flexible Response" (Santa Monica, Calif.: RAND Corporation, April 1983), p. 10.
28. Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 130–131, 152–157; and Osgood, *Limited War*, p. 243.
29. Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 147–152; and Legge, "Theater Nuclear

also gave NATO a military advantage, because they could be used to protect Western European borders from a Soviet armored invasion more cheaply than deploying symmetrical conventional forces.[30] Limited campaigns would deliberately avoid striking strategic targets such as cities, military bases, or nuclear weapons, which could provoke unrestrained Soviet nuclear retaliation.[31] Some proponents also advocated relatively limited campaigns using strategic weapons against Soviet strategic targets, especially later in the Cold War. Such limited strategic campaigns were intended to demonstrate U.S. escalation dominance and to signal to the Soviet Union that it could not "win" a nuclear war, in case the Soviet leadership contemplated using limited strategic nuclear strikes to achieve such a victory.[32]

To conduct limited nuclear campaigns and to control nuclear escalation, the United States would ideally have both tactical nuclear weapons and survivable strategic nuclear weapons, along with a robust and survivable command and control network. These capabilities would ensure that the United States could avoid "use-or-lose" pressures early in a conflict and could carry out sophisticated nuclear operations to destroy Soviet nuclear weapons during a protracted nuclear war.[33] Those capabilities also would reduce the Soviet Union's incentives to conduct preemptive strikes on U.S. nuclear forces to limit damage or to destroy the U.S. command system, in the event of further nuclear

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Weapons and the NATO Strategy of Flexible Response," p. 10. Legge points out, however, that NATO countries saw tactical nuclear weapons as coupling the defense of Europe to U.S. vulnerability to a strategic Soviet attack, which suggests that NATO countries were skeptical that nuclear escalation could be controlled.

30. Nitze, "Atoms, Strategy, and Policy," p. 194; Kissinger, *Nuclear Weapons and Foreign Policy*, p. 129; Osgood, *Limited War*, p. 251; and Stephen Biddle, "Can Conventional Forces Substitute?" in Biddle and Peter D. Feaver, eds., "Battlefield Nuclear Weapons: Issues and Options" (Cambridge, Mass.: Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University, 1989), pp. 67–96.

31. Desmond Ball, *Can Nuclear War Be Controlled?* Adelphi Paper No. 169 (London: International Institute for Strategic Studies, 1981), pp. 26–30; Nitze, "Atoms, Strategy, and Policy," p. 196; Buzzard, "Massive Retaliation and Graduated Deterrence," p. 229; Paul Bracken, "War Termination," in Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket, eds., *Managing Nuclear Operations* (Washington, D.C.: Brookings Institution Press, 1987), pp. 201–202; and Osgood, *Limited War*, p. 253.

32. Walter Slocombe, "The Countervailing Strategy," *International Security*, Vol. 5, No. 4 (Spring 1981), p. 21, doi.org/10.2307/2538711; Nitze, "Deterring Our Deterrent," p. 210; and William E. Odom to Zbigniew Brzezinski, "M-B-B Luncheon Item: Targeting," August 5, 1980, with Presidential Directive/NSC-59, "Nuclear Weapons Employment Policy," July 25, 1980, National Security Archive, George Washington University, Washington, D.C., p. 2, https://nsarchive2.gwu.edu/nukevault/ebb390/docs/7-25-80%20PD%2059.pdf.

33. See Odom to Brzezinski, "M-B-B Luncheon Item: Targeting," pp. 3–5.

escalation.[34] A command and control system capable of carrying out sophisticated nuclear operations in a protracted nuclear war would have been, however, extraordinarily challenging from a technological point of view.[35]

Skeptics of controlling nuclear escalation

By contrast, Cold War skeptics believed that a limited nuclear war would not remain limited because nuclear escalation was hard if not impossible to control. As Marc Trachtenberg writes, "the mere existence of nuclear forces means that . . . there is a certain irreducible risk that an armed conflict might escalate into a nuclear war."[36] Once one state used a nuclear weapon, escalation would be difficult to control because an adversary's reaction would be unpredictable. Crossing the nuclear threshold would confirm the adversary's fears that its opponent intended to fight an all-out nuclear war if the adversary did not back down quickly. Even if both superpowers believed in peacetime that they shared a preference to avoid an unlimited nuclear war, skeptics also worried that those beliefs might not endure in a war.[37]

The skeptics lacked confidence that the obstacles to controlling nuclear escalation could be overcome. First, the destructiveness of nuclear weapons challenged the ability of states to carry out precise and discriminate nuclear attacks and thus avoid collateral damage that might prompt an escalatory response.[38] Second, a state faced a use-or-lose dilemma if its nuclear weapons or command and control system could not survive a first strike.[39] Such states would have strong incentives to use their nuclear weapons first and on a massive

34. Nitze, "Deterring Our Deterrent," p. 197.
35. Disarming attacks during a protracted nuclear war would have required sophisticated intelligence, surveillance, and reconnaissance capabilities to know which Soviet nuclear weapons had already been launched, as well as two-way communications between U.S. leaders and nuclear forces to retarget U.S. nuclear weapons accordingly, so as to avoid striking empty Soviet missile silos. See Ball, *Can Nuclear War Be Controlled?*; Bruce G. Blair, *Strategic Command and Control* (Washington, D.C.: Brookings Institution Press, 1985), pp. 241–280; and Ashton B. Carter, "Assessing Command System Vulnerability," in Carter, Steinbruner, and Zraket, *Managing Nuclear Operations*, pp. 555–610.
36. Marc Trachtenberg, "The Influence of Nuclear Weapons in the Cuban Missile Crisis," *International Security*, Vol. 10, No. 1 (Summer 1985), p. 139, doi.org/10.2307/2538793.
37. Halperin, *Limited War in the Nuclear Age*, p. 64. See also Goldstein, "First Things First," pp. 79–80; and Thomas C. Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966), p. 112.
38. Ball, *Can Nuclear War Be Controlled?* pp. 26–30; and McGeorge Bundy et al., "Nuclear Weapons and the Atlantic Alliance," *Foreign Affairs*, Vol. 60, No. 4 (Spring 1982), p. 757.
39. Schelling, *Arms and Influence*, p. 229.

scale once they concluded that a nuclear war was inevitable. Moreover, the difficulty of conducting a damage limitation strike after a state's nuclear weapons or command and control system had been attacked gave leaders an incentive to carry out those operations early in a conflict.[40] Use-or-lose pressures could also induce states to use tactical nuclear weapons earlier than battlefield objectives would otherwise require.[41] Third, once the nuclear threshold had been crossed, the fog of war would make it difficult to determine whether an adversary was adhering to limits on targets or the geographical scope in a nuclear war. The technical difficulty of ensuring survivable two-way communications between a state's leaders and the operators of its nuclear weapons made this problem very difficult, exacerbating the fog of war.[42]

In their recommendations for force posture and doctrine, the skeptics emphasized the importance of strategic weapons but also envisaged a role for tactical weapons. Possession of a secure second-strike capability would maintain strategic deterrence and ensure that a state could also threaten to punish an adversary in a conventional invasion.[43] The skeptics also recognized that states could use limited nuclear strikes to gain a coercive advantage over an adversary by manipulating the risk of uncontrolled nuclear escalation, if the state threatened to use nuclear weapons first. Thus, they viewed tactical nuclear weapons as useful, but only for signaling resolve to risk an unlimited nuclear war and not as a tool for waging limited nuclear wars. In a situation of mutual vulnerability, the skeptics argued that a state gained a coercive advantage from the "balance of resolve" (a willingness to risk further escalation to

40. Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, N.Y.: Cornell University Press, 1989), p. 145. See also Ball, *Can Nuclear War Be Controlled?*; Blair, *Strategic Command and Control*; and Carter, "Assessing Command System Vulnerability."

41. Bernard Brodie, "Escalation and the Nuclear Option" (Princeton, N.J.: Princeton University Press, 1966), pp. 23, 64–65; and Legge, "Theater Nuclear Weapons and the NATO Strategy of Flexible Response," pp. 58–59.

42. Leaders would have difficulty assessing the extent of an adversary's nuclear attacks on their own nuclear weapons if they could not communicate with units in charge of operating those weapons. Leaders may then assume a much greater extent of nuclear damage than they had in fact sustained in a limited strike and retaliate massively. Fighting a limited nuclear war may encourage leaders to delegate authority to use tactical nuclear weapons to field commanders, with whom communications might falter as a war continues. Commanders could then order the use of nuclear weapons when their leaders would not. See Schelling, *Arms and Influence*, p. 194; Ball, *Can Nuclear Escalation Be Controlled?* pp. 14–26; Carter, "Assessing Command System Vulnerability," pp. 557–558; Jervis, *The Meaning of the Nuclear Revolution*, pp. 91–93; Bracken, "War Termination," p. 207; and Catherine McArdle Kelleher, "NATO Nuclear Operations," in Carter, Steinbruner, and Zraket, *Managing Nuclear Operations*, p. 459.

43. See, for example, Jervis, *The Meaning of the Nuclear Revolution*, pp. 14–16, 42–45.

defend the interests at stake), not from the "balance of capabilities" (the relative size and sophistication of each other's forces).[44] Because skeptics believed that any limited use of nuclear weapons could quickly escalate to an unlimited exchange, tactical nuclear weapons could improve the credibility of a state's threats to use nuclear weapons first. Using those weapons first would lower the cost of an initial nuclear attack in a conventional conflict, compared to the use of a strategic nuclear weapon.[45]

Skeptics differed in their views of the utility of threatening the limited first use of tactical nuclear weapons and, by implication, what was necessary to deter an adversary's limited first use. Some skeptics believed that it was possible—although extraordinarily risky—for two states to trade limited nuclear strikes and then negotiate an end to the conflict.[46] This group of skeptics, the "risk manipulators," would have viewed threats of limited rather than massive retaliation as the most credible way to deter an adversary's limited nuclear use.[47] Other skeptics, however, noted that limited nuclear strikes were likely to lead to the same outcome as unlimited nuclear strikes and therefore did not really reduce the cost of nuclear first use. Because a limited first use of nuclear weapons would likely escalate to an unlimited nuclear war, the costs of conducting either kind of strike were the same.[48] States therefore did not gain a significant coercive advantage from threats to carry out limited strikes first. These "pure skeptics" would have viewed a secure second-strike capability as sufficient to deter an adversary's limited first use of nuclear weapons.[49]

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44. Brodie, "Escalation and the Nuclear Option," p. 102; see also pp. 85–88, 101–102. A larger or more sophisticated nuclear arsenal would only matter against a state faced with a more resolved adversary if such an arsenal created a meaningful damage limitation capability, which was viewed as infeasible against the Soviet Union. See, for example, Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca, N.Y.: Cornell University Press, 1984), pp. 54–55.
45. Schelling, *Arms and Influence*, pp. 106–116.
46. For a summary of these arguments, see Charles L. Glaser, *Analyzing Strategic Nuclear Policy* (Princeton, N.J.: Princeton University Press, 1990), p. 53.
47. The term "risk manipulator" is drawn from Thomas Schelling's description of how a state could generate a risk of general nuclear war to coerce an opponent through selective nuclear use, although he suggests, like the proponents, that those risks could be managed. Schelling, *Arms and Influence*, pp. 108–144.
48. For a summary of these arguments, see Glaser, *Analyzing Strategic Nuclear Policy*, pp. 43, 52–54.
49. Bundy et al., "Nuclear Weapons and the Atlantic Alliance," p. 764; and Jervis, *The Meaning of the Nuclear Evolution*, p. 98. This view, however, is different from "existential deterrence," in which the mere possession of nuclear weapons—no matter how vulnerable—can deter an adversary's nuclear attacks.

IMPLICATIONS FOR CHINESE VIEWS OF NUCLEAR ESCALATION

The arguments of the Cold War proponents and skeptics about controlling escalation offer observable implications for China's views about nuclear escalation, doctrine, and force structure. There are, however, two important factors that may distinguish Chinese views, doctrine, and force structure from the Cold War arguments outlined above.

