Chinese Approaches to Nuclear Warfighting: US-China strategic relations and stability in the Asia Pacific

Abstract:

This article argues that current passive and static conceptualizations of Chinese approaches to nuclear and conventional deterrence are no longer appropriate. Recent evidence indicates that these postures are far more integrated, flexible, and dynamic than Beijing's official rhetoric suggests, and that during the past decade a de facto shift toward a limited nuclear war-fighting posture has already taken place. By applying an International Relations (IR) structural-realist lens to conceptualize a relatively under-researched discourse that relates to recent indications that China is contemplating the deployment of nuclear weapons for war-fighting (or victory-denial) purposes. A radical doctrinal shift of this kind (or even the perception of one) could presage a paradigm shift in China's long-standing nuclear posture and the nuclear balance in Asia.

Keywords: China; United States; deterrence; structuralism; realism

Introduction

The existing International Relations (IR) literature that relates to Chinese nuclear capabilities and doctrines has tended to emphasize stability and non-bellicosity in Chinese approaches to nuclear deterrence and military escalation, encapsulated by the long-standing 'minimum deterrence' posture and no-first-use (NFU) policy.[1] In general, the literature has painted a relatively benign, static, and isolated (from China's conventional war-fighting capabilities) picture of the evolution of Chinese thinking on strategic deterrence, which risks underestimating the increasingly dynamic, integrative, and flexible features of this shifting security paradigm.[2] That is, by overemphasizing the gradualist and passive aspects of China's formal nuclear posture over the past two decades, scholars and policy makers may overlook the very real possibility that as many of the technological, organizational, and other barriers to adopting a limited nuclear war-fighting doctrine and force structure are removed, the gap between China's nuclear

capabilities and the modest war-fighting ambitions of Chinese strategists will finally be reconciled.[3] This article argues that Chinese thinking on nuclear strategy includes positions in favour of a more flexible and robust nuclear posture, which has yet been endorsed in official documents, and indicative of an underlying receptivity to innovation (especially technological) in this area. What are the key drivers underlying Beijing's countenance of a nuclear war-fighting doctrine? And, is this shift emblematic of Beijing's broader revisionist ambitions (inferred by many US defense analysts) to replace the United States in the Asia-Pacific as the regional hegemon?[4]

The article analyzes the key areas of intersection and divergence in Beijing's thinking on conventional and nuclear deterrence, as well as the increasing commingling of Chinese conventional and nuclear capabilities and doctrines to support a limited war-fighting strategic posture. In particular, it highlights the increasing convergence of China's conventional and nuclear missile forces to fulfill the requirements of an integrated strategic deterrence posture predicated on targeting an adversary's military assets (including attacking counterforce targets with nuclear weapons), asymmetry, pre-emption, and a preference for limited strategic ambiguity—the "threat that leaves something to chance."[5] 'War-fighting' in the context of nuclear weapons has often been treated as meaning "damage limitation" or pursuit of a disarming first-strike capability. For the purposes of this discussion, the author defines the purpose of a 'war-fighting' doctrine as: victory-denial; military escalation control; or coercing an end to a conflict on acceptable terms, potentially including the use of tactical (or "theater") weapons preemptively to achieve limited deterrence objectives; the use of nuclear weapons for victory denial purposes at all stages of warfare.

China's nuclear-deterrence posture has been grounded for decades in minimal deterrence, with nuclear warheads de-mated from missiles, and its NFU policy. In contrast, China's conventional deterrence posture has been characterized by Western defense analysts as being based on war fighting, pre-emption, asymmetry, and supported by the development of offensive-dominant capabilities.[6] The closer alignment of these force postures would accomplish China's regional military objectives articulated in its defense strategic concept, including the use of asymmetric and pre-emptive tactics during future

"informatized" high-intensity warfare - marked by the information-driven capability to link geographically dispersed forces for unified action.[7] To be sure, should Beijing modify the composition of its nuclear forces to meet the operational requirements of war-fighting doctrine (e.g., sizable deployments of "tactical" nuclear weapons and missile-defense capabilities or the adoption of a launch-on-warning nuclear posture),[8] Washington would probably view it as a major shift in China's longstanding nuclear paradigm, and a fundamental challenge to the military balance in the Asia-Pacific region. These developments in Chinese nuclear capabilities and doctrine can be conceptualized with the 'security dilemma' International Relations (IR) concept. The extensive structural-realist literature has made clear that when a security dilemma exists in interstate relations spirals of mistrust and arms-racing can develop between states, which can cause increased tensions that results in conflict and war; even when neither side desires it.[9]

The article proceeds as follows. First, it discusses indications that intimates the reconciliation of the Chinese nuclear 'capabilities-doctrine' debate, which emerged from the late 1980s.[10] The removal of many of the military-technological, organizational, political-ideational, and arms-control constraints (i.e. the Treaty on the Non-Proliferation of Nuclear Weapons) impeding the implementation of a limited war-fighting doctrinal concept have cleared a path toward a substantially more powerful, survivable, mobile, flexible, and accurate nuclear-weapon capability for employment at all stages of the escalation ladder—especially for counterforce missions. Second, it considers evolving Chinese approaches to integrated strategic deterrence which combines conventional (including space and cyberwarfare) with nuclear capabilities and doctrines to deter and deny victory to a superior adversary for high-intensity local informatized warfare. The article examines how Chinese strategists have conceptualized these approaches, and explores how these views might be incorporated into Beijing's evaluations of its future nuclear posture. In particular, that China's increasingly commingled and diversified strategic missile forces have already been incorporated into a limited war-fighting military posture; and thus, Beijing's characterization of its declaratory nuclear posture has become increasingly out of step with China's evolving force structures and Chinese military writings, and that the lip-service paid to this stance by most external observers should be adjusted to reflect the more nuanced realities. Finally, it reflects on the

