



# Manufactured Deterrence: Bridging China's Nuclear Strategy and Practice

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## Abstract

China openly pursues a nuclear strategy of assured retaliation, but in reality, it has not achieved a credible second-strike capability. This article notes a gap between China's declaratory strategy and actual deterrence practice. It bridges the gap by proposing a new concept—manufactured deterrence—to explain how China compensates for its insufficient capabilities with practices to achieve deterrence. On the material basis of second-strike latency, Beijing deliberately employs opacity and ambiguity to generate and strengthen uncertainty in adversary counterforce planning, therefore producing deterrent power. Manufactured deterrence is not an intentional strategy, but the temporary and suboptimal consequence of China implementing its stated strategy. It captures the inadequate state of China's second-strike capability and hints itself as a stopgap practice. In the context of heightening great power competition, China is destined to materialize assured retaliation by increasing its arsenal to a level at which its warhead redundancy problem is solved. Beijing's nuclear modernization is not a doctrinal shift but an effort to address the gap between its declaratory strategy and manufactured deterrence. Therefore, acknowledging China's manufactured deterrence practice is the starting point for meaningful arms control talks between Washington and Beijing.

## Introduction

The continuous modernization and recently notable expansion of the Chinese nuclear arsenal have drawn considerable attention and raised concerns among researchers, policy-makers, and the public both outside and within China. One of China's famous nationalist advocates publicly called on social media to increase China's nuclear warheads to 1000 by 2030.<sup>1</sup> In June 2021, China was discovered building more than 100 new missile silos in its western desert.<sup>2</sup> China's advances in hypersonic missiles are impressive and thus very concerning for the Pentagon. For instance, its hypersonic missile tested in 2021 is believed to mature toward a Fractional Orbital Bombardment System capability and poses new

<sup>1</sup> Xijin Hu, "To Safeguard National Security, It Is Time for China to Build up Nuclear Deterrent," *Global Times*, 9 May 2020, <https://www.globaltimes.cn/content/1187841.shtml>.

<sup>2</sup> Joby Warrick, "China Is Building More Than 100 New Missile Silos in Its Western Desert, Analysts Say," *Washington Post*, 30 June 2021, [https://www.washingtonpost.com/national-security/china-nuclear-missile-silos/2021/06/30/0fa8debc-d9c2-11eb-bb9e-70fda8c37057\\_story.html](https://www.washingtonpost.com/national-security/china-nuclear-missile-silos/2021/06/30/0fa8debc-d9c2-11eb-bb9e-70fda8c37057_story.html).

challenges to US missile defense systems.<sup>3</sup> In reflection of these developments, the Pentagon adjusted its projections on Chinese warhead stockpile significantly and consecutively in recent years—from “double in size” (in the 400–500 range) to 1000, and then to 1500 by 2035.<sup>4</sup> Given the momentum China’s nuclear program is gaining, it could well trigger a new round of arms race and drag the world into Cold War 2.0.

In contrast to these recent developments, China had long been known for maintaining a restrained nuclear policy, keeping its arsenal “at the lowest level necessary for self-defense only.”<sup>5</sup> According to its defense white paper, China’s official nuclear strategy is deterrence through counterattack, in a self-defensive manner.<sup>6</sup> The document further elaborates that Beijing “aims at building a lean and effective nuclear force” and “maintains a credible nuclear deterrent force.”<sup>7</sup> Some scholars characterize Chinese nuclear strategy as assured retaliation.<sup>8</sup> Yet, whether China has established a credible second-strike capability<sup>9</sup> vis-à-vis its main adversaries (i.e., the USA and historically the Soviet Union) remains unclear. Despite China’s steady increase on military spending since 1999, its nuclear warheads have remained in the low hundreds as of this writing. Figure 1 shows China’s warhead estimates by year published by the Stockholm International Peace Research Institute (SIPRI). Although its modernization efforts have primarily focused on delivery vehicles, China’s nuclear force still mostly relies on land-based missiles, remaining much less diverse than American and Russian nuclear triads. Meanwhile, China has never disclosed the size or variety of its arsenal. Rather, it uses stringent concealment and camouflaging measures to hide the locations of its nuclear forces.

There is a notable gap between Beijing’s declaratory strategy and what it has been able to implement. China openly seeks to build and maintain a credible and effective nuclear deterrent. In reality, it has endured real nuclear vulnerability for decades, even when new resources become available. Its strategic force was once delayed and slow in developing operational and targeting plans. It has been opaque about its force size, basing, and deployment patterns, hiding its capabilities from being known. This opaque practice is at odds with the rationalist logic of deterrence. Why is there such a gap between Beijing’s words and deeds? If China does not have a credible second-strike capability, how does it deter adversaries with much larger and more capable arsenals? Tying back to China’s impressive modernization program described at the outset, have China’s nuclear strategy and its standard for how much is enough for a credible deterrent changed? This article studies China’s nuclear strategy and deterrence practice from the 1980s to the present day. In particular, it does so by going down from the declaratory level to the practice level, that is,

<sup>3</sup> Christopher M. Stone, “The Return of ‘FOBS’: China Moves the Space Arms Race into the Nuclear Sphere,” *The Hill*, 31 October 2021, <https://thehill.com/opinion/national-security/578797-the-return-of-fobs-china-moves-the-space-arms-race-into-the-nuclear/>.

<sup>4</sup> U.S. Department of Defense, “Military and Security Developments Involving the People’s Republic of China 2020,” <https://media.defense.gov/2020/sep/01/2002488689/-1/-1/1/2020-dod-china-military-power-report-final.pdf>; U.S. Department of Defense, “Military and Security Developments Involving the People’s Republic of China 2021,” <https://media.defense.gov/2021/nov/03/2002885874/-1/-1/0/2021-cmpr-final.pdf>; U.S. Department of Defense, “Military and Security Developments Involving the People’s Republic of China 2022,” <https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>.

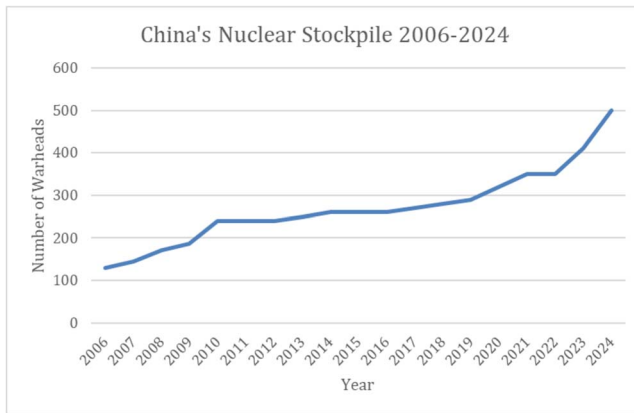
<sup>5</sup> *China’s National Defense in 2002* (Beijing: Information Office of the State Council of the People’s Republic of China, December 2002), sec. VII.

<sup>6</sup> *China’s National Defense in 2006* (Beijing: Information Office of the State Council of the People’s Republic of China, December 2006), sec. II.

<sup>7</sup> *Ibid.*

<sup>8</sup> Fiona S. Cunningham and M. Taylor Fravel, “Assuring Assured Retaliation: China’s Nuclear Posture and U.S.-China Strategic Stability,” *International Security*, Vol. 40, No. 2 (2015), pp. 7–50; M. Taylor Fravel, *Active Defense: China’s Military Strategy since 1949* (Princeton: Princeton University Press, 2019); 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 (2010), pp. 48–87; Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton: Princeton University Press, 2014).

<sup>9</sup> This article treats assured retaliation as equivalent to a credible second-strike capability.



**Fig. 1.** Estimated Chinese Nuclear Warhead Stockpile. **Data Source:** SIPRI yearbooks 2006–2024

the practical aspects of China's deterrence involving real situations and events, rather than just ideas and strategies. It aims to bridge the gap in understanding China's stated strategy and actual practice.

Scholarly research on these questions is important for multiple reasons. First, as China's foreign policy is allegedly becoming more assertive and its trade and diplomatic relations with the USA have become shaky, the interests and concerns around China's nuclear capability and strategy are on a steady rise. Yet, scholars and policy analysts are not sure why China is rapidly increasing its nuclear arsenal and what its objective is.<sup>10</sup> Second, at such a critical time, the logic of China's nuclear strategy and practice is not completely known outside of the Communist Party of China's inner decision-making circle. Chinese nuclear strategy is usually interpreted as minimum deterrence,<sup>11</sup> assured retaliation,<sup>12</sup> or first-strike uncertainty,<sup>13</sup> given its small and vulnerable nuclear force. Understanding how Chinese deterrence works is an important and urgent task. Third, China's resilient practice of opaqueness and ambiguity particularly warrants in-depth research. Obscure political culture associated with an authoritarian regime does not offer an adequate explanation. As its capability keeps growing, to what extent China improves its nuclear transparency will be a key factor in the management of US–China strategic relations.

This article inquires and consults the People's Liberation Army's (PLA's) authoritative academic writings and research publications in the areas of strategy and deterrence. These materials date from the 1980s to today, providing an opportunity to trace the evolution of the Chinese approach to nuclear weapons. In particular, it finds valuable speech evidence in biographical materials, such as the selected works, chronologies, biographies, autographies, and memoirs of party and military leaders and nuclear scientists who were involved in China's nuclear weapons program. In supplement to these abundant sources, two rounds of fieldwork were conducted in January 2017 and July 2019 in Beijing. Interlocutors

<sup>10</sup> Caitlin Talmadge and Joshua Rovner, "The Meaning of China's Nuclear Modernization," *Journal of Strategic Studies*, Vol. 46, Nos. 6–7 (2023), pp. 1116–48.

<sup>11</sup> John Wilson Lewis and Litai Xue, *China Builds the Bomb* (Stanford: Stanford University Press, 1988); Brad Roberts, Robert A. Manning, and Ronald N. Montaperto, "China: The Forgotten Nuclear Power," *Foreign Affairs*, Vol. 79, No. 4 (2000), pp. 53–63.

<sup>12</sup> Fravel and Medeiros, "China's Search for Assured Retaliation"; Narang, *Nuclear Strategy in the Modern Era*.