First, China has a small nuclear arsenal of approximately 290 warheads, of which less than half can strike the continental United States, and no ability to limit damage to its nuclear forces from a U.S. nuclear strike by attacking the United States first.[50] China therefore does not face use-or-lose pressures to carry out a damage limitation strike against the United States early in a conflict, which skeptics argued made nuclear escalation difficult to control in the Cold War. Nevertheless, the other factors that the skeptics identified are applicable to the U.S.-China nuclear relationship today: the effect of crossing the nuclear threshold on assessments of an adversary's willingness to fight an unlimited nuclear war, use-or-lose pressures created by a state's concerns over the survivability of its arsenal, the difficulty of avoiding collateral damage, and the fog of war. Use-or-lose pressures linked to arsenal survivability may be especially relevant to China's views of nuclear escalation control, given the small nuclear arsenal it relies on to deter the United States from attempting a damage-limiting strike. Even if the size of China's arsenal doubles over the next decade, as some U.S. intelligence officials have suggested recently, use-or-lose pressures might be reduced but they would not be eliminated, and China would not gain a damage limitation capability.[51]

The second factor that may distinguish Chinese and Cold War views, doctrine, and force structure is China's no-first-use policy. In July 2019, China reit-

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50. Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces, 2019," *Bulletin of the Atomic Scientists*, Vol. 75, No. 4 (2019), p. 172, doi.org/10.1080/00963402.2019.1628511.

51. One official, Lt. Gen. Robert P. Ashley Jr., stated that the size of China's arsenal would double. See Ashley, "Russian and Chinese Nuclear Modernization Trends," remarks at the Hudson Institute, Washington, D.C., May 29, 2019, https://www.dia.mil/News/Speeches-and-Testimonies/Article-View/Article/1859890/russian-and-chinese-nuclear-modernization-trends/. A second official, Daniel Taylor, suggested that the size of China's deployable arsenal could increase from the "low" hundreds to "several hundred," but would be constrained by China's stockpile of fissile material. See testimony of Daniel K. Taylor, Acting Defense Intelligence Officer for East Asia, Defense Intelligence Agency, Hearing on a "World-Class" Military: Assessing China's Global Military Ambitions, Before the U.S.-China Economic and Security Review Commission, 116th Cong., 1st sess., June 20, 2019, pp. 30–59, at p. 56, https://www.uscc.gov/Hearings/%E2%80%98world-class%E2%80%99-military-assessing-china%E2%80%99s-global-military-ambitions. Neither explained the basis for these assessments.

erated that policy in its most recent defense white paper.[52] China's nuclear force structure and doctrine also reflect the constraints of its no-first-use policy.[53] Compared to the United States and the Soviet Union in the Cold War, China is less likely to pursue military and coercive advantages from limited first use without first changing its no-first-use policy.

If, like the Cold War proponents, China is confident that nuclear escalation would be controlled, it should dismiss arguments that limited nuclear use changes a state's perception of an adversary's intentions to further escalate to an unlimited nuclear war. A country's shared interest with an adversary in avoiding nuclear war would be viewed as robust, even once nuclear weapons were used. If China is confident that nuclear escalation could be controlled, it may view the limited use of nuclear weapons as necessary to deter a limited U.S. nuclear strike (under its no-first-use policy) to avoid a "suicide or surrender" dilemma.[54] An operational doctrine for limited campaigns and a force structure including tactical nuclear weapons would be strong indicators of a belief that nuclear escalation could be controlled. China's no-first-use policy would likely prohibit the use of threats to launch nuclear weapons first for military or coercive advantages, but only because these uses are inconsistent with China's nuclear policy, not because they are misguided or unviable.

If China is skeptical that nuclear escalation can be controlled, it should worry that the limited use of nuclear weapons could lead adversaries to revise their views of one another's willingness to fight an unlimited nuclear war and increase the risks of such a conflict. Although a force structure geared toward conducting retaliatory strikes at the strategic and theater levels would still allow China to conduct limited nuclear strikes, a lack of tactical nuclear weapons and plans for limited nuclear campaigns in China's operational doctrine would suggest that China was skeptical that nuclear war would be controlled.

Nevertheless, if China is skeptical that nuclear escalation can be controlled, it might acquire tactical nuclear weapons or formulate campaigns to carry out limited nuclear strikes, for two reasons. First, China could threaten limited nuclear first use to gain a coercive advantage against the United States. Plans to manipulate nuclear risk with limited nuclear first use would, however, violate

52. Information Office of the State Council of the People's Republic of China, *China's National Defense in the New Era* (Beijing: Foreign Languages Press, 2019), p. 9.
53. Xiao Tianliang, ed., *Zhanlue xue* [Science of military strategy], rev. ed. (Beijing: Guofang daxue chubanshe, 2017), p. 385.
54. See Kissinger, *Nuclear Weapons and Foreign Policy*, pp. 7–12, 158.

China's no-first-use policy. Second, China might want the ability to conduct limited nuclear strikes to deter limited first use of nuclear weapons by the United States. Beijing is most likely to do so if it believes that (1) the United States plans to carry out limited nuclear strikes against China, and (2) large-scale retaliation by China would not be credible to deter limited first use by the United States. China's incentives to plan for limited nuclear use, however, are likely to be influenced by its confidence in its retaliatory capability. If China concludes that it could not deter U.S. retaliation for its first or second limited use of nuclear weapons, and that the United States could destroy most or all of China's nuclear arsenal in that retaliatory strike, China's leaders have weak incentives for the limited use of nuclear weapons given the competing incentives to preserve its forces to deter a larger-scale U.S. nuclear attack.

China's Confidence about Avoiding Nuclear Escalation

Mirroring the Cold War skeptics, China's strategic community is relatively confident that the use of nuclear weapons could be avoided in a conflict, for two reasons. First, they possess a strong belief that nuclear war cannot be controlled after nuclear weapons are used. According to Ge Dongsheng, the deputy commander of the Second Artillery (renamed the PLA Rocket Force in 2016) from 1999 until 2002, "If we do not have the ability to prevent nuclear war [*ezhi he zhanzheng*] and strictly control the escalation of local wars, there will be no insurmountable gap between local wars and large-scale world wars or even nuclear wars."[55] Second, many Chinese experts believe that the United States would avoid intervening in a conflict between a U.S. ally and China if doing so would ultimately lead to a nuclear confrontation.

CONTROLLING CONVENTIONAL AND NUCLEAR ESCALATION

China's experts believe that nuclear escalation would not be controlled once nuclear weapons are used, given the uncertain nature of interactions between nuclear-armed states. Thus, they believe that all leaders of nuclear weapons states would exercise great caution to avoid the initial use of nuclear weapons.

Paradoxically, the starting point for the view that nuclear escalation would not be controlled is the widespread conviction among Chinese experts that

55. Ge Dongsheng, *Nanwang lijian suiyue* [Memorable years sharpening the sword] (Beijing: Junshi kexueyuan chubanshe, 2016), p. 191.

conventional escalation can, in fact, be controlled and can remain limited in intensity.[56] After China's military strategy shifted in the late 1980s to focus on local wars on China's periphery, PLA officers began writing about how to control conventional escalation, including crisis management, to prevent the outbreak of local conflicts and how to prevent such conflicts from escalating to large-scale wars.[57] Historical examples, along with features of conventional warfare that distinguished it from nuclear warfare, inform these views. In the past, China fought limited wars with India and Vietnam in which escalation was controlled.[58] Likewise, in Chinese eyes, other states have demonstrated that conventional wars can be limited—for example, the Arab-Israeli wars, the 1990–91 Gulf War, and the 2008 Russia-Georgia war.[59] The use of nuclear weapons to limit escalation in conventional wars, however, is rarely, if ever, mentioned in these writings about conventional escalation.

By contrast, many Chinese experts agree that once nuclear weapons were used, subsequent nuclear escalation would not be controlled. As PLA scholar Chu Shaofeng writes, "Nuclear weapons should not be a means of [fighting] limited wars."[60] Chinese experts maintain that no evidence exists to support theories suggesting that limited nuclear war is possible.[61] Like the Cold War skeptics, they emphasize the high degree of uncertainty over how a state would react to being attacked with nuclear weapons first, which makes efforts to control nuclear escalation too risky in practice.[62] Chinese experts have identified serious obstacles to the control of nuclear escalation, including leaders' thinking, decisions and resolve, societal opposition to nuclear use, societal pressure on leaders not to back down, the circumstances of the country, and

56. Authors' interviews, nos. 3, 5, 11, 19, 21, 22, 23, and 24, Beijing, 2016.
57. See Morgan et al., *Dangerous Thresholds*; Henley, "War Control"; Kaufman and Hartnett, "Managing Conflict"; Johnston, "The Evolution of Interstate Security Crisis-Management Theory and Practice in China"; and Laird, "War Control." On the shift to local wars, see M. Taylor Fravel, "Shifts in Warfare and Party Unity: Explaining Changes in China's Military Strategy," *International Security*, Vol. 42, No. 3 (Winter 2017/18), pp. 37–83, doi.org/10.1162/ISEC_a_00304.
58. Authors' interviews, nos. 3, 5, 20, and 24, Beijing, 2016; Xiao, *Zhanlue xue*, p. 243; and Deng Hongzhou, "Meijun jubu zhanzheng zhanju kongzhi lilun tanxi" [Analysis of campaign control theories of U.S. local wars], *Zhongguo junshi kexue*, No. 4 (2006), p. 120.
59. Authors' interview, no. 24, Beijing, 2016; and Deng, "Meijun jubu zhanzheng zhanju kongzhi lilun tanxi," pp. 119–120.
60. Chu Shaofeng, "He shidai Meiguo youxian zhanzheng sixiang lunzheng" [U.S. debates on limited warfare in the nuclear age], *Waiguo junshi xueshu*, No. 10 (2010), p. 60.
61. Authors' interviews, nos. 8, 22, and 23, Beijing, 2016.
62. Authors' interview, no. 8, Beijing, 2016. See also Chu, "He shidai Meiguo youxian zhanzheng sixiang lunzheng," p. 59.

uncertainty about the adversary's anticipated reaction to a nuclear attack.[63] More generally, as one expert noted, it takes time to inflict destruction on an adversary in a conventional war, which makes escalation steps meaningful and controllable. By contrast, the speed of destruction of nuclear weapons makes such steps meaningless.[64]

Chinese experts believe that nuclear weapons would not be used in conventional wars between nuclear weapons states. Arms control expert Gen. Pan Zhenqiang notes that "the past five decades of international security practice has shown that even when nuclear weapon states suffer setbacks in conventional conflicts, they still do not dare to use nuclear weapons to reverse a [losing] war situation [*wanjiu zhanzheng taishi*]."[65] Many experts argue that, in the nuclear age, limited conventional wars offer the only way for states to achieve their political goals through military force.[66] According to Gen. Fu Quanyou, PLA chief of general staff from 1995 to 2002, "The U.S. and Soviet superpowers both had strong nuclear capabilities able to destroy one another a number of times, so they did not dare to clash with each other directly, war capabilities above a certain point change into war-limiting capabilities." Thus, for General Fu, "every international disagreement that resorted to the use of force . . . was solved through local [conventional] wars."[67] A few Chinese experts even view the nuclear shadow as influencing high-intensity conventional conflict, preventing limited conventional conflicts from becoming general wars.[68]

Chinese experts dismiss the idea that a limited nuclear war could be fought using only tactical nuclear weapons. Like the skeptics, they note that the introduction of tactical nuclear weapons into a conflict would have the same strategic significance as introducing strategic nuclear weapons. The nature of nuclear weapons remains the same regardless of their yield and range, in particular their radiation effects.[69] Furthermore, Chinese experts believe that it can

63. Authors' interviews, nos. 3, 8, and 21, Beijing, 2016.
64. Authors' interview, no. 17, Beijing, 2016.
65. Pan Zhenqiang, "Zhongguo bu shouxian shiyong he wuqi wenti yanjiu" [Research on the issue of China's no first use of nuclear weapons], in Li Bin and Zhao Tong, eds., *Lijie Zhongguo he siwei* [Understanding Chinese nuclear thinking] (Beijing: Shehui kexue wenxian chubanshe, 2015), p. 33.
66. Chu, "He shidai Meiguo youxian zhanzheng sixiang lunzheng," pp. 56, 60.
67. Fu Quanyou, *Fu Quanyou wenxuan* [Selected works of Fu Quanyou] (Beijing: Jiefangjun chubanshe, 2015), pp. 654–655.
68. Authors' interviews, nos. 7, 10, and 22, Beijing, 2016.
69. Authors' interview, no. 3, Beijing, 2016.