implications of a Chinese limited nuclear war-fighting posture for the US-China nuclear balance and strategic relations, and in particular the prospects for a destabilizing security dilemma in the nuclear domain.[11] It argues that the ambiguities associated with China's nuclear policies are likely to reinforce Washington's reliance upon worse-case scenarios for defense planning and to infer Beijing's (malign) intentions. In turn, these security-dilemma dynamics could lower the nuclear threshold, increase the risk of US-China deterrence failure, and cause a war-fighting posture, of the kind supported by Chinese proponents of a more robust nuclear stance, to become a self-fulfilling prophecy.[12]

China's reappraisal of nuclear war-fighting

The current IR literature on China's nuclear posture has tended to stress the stability and continuity of Chinese nuclear policy, underpinned by minimum deterrence and the NFU policy. This status-quo bias overstates the static and passive nature of Chinese nuclear thinking, and simultaneously understates the increasing dynamism, flexibility, and integrated (with China's conventional forces) features of China's nuclear posture. Purely quantitative assessments of China's nuclear arsenal do not adequately appreciate the implications of several recent qualitative changes to the People's Liberation Army's (PLA) nuclear force structure for on how Chinese strategists conceptualize "deterrence"—especially the increasing alignment of the PLA's offensive-dominant conventional war-fighting posture with its nuclear weapons and operating doctrines.[13] Although only a few Chinese strategists have explicitly advocated a shift in the function of nuclear weapons from minimal deterrence to war fighting, these minority views reflect broader pressures to assimilate Western nuclear strategies into traditional Chinese approaches to nuclear thinking.[14]

In his study of Chinese language open-sources on nuclear policy during the mid-1990s, scholar Alastair Iain Johnston argued that Chinese strategists never genuinely accepted a minimum-deterrence posture.[15] Moreover, as Johnston noted, since the late 1980s, Chinese strategists developed a concept of "limited deterrence" (or limited war-fighting) to describe the kind of nuclear posture China should aspire to once the conditions were opportune. This concept was designed to *deter* both nuclear and conventional warfare, and, if these efforts failed, to *compel* an adversary to back down to secure 'escalation

dominance'—in other words, escalate to de-escalate. According to some Chinese strategists, the successful implementation of a limited war-fighting posture requires sufficient amounts of accurate, survivable strategic missiles forces (capable of penetrating an adversary's missile defenses) to ensure a second-strike capacity; tactical theater missiles to target soft military targets (or 'asymmetric escalation' capabilities);[16] missile defense systems, and space-based early-warning systems to de-escalate future regional warfare.[17] Moreover, Chinese strategists have consistently and explicitly differentiated between the requirements of a "minimum" deterrence and a "limited" war-fighting posture—the latter clearly associated with the use of nuclear weapons for victory denial at all stages of warfare, and especially against a conventionally superior military adversary.

Recent evidence suggests that, far from fading into obscurity or being eschewed by Beijing's official rhetoric, Chinese startegic thinking on limited war-fighting has continued to shape and inform China's nuclear modernization efforts.[18] These Chinese publications suggests, therefore, the emergence of a pent-up interest in an expanded role for China's nuclear weapons, which has yet to be intgerated into China's formal doctrine. Furthermore, the apparent contradictions inherent in a nuclear posture that simultaneously argues for restraint and victory-denial nuclear war-fighting are likely to be reconciled, as the gap between the aspirations of Chinese strategists and the capabilities of the PLA's strategic forces narrows.[19] In short, qualitative improvements to Beijing's its nuclear force structure over the past two decades have given China the *ability* to use nuclear weapons (and pre-emptively) in regional wars, which implies a much broader and discriminate use for nuclear weapons than envisaged by proponents of minimum deterrence or assured retaliation.[20] Some observers have argued China could adopt a tiered (or more nuanced) approach to its nuclear posture. That is, allowing Beijing's continued adherence to minimum deterrence and NFU for its "strategic" nuclear forces, while adopting a limited war-fighting approach for its "non-strategic" nuclear and conventional missile forces. However, the research suggests that a dichotomous approach to deterrence is not consistent with Chinese evolving views on "integrated strategic deterrence" that encompasses space, cyber, and electronic warfare (EW) capabilities.[21]

Over the past two decades, many of the major impediments preventing a shift to a limited war-fighting posture have been removed. Unimpeded by these restrictions, Beijing's strategic thinking in future regional warfare will likely reflect more accurately the new options it has amassed in both the nuclear and conventional domains—to maximize the synergies that exist between these domains for limited local high-intensity "informatized" warfare. Former PLA Second Artillery Deputy Commander Zhao Xijun stated that a "flexible application" of deterrence across conventional and nuclear domains and from a strategic to tactical level of war is "indispensable for effective and credible deterrence."[22] This conceptualization of deterrence is also reflected in China's 2008 National Defense white paper, and is reiterated in China's most recent Military Strategy white paper.[23] Some of the major contraints on China's adoption of a nuclear war-fighting posture have included: military-technological, military-organizational, and arms control.