<sup>13</sup> Avery Goldstein, *Deterrence and Security in the 21st Century: China, Britain, France, and the Enduring Legacy of the Nuclear Revolution* (Stanford: Stanford University Press, 2000); Riqiang Wu, "Certainty of Uncertainty: Nuclear Strategy with Chinese Characteristics," *Journal of Strategic Studies*, Vol. 36, No. 4 (2013), pp. 579–614.

include Chinese strategists in military institutes, arms control experts in government research institutes, and scholars and researchers in academic institutions. It is noteworthy that these interviews were conducted before the revelation of Chinese construction of massive silo fields in 2021. These interviews discovered information that was different from conventional understanding of Chinese nuclear thinking. Although Chinese leaders and strategists tend to believe that deterrence can be easily achieved with a small nuclear force,<sup>14</sup> at least four interlocutors in Beijing raised their concerns about or acknowledged the insufficiency of Chinese deterrent.

The aforementioned research work has led to two primary findings. First, from the 1980s to the present day, Beijing practices manufactured deterrence to compensate for the insufficiency of its nuclear capabilities. China so far has only achieved second-strike latency—having the potential to counterstrike the initial attacker but falling short of establishing certainty. Based on such latency, China deliberately employs opaqueness and ambiguity to create and strengthen uncertainty in adversary counterforce planning, therefore producing deterrent power. Manufactured deterrence relies on both material capability (second-strike latency) and behavioral uncertainty (opaqueness) to negate nuclear threats from giant adversaries. Second, manufactured deterrence captures the inadequate state of China's second-strike capability while hinting itself as a stopgap practice. In the context of intensifying great power competition, Beijing is destined to achieve a credible second strike by increasing its arsenal to a level at which its warhead redundancy problem is solved. China's accelerated modernization is thus not a doctrinal shift but an effort to fully implement its declaratory strategy of assured retaliation.

The remainder of this article proceeds as follows. It first outlines the gap between China's declaratory strategy and deterrence practice by reaffirming its assured retaliation strategy and revealing the latent state of its second-strike capability. Next, it defines manufactured deterrence and elaborates its working mechanism to bridge the gap. The following section positions manufactured deterrence in the deterrence literature and clarifies its working conditions and limits. In light of this new concept, the article goes on to explain China's nuclear modernization and discuss its future. It suggests the negotiation of a treaty to cap Chinese and American warheads at a certain ratio to prevent an arms race. The next section highlights contributions of this new concept to the nuclear scholarship and the policy world. The article closes by recapping its research questions and major findings.

## The Gap between China's Declaratory Strategy and Deterrence Practice

As the fifth state to acquire nuclear weapons, China's nuclear profile is relatively low compared to second-ranking powers such as Great Britain and France, and extremely low compared to superpowers such as the USA and the Soviet Union/Russia. Minimum deterrence is believed to nicely characterize China's approach to nuclear weapons. There are two different definitions for this term though. The first definition holds that a small nuclear force can deter a large one,<sup>15</sup> as long as the retaliation is plausible. The small force need not be guaranteed to survive an enemy's first strike.<sup>16</sup> This definition and its logic seem to neatly capture the vulnerable state of Chinese nuclear force in the early

<sup>14</sup> Jishe Fan, "Zhongguo hezhengce de jiben luoji yu qianjing" ("The Basic Logic and Prospect of China's Nuclear Policy"), *Waijiao pinglun* (*Foreign Affairs Review*), No. 5 (2018), pp. 1–20; Jeffrey G. Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (Cambridge: MIT Press, 2007).

<sup>15</sup> Kenneth N. Waltz, "Nuclear Myths and Political Realities," *American Political Science Review*, Vol. 84, No. 3 (1990), p. 734.

<sup>16</sup> For a nice summary of this school of thought on deterrence, see Keir A. Lieber and Daryl G. Press, *The Myth of the Nuclear Revolution: Power Politics in the Atomic Age* (Ithaca: Cornell University Press, 2020), pp. 36–7.

1980s when it barely had any survivability but was deliverable against its main adversaries. This characterization was once a mainstream view among scholars.<sup>17</sup> As time goes by, this understanding conflicts with empirical evidence. China's nuclear capability clearly met this standard in the 1980s, but it did not stop modernizing its arsenal, with priority given to force mobility and survivability. Beijing obviously wants something more than the standard of minimum deterrence.

A second definition of minimum deterrence describes a strategy of preventing attacks by inflicting minimal damage upon the attacker with the *fewest* number of nuclear weapons possible.<sup>18</sup> Arguments about Chinese strategy embracing this deterrence logic typically emerged after the 2000s.<sup>19</sup> This definition hints that the retaliation threatened by the defender shall be assured. However, the question of whether China has a credible second-strike capability has never had a sure answer. Indeed, some scholars such as Michael Chase recently observed that China's nuclear posture is only *transitioning* to credible deterrence.<sup>20</sup> Most importantly, the Chinese government never explicitly commits to inflicting minimal damage. Chinese military academic writings in the late 1980s and 1990s used the term "limited nuclear retaliation."<sup>21</sup> Whereas this term signals a logic similar to minimum deterrence, Beijing's official narratives later abandoned it in favor of the term "self-defensive nuclear strategy."<sup>22</sup> The most thorough official statement about this matter was issued in 2002, according to which "[China] has always exercised utmost restraint on the development of nuclear weapons, and its nuclear arsenal is kept at the *lowest level necessary* for self-defense only."<sup>23</sup> While self-defense is almost a universal narrative to justify one's military policy, the scope and content of self-defense can be defined in a variety of ways. This statement certainly cannot be interpreted as a commitment to minimum deterrence, as "*lowest ... necessary*" carries a different meaning from "*fewest ... possible*." Obviously, the "necessary" for self-defense can be redefined as the circumstance changes.

Vipin Narang argues that China adopts an assured retaliation nuclear posture.<sup>24</sup> He defines assured retaliation with survivable second-strike forces and full transparency about one's capabilities.<sup>25</sup> Taylor Fravel and Evan Medeiros advance and refine the concept of assured retaliation specifically in the Chinese context. They argue that Chinese leaders "embraced the idea of deterrence through assured retaliation," and thus seeking assured retaliation is China's nuclear strategy.<sup>26</sup> Furthermore, Fiona Cunningham and Taylor Fravel state that China achieved assured retaliation in the mid-2000s with the deployment of road-mobile, solid-fueled intercontinental ballistic missiles (ICBMs).<sup>27</sup> Taylor Fravel and Evan Medeiros' analysis of Chinese leaders' nuclear thinking is thorough and accurate. This

<sup>17</sup> Lewis and Xue, *China Builds the Bomb*, p. 216; Roberts, Manning, and Montaperto, "China"; Litai Xue, "Evolution of China's Nuclear Strategy," in John C. Hopkins and Weixing Hu, eds., *Strategic Views from the Second Tier: The Nuclear Weapons Policies of France, Britain, and China* (San Diego: University of California Press, 1994), pp. 167–90.

<sup>18</sup> Committee on the U.S.-Chinese Glossary of Nuclear Security Terms, *English-Chinese, Chinese-English Nuclear Security Glossary* (Washington, D.C.: National Academies Press, 2008), p. 36.

<sup>19</sup> Bates Gill, James C. Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corps: Transition to Credible Deterrence," in James C. Mulvenon and Andrew N. D. Yang, eds., *The People's Liberation Army as Organization* (Santa Monica: RAND, 2002), pp. 510–86; Jeffrey Lewis, "Minimum Deterrence," *Bulletin of the Atomic Scientists*, Vol. 64, No. 3 (2008), pp. 38–41; Lewis, *The Minimum Means of Reprisal*.

<sup>20</sup> Michael S. Chase, "China's Transition to a More Credible Nuclear Deterrent: Implications and Challenges for the United States," *Asia Policy*, No. 16 (2013), pp. 69–102.

<sup>21</sup> Aiping Zhang, ed., *Zhongguo renmin jiefangjun (Contemporary China: The People's Liberation Army of China)* (Beijing: Dangdai zhongguo chubanshe, 1994), p. 119.

<sup>22</sup> *China's National Defense in 2006*, sec. II.

<sup>23</sup> *China's National Defense in 2002*.

<sup>24</sup> Narang, *Nuclear Strategy in the Modern Era*.

<sup>25</sup> Vipin Narang, "Posturing for Peace? Pakistan's Nuclear Postures and South Asian Stability," *International Security*, Vol. 34, No. 3 (2009/2010), p. 43.

<sup>26</sup> Fravel, *Active Defense*, p. 241; Fravel and Medeiros, "China's Search for Assured Retaliation," p. 51.

<sup>27</sup> Cunningham and Fravel, "Assuring Assured Retaliation," p. 7.

assured retaliation scholarship advances the understanding of China's nuclear approach by pointing out what China aims to achieve.

Moreover, China's official document elaborating its nuclear posture contains language that can be interpreted as seeking assured retaliation. The 2006 defense white paper states that the fundamental goal of its nuclear force is to "deter other countries from using or threatening to use nuclear weapons against China," and it upholds the principle of counterattack.<sup>28</sup> This language suggests a strategy that fits the standard definition of deterrence through punishment. The same document elaborates that China aims to build and maintain a "lean and effective" and "credible" nuclear deterrent force,<sup>29</sup> indicating that Beijing desires a guaranteed retaliation against adversaries. Meanwhile, the Second Artillery's<sup>30</sup> guiding principles, such as "close defense" (*yanmi fanghu*), "striking after the enemy has struck" (*houfa zhiren*), and "key-point counterstrikes" (*zhongdian fanji*),<sup>31</sup> are remarkably in line with a standard definition of second-strike deterrence. Until any new official statements are made by Beijing, it is safe to infer that China has been pursuing a nuclear strategy of assured retaliation since the 1980s.