be hard to distinguish between tactical and strategic weapons.[70] According to Zhu Guangya, an influential nuclear scientist, "The extent of the difference between strategic and tactical nuclear weapons is arbitrary, whether they are intercontinental or short-range nuclear weapons, once used their effects have no great difference."[71] For this reason, if two countries had both tactical and strategic weapons, the likely escalation from tactical to strategic weapons would maintain deterrence as if both had only strategic weapons. As a result, the use of tactical weapons could not help to limit a nuclear exchange.[72] One PLA scholar cited two of the same reasons why Cold War skeptics believed that tactical nuclear weapons would not improve the prospects of escalation control: the indiscriminate nature of a nuclear blast and use-or-lose pressures to destroy each other's tactical weapons.[73]

Based on the belief that the use of nuclear weapons would not remain limited, Chinese experts conclude that U.S. and Chinese national leaders would exercise great caution in deciding whether to use nuclear weapons. This view reflects a judgment that both the United States and China want to avoid a nuclear war. Chinese experts do not anticipate that U.S. leaders would manipulate the risk of nuclear escalation in a crisis or conflict. China's views are partly informed by observations of U.S. and Soviet behavior during the Cold War. As former Director of the Central Military Commission (CMC) General Office and Vice Commandant of the Academy of Military Science (AMS) Lt. Gen. Li Jijun remarked: "[By 2000] nuclear blackmail has already gone down a dead end, the originators also became deterred adversaries."[74] In other words, the superpowers that threatened nuclear first use to coerce each other had limited success using nuclear weapons as a "sword,"[75] and became themselves deterred from using nuclear weapons by the risk of mutual suicide.[76]

Despite a recognition that the United States has maintained a nuclear warfighting strategy after the Cold War, Chinese experts doubt both the utility of such a strategy and the willingness of U.S. leaders to carry out limited nuclear

70. Authors' interviews, nos. 8 and 10, Beijing, 2016.
71. Yuanzeneng chubanshe bianji weiyuanhui [Editorial committee of the nuclear energy press], ed., *Zhu Guangya yuanshuai bashi huadan wenji* [Collected works for the eightieth birthday of academician Zhu Guangya] (Mianyang: Yuanzineng chubanshe, 2004), p. 300.
72. Authors' interviews, nos. 10 and 11, Beijing, 2016.
73. Chu, "He shidai Meiguo youxian zhanzheng sixiang lunzheng," pp. 59, 60.
74. Li Jijun, *Lun zhanlue* [On strategy] (Beijing: Jiefangjun chubanshe, 2001), p. 53.
75. Authors' interview, no. 10, Beijing, 2016.
76. Authors' interview, no. 24, Beijing, 2016.

strikes against China. They attribute the U.S. view of nuclear weapons as tools for warfighting, meaning tools to destroy another country's military forces and supporting industry,[77] to a variety of factors, including the fact that the United States was the first state to develop nuclear weapons, the role of technology in driving U.S. nuclear strategy, the requirements of extended nuclear deterrence, and compensation for NATO's conventional inferiority during the Cold War.[78] One expert noted that while the United States has reserved the right to use nuclear weapons first, it has been very prudent about not actually using them.[79]

U.S. EXTENDED DETERRENCE

Chinese experts believe that the United States would avoid intervening in a conflict between a U.S. ally and China, if doing so would spark a nuclear confrontation. Most plausible conflict scenarios involving the United States and China would begin with a confrontation between China and a U.S. ally or Taiwan. Chinese assessments of the credibility of U.S. extended nuclear deterrence guarantees may therefore provide insights into Chinese assessments of U.S. resolve in a future conflict. Chinese experts do not expect that the United States would be able to prevent an ally from putting it in a position that would require such a choice. Nor do they expect that the United States would readily abandon an ally. Instead, they believe that the United States would act to defuse such a crisis before it reached a level of intensity that would include even the limited use of nuclear weapons. To some extent, this belief is an exception to the generally skeptical views of Chinese experts about the possibility of controlling nuclear escalation. Instead, it mirrors the view of Cold War proponents of limited nuclear war, who worried that the Soviet Union would not view U.S. extended deterrence guarantees as credible because neither superpower wanted an all-out nuclear war. These views are, however, still consistent with Chinese views of the difficulty of controlling nuclear escalation if nuclear weapons were used. If nuclear escalation could not be controlled, two nuclear-armed countries would have to resolve their conflict at the conventional level to avoid an all-out nuclear war.

Chinese experts recognize the dilemma that the United States faces between avoiding nuclear war with China and maintaining the credibility of its alliance

77. Authors' interview, no. 23, Beijing, 2016.
78. Authors' interviews, nos. 3, 8, 17, and 21, Beijing, 2016.
79. Authors' interview, no. 9, Beijing, 2016.

commitments.[80] Nevertheless, if a conflict did pose a risk of a nuclear confrontation with the United States, they believe that the United States would be able to control its ally—and may even abandon it to avoid being involved in a nuclear war and perhaps even a conventional war. Citing historical instances of U.S. abandonment of Egypt during the Cold War,[81] Chinese experts recognize that abandonment would be difficult for the United States, but not impossible. Furthermore, they note that abandonment is not binary. The United States could partially uphold its alliance commitments to preserve their credibility. One example cited by Chinese experts is the rhetorical support the United States gives to allies and other states in the South China Sea disputes without undertaking more costly political or military actions to support their claims against China.[82]

U.S. control could vary dramatically depending on which ally becomes involved in a conflict with China, the importance of U.S. interests at stake, and the behavior of the ally in the specific contingency. As a starting point for this assessment of the U.S. ability to control its allies, China's strategic community believes that the United States has manipulated its allies to provoke China,[83] or at least has taken advantage of allies' provocations of China.[84] Nevertheless, some Chinese experts emphasize differences among U.S. allies in the region. Some view Japan as harder for the United States to control than weaker allies.[85] Some Chinese experts are increasingly voicing concerns that Japan might acquire its own nuclear weapons.[86] Other experts, however, believe that the United States can still restrain Japan, describing the U.S.-Japan alliance

80. Authors' interviews, nos. 7 and 8, Beijing, 2016. For recent scholarship acknowledging the alliance dilemma, but not the risks it poses for U.S.-China nuclear relations, see Zuo Xiying, "Chengnuo nanti yu Meiguo Yatai lianmeng zhuanxing" [The commitment problem and the transformation of the U.S. alliance system in the Asia-Pacific], *Dangdai yatai*, No. 3 (2015), pp. 4–28.
81. Authors' interview, no. 7, Beijing, 2016.
82. Authors' interview, no. 19, Beijing, 2016. By contrast, some Chinese analysts identify actions by the United States in the South China Sea as a policy of dual deterrence toward its allies, rather than partial abandonment. See, for example, Zuo Xiying, "Yatai lianmeng zhuanxing yu Meiguo de shuangzhong zai baozheng zhanlue" [The transformation of East Asian alliances and U.S. dual assurance strategy], *Shijie jingji yu zhengzhi*, No. 9 (2015), pp. 59–81.
83. Authors' interviews, nos. 16 and 17, Beijing, 2016. On Chinese views of U.S. alliances more generally, see Adam P. Liff, "China and the U.S. Alliance System," *China Quarterly*, Vol. 233 (March 2018), pp. 137–165, doi.org/10.1017/S0305741017000601.
84. Authors' interview, no. 13, Beijing, 2016.
85. Authors' interviews, nos. 10, 16, and 24, Beijing, 2016.
86. See, for example, Liu Chong, "He wuqi yu changgui junshi chongtu de guanxi" [The relationship between nuclear weapons and conventional conflict], in Li and Zhao, *Lijie Zhongguo he siwei*, pp. 122–123.

arrangement as "the U.S. leads and Japan obeys."[87] More broadly, another Chinese expert notes that the United States ultimately controls the nuclear weapons underpinning the alliance and therefore controls the risk of nuclear escalation.[88]

Of course, Chinese experts are updating their judgments as the U.S.-China security competition intensifies. One expert observed that China's strategic community was more concerned that the United States could go to war with an ally against with China in 2016 than it was in 2014. Nevertheless, in 2016 and 2017, it did not believe that the United States would risk nuclear escalation with China for the interests of an East Asian ally.[89]

China's Operational Nuclear Doctrine and Nuclear Escalation

Few authoritative print sources are available with which to assess Chinese views of nuclear escalation. Interviews can help to fill this gap, but nevertheless must be handled with some caution. They provide an opportunity for interviewees to signal views that enhance deterrence but that may not reflect the actual beliefs driving Chinese nuclear decisionmaking. Interviewees may also be influenced by organizational interests and views that provide an incomplete picture of the views that inform official nuclear decisionmaking. The examination of operational doctrine, and whether some of the ideas about controlling conventional escalation are used in a nuclear context, provides one way to assess the accuracy of the views of escalation discussed above and their consistency with how China actually plans to use its nuclear weapons.

Two concepts from PLA thinking about escalation in conventional conflicts are potentially relevant to the question of nuclear escalation. The first is "war control" (*zhanju kongzhi*) or "effective control" (*youxiao kongzhi*), which could be viewed as including the limited use of nuclear weapons first to gain a military advantage. The concepts of war control and effective control are quite broad and highlight the need to reduce the risks and damage caused by warfare.[90] They include principles such as paying attention to "creating situa-

87. Zhang Hua, "Mei-Ri dui Tai zhengce de chayi xing fenxi" [Differences between U.S. and Japanese policies toward Taiwan], *Zhongguo junshi kexue*, No. 2 (2016), p. 47.
88. Authors' interview, no. 3, Beijing, 2016.
89. Authors' interview, no. 4, Beijing, 2016.
90. Shou Xiaosong, *Zhanlue xue* [Science of military strategy] (Beijing: Junshi kexueyuan chubanshe, 2013), p. 111; and Deng, "Meijun jubu zhanzheng zhanju kongzhi lilun tanxi," p. 118.

tions," "preventing and controlling crises," and "controlling the war situation." Controlling the war situation requires "war commanders to seize the initiative in war; be able to control war aims, means, scale [*guimo*], rhythm, time, and scope [*fanwei*]; [and] strive to achieve, at a relatively low cost, a favorable war outcome."[91] War control involves avoiding mission creep, fighting only when prepared, preventing a stalemate, and terminating a war to ensure stability of the postwar situation.[92] In interviews, Chinese experts offered different interpretations of war control, from the strict command and control of military units,[93] to limitation of the geographical scope, parties, casualties, goals, and intensity of a war.[94] Generally speaking, however, the concept focuses more on the overall context in which a war is fought, especially the prevention or containment of war and crisis management, and not on how to manage escalation once a war starts.

The second and potentially more relevant concept is the use of war to prevent war (*yi zhan zhi zhan*). In writings on conventional conflicts, "using war to prevent war" focuses primarily on deterrence, using the threat of a war to prevent the outbreak of war or using the threat of escalation in a war to deter further escalation.[95] In a nuclear context, using war to stop war could be viewed as foreshadowing the first use of nuclear weapons to manipulate risk to gain a coercive advantage, such as using warning shots to escalate to de-escalate a conflict. The 2013 *Science of Military Strategy*, for example, calls for China to both prevent crises from becoming conflicts and "dare to use war to stop war, unifying deterrence and actual fighting."[96] Similarly, one Chinese expert explained the concept as actively preparing for war to prevent war, preventing escalation through war, and stopping a war using war.[97] How to prevent escalation using war would depend on the context. For example, in the U.S.-China context, it could mean restraint in attacking each other's homelands but allowing attacks on other targets, including supply and logistics networks.[98] One ex-

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On effective control, see M. Taylor Fravel, "China's Changing Approach to Military Strategy: The Science of Military Strategy from 2001 to 2013," in Joe McReynolds, ed., *China's Evolving Military Strategy* (Washington, D.C.: Jamestown Foundation, 2016), pp. 40–73.

91. Shou, *Zhanlue xue*, pp. 112–116, at p. 115.
92. Ibid., pp. 115–116.
93. Authors' interviews, nos. 16 and 18, Beijing, 2016.
94. Authors' interviews, nos. 13, 14, and 24, Beijing, 2016 and 2017.
95. Zhao Xijun, ed., *Shezhan* [Coercive warfare] (Beijing: Guofang daxue chubanshe, 2003), p. 9.
96. Shou, *Zhanlue xue*, p. 113.
97. Authors' interview, no. 14, Beijing, 2017.
98. Ibid.

pert cited China's limited wars with India and Vietnam, as well as its border clash with the Soviet Union as examples of using war to control war.[99]

Nevertheless, our interviews and a review of available doctrinal sources provide no indication that either Chinese experts or the PLA views nuclear escalation through the lens of war control or using war to stop war. Consistent with the skepticism of Chinese experts that nuclear escalation can be controlled and with China's no-first-use policy, there is no evidence that China envisages using nuclear weapons first to gain a military advantage by destroying U.S. conventional forces or to gain a coercive advantage by demonstrating its greater resolve in a conflict with the United States. Along with the absence of discussion about nuclear escalation in Chinese writings on escalation control, these concepts for controlling conventional escalation do not telegraph a belief that China could control the process of nuclear escalation, for four reasons.