Military-technological

Western literature is rich in its discussion of the role that technology and innovation have played in China's nuclear modernization.[24] In particular, observers have emphasized the diversification from liquid-fueled to solid-fuel systems and from silo-based to road-mobile systems, and introduction of multiple independent targetable re-entry vehicles (MIRVs) for China's strategic missile forces.[25] The effects of military-technological advances on China's nuclear-operating doctrine has opened a door to a potentially more robust nuclear force posture not previously associated with Chinese nuclear strategy, and more closely aligned with China's more offensively configurated conventional stance.[26] Put another way, military-technological advancements across a range of capabilities has meant that China's aggregate nuclear posture should no longer be conceptualized independently of associated capabilities and concepts.[27] Rather, capabilities in these domains (especially space, cyber, and missile defense) are being synthesized into a force structure that incorporates war-fighting tools designed to deter both conventional and nuclear wars. That is, Chinese offensive-dominant space, cyber, and conventional precision strike capabilities have been inexorably fused into China's nuclear deterrence posture (for integrated strategic deterrence), a trend that is likely to continue as new and increasingly sophisticated capabilities are fielded As Columbia University's Robert Jervis

has argued, in cases where the offense is dominant, and especially when the offensive-defensive balance is not clearly distinguishable, the security dilemma between states is more intense.[28]

During a military parade in 2015, Beijing revealed its new intermediate-range ballistic missile (IRBM), the Dong-Feng 26 (DF-26), a dual-payload weapon capable (albeit untested) of targeting land and maritime targets in ranges out to Guam. According to the US DOD, the DF-26 missile would give China "its first precision strike capability against *theater (or counter-force) target*s" in regional conflicts.[29] Furthermore, improved space-based intelligence, surveillance, and reconnaissance (ISR) systems could allow China to shift from an assured retaliation posture (i.e., the ability to absorb a first strike and conduct a counterattack) to a launch-on-warning stance.[30] China's most recent defense white paper, concerning national military strategy, touched on planned enhancements to the PLA's nuclear "strategic early warning and command and control systems … to deter other countries from using or threatening to use nuclear weapons against China."[31] This statement suggests (albeit not explicitly) that a shift toward a launch-on-warning stance for enhancing China's nuclear deterrence that retains the option for a first-strike capacity is under consideration—a view that has also resonated within China's strategic community.[32] Similarly, the authors of a recent PLA Academy of Military Science publication, *Science of Military Strategy* (SMS), explicitly stated that China should not need to wait to absorb a nuclear attack before it launched a counter-strike, which forms part of the discussion on the merits of a launch-on-warning posture.[33] It is noteworthy that neither of these texts reflects on the potential escalation risks associated with a launch-on-warning posture, especially the possibility of accidental or inadvertent launches caused by false or misunderstood signals, technical issues, or errors of judgment, which could generate "use it or lose it" dynamics.[34] Several recent technological innovations will likely expedite China's emerging generation of offensive-dominant strategic missiles across the entire nuclear triad, which will have profound implications for the trajectory of its nuclear posture and policies.[35] Moreover, these enhancements have given Beijing new options to threaten the employment of nuclear weapons below the strategic level, i.e. at a tactical level against counterforce targets.[36]

First, China has enhanced the survivability of its ICBMs with road-mobile launchers, and increased their offensive utility with MIRVs, e.g. the refitted DF-31A and the new DF-41 ICBMs.[37] In 2016, amid rising tensions with the United States in the South China Seas, China tested its new road-mobile DF-41 ICBM with two MIRVs, just three days before Defense Secretary Ashton Carter visited the aircraft carrier USS *Stennis* in the South China Sea.[38] Defense analyst Rick Fisher interpreted this test as indication that the DF-41 was in its final testing phase ahead of deployment, and that it is estimated to be able to deliver as many as ten MIRVs—further complicating the task of US missile-defense interceptors.[39]

Second, China operates four (a fifth is believed to be under construction) second-generation ballistic nuclear-powered missile submarines (SSBNs), armed with short-range submarine-launched ballistic missiles (SLBMs) (known as JL-1 and JL-2) that were successfully tested in 2012.[40] According to the US this capability gives China its "first credible second-strike nuclear capacity".[41] In 2016, the Pentagon reported that "China will probably conduct its first SSBN nuclear deterrent patrol in 2016," which will have significant implications for how China handles (and potentially mates) its submarine nuclear warheads in peacetime.[42]

Third, in 2016 the DOD reported for the first time a potential nuclear role for Chinese long-range bombers (the H-6K), which were deployed on debut strategic deterrence missions in 2012.[43] Major upgrades to China's command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems for the HK-6K has enabled long-range nuclear precision strike missions—a capacity that only the United States, Russia, and France has possessed. China is also reported to be developing a small number of nuclear-capable air-launched land-attack cruise (ALCM) missiles (the CJ-20) for delivery from its modified HK-6K bombers. To be sure, the deployment of nuclear-capable ALCMs would signal that China is developing a new air-launched war-fighting strike capacity to augment its ballistic tactical weapons and core strategic forces.