### China's Second-Strike Capability

However, when it comes to deeds, the reality shows that Beijing's actions do not conform to its speech. As widely acknowledged, China has endured real nuclear vulnerability for decades vis-à-vis its main adversaries despite its continuous modernization efforts. In a recent study, Riqiang Wu models China's nuclear survivability after absorbing a first attack from the Soviet Union/Russia and the USA and concludes that China's retaliatory capability has been "far from assured."<sup>32</sup>

To achieve a credible second strike vis-à-vis mighty adversaries, China did not choose the path of building a large and diverse nuclear force, but consistently focused on improving its survivability and penetrability.<sup>33</sup> In the early years, playing on ambiguity about the size and location of its nuclear forces was an important part of China's survivability efforts. "Close defense" (*yanmi fanghu*) through stringent concealment and camouflaging used to be Second Artillery's main approach to achieving survivability and a key principle of its operational regulations.<sup>34</sup> Later on, thanks to China's modernization endeavor, mobility becomes more and more a key approach to improving survivability. The deployments of DF-31 and DF-31A in 2007 and DF-31AG in 2017 were two breakthroughs. However, according to a 2001 report, the US military has various programs in place to identify, characterize, and defeat underground facilities where China's road-mobile missiles are stored.<sup>35</sup> Meanwhile, technological developments in weapons accuracy and remote sensing in offense undercut the techniques of hardening and concealment in defense.<sup>36</sup> Moreover, Austin Long and Brendan R. Green point out that thanks to improvements in intelligence

<sup>28</sup> *China's National Defense in 2006*, sec. II.

<sup>29</sup> *Ibid.*

<sup>30</sup> China's Second Artillery Corps was renamed to Rocket Force in 2015. This article uses both terms to refer to China's strategic rocket forces.

<sup>31</sup> Rui Gao, ed., *Zhanlue xue (The Science of Military Strategy)* (Beijing: Junshi kexue chubanshe, 1987), p. 115.

<sup>32</sup> Riqiang Wu, "Living with Uncertainty: Modeling China's Nuclear Survivability," *International Security*, Vol. 44, No. 4 (2020), p. 86.

<sup>33</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," p. 71.

<sup>34</sup> Xijun Yu, ed., *Di'er paobing zhangyi xue (The Science of Second Artillery Campaigns)* (Beijing: Jiefangjun chubanshe, 2004), pp. 303–4.

<sup>35</sup> *Report to Congress on the Defeat of Hard and Deeply Buried Targets* (Washington, D.C.: Secretary of Defense and Secretary of Energy, July 2001), <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB372/docs/Underground-DeeplyBuried.pdf>.

<sup>36</sup> 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 (2017), pp. 9–49.

capability since the 1991 Gulf War, the USA is able to track and target mobile missiles, including those of China.<sup>37</sup>

On the penetrability front, China flight-tested DF-41 in 2015 and operates at least two DF-41 brigades today.<sup>38</sup> DF-41 is capable of carrying multiple warheads. China has reportedly conducted several successful flight tests of a boost-glide hypersonic missile, which is more likely to penetrate the US missile defense. The less-spoken fact is that the longest range that China's hypersonic missile tests have reached so far is 2100 km,<sup>39</sup> falling considerably short of threatening continental USA. In the domain of ballistic missile submarines, a Chinese arms control expert and strategist assessed that the current generation of type 094 was "no good" and China needed several more decades of research and development to make its ballistic missile submarines (SSBNs) sufficiently quiet.<sup>40</sup> On the other hand, the JL-2's range is estimated at 7000 km and JL-3 (China's next-generation submarine-launched ballistic missile (SLBM)) at 9000 km.<sup>41</sup> Capitalizing on geographic advantages, the USA has built undersea surveillance systems along the first island chain to monitor the movement of Chinese submarines.<sup>42</sup> Without submarines passing through the first island chain, Chinese SLBMs will not be able to threaten the US homeland. China has certainly made important progress in missile technology in recent decades, but so has the USA in its counterforce capabilities. According to Riqiang Wu's study, the probability that China's retaliatory warheads could overwhelm currently deployed US missile defense is estimated to be extremely low and negligible.<sup>43</sup>

Keir Lieber and Daryl Press assessed in 2006 that the USA had the capability to wipe out China's long-range retaliatory capability with a nuclear first strike.<sup>44</sup> Brendan Green and Austin Long in 2015 studied the extraordinary intelligence capabilities that the USA developed against relocatable targets and concluded that US counterforce capabilities against both Russian and Chinese arsenals were favored to launch successful first strikes.<sup>45</sup> Similarly, a strategist in Beijing expressed his concern about the vulnerability of the Chinese nuclear arsenal, saying "with only a handful warheads possibly surviving, the opponent would be tempted to take an adventurist approach in efforts to effectively destroy all Chinese nukes; without redundancy, China's strategic force is vulnerable to an opponent's disarming first strike."<sup>46</sup> Another interlocutor, when asked whether China has a credible second strike, bluntly said, "we pursue a retaliatory capability, but it is not really credible. We do not practice transparency, because we do not have the capability."<sup>47</sup> To be sure, there are different judgments about China's nuclear capabilities from the above assessments. The US International Security Advisory Board concluded in its 2012 report that "mutual nuclear vulnerability should be considered as a fact of life for both [the USA and China],"<sup>48</sup> essentially acknowledging that China does have a retaliatory capability against it. Charles Glaser and Steve Fetter assessed in 2016 that China's continuously progressing land-based

<sup>37</sup> Austin Long and Brendan Rittenhouse Green, "Stalking the Secure Second Strike: Intelligence, Counterforce, and Nuclear Strategy," *Journal of Strategic Studies*, Vol. 38, Nos. 1–2 (2015), pp. 61–4.

<sup>38</sup> Hans M. Kristensen and Matt Korda, "Chinese Nuclear Weapons, 2021," *Bulletin of the Atomic Scientists*, Vol. 77, No. 6 (2021), pp. 318–36.

<sup>39</sup> James M. Acton, "China's Advanced Weapons," testimony before the U.S.-China Economic and Security Review Commission, [https://carnegieendowment.org/files/Acton\\_Testimony\\_2\\_23\\_17.pdf](https://carnegieendowment.org/files/Acton_Testimony_2_23_17.pdf).

<sup>40</sup> Interview conducted in Beijing, July 2019.

<sup>41</sup> Kristensen and Korda, "Chinese Nuclear Weapons, 2021."

<sup>42</sup> Desmond Ball and Richard Tanter, *The Tools of Owatsumi: Japan's Ocean Surveillance and Coastal Defence Capabilities* (Canberra: ANU Press, 2015), pp. 51–4.

<sup>43</sup> Wu, "Living with Uncertainty," p. 99.

<sup>44</sup> Keir A. Lieber and Daryl G. Press, "The End of MAD? The Nuclear Dimension of U.S. Primacy," *International Security*, Vol. 30, No. 4 (2006), pp. 7–44.

<sup>45</sup> Long and Green, "Stalking the Secure Second Strike."

<sup>46</sup> Interview conducted in Beijing, July 2019.

<sup>47</sup> Ibid.

<sup>48</sup> *Report on Maintaining U.S.-China Strategic Stability* (Washington, D.C.: International Security Advisory Board, 26 October 2012), <https://2009-2017.state.gov/documents/organization/200473.pdf>.

mobile missiles had the potential to deny the USA absolute superiority.<sup>49</sup> A consensus seems to be that China does have a certain measure of second-strike capability vis-à-vis the USA, but this capability is not convincing or reliable.

With China not possessing a credible second strike, another approach to understanding Chinese nuclear strategy turns attention to the concept of “first-strike uncertainty”—challenging adversary’s confidence of destroying all of Chinese nuclear weapons on a first strike. Avery Goldstein argues that despite China’s nuclear vulnerability vis-à-vis its superpower adversaries, it still can generate “first-strike uncertainty” in the minds of adversary leaders to deter potential nuclear attacks against China.<sup>50</sup> Riqiang Wu further explains that the threshold of first-strike uncertainty for China is delivery capability, a degree of survivability through mobility and concealment, and an independent launch capability.<sup>51</sup> First-strike uncertainty seems to better capture the logic of China’s actual behavior by recognizing the insufficiency of its second-strike capability. Indeed, several interlocutors in Beijing mentioned that bilateral nuclear relations are not even on the agenda in Sino-American senior-level strategic and military talks, for instance, the eight rounds of US–China Strategic and Economic Dialogue held from 2009 to 2016, and that China’s nuclear capability remains a marginal issue in US–China relations until the late Trump presidency. They interpreted this as evidence that Chinese nuclear force was considerably inferior compared to America’s and that it did not really raise a concern for Washington until very recently.<sup>52</sup> US officials and scholars dispute this account, saying that their Chinese counterparts rejected USA’s repeated efforts to add nuclear issues to the agenda.<sup>53</sup> Regardless of the accounts, China either has a vulnerable force relative to America or does not want to be transparent about its force. Whereas it does not make political sense for the Chinese government to openly acknowledge its inability to ensure a counterstrike, the fact that several interlocutors shared their negative assessments of Chinese capability is remarkable.

The current literature does not note the gap between China’s declaratory strategy and actual practice in its nuclear behavior. What China has been able to implement and achieve, despite plenty of progress, does not fulfill its stated strategy. To date, China’s nuclear policy and thinking expressed by senior leaders are mostly directional and visional, providing basic principles and guidance about how to approach nuclear weapons. They did not instruct on concrete requirements of credible deterrence, let alone operational regulations. Many observers acknowledge that the Second Artillery did not start to develop an operational doctrine until the mid-1980s.<sup>54</sup> Guiding principles and operational regulations laid out in the PLA’s teaching and training materials mostly focus on survivability measures. No evidence indicates that the PLA has developed detailed doctrines for the use of nuclear weapons as military instruments, such as intrawar escalation control.<sup>55</sup> It has been opaque about its force size, basing, and deployment patterns, hiding its capabilities from being known. Before the 2000s, even its force survivability was more based on these opaqueness and ambiguity measures. Fiona Cunningham and Taylor Fravel noted in 2015 that in the face of increasing US conventional prompt strike capabilities, China chose to rely on limited ambiguity regarding its no-first-use policy at the expense of crisis stability, to avoid building a larger nuclear arsenal. The latter was “the other most likely alternative option” to deter US

<sup>49</sup> 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 (2016), pp. 49–98.

<sup>50</sup> Goldstein, *Deterrence and Security in the 21st Century*, pp. 111–38.

<sup>51</sup> Wu, “Certainty of Uncertainty,” p. 581.

<sup>52</sup> Various interviews conducted in Beijing, January 2017 and July 2019.

<sup>53</sup> This source was provided by an anonymous reviewer.

<sup>54</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” pp. 56–7; John W. Lewis and Litai Xue, “Making China’s Nuclear War Plan,” *Bulletin of the Atomic Scientists*, Vol. 68, No. 5 (2012), p. 48.