First, the PLA's operational doctrine contains only one campaign that involves the use of nuclear weapons, the nuclear counterattack campaign (*hefanji zhanyi*). The campaign outlines how China will counterattack after having been attacked with nuclear weapons. Descriptions of the campaign from multiple sources published since the early 2000s do not use any of the concepts from conventional campaigns discussed above.[100] By contrast, the PLA's operational doctrine does describe strike options for the limited, first use of its conventional missiles to deter the outbreak of war, "using threats of use or the use of a few conventional missile weapons to frighten [*zhenshe*] the adversary, thus preventing the outbreak of war or controlling the situation."[101]

Second, Chinese doctrine does not (as far as we can tell) contain any analogous concepts of controlling the scope, parties, casualties, goals, and intensity of nuclear campaigns. PLA Rocket Force officers have emphasized that decisions about the scope, targets, and intensity of nuclear campaigns rest with the CMC, China's top military decisionmaking body.[102] They do not indicate

99. Authors' interview, no. 20, Beijing, 2016.
100. See, for example, Yu Jixun, ed., *Di'er paobing zhanyi xue* [The science of Second Artillery campaigns] (Beijing: Jiefangjun chubanshe, 2004), p. 298; Xue Xinglin, ed., *Zhanyi lilun xuexi zhinan* [Campaign theory study guide] (Beijing: Guofang daxue chubanshe, 2001), pp. 384–393; and Shou, *Zhanlue xue*, pp. 174–175.
101. Xue, *Zhanyi lilun xuexi zhinan*, p. 393. See also Yu, *Di'er paobing zhanyi xue*, p. 292; and Xiao, *Zhanlue xue*, p. 134.
102. Deng Lizhong, "Xinxi tiaojian xia di'er paobing he daodan zuozhan yunyong lilun yanjiu" [Research on the combat role of Second Artillery nuclear missile forces under informatized conditions], master's thesis, National Defense University, Beijing, 2004, p. 32.

whether CMC members have any systematic concept or text to guide those decisions. As far as we can tell from the 2004 *Science of Second Artillery Campaigns*, a campaign manual authored by leaders of the Second Artillery, China lacks a nuclear warning-shot campaign that mirrors its plans to use conventional missiles to deter war or that could be viewed as analogous to the escalate to de-escalate concept of limited nuclear use proposed by some Russian strategists. China's leaders could, of course, request that the missile force develop such an option on short notice, but the lack of a preplanned option suggests that when the book was written, leaders did not anticipate ordering a nuclear warning shot.

Third, Chinese experts reject the possibility of using nuclear weapons first, even though they acknowledge it could be an option for China. According to a former vice commandant of the PLA's National Defense University, Xiao Tianliang, from a military standpoint, using nuclear weapons first would allow a state to seize the initiative. A no-first-use policy can leave a country with a crippled retaliatory capability and thus in an unfavorable situation. Nevertheless, "it is necessary to see that in international political and military struggles, political advantage and justness are most fundamental to the ability to win the initiative and strive for victory." Xiao explained that "our insistence on a defensive position, the no-first-use of nuclear weapons, is sufficient to completely show our good faith for peace, which is favorable for gaining the strategic initiative" at the political level.[103]

Two sentences in the 2004 *Science of Second Artillery Campaigns*, however, do hint at a capability for limited nuclear retaliation. One sentence states the nuclear counterattack force should be divided into an initial assault group (*shouci tujiqun*) and a follow-on assault group (*erhou tujiqun*), which implies at least two waves of counterstrikes.[104] Another sentence states that China's nuclear forces could be organized into two models: one involving two or more missile bases and the other involving only one missile base.[105] Taken together, these sentences could be read as a desire to create a more tailored nuclear strike capability for limited retaliation. In other words, to deter an adversary's further nuclear use in response to China's retaliatory strike, China may hold in reserve

103. Xiao Tianliang, *Xiao Tianliang jianggao zixuanji* [Selected lectures of Xiao Tianliang] (Beijing: Guofang daxue chubanshe, 2015), p. 256.
104. Yu, *Di'er paobing zhanyi xue*, p. 145.
105. Ibid., p. 147.

the weapons from other bases or a follow-on assault group. That capability could also give China the ability to carry out limited first use of nuclear weapons to demonstrate resolve or even for military advantage.

Nevertheless, these sentences do not provide evidence that China might envision using nuclear weapons first in a limited manner to achieve its aims in a conventional conflict, either to manipulate risk or because it could control nuclear escalation. They are mentioned only in the context of a nuclear counterattack, not nuclear first use. Instead, they are most likely outlining different options for China if nuclear deterrence fails. If China is attacked with only a few nuclear weapons, it may want to counterattack in a symmetrical way to deter subsequent attacks and thus limit its initial counterstrike to one base.

These sentences do not have clear implications for understanding Chinese views of nuclear escalation. They could be read as evidence that China believes that it is possible to control further nuclear escalation once nuclear weapons are used, contrary to the skeptical views of Chinese experts about the prospects of controlling nuclear escalation described above. A number of factors, however, caution against interpreting these sentences in this way. Most importantly, the *Science of Second Artillery Campaigns* does not describe the scenarios in which the missile force would conduct retaliatory nuclear strikes of a small scale or slow tempo. It simply states that dividing up nuclear retaliatory forces into initial and follow-on strike groups "is favorable to preparing strike forces to serve as an important counterweight to prevent escalation to nuclear war," while the number of bases involved in a strike are formed "according to the scale of the counterstrike campaign."[106] These sentences appear within paragraphs describing combat formations, with no discussion of their relationship to strategic objectives. In addition, it is not possible to tell from this volume whether China's missile force holds beliefs similar to those of the experts we interviewed, or whether their views are more similar to those of the Cold War proponents. These sentences may also reflect the organizational bias of the missile force, described below, toward focusing on questions of nuclear operations without discussing their strategic implications.

These sentences could also describe counterattack campaigns against China's regional adversaries, or waves of retaliatory strikes to ensure that targets are destroyed, rather than indicating a campaign for limited retaliation. If China is attacked by a regional adversary and not the United States, it might

106. Ibid., pp. 145, 147.

counterattack only with the missiles associated with a particular base, such as using medium-range ballistic missiles (MRBMs) and intermediate-range ballistic missiles (IRBMs) against Russia or India. Campaign planning involving more than one wave of nuclear strikes could also allow the PLA Rocket Force to ensure that it destroys its targets. A 2001 description of China's nuclear counterattack campaign indicates that supplementary attacks would follow initial and follow-on waves of strikes if the missile force's assessments of the effectiveness of earlier waves indicated that some targets were not destroyed.[107]

More recent PLA writings indicate that China does not intend to be drawn into a limited nuclear war with the United States in which it would retaliate against a limited U.S. nuclear strike with a symmetrical attack. A 2013 AMS textbook on service strategy noted that "it is necessary to . . . control the scope of the nuclear counterattack." Specifically, the authors write that China "should not conduct symmetrical nuclear strikes against an adversary, should not let oneself be led by the nose by an adversary, but play to one's strengths." Repeating a Maoist maxim contrasting China's restrained nuclear posture to the superpowers' ambitious nuclear postures, the book states that "you fight your way, I fight my way."[108] Even so, Western experts do not currently believe that China deploys low-yield warheads that could limit collateral damage, its most limited retaliatory nuclear strike would be much more destructive than a limited U.S. first strike and would therefore be viewed as escalatory by U.S. decisionmakers, creating strong incentives for the United States to hit back. China's nuclear warheads for its road-mobile systems are estimated to have a yield of 200–300 kilotons, whereas the yield of a U.S. B61 bomb ranges from 0.3 to 170 kilotons.[109] Thus, even a limited Chinese retaliatory strike, with only

107. Xue, *Zhanyi lilun xuexi zhinan*, p. 391. It is unlikely that China has a battle-damage assessment capability for nuclear strikes that would survive after China was attacked with nuclear weapons and had carried out a nuclear counterstrike campaign.
108. Zhou Xinsheng, ed., *Junzhong zhanlue jiaocheng* [Study guide to military service strategy] (Beijing: Junshi kexueyuan chubanshe, 2013), p. 206.
109. Hans M. Kristensen and Robert S. Norris, "United States Nuclear Forces, 2018," *Bulletin of the Atomic Scientists*, Vol. 74, No. 2 (2018), p. 121, https://doi.org/10.1080/00963402.2018.1438219; and Kristensen and Korda, "Chinese Nuclear Forces, 2019," p. 172. China could likely reduce the yield of existing warheads without testing or other actions observable to researchers. In 2018, the Pentagon noted that Chinese defense industry publications had mentioned a new low-yield warhead, but at the time of writing there is no open-source evidence to indicate that China is developing or deploying such a warhead. Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2018* (Washington, D.C.: U.S. Department of Defense, 2018), p. 77.

one weapon, could easily be more destructive than the initial U.S. strike. Furthermore, in a limited response, China's nuclear-armed MRBMs or IRBMs could only strike U.S. bases in Japan, South Korea, or Guam, which the United States would view as escalatory, because these are strategic assets in any U.S.-China contingency and would cause significant collateral damage. By contrast, the United States could attack any number of strategic or nonstrategic targets on or off the Chinese mainland.

Mirroring the Cold War skeptics, authors of other military texts that discuss how China might conduct a nuclear counterattack do not embrace the idea that a nuclear war can be won. The 2013 *Science of Military Strategy* notes that if China carries out a nuclear counterattack, "[it] must inflict unbearable destruction on the adversary, and frighten the adversary." Nevertheless, the authors note, "China also needs to control the intensity, target scope, and rhythm of the [nuclear] counterstrike, not consider winning nuclear war as the goal, [but] prevent a situation in which China and its adversary are using nuclear weapons to attack each other."[110] This sentence could be interpreted as indicating that China should develop the capability to respond proportionately to a limited nuclear strike to deter an adversary's limited first nuclear use, but it underscores the goal of deterring nuclear use in a conventional conflict, not fighting a limited nuclear war. Former Second Artillery Deputy Commander Ge Dongsheng described the goal of China's nuclear strategy in the post–Cold War era as "firmly believing that 'there is no winner in nuclear war.'" According to Ge, "Effective nuclear retaliation [would] achieve the goal of preventing [*zhizhi*] the escalation of war and eventually terminating the war."[111] Ge's statement reflects Chinese views that one role of nuclear weapons is to deter an adversary from escalating a conventional war to a nuclear one, as discussed in the following section on decoupling.

Fourth, Chinese sources suggest that, rather than escalating a conventional conflict that is going badly to the nuclear level to win a political victory, China might engage in a prolonged conventional war or terminate a war even if it is not able to achieve its war aims. PLA texts warn that, although China should aim to fight a quick war, it should also be prepared for a prolonged war. More importantly, it should be prepared to terminate a conventional war if circumstances become unfavorable. According to the 2013 *Science of Military Strategy*,

110. Shou, *Zhanlue xue*, p. 176.
111. Ge, *Lijie nanwang suiyue*, pp. 191, 442.

it is preferable to conclude a war quickly with a stronger adversary: "War commanders must always insist on a quick resolution as the first choice, but they must proceed from the most complex and difficult situation to formulate an organic, unified operational plan that strives for a quick decision, dares [to engage] a stalemate, and [includes] postwar control."[112] Similarly, the 2017 *Science of Military Strategy* warns that when China's military goals "have not been completely achieved," when China has "encountered serious difficulties" on the battlefield, or when "important changes have occurred in the war situation," it could abandon some of its initial goals in the conflict and terminate the war. In that contingency, China's main aim should be to terminate the war "in the most favorable way for one's own interest."[113] These views on ending a war in unfavorable circumstances also appear in textbooks written for party cadres.[114] If China is losing a conventional war, Chinese leaders have only bad options, but the limited first use of nuclear weapons is by no means the best of those bad options.