Finally, recent advances in hypersonic boost-glide technology could significantly enhance the maneuverability and speed of China's nuclear-capable (and conventional) high-precision missiles for regional pre-emptive strikes, and penetrate US missile defense

systems.[44] Whether Chinese hypersonic weapons are armed with nuclear-payloads will indicate strongly how Beijing intends to integrate these variants into future PLA operational doctrines, which will have profound implications for US deterrence and the intensity of the US-China security dilemma.[45] IR theorists have long warned of the dangers of states' overdependence on military technology for the purpose of increasing and maintaining security.[46] Structural-realist scholars have argued that the security dilemma is at its "most vicious when commitment, strategy or *technology* dictates that the *only route to security lies through expansion*" of military power.[47]

In sum, these military-technological advancements have enhanced the accuracy, speed, precision, ranges, maneuverability, and survivability of Chinese nuclear weapons in a manner that appears incongruous with the requirements of a minimum deterrence. This approach suggests China is less willing to accept qualitative inferiority with the United States (and to a lesser extent India and Russia) in the nuclear arena required for minimal deterrence, and increasingly convinced of the deterrence value of a limited war-fighting posture to ensure a robust second-strike capacity and control escalation.[48] Moreover, the pace and extent of these qualitative advances appear to have outpaced changes to China's military doctrine i.e. the formal conceptual structures that supposedly guide the development and operation of forces. As a corollary, even in the absence of formal changes to China's nuclear doctrine the integration of its nuclear weapons and operations with non-nuclear capabilities in offense-dominant domains, together with the on-going qualitative advances associated with China's nuclear modernization, risks intensifying the security dilemma with the United States; including (most worryingly) in the nuclear domain itself.

Military-organizational

In 2015, China announced a major military reorganization that included a new nuclear missile command structure. Most notably, the PLA's Second Artillery Force (PLASAF) responsible for China's strategic missiles was replaced by the new PLA Rocket Force (PLARF). This reorganization formally elevated Chinese strategic forces to an equal status with the PLA army, navy and air force services.[49] Chinese President Xi Jinping reiterated that the Rocket Force is a "core force of strategic deterrence" to uphold

national security, enhance the PLA's nuclear deterrence and counter-strike capacity, build a long-range precision strike capability, and buttress China's position as a major military power. De facto it appears Xi Jinping has embraced a war-fighting doctrine for the Rocket Force. Xi stated that the core mission of the Rocket Force is to:

> Enhance credible and reliable nuclear deterrence and counter nuclear strike capability in accordance with the strategic requirements of *nuclear and conventional missiles* and of *full-area war deterrence*… and strive to build a powerful modernized rocket force.[50]

Xi also called on the Rocket Force to enhance China's nuclear deterrence and counter-strike capacity, especially using medium and long-range precision strike missiles to ensure a credible and reliable nuclear deterrent.[51]

Notwithstanding the claims of China's Ministry of National Defense that the creation of PLARF would not alter Chinese nuclear policies, the official sanctioning of this new military service demonstrated the convergence of Beijing's expansive conceptualization of "strategic deterrence" with the necessary qualitative advances in the PLA's strategic forces to fulfill the requirements of nuclear war-fighting.[52] Moreover, this intersection has occurred without the political dogma and ideational constraints faced by earlier generations of Chinese military leaders. In short, the promotion of Chinese strategic forces, together with significant qualitative enhancements to its capabilities, has finally aligned China's (nuclear and conventional) war-fighting tools and the aspirations of its military leaders with a command structure and the political will necessary to formalize a doctrinal shift.

What remains unknown, however, is how Chinese thinking and operational doctrines will evolve to reflect the inexorable linkages that have formed between China's integrated strategic deterrent capabilities and its reorganized military structure. For example, although Chinese strategists frequently discuss cross-domain warfare to deter adversaries and control escalation, they have rarely considered the risks associated with these tactics such as: how weaknesses in one domain could be offset by the strengths in another, or related, how capabilities in one domain could be used to deter (or control escalation) conflict in another. To be sure, questions such as these will become more pressing as the reorganization of the PLA diffuses China's burgeoning cross-domain war-fighting

capabilities across multiple military services, which will have implications for escalation management and tactical signaling during future crises or conflict. It also remains unclear from existing open sources how Chinese strategists expect these reforms to impact China's ability to coordinate its disparate war-fighting tools, or in what ways a more powerful and dynamic strategic missile force structure could enable it to expand its war-fighting posture into other domains, notably space and cyberwarfare.[53]

Arms control

Although little is known of the precise link between China's official position (and decision-making processes) on arms control and the evolution of its nuclear limited war-fighting doctrinal preferences, the evidence suggests that the these positions have historically reinforced one another.[54] Beijing's attitude toward nuclear arms control and disarmament are best viewed through the lens of China's broader strategic objectives: to safeguard its security; frustrate nuclear blackmail (especially from the United States, given its asymmetric advantage in nuclear forces); deter others from initiating a first strike; and preventing US missile defenses from neutralizing China's retaliatory capacity.[55] Whilst Beijing remains committed to its obligations under Article VI of the 1970 Treaty on the Non-Proliferation of Nuclear Weapons and has maintained broad— if lukewarm—support for the 1997 Comprehensive Nuclear-Test-Ban Treaty and the (as-yet negotiated) Fissile Material Cut-off Treaty negotiations, it has placed the onus on the United States and Russia to take the initiative on further reductions before Beijing would consider engaging in any formal nuclear disarmament dialogue.[56]