<sup>55</sup> Fravel and Medeiros, “China’s Search for Assured Retaliation,” pp. 56–7.

conventional attacks on the Chinese nuclear arsenal.<sup>56</sup> This observation correctly implies that there is a gap between China's assured retaliation and its actual capability and thus a delay in attaining a credible second strike. China attempts to fill the gap with a practice, which is injecting ambiguity into its no-first-use policy. In summary, assured retaliation is China's declaratory strategy, something it aims to achieve. First-strike uncertainty describes its deterrence practice, something it practically does. Nonetheless, it is unclear whether this practice will work when the stakes of crises are higher. Therefore, more attention needs to be given to China's deterrence practice to provide a complete explanation of its nuclear approach and its accelerated modernization efforts.

## China's Manufactured Deterrence and Its Working Mechanism

Without attaining the capability necessary for assured retaliation, how does China deter? This article argues that China compensates for its capability insufficiency with practical measures in its deterrence behavior. Deterrence practice refers to what a state actually and practically does in the real world in efforts to achieve deterrence as opposed to what it officially pursues about deterrence. In stark contrast to its declaratory strategy of assured retaliation, China based the survivability of its forces on secrecy and ambiguity in the early years; it relies on concealment, camouflaging, and mobility for survivability instead of building a larger arsenal; it prioritizes land-based missiles over SLBMs to improve force mobility; and it persistently engages in opaqueness and ambiguity to obfuscate its capability. These measures and exercises seem to generate deterrent power against adversaries, as China has been free of nuclear threats since the 1969 Sino-Soviet border conflict. To the extent that China relies on these behavioral measures to achieve deterrence, this article terms its actual deterrence practice manufactured deterrence.

Manufactured deterrence refers to the fashion in which a state employs opaqueness and ambiguity to compensate for its disadvantages in nuclear capability in order to generate deterrent power against a mightier adversary. As China's second-strike capability is not credible, its nuclear arsenal alone does not have sufficient material power to deter adversaries from using or threatening to use nuclear weapons against China. By withholding key information and exercising secrecy and ambiguity, Beijing generates nagging fears in an adversary's mind that it might miss some Chinese warheads in a first-strike attempt. This sort of worry about missing some Chinese warheads, no matter how low the possibility is, creates and bolsters deterrent power. The key to China's manufactured deterrence practice is to maintain and heighten this kind of worry in the minds of adversaries as much as possible. One interlocutor in Beijing very neatly explained the logic of China's manufactured deterrence: "Our nuclear retaliatory strike is not really credible. We thus have to use opaqueness, non-transparency, and ambiguity to create more uncertainty in the minds of our adversaries. There are many stages where ambiguity can be played around, such as survivability and penetration, to generate deterrent effects. Because our weapon technologies are not sufficiently advanced, we use ambiguity and opaqueness to produce uncertainty."<sup>57</sup> In fact, China's practice of nuclear opaqueness and ambiguity was anticipated by Kenneth Waltz, as he predicted that smaller nuclear powers would engage in deceptions to maximize the deterrent power of their relatively vulnerable nuclear arsenals.<sup>58</sup> As Beijing is not bound by many of the arms control treaties, it is able to limit transparency and thus increase uncertainty about its nuclear capabilities. Other Western scholars also note the important role played by non-transparency in China's deterrence behavior. Iain

<sup>56</sup> Cunningham and Fravel, "Assuring Assured Retaliation," p. 46.

<sup>57</sup> Interview conducted with a retired PLA strategist in Beijing, July 2019.

<sup>58</sup> Kenneth N. Waltz, "Toward Nuclear Peace," in Robert Art and Kenneth N. Waltz, eds., *The Use of Force* (Lanham: University Press of America, 1988), pp. 695–9.

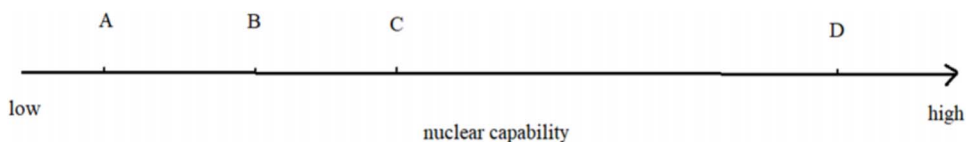


Fig. 2. Nuclear Capability Continuum

Johnston writes, “transparency is not in the interests of weak states, who need to keep superior adversaries guessing about their capabilities.”<sup>59</sup> Similarly, Oriana Mastro argues that rising powers reject military transparency due to their vulnerability and only the more powerful actors can leverage transparency to enhance deterrence.<sup>60</sup> Being on the weak side, China has rational incentives to practice opaqueness and even deception to make its deterrence work.

What are the sources of China’s deterrent power? Avery Goldstein and Riqiang Wu both use the term first-strike uncertainty to explain the working logic of China’s nuclear deterrent. First-strike uncertainty is defined as “doubt that even the best planned surprise attack will neutralize the victim’s ability to launch an unacceptably punishing retaliatory strike.”<sup>61</sup> Where does this uncertainty come from? For Avery Goldstein, it is mainly created by Second Artillery’s survivability measures and the uncertainties about Beijing’s retaliation decisions.<sup>62</sup> For Riqiang Wu, the sheer existence of first-strike uncertainty is not sufficient to deter. Rather, only when adequate uncertainty is created by China’s advances in delivery platforms, its nuclear force obtains deterrent power against adversaries.<sup>63</sup>

Building on the concept of first-strike uncertainty, this article argues that uncertainty is generated by two types of sources: a material source of second-strike latency and a behavioral source of nuclear opaqueness. For a state possessing a small and vulnerable nuclear force, these two elements work in tandem to produce deterrent power against vastly superior adversaries. The material power—a latent second-strike capability—is the prerequisite. It offers a basis on which China could play opaqueness and ambiguity regarding its nuclear capabilities and policy to generate deterrent effects. On the other hand, second-strike latency alone does not effectively deter due to immense inferiority to adversaries. Key information about one’s arsenal, such as force size and basing, needs to be withheld to create doubt and confusion on adversaries’ counterforce planning. The following paragraphs explain how China develops and slowly improves its latent second-strike capability and exercises opaqueness to preserve security when facing giant nuclear foes.

### Second-Strike Latency

With slow but continuous progress, China’s nuclear force gradually attained a delivery capability to reach an adversary’s heartland, a degree of survivability, and a limited penetrability. These capabilities constitute second-strike latency—having the potential to counterstrike the initial attacker but falling short of establishing certainty. Unlike nuclear acquisition, which can be marked by a first successful nuclear test, a latent second-strike capability cannot be defined by a cutoff event. Rather, it describes a spectrum—from point B to point C in Figure 2, where it is placed on a continuum of nuclear capability.

<sup>59</sup> Alastair Iain Johnston, “China’s New ‘Old Thinking’: The Concept of Limited Deterrence,” *International Security*, Vol. 20, No. 3 (1995), p. 31.

<sup>60</sup> Oriana S. Mastro, “The Vulnerability of Rising Powers: The Logic Behind China’s Low Military Transparency,” *Asian Security*, Vol. 12, No. 2 (2016), pp. 63–81.

<sup>61</sup> Goldstein, *Deterrence and Security in the 21st Century*, p. 44.

<sup>62</sup> Goldstein, *Deterrence and Security in the 21st Century*.

<sup>63</sup> Wu, “Certainty of Uncertainty.”

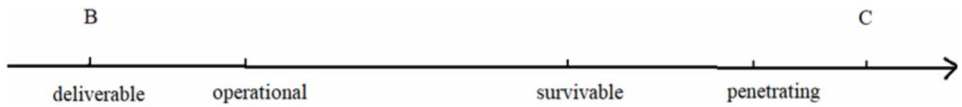


Fig. 3. Second-Strike Latency Stages

Figure 2 illustrates the four levels of nuclear capability prescribed by four deterrence views, as neatly summarized by Keir Lieber and Daryl Press.<sup>64</sup> Point A represents a state possessing nuclear weapons but without the ability to deliver them. This capability can be symbolized by the milestone event of testing a bomb—nuclear acquisition. Existential deterrence school posits that this level of capability is enough to deter attacks. Point B represents a reliable delivery capability with adequate target coverage—the ability to deliver a nuclear bomb reaching an opponent’s heartland. Up until point B, a nuclear weapons program’s top priority is not survivability, but delivery range and reliability. For example, North Korea’s nuclear capability is seemingly approaching point B. The minimum deterrence school<sup>65</sup> contends that a nuclear force at this level suffices to deter nuclear aggression. Point C marks the possession of survivable and effective delivery systems with high penetrability, along with an appropriate number of warheads, to ensure successful retaliation upon the initial attacker. In other words, point C represents the achievement of assured retaliation. Point D marks a capability at the level of assured destruction, which was achieved by both superpowers at the peak of the Cold War. The distances between the points on the axis are not proportional to the real differences between corresponding nuclear capabilities.

The segment between points B and C in Figure 2 is zoomed in and shown in Figure 3 to explain the range of second-strike latency. It goes through several stages, from deliverable to operational, then to survivable, and then to penetrating. It finally matures to a credible second-strike capability at point C. At point B, being deliverable means that a state has successfully flight-tested its missiles with a range reaching an opponent’s heartland. Being operational means the missiles are deployed and the strategic force troops can independently launch missiles without outside technical support from the manufacturers or missile test bases.<sup>66</sup> For a nascent nuclear force, this step can be a tremendous challenge. Survivability is more essential for a force aiming to achieve deterrence through assured retaliation. However, survivability is in relative terms and affected by adversary intelligence and counterforce capabilities. It does not have a stationary threshold to meet. Penetrability denotes a state’s ability to defeat the opponent’s defense systems using one’s surviving nuclear forces. These four technical criteria are not necessarily sequential or linear to meet. They may be developed and improved simultaneously. A nuclear capability located anywhere between points B and C is defined as a latent second-strike capability ( $B < x < C$ ). It is necessary to point out that this concept of second-strike latency is fundamentally different from the concept of nuclear latency. Nuclear latency refers to a capacity that a state possesses to indigenously produce nuclear weapons but remains behind the threshold of assembling and testing a nuclear bomb. The latency discussed in this article is about second-strike capability, not nuclear acquisition. Back to China’s case, it reached point B in the early 1980s with its first ICBM (DF-5) successfully flight-tested and entered into service soon after. Despite that China’s nuclear modernization efforts have primarily focused on delivery vehicles, its capability has still not reached point C, falling short of assuring retaliation.