China's Nuclear Force Structure and Nuclear Escalation

China's nuclear force structure, along with discussions among Chinese experts about what kind of forces to develop, can also be used to assess the robustness of Chinese views of nuclear escalation. If China intended to use nuclear weapons in a conventional conflict, then it would consider and most likely develop tactical or lower-yield weapons as the most credible and effective nuclear options for those purposes. A tactical nuclear weapons capability would provide strong evidence that China's nuclear posture had been influenced by the view that nuclear escalation could be controlled. Instead, consistent with views about the difficulty of controlling nuclear escalation, China has not deployed tactical nuclear weapons, although it could still use its strategic nuclear forces for limited nuclear strikes. In addition, although some of China's conventional and nuclear forces are commingled, this does not appear to be a deliberate effort by China to manipulate risk.

112. Shou, *Zhanlue xue*, p. 133.
113. Xiao, *Zhanlue xue*, p. 250.
114. Liu Yazhou, ed., *Dangdai shijie junshi yu Zhongguo guofang* [Contemporary world military affairs and China's national defense], rev. ed. (Beijing: Zhonggong zhongyang dangxiao chubanshe, 2016), p. 233.

TACTICAL NUCLEAR WEAPONS

China never deployed tactical nuclear weapons either to counter a Soviet invasion of China in the 1980s or, to date, to threaten limited nuclear strikes in a maritime and air war against the United States. Chinese leaders decided to develop a tactical nuclear weapons capability in the late 1970s, but never deployed these weapons.[115] Some PLA officers advocated for the deployment of tactical nuclear weapons in the late 1980s and again in the early 2000s,[116] but these recommendations have not yet produced changes in China's force structure. The addition of tactical nuclear weapons into China's arsenal would have been easy to observe.

PLA officers and researchers worried that even if China possessed tactical nuclear weapons, it would still have no good options in response to a stronger adversary's limited use of tactical nuclear weapons in a conflict. These individuals considered but dismissed the arguments of Cold War proponents described above that tactical nuclear weapons could prevent China from facing a choice between suicide or surrender. As one Second Artillery officer wrote in 2004, "Once an adversary uses small-yield nuclear weapons to attack our military targets, if we use a corresponding [number] of nuclear weapons to counterattack at the same level, we will enter a war of attrition we cannot win." Furthermore, "if we choose to use large-yield strategic nuclear weapons to counterattack with a heavy fist, then we will initiate a large-scale nuclear war."[117] In other words, unless China builds an arsenal of tactical nuclear weapons as large as that of the United States, the United States would always have escalation dominance over China in a tactical exchange, delaying but not avoiding Beijing's unpalatable choice between suicide and surrender. Although the United States is estimated to have around 500 nonstrategic nuclear weapons, approximately 200 of which are deployed in Europe for the defense

115. Jonathan Ray, "Red China's 'Capitalist Bomb': Inside the Chinese Neutron Bomb Program," China Strategic Perspectives No. 8 (Washington, D.C.: Institute for National Strategic Studies, National Defense University, January 2015); and Fiona S. Cunningham, "Maximizing Leverage: Explaining China's Strategic Force Postures in Limited Wars," Ph.D. dissertation, Massachusetts Institute of Technology, 2018.

116. On the late 1980s discussion of tactical weapons, see Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3 (Winter 1995/96), pp. 26–29, doi.org/10.2307/2539138. On the early 2000s discussion, see Ge, *Nanwang lijian suiyue*, p. 345.

117. Deng, "Xinxi tiaojian xia di'er paobing he daodan zuozhan yunyong lilun yanjiu," p. 9. Similar views were expressed in authors' interviews, nos. 3 and 5, Beijing, 2016 and 2017.

of NATO, the remaining 300 warheads still equal the size of China's current total stockpile of nuclear warheads.[118]

Chinese experts offered a number of reasons why China did not need to deploy tactical nuclear weapons. To start, they are inconsistent its no-first-use policy and what China describes as its defensive nuclear policy.[119] When China considered the implications of tactical nuclear weapons for its no-first-use policy in the past, experts concluded that they would be difficult to use without violating the policy. Because they have a warfighting capability, units armed with them could not know if China had been attacked with nuclear weapons to comply with that policy.[120] Tactical nuclear weapons also lacked strategic utility for China. The U.S. and Soviet definition of tactical weapons is meaningless in geographical contexts other than Europe, because the close proximity of opposing nuclear-armed states would allow them to destroy each other's strategic targets with "tactical"-range nuclear weapons. Moreover, no U.S. targets lie within "tactical" range of the Chinese mainland.[121] Chinese experts remarked that the United States has tried to delineate the threshold between tactical and strategic nuclear weapons. Instead, China has made efforts to emphasize the conventional-nuclear threshold, reflecting its assessment of the difficulty of controlling escalation to unlimited nuclear war thereafter.[122]

A key assumption in Chinese views of tactical nuclear weapons is that China does not need to substitute nuclear weapons for conventional weapons to gain a military advantage or coercive advantage over an adversary. On the one hand, many Chinese experts claim that nuclear weapons cannot replace conventional weapons.[123] As arms control expert Sun Xiangli notes, "In respect of the measures of China's national security, nuclear and conventional weapons each have their own use."[124] On the other hand, China arguably never needed

118. Amy F. Woolf, "Nonstrategic Nuclear Weapons" (Washington, D.C.: Congressional Research Service, January 17, 2019), https://fas.org/sgp/crs/nuke/RL32572.pdf. For a smaller estimate of the U.S. tactical nuclear weapons arsenal, see Kristensen and Norris, "United States Nuclear Forces, 2018," p. 121.
119. Authors' interviews, nos. 3 and 12, Beijing, 2016 and 2017. Sun Xiangli, *He shidai de zhanlue xuanze: Zhongguo he zhanlue wenti yanjiu* [Strategy choices in the nuclear era: Research on China's nuclear strategy] (Mianyang: Zhongguo gongcheng wuli yanjiuyuan zhanlue yanjiu zhongxin, 2013), p. 31; and Liu Huaqiu, "China and the Neutron Bomb" (Stanford, Calif.: Center for International Security and Arms Control, Stanford University, June 1988), p. 27.
120. Authors' interview, no. 12, Beijing, 2017.
121. Authors' interviews, nos. 8, 11, and 17, Beijing, 2016.
122. Authors' interview, no. 8, Beijing, 2016; and Liu, "He wuqi yu changgui junshi chongtu de guanxi."
123. Authors' interviews, nos. 8, 22, and 24, Beijing, 2016.
124. Sun Xiangli, "Zhongguo he zhanlue yanjiu" [Research on China's nuclear strategy], in Zhang

to consider compensating for its conventional weakness with nuclear weapons, unlike the United States when it deployed them on the European central front in the Cold War.[125] In the 1950s, Chinese leaders were confident that China's large population and expansive territory would allow China to eventually defeat a U.S. invasion, which led them to adopt a no-first-use policy.[126] Because of strategic depth, in a war with the Soviet Union, China would not have needed to use nuclear weapons first for a military advantage, even if the first use of tactical nuclear weapons would have been a viable option later in the Cold War, at an operational level, to stop an invasion.[127]

Today, however, China faces a situation of conventional inferiority, because its vast geography would be less relevant in a limited naval and air war with the United States. Although China can still leverage its depth to provide sanctuary for its military forces—by deploying its conventional missiles in its hinterland beyond an adversary's striking range—its coastal cities remain vulnerable to attack. Nevertheless, Chinese experts do not think that nuclear weapons could substitute for China's conventional weakness in this kind of conflict either. In an air and naval war with the United States, China would still face a nuclear-armed adversary that could retaliate if China used nuclear weapons first, whether to gain a coercive advantage or a military advantage.[128]

New nuclear delivery systems that China has deployed or is developing raise the question of whether those capabilities would enhance its ability to control nuclear escalation and could therefore be used for limited nuclear strikes. The DF-26 ballistic missile, a highly accurate missile with a range of approximately 4,000 kilometers, was described as having the capability to be armed with either conventional or nuclear warheads when it made its debut at a 2015 Chinese military parade.[129] This missile could allow China to

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Tuosheng, Li Bin, and Fan Jishe, eds., *He zhanlue bijao yanjiu* [Comparative research on nuclear strategy] (Beijing: Shehui kexue wenxian chubanshe, 2014), p. 14. See also Xiao, *Zhanlue xue*, pp. 387–388.

125. Authors' interviews, nos. 3, 11, 21, 23, and 24, Beijing, 2016.

126. Lu Yin, "On China's Nuclear Doctrine and Force Posture" (Stockholm: Stockholm International Peace Research Institute, forthcoming), p. 9; and Pan, "Zhongguo bu shouxian shiyong he wuqi wenti yanjiu," p. 37. On China's military strategy in the 1950s, see M. Taylor Fravel, *Active Defense: China's Military Strategy since 1949* (Princeton, N.J.: Princeton University Press, 2019), pp. 72–106.

127. Liu, "China and the Neutron Bomb."

128. Authors' interviews, nos. 9 and 17, Beijing, 2016.

129. Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments involving the People's Republic of China, 2019* (Washington, D.C.: U.S. Department of Defense, 2019), p. 44.

more precisely target an adversary's military capabilities with nuclear weapons, such as U.S. air and naval bases in Japan, South Korea, or Guam.

Nevertheless, although the use of the DF-26 for limited nuclear strikes is possible and plausible, two factors caution against assuming such a role for this new system. First, China has possessed a road-mobile MRBM, the DF-21A, capable of striking U.S. bases in Japan and South Korea since the early 1990s. When they were first developed, these missiles were technological stepping-stones toward China's solid-fueled JL-2 submarine-launched ballistic missile, road-mobile DF-31 series ICBMs, and road-mobile conventional MRBMs. However, they also play a regional deterrence role, because they can hold Russian and Indian strategic targets at risk. Thus, new Chinese theater-range nuclear forces may have a similar range of roles beyond holding U.S. forces in East Asia at risk. In addition, no recent Chinese writings have suggested that a nuclear DF-26 would have role distinct from those of existing MRBMs and ICBMs. Instead, it appears to be part of China's efforts to modernize this class of ballistic missiles. Second, there is no evidence yet that China has deployed the nuclear-armed version of the missile. The first DF-26 brigade seems to have been equipped with a conventional variant, based on its integration with the existing communications systems.[130] Furthermore, that unit is garrisoned in China's interior province of Henan, suggesting that the longer range of the DF-26 allows China to improve the survivability of the missile as well as extend its range to targets such as Guam.

China is also developing a long-range strategic bomber that is expected to be nuclear capable.[131] That platform, perhaps combined with an air-launched MRBM under development,[132] will also likely provide China with the ability

130. The brigade is believed to be linked to the integrated command platform (ICP), which is intended to enable joint operations. Nuclear units are not believed to be linked to the ICP. Statement of Mark A. Stokes, Executive Director, Project 2049 Institute, Hearing on Chinese Advanced Weapons Development, Before the U.S.-China Economic and Security Review Commission, 115th Cong. 1st sess., February 23, 2017, p. 5, https://www.uscc.gov/sites/default/files/Stokes_Testimony.pdf; and Shi Yijie, "Wei daying xinxi hua zhanzheng chashang tengfei" [Plugging into rapid advances in capabilities for winning informationized wars], *Huojian Bingbao*, December 2, 2014. See also Defense Intelligence Agency, *China Military Power: Modernizing a Force to Win* (Washington, D.C.: U.S. Department of Defense, 2019), p. 91, which describes the DF-26 alongside China's conventional rather than nuclear missile systems.

131. Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2018*, pp. 70, 77.

132. Ankit Panda, "Revealed: China's Nuclear-Capable Air-Launched Ballistic Missile," *Diplomat*, April 10, 2018, https://thediplomat.com/2018/04/revealed-chinas-nuclear-capable-air-launched-

to conduct more precise nuclear strikes. Yet, like the DF-26, it is too soon to tell whether the PLA would use a strategic bomber to conduct precise, limited nuclear strikes, whether it would use them as an alternative means of delivering a nuclear counterattack according to counterstrike campaign plans based on existing doctrine, or whether it would be used primarily for conventional missions (especially anti-ship missions).