Furthermore, although China's defense white papers have consistently stressed the deployment of a "lean and effective" nuclear force, this concept does not impose specific numerical constraints on China's nuclear arsenals.[57] Rather, *lean* implies a modest force posture and underscores Beijing's desire to avoid a costly arms race in the nuclear arena, while *effective* stresses qualitative improvements to enhance the survivability, accuracy, striking power, and credibility of China's strategic deterrence— especially to counter US BMD.[58] According to Major General Yao Yunzhu, "to keep the arsenal effective, China has to modernize it to ensure credibility after a first nuclear strike"—in other words, a second-strike capacity. To be a sure, a "lean and effective" nuclear force *prima facie*

aligns with the basic requirements of minimal deterrence. However, one of the major problems with "minimal deterrence" is that it requires an accurate understanding of the level of damage an adversary finds unacceptable, which invariably changes over time. Thus, a previously "credible" deterrent may no longer be perceived as credible. Moreover, it is important to note that a limited war-fighting capacity does not require parity with other nuclear powers (i.e. the United States and Russia) to be effective. Rather, the doctrine is asymmetric in nature, and as a corollary, China only requires sufficiently credible war-fighting capabilities to deter and deny victory to an enemy.

Chinese strategists have often ambiguously declared their general commitment to minimum deterrence, whilst simultaneously arguing in favor of first strikes and pre-emptive warfare in both the nuclear and conventional domains.[59] For example, the authors of the leaked secret publication *Science of Second Artillery Campaigns* (SSAC) stated:

> The most important type of future regional wars will be conventional conflicts under conditions of nuclear deterrence, deterrence and actual war-fighting will exist at the same time, and their function and effectiveness will be mutually complementary.[60]

This apparent contradiction can be explained by the confluence of Chinese conceptualizations of conventional and nuclear war-fighting and deterrence, which contrasts with external observers' overly passive and static perceptions of Chinese deterrence.[61]

Therefore, the only remaining arms-control policy preventing a formal shift to a nuclear war-fighting posture is China's long-held NFU commitment.[62] Over the past decade, however, Chinese strategists have questioned the strategic logic underpinning China's adherence to NFU, which raised concerns that Beijing could place conditions on this commitment or even do away with the policy entirely.[63] Chinese strategists have discussed broad scenarios under which Beijing could attach caveats to its NFU policy that would appear to countenance a first nuclear strike.[64] Most controversially, nuclear weapons could be considered in retaliation against a conventional attack on Chinese strategic nuclear forces, and in particular to counter US BMD and long-range precision munitions.[65] Several US defense analysts have argued that Chinese strategists consider

the ambiguity generated by internal debates on the conditions China could place on its NFU pledge as strengthening China's deterrent.[66] To be sure, ambiguities caused by the lack of clarity surrounding Chinese internal debates will continue to undermine the credibility of China's adherence to its NFU pledge, whilst keeping the option open for Beijing to formalize its de facto limited war-fighting posture.[67]

Evolving Chinese thinking on 'deterrence', tactical nuclear weapons and missile defense

Chinese conceptualization of deterrence (or the Chinese term *weishe*) is best understood as a form of coercion, which includes elements of both "deterrence" and "compellence."[68] To be sure, Chinese strategists' conception of "nuclear deterrence and compellence are often indistinguishable."[69] That is, the threat of military force to coerce an adversary to comply with a particular set of demands combining: a capacity to inflict precise and targeted damage; the demonstration of the willingness to use this capacity; and a tactical preference for military signaling to convey the means and will to carry out these threats. Chinese views on deterrence have also been heavily influenced by a strategic-cultural tradition that emphasizes minimalism, ambiguity, flexibility, and patience. Chinese strategists have frequently drawn from historical military discourses and strategic theories (e.g. Mao's *Theory of People's War* and "active defense") to inform and authenticate their thinking on deterrence, and the relationship between threats and capabilities.[70] For example, China's 2015 Victory Day Parade represented a very public demonstration of Beijing's growing confidence in its enhanced strategic deterrence, especially *vis-à-vis* the United States. Most notable, Chinese state media officially described the PLA's new dual-payload DF-26 IRBM as a "new weapon for strategic deterrence."[71]

Evolving Chinese conceptions of strategic deterrence (or the Chinese concept of "integrated strategic deterrent") shares similarities with the US "peace through strength" concept and describes a multifaceted and holistic version of deterrence. As the authors of the authorized doctrinal *SMS* described:

> The comprehensive employment of all types of strategic deterrence to give full play to deterrence as a whole for serving national military strategy… an integrated strategic deterrence is formed… [with] conventional force as the mainstay, nuclear force as the back-up and reserve force as the support.[72]

The inexorable blurring of the PLA's conventional and nuclear, and offensive and defense capabilities by shortening the timeframe for crisis decision making, and compressing the (albeit poorly defined) US-China nuclear escalation ladder will pose increasing existential risks to US-China strategic stability in the Asia Pacific.[73] Under crisis conditions, these risks could exacerbate existing US-China misperceptions and misunderstandings that in turn will likely increase the incentives for early and pre-emptive attacks, which are baked into the competing doctrines and operational concepts on both sides, e.g. US Air-Sea Battle (renamed Joint Concept for Access and Maneuver in the Global Commons), and China's anti-access, area-denial (A2-AD) strategy.