For a less developed country such as China, building a second-strike capability is a task as arduous as building its first nuclear bomb, if not more. China had completed the

<sup>64</sup> Lieber and Press, *The Myth of the Nuclear Revolution*, pp. 33–41.

<sup>65</sup> Here, the minimum standard entails a capability of plausible retaliation.

<sup>66</sup> Wu, “Certainty of Uncertainty,” p. 603.

work of weaponizing nuclear devices and miniaturization of hydrogen bombs by the mid-1980s.<sup>67</sup> Technological challenges in developing delivery platforms proved more difficult to overcome. China's DF-4 (4750 km), the first missile to cover the European part of the Soviet Union, was flight-tested in 1969. More than a decade later, the DF-5 (12 000 km)—China's first ICBM capable of targeting the continental USA—had a successful flight test in the South Pacific. The DF-5 denotes that China's nuclear capability has reached the deliverable stage. According to Riqiang Wu's documentation, the Second Artillery gained independent launch capability in the mid-1980s,<sup>68</sup> reaching the milestone of operability. As silo-based missiles, DF-5s are vulnerable to an adversary's counterforce strikes. In addition to camouflaging fixed silos, China builds "a large number of bogus silos," and "shallow holes disguised to look like the real thing" to provide a measure of survivability to its DF-5s.<sup>69</sup> While these deceptive measures may or may not work, the deployment of DF-5s marks the beginning of China's latent second-strike capability.

The possibility of a Chinese punitive counterstrike created by DF-5s is very slim, given the low efficacy of their concealment measures.<sup>70</sup> The DF-31s (7200 km), as China's second-generation solid ballistic missile, can be dispersed from their forward bases to one of three pre-planned launch sites and fired there.<sup>71</sup> This mobility, though limited, significantly improved the Chinese nuclear force's survivability than what the DF-5 had generated. The DF-31A, the extended-range version (11 200 km) of DF-31, features both adequate target coverage and road mobility. Once deployed in 2007, the possibility of Chinese retaliation became serious and could no longer be ignored. The 2017 deployed DF-31AG is a major improvement over the DF-31A, because its TELs can travel over more rugged terrain and thus more likely to survive long enough to launch a counterstrike. Nonetheless, it is hard to judge whether China's Rocket Force has gained survivability at near certainty after the DF-31AG deployment. According to one interlocutor in Beijing, an opponent could, in theory, attack an area of a 30-minute truck-moving or train-moving radius centered around a Chinese missile's location, therefore preemptively destroying the missile no matter in which direction it is being carried by a truck or train on the ground.<sup>72</sup> Therefore, if the location of a DF-31 AG is known to US intelligence, the survivability increased by its robust mobility is not much.

Ten MIRVed (multiple independently targetable reentry vehicle) DF-5s entered into service in 2015, considerably improving the Rocket Force's penetrability. Yet, without a launch-on-warning posture, the credibility these MIRVed DF-5s add to China's second strike is unclear.<sup>73</sup> The recently deployed DF-41s (12 000 km) represent China's most advanced missile technology, through which Rocket Force's survivability and penetrability are both notably improved. The DF-41 carries three MIRVs, has better mobility, needs a shorter launch preparation time than the DF-31A, and requires no pre-planned launch sites.<sup>74</sup> Being able to keep moving randomly, the credibility that DF-41 brings to China's second strike is immense. In addition to being uncertain of locating and destroying all Chinese warheads in their counterforce planning, adversaries now have to worry about their success rate of intercepting all Chinese retaliatory missiles. Nonetheless, punitive counterstrikes by DF-41s against an adversary's preemptive strikes are not assured.<sup>75</sup> Increasing US renaissance

<sup>67</sup> Hongyu Zhang, "China Opposing Nuclear Nonproliferation: A Rational Policy with an Ideological Mask," *Journal of Asian and African Studies*, Vol. 56, No. 2 (2021), p. 312.

<sup>68</sup> Wu, "Certainty of Uncertainty," p. 608.

<sup>69</sup> John W. Lewis and Di Hua, "China's Ballistic Missile Programs: Technologies, Strategies, Goals," *International Security*, Vol. 17, No. 2 (1992), pp. 24–5.

<sup>70</sup> Wu, "Living with Uncertainty," pp. 93, 103.

<sup>71</sup> *Ibid.*, p. 90.

<sup>72</sup> Interview in Beijing, July 2019.

<sup>73</sup> Cunningham and Fravel, "Assuring Assured Retaliation," pp. 30–1.

<sup>74</sup> Kristensen and Korda, "Chinese Nuclear Weapons, 2021"; Wu, "Living with Uncertainty."

<sup>75</sup> Wu, "Living with Uncertainty," p. 112.

and missile defense capabilities stand as a huge obstacle to the Rocket Force's penetrating ability. The survivability of SLBMs is generally better than that of land-based missiles. To date, China has not yet acquired a reliable sea-based nuclear leg, despite making meaningful progress.

Although Chinese nuclear force is short of guaranteeing retaliation, its retaliatory potential against the mightiest adversary does exist. China openly pursues assured retaliation, but has achieved second-strike latency. Does this latency alone effectively deter its vastly mightier adversaries? According to Riqiang Wu's standard of first-strike uncertainty, the Second Artillery became able to generate enough uncertainty to deter adversaries in the mid-1980s.<sup>76</sup> However, Beijing's practice speaks differently. Keenly aware of the low credibility of its retaliatory strike, Beijing relies on exercising "the art of war" to confuse adversaries about its nuclear capabilities. Beijing does not seem confident to solely rely on its material capability to generate deterrent effects.

### *Enduring Opaqueness and Ambiguity*

On one hand, China continues its modernization efforts to advance its missile technology and thus improves its second-strike capability. On the other hand, China engages in opaqueness and ambiguity to produce and enhance the deterrent effects of its small nuclear force. In fact, this non-transparent approach is openly adopted by the PLA and promoted by Chinese senior leaders. Strategists at the National Defense University argue that to strengthen China's nuclear deterrent, China needs to mobilize a variety of methods, including political, military, and diplomatic means to confuse the enemies (*yidi*) to create advantages for itself.<sup>77</sup> In August 1978, Deng Xiaoping raised the idea of "applying guerrilla war thoughts to the use of modern weapons."<sup>78</sup> By modern weapons, he was referring to China's strategic forces. "Expanding thinking" (*tuozhan silu*) is described as one tactic to bolster China's deterrent in PLA's academic writings.<sup>79</sup>

Partly due to the secret nature of the nuclear weapons program, the Chinese government strives to keep the development of its strategic force in the dark. The most important information China withholds is the size of its arsenal, including the numbers of warheads, missiles, and launchers. During the Cold War, the Soviets struggled to estimate Chinese strategic offensive capabilities and had to do "worst case estimating."<sup>80</sup> For the USA, the margin for error in best estimates was as high as 2–300% in estimates made in the 1990s.<sup>81</sup> China does not join many of the arms control treaties, especially the bilateral ones between the USA and the Soviet Union/Russia, it therefore does not have the obligation to offer an accounting of its arsenal or agree to verification schemes. Rather, it works diligently with various methods to disguise and conceal its nuclear underground facilities, hoping to deceive the adversary's intelligence efforts.

In the early years before and after nuclear acquisition, with extreme technological inferiority, China relied on intense secrecy to hide its nuclear weapons program and safeguard its nascent nuclear arsenal. Since silo-based ICBMs were deployed, maintaining opacity and ambiguity regarding the number of deployed missiles is Beijing's purposeful measure. If an adversary knows the number and locations of these missiles, it would have confidence in its ability to destroy them all in a counterforce strike. Because Beijing does not disclose the number of these ICBMs, it is difficult for the adversary to rule out some errors in

<sup>76</sup> Wu, "Certainty of Uncertainty," p. 608.

<sup>77</sup> Xuhua Yang and Renzhao Cai, *Weishe lun (Theory of Deterrence)* (Beijing: Guofang daxue chubanshe, 1990), p. 410.

<sup>78</sup> Zhang, *Zhongguo renmin jiefangjun*, p. 118.

<sup>79</sup> Xiaosong Shou, ed., *Zhanlue xue (The Science of Military Strategy)* (Beijing: Junshi kexue chubanshe, 2013), p. 173.

<sup>80</sup> Cited in Goldstein, *Deterrence and Security in the 21st Century*, p. 126.

<sup>81</sup> Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, *British, French, and Chinese Nuclear Weapons* (Boulder: Westview Press, 1994), pp. 358–9, 365.

its estimate.<sup>82</sup> As Riqiang Wu rightfully observes, China must keep the size and locations of its warheads a secret, and use stringent concealment and camouflaging measures to hide its nuclear bases.<sup>83</sup> Before China's nuclear force gained sufficient mobility, its survivability was even once based on opacity. Major General Yunzhu Yao from PLA's Academy of Military Science once explained, For a state adopting a no-first-use policy and intending not to waste too much money on unusable weapons, dependence on opaqueness to bring about greater deterrent value is a wise choice.<sup>84</sup>

In addition to opaqueness, ambiguity is another key feature of China's nuclear behavior. Taylor Fravel and Evan Medeiros note that the most acute problems of data availability in studying Chinese nuclear issues partly reflect China's decision to maintain ambiguity regarding multiple attributes of its nuclear force.<sup>85</sup> Whereas China's targeting policy is generally stated as countervalue, the PLA does not maintain a clear distinction between counterforce and countervalue targets.<sup>86</sup> PLA's military academic writings and teaching textbooks highlight the importance of targeting an adversary's forces and related military facilities in its "key point counterstrikes,"<sup>87</sup> causing ambiguity about China's targeting policy. There is a new area in which Beijing starts to allow ambiguity to grow within a certain limit, as new challenges to its second-strike capability emerge. As the USA develops and strengthens new counterforce capabilities, for instance, improvements in intelligence, surveillance, and reconnaissance, and the Conventional Prompt Global Strike program, China's latent second-strike capability risks to be even less credible in the face of US nuclear primacy. Most notably, its no-first-use policy is challenged by the question of how it would respond if its nuclear forces are attacked by conventional long-range strikes. Facing these new challenges, the most viable and secure countermeasure for China would be building a larger and more robust nuclear arsenal. Surprisingly, aside from a slow-paced and modest expansion of warheads,<sup>88</sup> Beijing has been mostly silent on this issue. However, it did allow a public debate within PLA circles about whether to discard or place conditions on its commitment to no-first-use policy in the mid-2000s.<sup>89</sup> Notably, China's 2013 national defense white paper did not explicitly mention no-first-use for the first time since the inception of this publication. Beijing renewed its commitment to no-first-use in its next edition of defense white paper in 2015.<sup>90</sup> Moreover, according to Fiona Cunningham and Taylor Fravel's interlocutors, Beijing has decided how to respond if its nuclear weapons assets are attacked by conventional strikes, but it will not make that decision public.<sup>91</sup>

Whether intended or not, Beijing's silence combined with different voices from PLA strategists has injected a certain degree of ambiguity over the application of its no-first-use policy. This created ambiguity forces adversaries to guess whether China's no-first-use pledge is unconditional and assess the merits of conventional attacks on China's nuclear facilities. Therefore, the creation of such ambiguity has a deterrent power, or

<sup>82</sup> Bin Li, "Tracking Chinese Strategic Mobile Missiles," *Science & Global Security*, Vol. 15, No. 1 (2007), p. 4.