COMMINGLING OF CONVENTIONAL AND NUCLEAR MISSILE FORCES

If China believes that nuclear escalation cannot be controlled, it could commingle the deployment of conventional and nuclear missiles to manipulate the risk of nuclear escalation to gain a coercive advantage. Given that its no-first-use policy would prohibit threats of even the limited first use of nuclear weapons, China could look for other ways to increase the risk of unlimited nuclear war without violating its declaratory policy. Some Western experts have argued that China increases the risk of nuclear weapons use by commingling its conventional and nuclear missiles, submarines, their supporting infrastructure, and command and control networks.[133] Zhao and Li also report that some Chinese experts now recognize that commingling conventional and nuclear weapons could help to protect both kinds of capabilities from U.S. preemptive strikes.[134]

China's conventional-nuclear missile commingling is perhaps best understood as a side effect of organizational imperatives. China established its first conventional missile unit in 1993 as an experimental unit within the then-exclusively nuclear Second Artillery. Conventional missile units remained within the Second Artillery to take advantage of organizational efficiencies in training and equipment. Moreover, for operational flexibility, conventional missiles were dispersed among different Second Artillery bases, rather than centralized in one exclusively conventional missile base. As the *Science of Second Artillery Campaigns* explains, "In wartime, by moving across theater commands, many conventional missile forces can be concentrated in the main

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ballistic-missile/; and Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China, 2019*, p. 67.

133. Christensen, "The Meaning of the Nuclear Evolution," p. 470; Eric Heginbotham et al., *China's Evolving Nuclear Deterrent: Major Drivers and Issues for the United States* (Santa Monica, Calif.: RAND Corporation, 2017), p. 158; Joshua Rovner, "Two Kinds of Catastrophe: Nuclear Escalation and Protracted War in Asia," *Journal of Strategic Studies*, Vol. 40, No. 5 (August 2017), pp. 9–11, doi.org/10.1080/01402390.2017.1293532; and Talmadge, "Would China Go Nuclear?"

134. Zhao and Li, "The Underappreciated Risks of Entanglement," p. 53.

direction." Moreover, "it is not realistic to rely on a single missile base to implement operational command for all conventional missile units participating in war."[135] China's decision to develop conventional and nuclear variants of the DF-21 ballistic missiles appears to also be motivated by efficiency rather than the manipulation of risk. A 2013 AMS textbook notes that producing a "basic type" of missile and reducing the number of different kinds of missiles allowed the missile force to use the same launch platforms and testing equipment for multiple missiles.[136]

Today, China's commingling of conventional and nuclear missiles within the PLA Rocket Force increases the risk of nuclear escalation in a U.S.-China conventional conflict.[137] If China were using commingling as a method of manipulating the risk of nuclear escalation, the extent of commingling would likely be much greater and be increasing. There is some evidence to suggest, however, that the extent of commingling is decreasing. There are also hints that the PLA's command and control arrangements for conventional and nuclear missiles are becoming increasingly separate. Those changes appear to be a consequence of the availability of capabilities and organizational structures to integrate conventional missile units into joint campaigns with other PLA services. Campaign manuals indicate that theater commanders could authorize the use of conventional missiles in joint campaigns during wartime.[138] To facilitate the use of conventional missiles in joint campaigns, conventional missile units are patched into the PLA's integrated command platform (ICP) used to command conventional operations. Likely reflecting the CMC's strict control over nuclear weapons use, the command network for nuclear units is not believed to be connected to the ICP.[139] The participation of conventional missile units in joint training, though limited in the past, is likely to increase in the future as a result of the 2016 PLA reforms to implement a joint command struc-

135. Yu, *Di'er paobing zhanyi xue*, p. 160.
136. Zhou, *Junzhong zhanlue jiaocheng*, p. 210. On the organizational reasons for China's conventional and nuclear missile commingling, see also David C. Logan, "Making Sense of China's Missile Forces," in Phillip C. Saunders et al., eds., *Chairman Xi Remakes the PLA* (Washington, D.C.: National Defense University Press, 2019), p. 160.
137. See Talmadge, "Would China Go Nuclear?"
138. It is likely, however, that the CMC would maintain some authority over how conventional missiles are used in a future joint campaign. Yu, *Di'er paobing zhanyi xue*, p. 161.
139. No missile force units reported to be connected to the ICP in Chinese-language media are equipped with nuclear missiles. See, for example, Shi, "Wei daying xinxi hua zhanzheng chashang tengfei."

ture. Such an increase could further widen the differences between conventional and nuclear missile unit command and control arrangements.[140]

Explaining China's Confidence about Avoiding Nuclear Escalation

There are at least three reasons why China's strategic community holds relatively confident views about China's ability to avoid escalation from conventional to nuclear war: the long-standing decoupling of its conventional and nuclear strategies; the availability of other strategic capabilities such as conventional missiles, space weapons, and cyberweapons; and organizational biases of different groups involved in China's nuclear strategy and missile operations.

CONVENTIONAL AND NUCLEAR DECOUPLING

Historically, China did not integrate its strategy for the use of nuclear weapons with its conventional strategy for fighting total wars in either the Mao era or in planning for local wars since the 1980s. The legacy of decoupling remains today and offers one important explanation for the confidence Chinese experts express about avoiding nuclear escalation documented above.

Since the beginning of the nuclear era, China's top party leaders have viewed the utility of nuclear weapons as limited to preventing nuclear coercion and deterring the first use of nuclear weapons against China.[141] Chinese leaders were explicit in their view that nuclear weapons could not win wars. Instead, they maintained that wars could be won only with conventional weapons. In 1961, in a lengthy conversation with British Field Marshal Bernard Montgomery, Chinese leader Mao Zedong argued, "If you want to fight, you still need to use conventional weapons to fight."[142] Two decades later, during a meeting with the prime minister of Denmark, Deng Xiaoping cautioned: "Do not ignore conventional war. Because with nuclear weapons, if

140. See Kenneth W. Allen and Jana Allen, "Building a Strong Informatized Strategic Missile Force: An Overview of the Second Artillery Force with a Focus on Training in 2014" (Washington, D.C.: Jamestown Foundation, 2015); and Logan, "Making Sense of China's Missile Forces," pp. 415–416.

141. M. Taylor Fravel, and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure," *International Security*, Vol. 35, No. 2 (Fall 2010), pp. 48–87, doi.org/10.1162/ISEC_a_00016.

142. Pang Xianzhi and Feng Hui, eds., *Mao Zedong nianpu, 1949–1976* [A chronicle of Mao Zedong's life, 1949–1976], Vol. 5 (Beijing: Zhongyang wenxian chubanshe, 2013), p. 27.

you have them, I will have them. If you have more, I will have more and perhaps no one will dare to use them. Conventional war is possible."[143]

Based on these views, China's national military strategy, also called the "strategic guidelines" (*zhanlue fangzhen*), has provided guidance only for how China would conduct conventional operations. It does not describe the role of nuclear weapons in conventional conflicts, though the general principle of "active defense" has reinforced China's emphasis on a retaliatory nuclear posture. Perhaps the most telling example is the 1980 strategic guideline, which outlined how China would fight in the first phase of a Soviet invasion. The strategy focused on how to defeat a conventional assault by using conventional weapons, not by threatening the use of nuclear weapons. China's senior military officers would consider nuclear strikes only if the Soviets used nuclear weapons first against China. Moreover, even though China's forward defense would likely have failed to halt a Soviet advance, the use of nuclear weapons was still not incorporated into the strategy for such a war even though it may have been able to deter the Soviets. Instead, the plan was to fight a protracted conventional war on Chinese territory, with the goal of the forward defense being to buy time for a nationwide mobilization and protect key cities from being occupied.[144]

The PLA's operational doctrine reflects this decoupling of conventional and nuclear strategy. Doctrinal texts on campaigns and the operational art for the Second Artillery published in the mid-1990s describe only a nuclear counterattack mission and contain no discussion about the use of nuclear weapons in a conventional conflict.[145] In teaching texts on campaigns published throughout the 2000s, the same decoupling is evident.[146] The only campaign described in these sources is the "nuclear counterstrike campaign" (*hefanji zhanyi*) indicating that the sole scenario in which China planned for the use of nuclear weapons was in response to first use of nuclear weapons against China. Nor is the

143. Zhongyang junwei bangongting [CMC general office], ed., *Deng Xiaoping guanyu xin shiqi jundui jianshe lunshu xuanbian* [Selected discussions of Deng Xiaoping on military force building in the new era] (Beijing: Bayi Chubanshe, 1993), p. 41.
144. Fravel, *Active Defense*, pp. 139–181.
145. Qian Gui and Pan Riyuan, eds., *Di'er paobing zhanyi zhanfa* [Second Artillery campaigns and tactics] (Beijing: Lantian chubanshe, 1996).
146. Gao, *Zhanlue xue* [The science of military strategy] (Beijing: Junshi kexue chubanshe, 1987); Peng Guangqian and Yao Youzhi, eds., *Zhanlue xue* [The science of military strategy] (Beijing: Junshi kexue chubanshe, 2001); Shou, *Zhanlue xue*; Wang Houqing and Zhang Xingye, eds., *Zhanyi xue* [The science of military campaigns] (Beijing: Guofang daxue chubanshe, 2000); and Zhang Yuliang, *Zhanyi xue* [The science of military campaigns] (Beijing: Guofang daxue chubanshe, 2006).

use of nuclear weapons discussed in other conventional campaigns, such as the "island landing" campaign (Taiwan) or the "border area counterattack" (India). The only role for nuclear weapons in a conventional conflict that is recognized in PLA texts is to deter an adversary from threatening nuclear first use to coerce China and affect the outcome of a conventional war.[147]

The only exception to China's decoupling of its conventional and nuclear forces appears in the 2004 *Science of Second Artillery Campaigns*. It contains several suggestions for nuclear signaling that do imply a role for nuclear weapons in a conventional conflict even if such signaling falls short of actual use. At the most extreme, it would include lowering the threshold for no first use.[148] If Chinese leaders did lower the threshold for no first use, however, the book does not offer a description of what a limited first-use campaign might look like.[149] Importantly, this text was published at a time when Chinese experts were debating whether China needed to add conditions to its no-first-use policy to bolster its strategic deterrence posture. At that time, China's conventional military inferiority vis-à-vis Taiwan and the United States was much greater than it is today. Nor did China have the variety of nonnuclear strategic weapons that it presently has, such as anti-satellite weapons, with which to gain strategic leverage without crossing the nuclear threshold. That debate over no first use ended with no changes to China's no-first-use policy or its nuclear strategy. Other doctrinal documents published after this 2004 volume indicate that the Second Artillery continued to emphasize a retaliatory campaign for China's nuclear forces, not nuclear use in a conventional conflict.[150]

Strategic Substitution

Reflecting China's leaders' beliefs that the utility of nuclear weapons is limited, China has developed nonnuclear strategic weapons since the early 1990s. These include conventional ballistic missiles, counterspace weapons, and

147. See, for example, Zhou, *Junzhong zhanlue jiaocheng*, p. 204.
148. Yu, *Di'er paobing zhanyi xue*, pp. 294–296.
149. A thesis written by a Second Artillery officer at the same time describes a limited first-use campaign and notes that if a declaration to lower the threshold for no first use failed to deter an adversary, the credibility of China's nuclear posture in the future could be compromised. Deng, "Xinxi tiaojian xia di'er paobing he daodan zuozhan yunyong lilun yanjiu," pp. 10, 39–41. We speculate that the omission of a first-use campaign from the book was deliberate and suggests that lowering the nuclear threshold would not necessarily mean that China would use its nuclear weapons first.
150. See, for example, Shou, *Zhanlue xue*, p. 175; and Zhang, *Zhanyi xue*, pp. 583–594.

cyberattack capabilities.[151] Unlike nuclear weapons, China does intend to use these capabilities first to gain military and coercive advantages in a conventional conflict. China is perhaps more confident that nuclear use can be avoided because these nonnuclear strategic weapons give it more rungs on the escalation ladder below the nuclear threshold. Chinese leaders might hope that the first use of conventional missiles, anti-satellite weapons, or large-scale cyberattacks would impose sufficient costs on an adversary in a limited conventional conflict that it could terminate the conflict below the nuclear threshold.[152] According to the 2013 *Science of Military Strategy*, China could "when necessary take an appropriate action of brinkmanship in war, by using limited but effective warning firepower strikes and information attacks to coerce the adversary to retreat to avoid defeat [*zhinan ertui*] and to stop when they see the danger."[153]