Since the 1980s, Chinese strategists have expressed a clear preference for tactical nuclear weapons (especially dual-capability ballistic and cruise missiles) as a way to build rungs on the "nuclear ladder" to enhance the credibility of China's nuclear deterrence—especially to defend China's periphery against superior adversaries. Chinese-language open-source literature suggests China has possessed the ability to develop low-yield tactical nuclear weapons since the 1970s. However, to date no clear evidence has emerged to corroborate reports that China has deployed (or mated) warheads of these kinds with delivery vehicles.[74] Similar to the arguments promulgated by NATO planners during the Cold War era, Chinese defense planners viewed the possession of a range of nuclear options as strategically advantageous to avoid a Solomonic choice: to use strategic nuclear weapons pre-emptively (precluded by NFU) or remain paralyzed and vulnerable to first strikes.[75] Moreover, these strategists have also envisioned the use tactical nuclear weapons in conjunction with other conventional asymmetric capabilities (i.e. antiship ballistic and cruise missiles; ASATs and cyberwarfare), to strike at a superior adversary's (especially US) command-and-control structures and evade its missile defenses.

Chinese military writings have generally avoided explicitly stating under what circumstances and against what kind of adversaries China may consider deploying tactical nuclear weapons.[76] That said, given the types of military targets described by Chinese analysts, and that the target would likely be nuclear-armed, we can infer that the PLA's tactical nuclear weapons (especially its dual-capability missiles) would feature prominently in the formulation of a limited war-fighting deterrence posture.[77] For example, China possesses several nuclear-capable IRBMs and medium-range ballistic missiles, e.g. the new DF-26 and the road-mobile DF-21, respectively, which, according to Beijing, can perform medium to long range precision attacks on both land and large to medium sized maritime targets in estimated ranges of 3,000 to 4,000 kilometers, i.e. able to target US bases in Guam and US aircraft carriers operating in the Western Pacific.[78]

In terms of doctrine, former Second Artillery deputy commander Lieutenant General Zhao Xijun opined that China should not only have "strategic nuclear forces but also campaign and tactical nuclear forces" to ensure the credibility of its deterrent posture at all levels of war.[79] Moreover, Zhao's comment that Chinese tactical weapons "can carry a nuclear warhead or special warhead according to the needs of the task and strike targets" implied that the capabilities for this purpose already exist.[80] Although Zhao's comments do not represent official military strategy, his views are nonetheless indicative of an increasingly expansive concept of strategic deterrence advocated by Chinese strategists to ensure a credible deterrence posture at all levels of warfare on the modern battlefield.

Beijing's long-held hostility toward missile-defense systems led to the prioritization of programs to increase the survivability and penetrability of China's nuclear forces to survive a first strike, i.e. solid-fuel road-mobile missiles, MIRVed warheads, and the development of SSBNs. During the past decade, Beijing has also earnestly begun to develop an indigenous missile-defense capability to enhance the credibility of Chinese nuclear deterrence.[81] Moreover, given that China's war-fighting capabilities (especially its space-based ISR capabilities) will likely be targeted by an adversary early on or pre-emptively in a future regional conflict, Chinese strategists have increasingly viewed a BMD capacity as a crucial means to protect China's burgeoning war-fighting tools and to preserve the credibility and flexibility of its strategic deterrence.[82] Viewed through a structural-realist (zero-sum) lens, China's expanding suite of war-fighting capabilities

and evolving doctrinal preferences have led to the very kinds of qualitative arms racing and action-reaction security-dilemma dynamics that Beijing has long been loath to engage in.[83] As Chinese scholar Li Bin has noted, "China's promise to not get involved in arms races does not rule out … security dilemmas."[84]

For example, evidence suggests that, in spite of Washington's reassurances, the decision to deploy Terminal High-Altitude Area Defense (THAAD) systems in South Korea have heightened Beijing's fears and directly influenced its regional strategic calculations.[85] Since this decision was announced in 2015 China has perceptibly intensified efforts to develop hypersonic (and possibly nuclear-capable) variants for its short- and intermediate-range ballistic and cruise missiles, to penetrate US layered missile-defense systems.[86] Furthermore, THAAD systems have been the target of regular cyber-espionage attacks attributed to Chinese IP addresses. Chinese-language open-source evidence indicates that Chinese strategists have increasingly viewed proposals from the Obama administration to modernize its nuclear triad (and especially proposals for new air-launched nuclear-capable cruise missile) as the continuation of the "basic characteristics of a war-fighting strategy."[87] These developments, together with other US military countermeasures and offsetting concepts, will likely convince Beijing of the tactical advantages and strategic necessity of "formally" adopting a limited nuclear war-fighting doctrine, to prepare for future regional informatized warfare.

Implications of a Chinese nuclear war-fighting posture

Over the past decade, there has been much ink spilled on the implications for regional strategic stability and military escalation management caused by US-China action-reaction policies and arms-racing dynamics in the Asia Pacific, and in particular the ramifications of any alterations to China's nuclear polices and postures.[88] To be sure, the mere possibility of China using its nuclear-capable war-fighting tools in limited and tactical missions to deter the United States in nuclear or conventional conflicts and of a manner, timing, and purpose that Washington would unlikely anticipate could harbinger a paradigm shift in US-China strategic relations.

Therefore, if US defense planners' net assessments concluded that Chinese war-fighting capabilities could presage a fundamental shift in trajectory of China's approach to nuclear deterrence (e.g. if space-based ISR advancements enabled a launch-on-warning posture) intended to support Beijing's aggressive assertions of sovereignty (e.g. in the East and South China seas, or the Taiwan Strait) the implications for US forward force postures, extended nuclear assurances, and nuclear deterrence in future warfare in the Asia Pacific would be profound.[89] Moreover, China's propensity for strategic ambiguity and opacity in the nuclear domain (especially the intended purpose for its war-fighting capabilities) will likely reinforce the Pentagon's preference for worse case scenario capacity-based assessments to infer Chinese malign intent, which in turn will inform and guide US countermeasures.