<sup>83</sup> Riqiang Wu, "How China Practices and Thinks about Nuclear Transparency," in Bin Li and Tong Zhao, eds., *Understanding Chinese Nuclear Thinking* (Washington, D.C.: Carnegie Endowment for International Peace, 2016), p. 238.

<sup>84</sup> Yunzhu Yao, "China's Perspective on Nuclear Deterrence," *Air & Space Power Journal; Maxwell AFB*, Vol. 24, No. 1 (2010), p. 29.

<sup>85</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," p. 52.

<sup>86</sup> Gao, *Zhanlue xue*, p. 235.

<sup>87</sup> Gao, *Zhanlue xue*; Zhanke Kang, Gen'an Li, and Pengfei Li, eds., *Junbingzhong zhishi yu yunyong (Knowledge and Application of the Military Services and Arms)* (Beijing: Junshi kexue chubanshe, 2004), pp. 139–41; Xinglin Xue, ed., *Zhanyi lilun xuexi zhinan (Campaign Theory Study Guide)* (Beijing: Guofang daxue chubanshe, 2001), pp. 384–93.

<sup>88</sup> This observation holds until the revelation of China building 100 new missile silos in 2021.

<sup>89</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," p. 80.

<sup>90</sup> *China's Military Strategy* (Beijing: Information Office of the State Council of the People's Republic of China, May 2015).

<sup>91</sup> Cunningham and Fravel, "Assuring Assured Retaliation," p. 21.

at least strengthens China's deterrent, effectively dissuading conventional threats to its nuclear arsenal.<sup>92</sup> This manufactured deterrent power is acknowledged in authoritative PLA writings—"sometimes allowing different people to speak with different voices can have an even better deterrent effect than speaking with the same voice."<sup>93</sup>

It is noteworthy that opacity alone does not manufacture deterrence. The worry in an adversary's mind is generated by a combination of China's second-strike latency and the incomplete information problem caused by its nuclear non-transparency. Second-strike latency provides the basis for trickery maneuvering. Without second-strike latency as the material base, there is no room for Beijing to exercise "the art of war." Second-strike latency and non-transparency mutually prove each other's presence. Because China's second-strike capability is not sufficiently credible, it relies on opacity and ambiguity to create uncertainty on adversaries' counterforce planning. Because opacity and ambiguity are still employed, it reflects Beijing's diffidence in its ability to inflict unacceptable punitive damage.

### Discussions on Manufactured Deterrence

Still, a few things need to be clarified. The idea that deterrence is *manufactured* is meant to capture China's reliance on opacity and ambiguity to compensate for its capability deficiency. It is different from Thomas Schelling's "the threat that leaves something to chance,"<sup>94</sup> as a measure to inject uncontrolled uncertainty to make a nuclear threat credible. The uncertainty in this context is generated on one's credibility, not capability. The uncertainty generated in manufactured deterrence is on one's retaliatory capability, not the credibility of striking back with nukes. Moreover, manufactured deterrence needs not be confused with virtual deterrence or existential deterrence. Virtual deterrence theory argues that nuclear latency fulfills the role of an actual nuclear arsenal to deter would-be aggressors. The deterrence effect is based on a capability of nuclear latency.<sup>95</sup> Proponents of existential deterrence hold that the very fact of possessing nuclear weapons, even without effective delivery vehicles, is enough to deter attacks.<sup>96</sup> Clearly, the capability required by manufactured deterrence is above those of virtual deterrence and existential deterrence.

Manufactured deterrence advances the concept of first-strike uncertainty by explicitly identifying the two sources of uncertainty. The material source—second-strike latency—is technically a higher standard than first-strike uncertainty. The former entails not only survivability but also penetrability. A surviving Chinese nuclear force does pose severe uncertainty to an adversary's first strike, but it is still short of ensuring a second strike without gaining penetrability. Second-strike latency is a concept in the context of a credible second strike. The word "latency" hints that its standard is not adequate for deterrence and it needs compensation from the behavioral source to work. However, the behavioral source is not explicitly discussed and stressed in the literature of first-strike uncertainty, despite being a notable and indispensable part of China's deterrence practice. Manufactured deterrence therefore more completely conceptualizes and explains what China in practical terms does to preserve its security with a small and less advanced nuclear arsenal.

Do adversaries know that China's second-strike capability is not credible? If yes, would they not be free to threaten a nuclear war against China? In other words, why has China's manufactured deterrence worked so far? China's declaratory countervalue targeting is a contributing factor. As noted in last section, China's targeting policy is ambiguous, but is widely understood as countervalue targeting. The Secondary Artillery specifically targets

<sup>92</sup> Fravel and Medeiros, "China's Search for Assured Retaliation," p. 86.

<sup>93</sup> Shou, *Zhanlue xue*, p. 173.

<sup>94</sup> Thomas C. Schelling, *The Strategy of Conflict* (Cambridge: Harvard University Press, 1980), pp. 187–203.

<sup>95</sup> Rupal N. Mehta and Rachel Elizabeth Whitlark, "The Benefits and Burdens of Nuclear Latency," *International Studies Quarterly*, Vol. 61, No. 3 (2017), p. 517.

<sup>96</sup> Summarized in Lieber and Press, *The Myth of the Nuclear Revolution*, pp.34–6.

adversaries' populated cities to create "far-reaching terror and psychological pressure" to "shock the enemy's spirit" before the war breaks out, therefore to "enhance our deterrent power."<sup>97</sup> Among the guiding principles given by Mao Zedong about nuclear force development, "high explosive yield over striking accuracy" is emphasized.<sup>98</sup> In a nuclear crisis, China does not seek step-by-step escalation, but would go straight to the ultimate result—mutual destruction.<sup>99</sup> Countervalue targeting amplifies the nagging fears that adversaries have about the consequences of possible Chinese retaliation.

Another factor at play is the security environment in which China's manufactured deterrence operates—low confrontation and even favorable great power relations. Sino-Russian relations have been steadily closer and closer since the 1990s. From the 1970s until recently, US–China relations have been mostly stable and cooperative, with some occasional frictions. In low-confrontation great power politics, China and its adversary do not need to come down to the brink of contesting their nuclear capabilities and resolve. Therefore, the adversary does not need to be as much risk-taking as it is at high crises. Such a security environment allows second-strike latency and non-transparency to work in China's favor to play out the logic of manufactured deterrence. Moreover, the nuclear relationship between the USA and China is not symmetric. Not only is asymmetry reflected in the disparity of their arsenal size, but it also lies in the strategic levels at which these two players contest. For China, preventing nuclear attacks from the USA is central deterrence. In contrast, deterring Chinese aggression in the Asia-Pacific is essentially a task of peripheral and extended deterrence for the USA. The Chinese Mainland's military threats over Taiwan and USA's Asian allies are considerably more credible than those posed to the USA itself. The majority of US warheads target Russia. China only needs to balance against a small portion of US warheads. This strategic asymmetry also works in China's favor, allowing room for its manufactured deterrence to work.

Someone may question the concept of manufactured deterrence by pointing out that the Chinese government never openly seeks a latent second-strike. Should manufactured deterrence be intentionally pursued in the minds of Chinese leaders? Manufactured deterrence has two components. It is unintentional on the capability component (the material source), as China intentionally seeks a "lean and effective" and "credible deterrent."<sup>100</sup> Beijing does not deliberately seek or maintain second-strike latency. On the contrary, it continuously modernizes its nuclear forces. Second-strike latency is the temporary state of its nuclear capability before reaching assured retaliation. Manufactured deterrence is intentional on the opaqueness component (the behavioral source). The PLA deliberately engages in opaqueness, ambiguity, and even deception to compensate for its capability drawbacks. Manufactured deterrence is the temporary and suboptimal consequence of China pursuing and implementing its stated strategy. It is a stopgap practice. China's manufactured deterrence has worked because it has not yet been challenged in a highly confrontational scenario. It will likely prove ineffective once the antagonism between the USA and China intensifies to a high level.

## Explaining China's Nuclear Modernization and Its Future

China's nuclear modernization and expansion have generated differing interpretations and competing policy solutions in the US strategic community. Caitlin Talmadge and Joshua Rovner nicely summarize these views into three perspectives: the relaxed views Chinese modernization as continuous efforts to improve force survivability and thus not

<sup>97</sup> Yang and Cai, *Weishe lun*, p. 411.

<sup>98</sup> Lijuan Cai, "Lun Mao Zedong hezhanlue sixiang" ("A Discussion of Mao Zedong's Nuclear Strategic Thoughts"), *Lingnan xuekan (Journal of Lingnan)*, No. 3 (2005), p. 42.

<sup>99</sup> Interview with an arms control expert in Beijing, July 2019.