PLA texts indicate that conventional missiles, counterspace, and cyberattack capabilities have advantages over nuclear weapons for strategic deterrence. A text published by the National Defense University indicates that conventional missiles were more usable than nuclear missiles. As nuclear weapons become less usable, the book suggests, more countries are relying on conventional missiles for both deterrence and warfighting roles.[154] Writing in 2004, a Second Artillery officer argued that counterspace and cyberattacks could be more effective than nuclear weapons in the era of "informatized" (*xinxihua*) local wars in which information technology is integrated into all aspects of military operations. Counterspace attacks could reduce the military superiority of the United States by paralyzing its space support systems, achieving a deterrent effect without incurring casualties. Meanwhile, cyberattacks were cheap for China to develop and could paralyze a highly networked society such as the United States with poor network defenses.[155] China's vulnerability in space

151. Shou, *Zhanlue xue*, pp. 134–153; Xiao, *Zhanlue xue*, pp. 122–138; Xiao, *Xiao Tianliang jianggao zixuanji*, pp. 117–123; Michael S. Chase and Arthur Chan, *China's Evolving Approach to "Integrated Strategic Deterrence"* (Santa Monica, Calif.: RAND Corporation, 2016); and Dennis Blasko, "China's Evolving Approach to Strategic Deterrence," in McReynolds, *China's Evolving Military Strategy*, pp. 279–297.
152. For a detailed analysis of China's substitution approach to strategic deterrence, see Cunningham, "Maximizing Leverage."
153. Shou, *Zhanlue xue*, p. 119.
154. Huo Xiaoyong, ed., *Junzhong zhanlue xue* [Science of service strategy], 2nd ed. (Beijing: Guofang daxue chubanshe, 2007), p. 229.
155. Deng, "Xinxi tiaojian xia di'er paobing he daodan zuozhan yunyong lilun yanjiu," pp. 27–28, 43; and Yu, *Di'er paobing zhanyi xue*, pp. 339, 352.

and especially cyberspace has grown since 2000. There are signs that China will exercise greater caution in the use of those capabilities, at least in peacetime and crises, because of its increasing vulnerability to counterattack. Nevertheless, recent PLA writings indicate that offensive cyber and space capabilities would still play a "deterrence and warfighting" role, as they had become "the strategic focal point in the great power game and the strategic commanding heights of informatized wars."[156]

Despite the clear emphasis in Chinese thinking on integrating nuclear and nonnuclear capabilities for strategic deterrence, China's use of these nonnuclear capabilities remains largely decoupled from its nuclear strategy. PLA writings are silent about what China would do if an adversary did not capitulate after large-scale space, cyber, or conventional missile attacks. Nor do they seriously interrogate whether those attacks might prompt an adversary to respond with nuclear threats or attacks on support capabilities for China's nuclear arsenal.[157]

ORGANIZATIONAL BIASES

Within China's strategic community, two groups focus on thinking about nuclear weapons and their use: nuclear experts and the military officers responsible for China's nuclear weapons. Unfortunately, neither examines the potential for escalation and crisis instability in any detail.

China's nuclear experts draw largely from members of China's civilian arms control and weapons design communities. These individuals tend to emphasize force structure, general principles for the use of nuclear weapons, and the broader political and diplomatic context of nuclear strategy. They are most likely to shape China's overall nuclear strategy. Because most are not from the PLA, however, much less the PLA Rocket Force, they do not examine the role that nuclear operations such as deployments or signaling might play in a conventional conflict before those weapons are used, and their impact on broader questions of crisis stability. Such individuals tend not to study conventional

156. Wang Kebin, "Jianding buyi zou Zhongguo tese xinxi qiangjun zhi lu" [Resolutely take the path of strengthening the military by informatization with Chinese characteristics], *Zhongguo junshi kexue*, No. 2 (2015), pp. 3–4.

157. Some recent texts are, however, starting to recognize the links between the security of China's space assets and computer networks, on the one hand, and a reliable and effective nuclear deterrent, on the other. See, for example, Zhang Shibo, *Zhanzheng xin gaodi* [The new high ground of warfare] (Beijing: Guofang daxue chubanshe, 2016), p. 19.

conflicts and how they might escalate. Their inattention to nuclear escalation risks is also likely shaped by the view within this community that nuclear weapons possess limited utility. Members of this group are slowly starting to pay more attention to these questions, prompted by the concerns of Western researchers about inadvertent escalation. Nevertheless, they may lack the accurate information about China's nuclear operations they would need to assess these risks.[158]

By contrast, commanders from the PLA Rocket Force emphasize operational doctrine for their service. They tend not to examine the broader strategic context for the use of nuclear weapons, based on the assumption that it would be coordinated at a higher level, either by the CMC or the Politburo Standing Committee, and their service is simply charged with executing the missions and tasks assigned to it. The sentences in the 2004 *Science of Second Artillery Campaigns* hinting that China could conduct limited retaliatory strikes may be one example of this organizational bias among China's nuclear operators. The force's inattention to strategic questions is in many ways deliberate, as Chinese leaders have historically excluded the Second Artillery from the development of nuclear strategy, while scientists and engineers have had much more influence.[159]

Of course, operational actions could increase instability in a conventional crisis. Indeed, many of the signaling actions listed in the 2004 *Science of Second Artillery Campaigns* are precisely the kinds of operational actions that could be mistaken as preparations for first use and create incentives for the United States to (mistakenly) preempt a Chinese nuclear strike. They have attracted a great deal of attention outside China for this reason. Likewise, this text does not examine the broader implications of the methods of signaling that it suggests. The most likely reason is that the operationally focused PLA Rocket Force does not stress larger strategic questions such as crisis stability or escalation risks. Some Western scholars warn that these problems could intensify as officers with experience implementing the coercive and warfighting missions of China's conventional missiles step into leadership roles that could allow their experience to shape the PLA Rocket Force's approach to nuclear missile operations.[160]

158. Authors' interview, no. 16, Beijing, 2016; and Zhao and Li, "The Underappreciated Risks of Entanglement," pp. 50, 52.
159. Authors' interview, no. 22, Beijing, 2016. See also Fravel, *Active Defense*, pp. 236–269.
160. Heginbotham et al., *China's Evolving Nuclear Deterrent*, pp. 106–107, 116–117.

Speculatively, concerns about operational actions that increase crisis instability would have to be raised at the leadership level, where strategy and decisions on nuclear arms control, weapons design, and operations are coordinated. We were unable to determine whether there is currently an organization or institutional mechanism within the PLA or China's Communist Party responsible for nuclear strategy that would serve as an appropriate forum for airing these concerns.

Overconfidence about Controlling Nuclear Escalation?

In light of their confidence about avoiding nuclear escalation, how much control do Chinese experts believe that their leaders would have over escalation in both conventional conflict and from a conventional war to a nuclear war? Although their views vary, Chinese experts likely overstate the ability of China's leaders to control escalation, even if nuclear weapons are not used.[161] Their confidence is also an exception to China's generally skeptical views about nuclear escalation control, because it reflects a belief similar to that of the Cold War proponents that Chinese and U.S. perceptions of each other's desire to avoid nuclear war would be robust even once a conflict began. Chinese experts hold these beliefs not because they share the views of proponents about controlling nuclear escalation, but because they underplay the pressures to escalate to a nuclear war that could result from interactions between the United States and China in a conventional conflict.

One reason why the amount of control is likely overstated is that Chinese experts may equate the CCP's strict control over the PLA, and its nuclear forces in particular, with a corresponding ability to control escalation once a crisis or conflict erupted. In addition to the PLA's centralized command structure, the presence of political commissars, officers who are tasked with ensuring party decisions are implemented within the PLA, is seen as strengthening escalation control by ensuring that subordinates comply with the intent of China's top military decisionmakers on the CMC.[162] More generally, a recent defense policy study guide for party cadres underscores that China's nuclear missiles and ballistic missile submarines "are under the direct control of the

161. Xiao, *Zhanlue xue*, p. 249; and Deng, "Meijun jubu zhanzheng zhanju kongzhi lilun tanxi," p. 121.
162. Authors' interview, no. 13, Beijing, 2016. See also Zhao and Li, "The Underappreciated Risks of Entanglement," p. 69.

CMC." Thus, all command decisions flow from the CMC: "When the country is under a nuclear threat, according to the commands of the CMC, [they will] increase alert status, make good preparations for nuclear counterattack, prevent the enemy from using nuclear weapons against us; when the country receives a surprise nuclear attack, [they will] use nuclear missile weapons to carry out a resolute counterattack against the enemy."[163] Given the CMC's tight control, and how it is discussed, it is more difficult for experts to imagine accidents and mistakes involving nuclear weapons. In addition, in some campaigns the CMC may also directly control the conventional missile force.[164] Some PLA texts also suggest that anti-satellite weapons and strategic cyberattacks would be similarly strictly controlled.[165] Chinese leaders' strict control over strategic weapons, however, is not the same as strict control over how an adversary acts in a conflict or how a crisis unfolds.

A second reason why the amount of control exercised by China's national leaders may be overstated is that many written sources and some experts do not consider how China's actions in a crisis or war could be misperceived and increase the odds of nuclear escalation by the United States. The 2004 *Science of Second Artillery Campaigns*, for example, suggests arming an ICBM with a conventional warhead to attack an opponent's homeland as a way to signal resolve and counter air raids against China. The goal would be to "to shock the adversary psychologically, and create terror in the strong adversary's population, making the strong adversary's domestic anti-war sentiment increase sharply."[166] Of course, such a launch would be indistinguishable from a nuclear attack to the U.S. early warning system, creating great risks (however unwanted) of nuclear escalation. Although there are no indications that China is preparing to use ICBMs in this way, the point is that sources like the 2004 *Science of Second Artillery Campaigns* do not assess the potential consequences of the actions that they propose.

A third reason why the amount of control exercised by China's national leaders may be overstated is that Chinese sources and experts tend to assume that conventional escalation can be controlled because an adversary will re-

163. Zhang Yang, ed., *Jiakuai tuijin guofang he jundui xiandaihua* [Accelerating and pushing forward defense and military modernization] (Beijing: Dangjian duwu chubanshe, 2015), p. 79.
164. Yu, *Di'er paobing zhanyi xue*, pp. 160–161.
165. Ye Zheng, ed., *Xinxi zuozhan xue jiaocheng* [Study guide to information warfare] (Beijing: Junshi kexueyuan chubanshe, 2013), p. 109.
166. Yu, *Di'er paobing zhanyi xue*, p. 402.

spond proportionately to China's actions. An adversary's response can be accurately predicted if its intentions and interests in the conflict are well understood. Chinese sources do not generally acknowledge the possibility that an adversary could respond in a crisis or war with a disproportionate counterattack. For example, the 2017 *Science of Military Strategy* argues that long-range warning shots, most likely using conventional missiles or air strikes, would need to be calibrated to prevent an adversary overreaction or underreaction. The strike would require "a small amount of intimidation [*shaoliang zhenshe*] to affect a military or political target that is clear, relatively isolated and easy to attack, and does not injure the population." As the purpose of the strike is not war but deterrence, "it is necessary to precisely judge the situation, strictly control the means and scope of the attack to prevent the action from escalating and expanding to develop into war."[167] Likewise, the 2004 NDU text *Coercive Warfare*, authored by missile force officers, noted that it is necessary to "strictly control the intensity of deterrence at the precise deterrence opportunity." China must be able to select the correct intensity of escalation for the circumstances, but regarding high-intensity actions, "it is necessary to know when to stop [*shike erzhi*], you do not want to make the situation expand." Optimistically, the book states that if China considers adversary interests and intentions, "only then can employing a certain level of escalation be sufficient to affect [*chongdong*] the adversary's psychology."[168]

A fourth reason, also related to misperceptions, concerns China's nuclear signaling. In general, Chinese sources indicate that China would engage in nuclear signaling to prevent nuclear coercion or to deter an imminent nuclear strike.[169] An adversary, however, might view such signals as preparations to use nuclear weapons in a crisis or conflict. An example is the "strategic deterrence" step of "implementing movements of land-based and sea-based strategic nuclear weapons" when war is imminent. This action is described in the 2017 *Science of Military Strategy* as one way of "adjusting deployments" of different military capabilities.[170] Such actions could be taken to ensure the survivability of the arsenal, but they could be mistaken as preparations to conduct a first strike.[171] A textbook for party cadres on defense policy indicates that

167. Xiao, *Zhanlue xue*, p. 134.
168. Zhao, *Shezhan*, p. 9.
169. Yu, *Di'er paobing zhanyu xue*, pp. 291, 295.
170. Xiao, *Zhanlue xue*, p. 133.
171. Authors' interview, no. 10, Beijing, 2016.