In response, Beijing—fearful that US security gains could come at China's expense—could formalize this war-fighting posture in a self-fulfilling prophecy, which may augur a self-reinforcing, downward spiral toward an intense security dilemma. To be sure, recent open-source evidence indicates that Chinese strategists view recent expansions to China's war-fighting capabilities as reasonable and necessary security-seeking responses to counter (and deter) US military policies and postures; US strategists, in turn, perceive such expansion as evidence that China is Washington's main adversary, and seek to contain its power and influence in Asia and undermine Chinese nuclear deterrence.[90] Structural-realist IR theorists have described how spirals of mistrust can develop between states even in situations where both sides are seeking security:[91]

> For you to know that you yourself mean him no harm, and that you want nothing from him save guarantees for your *own safety;* and it is never possible for you to realize or remember properly that since he *cannot see the inside of your mind*, he can never have the same *assurances of your intentions* that you have (emphasis by the author not in the original).[92]

Moreover, in cases where incentives (or disincentives) exist for each side *not* to cooperate, both sides will likely pursue their own narrow self-interests, and become predisposed to view the other as an adversary, which, under the presence of the security dilemma, leaves both sides worse off.[93]

Recent evidence suggests that Chinese strategists recognize the trade-off caused by the strategic ambiguities surrounding Beijing's nuclear policies and postures—in particular, the risk that this approach might backfire and prompt Washington to seek ways (i.e. air-sea battle, BMD, and nuclear modernization) "to enrich and improve its nuclear policy in order to counter" China's strategic ambiguities.[94] Equally, a failure by Washington to more rigorously appreciate the evolving nature of Chinese strategic deterrence and attitudes toward escalation philosophy will increase the risk that, in future warfare, the United States will be unable to effectively deter acts of aggression by China, and in a strategic environment highly susceptible to crisis instability.[95] Moreover, under crisis conditions when states' decisions are more prone to misinterpretation and misperception, the security dilemma between states will be more intense and difficult to ameliorate.[96]

Cold War-era scholarship on nuclear deterrence posits that, in situations where a conventionally weaker state with a secure second-strike capacity faces a more powerful adversary, conflict will more easily and inadvertently cross the nuclear threshold—especially if tactical nuclear weapons are present.[97] In the case of the US-China security relations, these dynamics could be compounded by the apparent Chinese belief that its nuclear deterrent will necessarily prevent a conventional conflict from escalating into a nuclear one. That is, Chinese strategists have tended to overestimate China's ability to effectively manage the escalation process, and underestimate the inherent risks of unintentional escalation—especially if either side misunderstands military tactical signals during a crisis.[98] Chinese strategists have indicated that if the United States employed nuclear signaling tactics against China to communicate resolve (similar to those used against North Korea in 2013),[99] Beijing would likely escalate the situation with its own nuclear signaling to deter the United States, including: missile tests; deploying SSBNs; raising the alert-status of Chinese nuclear forces; and ultimately adjusting China's nuclear policies.[100]

Conclusion

The central arguments proffered in this article can be summarized as follows: First, the existing literature that relates to Chinese approaches to nuclear deterrence paints an overly static and passive isolated picture that understates the increasing dynamic and integrated features of China's burgeoning cross-domain war-fighting tools. Thus, the characterization of China's nuclear posture by external observers—exemplified by the continued lip-service paid to minimum deterrence and NFU—risks misaligning the PLA's commingled (nuclear and conventional) capabilities and doctrines to support a de facto limited war-fighting posture.

Second, evidence from Chinese open sources suggests that Chinese thinking on limited war-fighting, rather than being eschewed by Beijing in favor of a minimal deterrence (or assured destruction) posture, has continued to influence China's nuclear modernization efforts. Moreover, Chinese literature on nuclear thinking includes positions that favour a more flexible and robust nuclear posture than has yet been endorsed in official documents or reflected in China's formal doctrine, which indicates an underlying receptivity for innovation in this domain; aligning the PLA's nuclear forces with its offensive-dominant conventional stance for high-intensity, asymmetric (or 'asymmetric escalation'), and pre-emptive future warfare. Several unknowns and strategic uncertainties remain including: How closely will China's nuclear and conventional domains be aligned, and at what levels? For instance, could there be a greater degree of alignment at the theater level (as the PLA possesses dual-capacity MRBMs and IRBMs) but less at the strategic level (since China's ICBMs are currently nuclear)? And how will hypersonic weapons and glide vehicles affect this dynamic, especially if they are deployed to enhance both conventional and nuclear missiles?

Third, Chinese evolving conceptualization of strategic deterrence reflects a multifaceted cross-domain version of deterrence, which lends itself to the blurring of traditional conventional-nuclear and offensive-defense distinctions. This inexorable clouding by shortening the decision-making timeframe during crisis, and compressing the nuclear escalation ladder will likely negatively impact US-China strategic stability, and increase the incentives (on both sides) for pre-emptive tactics. Thus, even in the absence of

radical changes to China's nuclear doctrine, technological advances to China's nuclear posture combined with the integration of its nuclear capabilities with non-nuclear ones in offense-dominant domains, risks intensifying security dilemma dynamics with the United States; including in the nuclear domain itself. This interpretation of the thesis does not, however, contend that Beijing has adopted or will formally an actual nuclear war-fighting doctrine; rather that the trajectory of China's military modernization and integration are taking them to a place with many of the same potential risks and strategic implications.