<sup>100</sup> *China's National Defense in 2006*, sec. II.

severely threatening to US security; the alarmed interprets Chinese moves as evidence of increased ambition and aggressiveness to revise the international order; the concerned is worried about the outcome of China more likely engaging in conventional conflicts under a nuclear shield.<sup>101</sup> David Logan and Phillip Saunders find three factors as key drivers of China's significant expansion: maintaining force survivability, building a nuclear shield, and seeking great power status.<sup>102</sup> Henrik Hiim, Taylor Fravel, and Magnus Trøan discuss the risks of conventional and nuclear entanglement and China's changing posture with its increased nuclear capabilities.<sup>103</sup> The above analyses are insightful but mostly (particularly the alarmed and concerned perspectives) focus on China's ongoing expansion and its implications without asking where China's nuclear program was before expansion. Although Henrik Hiim, Taylor Fravel, and Magnus Trøan reaffirm that China is not shifting away from an assured retaliation strategy, they do not note that this strategy still remains at the declaratory level.

Manufactured deterrence offers a powerful perspective on the drivers and aims of China's nuclear modernization. China's practice of manufactured deterrence has worked in a relatively favorable and low-confrontation environment for several decades. Yet, the real challenge for it is set to come as fierce *realpolitik* between China and the USA is unfolding. The efficacy of this practice remains unclear if the tensions between the two continue to intensify, especially if spiraling to a Cold War level. When the stakes are extremely high at big crises, the uncertainty on which manufactured deterrence relies may be outweighed by an adversary's increased risk-taking ability. In other words, retaliation needs to be assured to dispel the adversary's appetite for higher risks. Moreover, the adversary may take damage limitation measures to establish nuclear primacy over China if the latter's capability remains at the same level of second-strike latency. Consequently, although its standard for a credible deterrent does not change, Beijing will choose to rely more on capabilities and less on behavior. This means that China will upgrade to and materialize a credible second-strike capability.

China can do so by either or by some combination of three approaches. The first is to expand China's warheads and land-based missiles to a level that the redundancy problem is solved. Bin Li points out that China's current arsenal lacks redundancy, as Beijing worries that its few retaliatory warheads would be neutralized by new US countermeasure efforts.<sup>104</sup> The second approach is to build very quiet SSBNs and patrol at least one of them at all times. The third is to put its silo-based missiles in a launch-on-warning mode. In recent years, China has seemed to prioritize its modernization efforts on sea-based nuclear force.<sup>105</sup> Yet, building quiet SSBNs is technologically most challenging for Beijing and it will probably take several more decades to achieve this goal. Henrik Hiim, Taylor Fravel, and Magnus Trøan note that China is possibly adopting a launch-on-warning posture given the increased role of silo-based ICBMs in its nuclear forces.<sup>106</sup> However, launch-on-warning is a dangerous approach because of the risk of false alarms. Whether launch-on-warning constitutes a violation to China's no-first-use pledge is yet to be clarified by Beijing.<sup>107</sup> Moreover, building an effective early warning system is likely to take China quite some time. Without quiet SSBNs or launch-on-warning options available in the near future, China is

<sup>101</sup> Talmadge and Rovner, "The Meaning of China's Nuclear Modernization."

<sup>102</sup> David C. Logan and Phillip C. Saunders, *Discerning the Drivers of China's Nuclear Force Development: Models, Indicators, and Data* (Washington, D.C.: National Defense University Press, 2023).

<sup>103</sup> Henrik Stålhane Hiim, M. Taylor Fravel, and Magnus Langset Trøan, "The Dynamics of an Entangled Security Dilemma: China's Changing Nuclear Posture," *International Security*, Vol. 47, No. 4 (2023), pp. 147–87.

<sup>104</sup> Bin Li, "The Revival of Nuclear Competition in an Altered Geopolitical Context: A Chinese Perspective," *Daedalus*, Vol. 149, No. 2 (2020), pp. 56–68.

<sup>105</sup> Tong Zhao, "Tides of Change: China's Nuclear Ballistic Missile Submarines and Strategic Stability," Carnegie Endowment for International Peace, 2018, p. 8.

<sup>106</sup> Hiim, Fravel, and Trøan, "The Dynamics of an Entangled Security Dilemma."

<sup>107</sup> Cunningham and Fravel, "Assuring Assured Retaliation," p. 31.

almost destined to lean on the quantity approach. With its newly gained economic resources, realizing a credible second-strike through arsenal expansion is an achievable option for China. Once achieved, China's manufactured deterrence will materialize to a genuine deterrence strategy, with the ability to assure retaliation upon the initial attacker. With reported silo construction and warhead buildup, China is already moving in this direction. It is worth noting that this move does not represent a doctrinal shift. Rather, Beijing is closing the gap between a stated strategy and its implementation. China's modernization and expansion efforts so far represent its endeavor to achieve assured retaliation.

After the above step, there are two possibilities that China's nuclear force development may head to in the long future. First, if assured retaliation is somehow also achieved through quiet SSBNs,<sup>108</sup> China may build a nuclear force that is capable of ensuring minimal yet unacceptable damage, setting a limit to its force development. This outcome may also be achieved through an arms control treaty by capping China's warheads. Either way, it would suggest that China will adopt a minimum deterrence<sup>109</sup> strategy in the future. Meanwhile, China's pledge to no-first-use is likely to remain valid. However, in the face of US nuclear superiority and its increasing willingness to take advantage of it, will China's future minimum deterrence (assuming it adopts such a strategy) work? How much is enough for it to work and yet still minimal? If the logic of mutual vulnerability holds,<sup>110</sup> China will establish an asymmetric but stable nuclear relationship with the USA. Undoubtedly, the PLA will have enormous work to do in specifying its strategy, detailing its operational doctrines, and developing contingency and escalation management plans. During the Cold War, nuclear war threats from the USA to China were not credible, because such a threat to a militarily inferior state is redundant.<sup>111</sup> As Chinese conventional power continues to grow and its gap with the US military narrows, nuclear war threats will become realistic and credible. For Beijing, the utility of nuclear weapons has been largely limited to political scope. However, with heightening tensions, China's Rocket Force is destined to tackle military challenges, such as a military standoff involving nuclear weapons. Thomas Christensen points out that China's second-strike now matters for the first time with conventional confrontation between Beijing and Washington becoming highly possible.<sup>112</sup> The PLA needs plans to respond to this emerging scenario. This does not mean the Rocket Force needs to go down for war-fighting planning. When tensions are high, even pure deterrence requires highly detailed operational doctrines and high-level readiness. China can reach mutual deterrence with the USA either through this minimum deterrence approach or assured retaliation. Once there, whether it will be emboldened in regional conventional conflicts is a concern for many.<sup>113</sup>

Second, if minimum deterrence does not work in the face of nuclear superiority, then how far will China's nuclear expansion need to go? China may voluntarily or involuntarily engage in a nuclear arms race with the USA. The USA now considers China "the most serious long-term challenge."<sup>114</sup> If the military and security competition between them escalates to a global level, their nuclear relationship will likely evolve from a peripheral-central asymmetry to a central-central symmetry. Beijing takes a serious lesson from the collapse

<sup>108</sup> For instance, China acquires quiet SSBNs in less than two decades from today.

<sup>109</sup> Defined as "threatening the lowest level of damage necessary to prevent attack, with the fewest number of nuclear weapons possible," see Committee on the U.S.-Chinese Glossary of Nuclear Security Terms, *English-Chinese, Chinese-English Nuclear Security Glossary*, p. 36.

<sup>110</sup> Robert Jervis, *The Illogic of American Nuclear Strategy* (Ithaca: Cornell University Press, 1984).

<sup>111</sup> Todd S. Sechser and Matthew Fuhrmann, *Nuclear Weapons and Coercive Diplomacy* (Cambridge: Cambridge University Press, 2017), p. 47.

<sup>112</sup> Thomas J. Christensen, "The Meaning of the Nuclear Evolution: China's Strategic Modernization and US-China Security Relations," *Journal of Strategic Studies*, Vol. 35, No. 4 (2012), pp. 447–87.

<sup>113</sup> Abraham Denmark and Caitlin Talmadge, "Why China Wants More and Better Nukes," *Foreign Affairs* (2021); Evan B. Montgomery and Toshi Yoshihara, "Speeding Toward Instability? Hypersonic Weapons and the Risks of Nuclear Use," Center for Strategic and Budgetary Assessments, 2023.

<sup>114</sup> Antony J. Blinken, "The Administration's Approach to the People's Republic of China," 2022.

of the Soviet Union and tries hard to avoid an arms race with Washington. Nonetheless, if the tensions between them grow to a Cold War level, will Beijing in the long run rival Washington's nuclear capabilities on all fronts? Simply put, it not only depends on China but also on the USA. As Fiona Cunningham and Taylor Fravel have rightfully observed, China's rise alone is insufficient to prompt a change in its nuclear strategy.<sup>115</sup> Matthew Kroenig argues that nuclear superiority is critical to win nuclear crises and contributes to a variety of national security goals.<sup>116</sup> If this theory holds true, winning the nuclear contest will be key to the US–China great power competition. US efforts in enhancing its strategic superiority will be perceived by China as reducing and even neutralizing its nuclear deterrent and thus interpreted as intentions to militarily contain China's rise. US efforts likely will pressure China's strategy to evolve beyond minimum deterrence and head toward assured destruction. If an arms race takes place, China may end up rivaling US nuclear power by developing an assured destruction capability. In this scenario, China's no-first-use commitment would be greatly at odds with its security needs and may be abandoned. Significant changes in China's strategy would be expected. This does not mean to blame the USA as the cause for such a horrifying outcome. Rather, this outcome will be another tragedy of great power politics.

With arms race as a possibility, the future of US–China nuclear relations looks dark. However, it does not mean there is no solution to prevent the worst. Phillip Saunders and David Logan suggest the option to manage nuclear competition with China instead of offsetting Chinese buildup.<sup>117</sup> Capping Chinese warheads at a certain ratio to American warheads (for instance, 1:3) through a bilateral or multilateral treaty can be a solution. The treaty shall also include clauses restricting the number of delivery vehicles and missile defense systems. The first challenge to this solution is how to bring the Chinese on board. As the ratio is not at 1:1, such an arms control treaty does not follow the principle of reciprocity and thus looks unfair to China. However, at the agreed ratio, the size of the Chinese arsenal shall allow it to possess a credible second-strike against the USA and the latter does not seek to eliminate or neutralize this capability. Achieving assured retaliation will be a significant advancement for the Chinese nuclear force as compared to its current manufactured deterrence. Given that the nuclear deterrence relationship between the two countries is central-peripheral, this seemingly unfair treaty shall help establish strategic stability and therefore provide long-term security for China. Moreover, the successful avoidance of an arms race with the USA is the biggest motive for China to accept such a treaty.