"when the country suffers a nuclear threat, according to the order of the CMC, [nuclear missile units and ballistic missile submarine units] increase their alert status and prepare for a nuclear counterattack, to stop [*shezhi*] an enemy from using nuclear weapons against us," which could involve such signaling. The text states, however, that only "when our country suffers a nuclear attack, [will they] use nuclear weapons to carry out a resolute counterattack."[172] This distinction between nuclear signaling and preparations for first use could, however, easily be lost on U.S. decisionmakers who are skeptical that China will adhere to its no-first-use policy in an actual conflict. Chinese experts' confidence in their country's no-first-use policy makes them less likely to recognize the risks of nuclear escalation that could arise from misperceptions of intent and unintended consequences of Chinese and U.S. actions.[173]

Conclusion

In this article, we have argued that China's strategic community is relatively confident about the ability of China to avoid nuclear escalation in a conflict with the United States. The most important reason is that the members of this community believe that once nuclear weapons are used, subsequent use by either side cannot be controlled. Thus, they do not believe that a limited nuclear war would stay limited. Instead, it would likely escalate into an unlimited one. Chinese experts expect that these features of nuclear war will lead U.S. and Chinese decisionmakers to avoid any nuclear use and resolve any conflict at the conventional level. They also believe that the United States will exercise sufficient control over a crisis involving a U.S. ally or partner so that the use of nuclear weapons is not considered.

China's operational doctrine for the use of its nuclear weapons and its nuclear force structure are consistent with these views about the difficulty of controlling escalation. That is, China's operational doctrine does not contain plans to wage a limited nuclear war, which China might pursue if it believed nuclear escalation could be controlled. The focus of China's nuclear operations remains on how to retaliate after China is attacked with nuclear weapons to deter such attacks in the first place. Similarly, although China's nuclear arsenal is

172. Liu, *Dangdai shijie junshi yu Zhongguo guofang*, p. 140.
173. Cunningham and Fravel, "Assuring Assured Retaliation," pp. 46–47; Goldstein, "First Things First," pp. 64–65; and Zhao and Li, "The Underappreciated Risks of Entanglement," p. 64.

expanding, China is not developing forces that would be optimized for use in a limited nuclear war, especially tactical nuclear weapons. The long-standing decoupling of conventional and nuclear strategy, the availability of nonnuclear strategic weapons such as cyberweapons, and the organizational biases of nuclear experts and the PLA's missile commanders explain this relative confidence about avoiding escalation. Chinese experts likely overestimate their leaders' ability to control escalation, because they underplay the pressures to escalate to a nuclear war that their leaders could not control—for example, if an adversary overreacts or misperceives Chinese signaling with nuclear or nonnuclear strategic weapons.

Several implications follow from our analysis, all of which raise concerns about crisis stability and the ability of the United States and China to prevent nuclear escalation in a crisis between the two states. First, China's approach to deterrence may be suboptimal—at least from the perspective of deterring either U.S. conventional strikes against its nuclear infrastructure or limited U.S. nuclear strikes against its nuclear arsenal. Although China maintains some ambiguity over whether it would respond to a conventional strike on its nuclear forces with nuclear weapons, China's overall confidence that a U.S.-China conventional conflict would not escalate to nuclear war may reduce the effectiveness of its deterrent against this kind of attack by persuading an adversary that such strikes would not elicit nuclear retaliation. China's confidence could even embolden an adversary to gamble that a limited nuclear first strike against China would not elicit nuclear retaliation. This, in turn, would increase the odds of such U.S. attacks and create strong pressure for China to retaliate to deter further attacks on its nuclear forces, resulting in nuclear escalation.

Our research, however, does not indicate how the small size of China's arsenal compared with that of the United States would affect its response to U.S. limited nuclear strikes. China could respond with limited nuclear retaliatory strikes; it could threaten or pursue unlimited nuclear retaliation; it could respond with nonnuclear forces; or it could respond in another way, including terminating the conflict. More research is needed to explore the relationship between the size and vulnerability of China's arsenal and its views of nuclear escalation control.

Second, the United States and China hold opposing beliefs about escalation above and below the nuclear threshold that may also contribute to instability. U.S. experts worry more than Chinese experts that the two countries might not

be able to control the escalation of a conventional war to high levels of intensity, which could push a conflict over the nuclear threshold, but are more sanguine about (or at least are divided about the possibility of) controlling nuclear escalation after nuclear weapons have been used.[174] This likely reflects the overwhelming superiority of U.S. nuclear forces (especially against a smaller nuclear power), decades of nuclear planning for a range of scenarios (including limited nuclear warfighting), and an emphasis on achieving dominance in conventional operations.

As this article demonstrates, however, Chinese experts hold an opposing perspective. They are quite pessimistic about controlling nuclear escalation once the threshold for the use of nuclear weapons has been crossed. By contrast, however, they are quite confident (perhaps overly confident) about controlling conventional escalation before the nuclear threshold is crossed. As noted earlier, almost all of the available literature from Chinese military sources on escalation examines conventional escalation and not nuclear escalation. At least in the post–Cold War era, U.S. conventional operations against other militaries have emphasized seizing and exploiting air superiority, meaning that control of conventional escalation was not a concern for the United States because it had the luxury of fighting adversaries with no plausible means to escalate. Although China has not fought a war since 1979, it has engaged mostly in limited uses of force in local conflicts or displays of force and has certainly not achieved conventional dominance over an adversary to the same extent as the United States.

These contrasting beliefs about the feasibility of controlling conventional and nuclear escalation suggest that a conventional conflict is more likely to escalate to high levels of intensity, increasing the chances of nuclear escalation. China, for example, could take actions it believes will deter the United States at the conventional level, only to be confronted with a U.S. desire to overmatch China in response and establish the same extent of conventional dominance that the United States has enjoyed for several decades against other adversaries.[175] Yet, such actions could include steps to degrade China's nuclear forces,

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174. For recent examples, see Colby, "If You Want Peace, Prepare for Nuclear War"; Manzo and Warden, "After Nuclear First Use, What?"; and Jeffrey A. Larsen and Kerry M. Kartchner, eds., *On Limited Nuclear War in the 21st Century* (Palo Alto, Calif.: Stanford University Press, 2014).

175. The initial Center for Strategic and Budgetary Assessments report on AirSea Battle, for example, reflects this thinking. Stephen Biddle and Ivan Oelrich, however, show that the United States may never be able to achieve such dominance over China. See Jan Van Tol et al., "AirSea Battle: A

either inadvertently by targeting China's conventional missiles or intentionally to force China to either surrender or escalate to nuclear war. Those U.S. attacks might create strong pressures on China to engage in nuclear signaling or mobilization of its land-based nuclear missiles and ballistic missile submarines to protect its deterrent or even threaten nuclear use to deter further attacks on its nuclear arsenal. In response, the United States may attempt a large-scale nuclear strike to try to eliminate China's nuclear forces or at least limit damage from China's use of nuclear weapons. If the two countries have different views about when the natural firebreaks in a conflict will occur, they may focus on negotiating an end to the conflict at different times in this escalatory spiral and therefore miss opportunities to negotiate an end to the conflict altogether.[176] In short, based on differing views about controlling escalation, escalation at both the conventional and nuclear levels may be more likely.

The flip side, however, might be enhanced caution. China may anticipate U.S. efforts to escalate a conventional war to achieve conventional dominance while the United States may anticipate a disproportionate Chinese nuclear response if it were to conduct limited nuclear strikes in a conflict. Both countries may therefore be extremely cautious in a crisis or low-intensity conflict. Further, despite the views outlined above, the two countries have not always acted on their confidence about controlling conventional or nuclear escalation. Historically, China has exercised more caution (most of the time) when facing a superior adversary, based on the imperative of conserving its forces. Despite models that show U.S. nuclear superiority and the ability to limit damage using a nuclear first strike,[177] U.S. leaders have appeared reluctant to accept significant nuclear risk, especially in the post–Cold War era.[178]

Ironically, one factor that contributes to these opposing views is China's no-

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Point-of-Departure Operational Concept" (Washington, D.C.: Center for Strategic and Budgetary Assessments, 2010); and Biddle and Oelrich, "Future Warfare in the Western Pacific: Chinese Antiaccess/Area Denial, U.S. AirSea Battle, and Command of the Commons in East Asia," *International Security*, Vol. 41, No. 1 (Summer 2016), pp. 7–48, doi.org/10.1162/ISEC_a _00249.

176. Bernard Brodie recognized that firebreaks needed to be shared by both adversaries to be effective. See Brodie, "Escalation and the Nuclear Option," pp. 107–111.

177. Keir A. Lieber and Daryl G. Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security*, Vol. 30, No. 4 (Spring 2006), pp. 7–44, doi.org/10.1162/isec.2006.30.4.7; Brendan Rittenhouse Green and Austin Long, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies*, Vol. 38, Nos. 1–2 (February 2014), pp. 38–73, doi.org/10.1080/01402390.2014.958150; and Keir A. Lieber and Daryl G. Press, "The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence," *International Security*, Vol. 41, No. 4 (Spring 2017), pp. 9–49, doi.org/10.1162/ISEC_a_00273.

178. Richard K. Betts, *Nuclear Blackmail and Nuclear Balance* (Washington, D.C.: Brookings Institu-

first-use policy. Many U.S. analysts do not believe that it is a credible pledge, because China has not stated how it plans to end a conventional war it is losing.[179] China perhaps does not feel a need to reveal such plans, either because of its experience in fighting and ending limited wars without achieving its initial ambitions (in Korea and perhaps in Vietnam) or because it would not want to reveal such plans to a stronger adversary that could then exploit them. On the other hand, Chinese experts view the pledge as the guiding principle for the role of Chinese nuclear weapons in any future conflict with the United States. As they do not plan to use nuclear weapons first, even when losing, they may not explore this point in their writings. Chinese experts may also discount the likelihood that its actions in a crisis or conflict could be mistaken by the United States as preparations to use nuclear weapons first.

Third, greater attention to nuclear escalation is needed in China. The gap between its strategic community and the PLA Rocket Force needs to be bridged. Looking forward, the new Strategic Planning Office under the CMC may endeavor to pursue greater coordination between China's overall strategy and the role of nuclear weapons in crises and conflicts.

A fourth implication of Chinese views of nuclear escalation for U.S.-China crisis stability concerns whether these views may change in the future. We suggest that China's strategic community is unlikely to change its view that further nuclear escalation cannot be controlled once it is engaged in a crisis or conventional conflict with the United States. Nevertheless, several possibilities should be considered.

First, Chinese experts may revise their views about the ability of the United States to control its allies and avoid a nuclear confrontation with China, points on which China's views currently diverge with the arguments of the Cold War skeptics. The realization in a crisis or conflict that the United States may be unable or unwilling to control its allies, or willing to run the risk of a nuclear war with China to defend them, could deter China from engaging in a high-intensity conventional conflict with a U.S. ally. It could also prompt China to engage in nuclear signaling to try to deter a U.S. first strike, which could in turn be misperceived by Washington.

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tion Press, 1987); and Brad Roberts, *The Case for U.S. Nuclear Weapons in the 21st Century* (Stanford, Calif.: Stanford University Press, 2016), pp. 11–50.

179. See, for example, Thomas G. Mahnken, "Future Scenarios of Limited Nuclear Conflict," in Larsen and Kartchner, *On Limited Nuclear War in the 21st Century*, pp. 138–140.

A second possibility is that proponents of nuclear escalation control and limited use, who may exist within the PLA Rocket Force, increase the force's historically limited influence over nuclear strategy formulation within China, thus changing Chinese views toward escalation control. The availability of precise theater capabilities and tactical delivery systems, currently deployed with conventional payloads only, would allow China to develop options for limited war with relative ease, if a political decision to do so is made.[180]

A final possibility is that Chinese views could change without a crisis or a conflict as a catalyst. China may change its views that nuclear escalation would not be controlled if current U.S. attention to limited nuclear war leads Chinese experts to agree that preparing for limited retaliatory nuclear strikes is the best way to deter U.S. limited nuclear use and further nuclear use. Any U.S. actions that would encourage China to consider limited nuclear use, whether to deter the United States or to de-escalate a conventional conflict, would likely increase regional instability and risks to the United States and its allies.

180. Heginbotham et al., *China's Evolving Nuclear Deterrent*, pp. 135–137.