The second challenge to such a solution would be US acceptance of China possessing punitive power against it. Given the immense nuclear superiority the USA currently enjoys over China, Chinese attainment of assured retaliation is likely to be perceived by Washington as a relative loss. Nonetheless, it is in the USA's interest for China to be confident in its second-strike capability,<sup>118</sup> unless Washington is confident of outpacing Beijing in an arms race. A mutual deterrence relationship based on credible second strikes is more stable and tenable. Beijing could do two things to reassure Washington. First, it shall continuously and firmly commit to no-first-use. No-first-use is China's signature policy and has a legacy of nearly 60 years. The continuation of this pledge will help China win trust over the warhead capping treaty. Second, as its capability grows and reliance on opacity

<sup>115</sup> Cunningham and Fravel, "Assuring Assured Retaliation," p. 8.

<sup>116</sup> Matthew Kroenig, *The Logic of American Nuclear Strategy: Why Strategic Superiority Matters* (New York: Oxford University Press, 2018).

<sup>117</sup> Phillip C. Saunders and David C. Logan, "The Implications of the PLA's Nuclear Expansion and Modernization for China's Crisis Behavior," in Roy D. Kamphausen, ed., *China's Military Decision-Making in Times of Crisis and Conflict* (Washington, D.C.: National Bureau of Asian Research, 2023), pp. 151–74.

<sup>118</sup> James M. Acton, "Do not Panic about China's New Nuclear Capabilities," *The Washington Post*, 27 July 2021, <https://www.washingtonpost.com/politics/2021/06/30/dont-panic-about-chinas-new-nuclear-capabilities/>; Cunningham and Fravel, "Assuring Assured Retaliation."

declines, Beijing shall do its best in improving transparency to alleviate US concerns. How Washington perceives China's nuclear expansion will be key to the maintenance of a stable nuclear relationship. If Beijing makes it clear that its modest expansion is aimed at materializing its manufactured deterrence to genuine deterrence through assured retaliation, Washington will hopefully refrain itself from heavily investing in missile defense and counterforce capabilities. On the contrary, if Washington views Chinese nuclear expansion as revisionist behavior seeking nuclear parity, it will likely strengthen its strategic superiority in all domains. Consequently, the USA's newly increased capabilities will deny Chinese efforts in achieving a credible second strike. Once entering into a vicious cycle, it will be hard to avoid an arms race. Building trust by increasing transparency and regularizing bilateral military dialogues with the USA is the way forward for China.<sup>119</sup> Due to space limitations, the technical questions of how many warheads would suffice for a credible Chinese retaliatory strike and what the capping ratio should be are not discussed in this article.

## Implications

As a new concept in the study of nuclear deterrence, manufactured deterrence brings important value to the scholarship and the policy world. First, it contributes to the literature by clarifying China's nuclear strategy and capturing its actual deterrence practice. Scholars disagree in what best characterizes China's nuclear strategy. In reality, their terms capture the different features in different periods or the different aspects of an evolving subject. Minimum deterrence defined as a small force providing plausible retaliation neatly captures the state of Chinese nuclear forces in the early 1980s. Assured retaliation correctly captures China's force development goal, which has not been fulfilled. First-strike uncertainty more closely reflects what China does in reality, but it is not China's long-term strategy. Manufactured deterrence confirms that China's stated strategy is assured retaliation. In practice, deterrence is *manufactured* by creating first-strike uncertainty through a combination of second-strike latency and opaque behavior. Manufactured deterrence captures the inadequate state of China's second-strike capability while hinting at the stopgap nature of this practice.

In particular, by noting the distance between a nuclear strategy and its implementation, manufactured deterrence reconciles the debate between assured retaliation and first-strike uncertainty in the literature. Fiona Cunningham and Taylor Fravel argue that China's assured retaliation needs to be regained in the face of new US advances in strategic capabilities.<sup>120</sup> First-strike uncertainty scholars challenge assured retaliation argument<sup>121</sup> by pointing out that China's retaliatory strike is "far from assured."<sup>122</sup> This article agrees that China seeks assured retaliation as its strategy, but has not acquired such a capability vis-à-vis its main adversaries. Meanwhile, it employs various practical measures with second-strike latency and opaqueness in particular, to compensate for the lack of a credible second strike. Manufactured deterrence accredits first-strike uncertainty as the mechanism by which China's manufactured deterrence works. It extends the concept of first-strike uncertainty by including non-transparency as its behavioral source. Manufactured deterrence through first-strike uncertainty is what China does before reaching assured retaliation.

Second, manufactured deterrence offers meaningful insights on the question of US-China nuclear relations. Joining the debate about policy responses to China's nuclear

<sup>119</sup> Riqiang Wu, "Zhongmei ruhe bimian he junbei jingsai" ("How to Avoid a Sino-American Nuclear Arms Race"), *Dangdai meiguo pinglun* (Contemporary American Review), No. 2 (2017), pp. 39–60.

<sup>120</sup> Cunningham and Fravel, "Assuring Assured Retaliation."

<sup>121</sup> Wu, "Certainty of Uncertainty," p. 593.

<sup>122</sup> Wu, "Living with Uncertainty," p. 86.

modernization, it strengthens reasoning of the relaxed view by clarifying the *manufactured* nature of China's current deterrence practice. Some US policy analysts and news reports exaggerate China's nuclear capabilities and the threats they pose.<sup>123</sup> This may be politically and rhetorically logical, given the USA's growing anxiety in facing a rising China. Nonetheless, it is strategically more important to accurately assess China's capabilities for sound policymaking. As US–China power competition intensifies in the coming decades, manufactured deterrence will likely not work. Beijing is expected to achieve assured retaliation by expanding its arsenal, which raises concerns about an arms race. An accurate understanding of China's strategy and deterrence practice is essential to manage and maintain a stable nuclear relationship between the two countries. Acknowledging China's manufactured deterrence provides a solid starting ground for the two countries to negotiate a warhead capping treaty.

Third, this article sheds light on the study of developing nuclear-armed states for future research. As the number of nuclear powers grows, all of these newcomers are developing countries. This group of nuclear-armed states is understudied. Avery Goldstein categorizes Britain, France, and China as second-rank nuclear states.<sup>124</sup> Vipin Narang studies the nuclear strategy of regional powers, grouping France, China, India, Pakistan, and Israel into one club.<sup>125</sup> No scholar has yet studied latecomer nuclear powers as a group of developing countries. Keeping warheads undeployed is a common feature of these states' nuclear posture. Being an economically developing country is potentially an important variable to shape their nuclear strategies and postures. China became a nuclear power when it was less developed. The features and characters of its nuclear policy were largely shaped before its spectacular economic achievements. Therefore, China is a good representative of developing nuclear-armed states. A common theme shared by these states is the thrifty use of a luxury weapon—they all squeezed their economies to acquire nuclear weapons but refrain from deploying them. Do these states practice manufactured deterrence as China does? More scholarly attention is warranted to understand the nuclear approach of developing countries as a group.

## Conclusion

China openly pursues a strategy of assured retaliation, but in reality, it has not achieved a credible second-strike capability. This article notes a gap between China's declaratory strategy and actual deterrence practice. It bridges the gap by proposing a new concept—manufactured deterrence, which captures how China practices nuclear non-transparency based on second-strike latency to produce deterrent effects against vastly mightier opponents. Second-strike latency means that China's nuclear capability has the potential to counterstrike the initial attacker but falls short of establishing certainty. China deliberately employs opacity and ambiguity about its nuclear forces to hinder adversary intelligence gathering and counterforce planning. Indeed, besides a material source of second-strike latency, nuclear non-transparency provides a behavioral source on which China depends to generate fear about Chinese retaliation in an adversary's mind. Manufactured deterrence should not be mistaken as China's nuclear strategy. Beijing does not pursue it as an aim, but passively practices it to preserve security facing giant adversaries. Both China's countervalue targeting and the low-confrontation international environment are contributing factors to

<sup>123</sup> Matthew Kroenig, "China's Nuclear Silos and the Arms-Control Fantasy," *Wall Street Journal*, 7 July 2021, <https://www.wsj.com/articles/chinas-nuclear-silos-and-the-arms-control-fantasy-11625696243>; Charles A. Richard, "Space and Missile Defense Symposium," 12 August 2021, <https://www.stratcom.mil/Media/Speeches/Article/2742875/space-and-missile-defense-symposium/>.

<sup>124</sup> Goldstein, *Deterrence and Security in the 21st Century*.

<sup>125</sup> Narang, *Nuclear Strategy in the Modern Era*.

the success of China's manufactured deterrence. It has worked so far because it is not yet up to a real test.

The power of manufactured deterrence in explaining China's puzzling nuclear behavior also provides insights on the causes and future of Chinese nuclear modernization. As the term conveys the inadequate state of China's second-strike capability, Beijing's practice of manufactured deterrence is predicted to come short of meeting challenges posed by its intensifying security competition with Washington in the coming decades. China is most likely materializing a credible second-strike capability by expanding its arsenal to a level where its redundancy problem is solved. Therefore, it will be able to implement a deterrence strategy without heavily relying on opaqueness. Beijing's nuclear modernization, as it stands now, does not represent a doctrinal shift, but the realization of assured retaliation from manufactured deterrence. In this process, China shall significantly improve nuclear transparency to alleviate US concerns and allow rationalist deterrence to play out. Whether China's deterrence strategy will go beyond a credible second-strike is something to watch in the long future. Two possibilities are foreseen: first, China may manage to obtain quiet SSBNs to adopt minimum deterrence and thus is able to maintain a stable nuclear relationship with the USA through mutual vulnerability. Second, a nuclear arms race cannot be ruled out if the security competition between the two spirals up to a global level.

This new conceptual framework in explaining China's nuclear strategy and practice is meaningful for nuclear scholarship and the study of international security. It deepens scholarly understanding of the imbalance between declaratory strategy and deterrence practice in China. Other developing nuclear-armed states share the features of possessing small and less advanced arsenals and keeping warheads undeployed. The term manufactured deterrence has the potential to be applied to these cases. This article thus offers a new concept and perspective to study the deterrence behavior of non-industrial nuclear powers.

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