Finally, viewed through a structural-realist lens, the formalization of a limited nuclear war-fighting posture and the lowering of the nuclear threshold may be lowered considering: the convergence of China's expanding suite of war-fighting capabilities with Chinese strategists' evolving approaches to strategic deterrence; the commingling of its nuclear and conventional weapons and doctrines; sanguine Chinese attitudes towards the risks of inadvertent or accidental nuclear conflict; the opacity and ambiguity that surrounds China nuclear domain; and Beijing's heightened threat perceptions caused by US "absolute security." To be sure, a *de jure* nuclear war-fighting posture would likely presage a self-reinforcing downward spiral toward an intense security dilemma in the nuclear domain.

Several implications and future research topics follow from the findings of this article. First, future research would be beneficial on how the Chinese security community views the US-China relationship in the nuclear domain. In particular, who on the Chinese side is leading this fundamental re-think, is it being challenged, and if so, in what ways and to what degrees of success? How are these views changing in response to US military policies and posture in Asia? And finally, how are the PLA's "new" capabilities likely to affect Beijing's thinking about its nuclear options in future warfare? Second, defense analysts will need to closely monitor the development of China's commingled capabilities that might increase Beijing's future war-fighting options (e.g. space-based ISR for a launch-on-warning posture), and especially indications of changes to the PLA's operational doctrines as a result of these developments. Third, it remains to be seen whether the PLA emerges from its recent major overhaul as a stronger and more coordinated joint war-fighting force, and many unknowns exist. For example, what will

be the precise responsibilities of the new Rocket Force for China's overall nuclear assets - will the new service's responsibilities be confined to only land-based missiles, or will they also control China's sea- and air-based nuclear-capable missiles?

On the future modern battlefield, where the boundaries between war and peace and conventional-nuclear and offense-defense lines are increasingly blurred; where an aggressor is likely to resort to early and pre-emptive tactics to assert escalation dominance; and where states rapidly accumulate, synthesize, and diffuse progressively advanced war-fighting tools, interstate security dilemmas will become more frequent, intense, intractable, and destabilizing.

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Notes

[1] China has maintained a nuclear posture that can be described as 'minimum deterrence', though Chinese leaders in the past shied away from the term of 'deterrence' the most recent 2015 defense White Paper states: "China has always kept its nuclear capabilities at the *minimum level* required for maintaining its national security", Ministry of National Defense, The People's Republic of China 2015 *China's Military Strategy, 2014*, Information Office of the State Council, Beijing, China. Yao Yunzhu, "China's Perspective on Nuclear Deterrence," *Air and Space Power Journal*, Vol. 24, No. 1 (Spring 2010); Li, Bin. and Zhao, Tony. (eds.) (2016) *Understanding Chinese Nuclear Thinking.* Washington, D.C.: Carnegie Endowment for International Peace; Fravel, Taylor M. and Medeiros, Evan S. .(2010) "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure", *International Security,* 35(2), pp.48-87; Lewis, Jeffrey. (2013) "China's Nuclear Modernization: Surprise, Restraint, and Uncertainty", in Tellis, Ashley, and Tanner, Travis. (eds.) *Strategic Asia 2012-13: China's Military Challenge.* Washington, D.C.: The National Bureau of Asian Research (NBR), pp.76-77.

[2] More recently, non-Chinese analysts have begun to argue that China is no longer satisfied with a minimum deterrence posture - especially as a result of U.S. military policies in Asia. Several analysts have also discussed the implications of a shift in China's nuclear policies and strategic thinking. See, Delpech, Therese. (2012) *Nuclear Deterrence in the 21st Century.* Washington D.C.: RAND Corporation, pp.128-129; Cimbala, Stephen .J. (2015) "Chinese Military Modernization: Implications for Strategic Nuclear Arms Control", *Strategic Studies Quarterly,* (Summer), pp. 11-19; Haynes, Susan T. (2016) *Chinese Nuclear Proliferation: How Global Politics is Transforming China's Weapons Build-up and Transformation.* Lincoln, NE: Potomac Books.

[3] "Minimum deterrence" requires only a small amount of nuclear warheads for use in "counter-value" (i.e. targeting of an adversary's cities and civilian populations) second strikes, necessary to *deter* an adversary from attacking - and is underwritten by a no-first-use policy. "Limited deterrence" requires possessing enough capabilities deter *both* conventional, theater, and nuclear wars, and to control military escalation during a nuclear war - or "escalation to de-escalate".

[4] Haynes, Susan.T. (2016) *Chinese Nuclear Proliferation: How Global Politics is Transforming China's Weapons Build-up and Transformation.* Lincoln, NE: Potomac Books. There has been a debate amongst scholars in the U.S. on Chinese so-called "assertiveness", for example, see Swaine, Michael. (2010). Perceptions of an assertive China part 1: On 'core interests'. *China Leadership Monitor, 34*(Winter); and in response, Johnston, Alastair. I. (2013). How new and assertive is china's new assertiveness? *International Security, 37*(4), pp.7-48.

[5] Schelling, Thomas. C. (1960). *The strategy of conflict*. Cambridge, Mass; London: Harvard University, chap. 8.

[6] See, Chase, Michael. S., & Erickson, Andrew. S. (2012). The conventional missile capabilities of china's second artillery force: Cornerstone of deterrence and warfighting. *Asian Security, 8*(2), pp.115-137. Chinese strategists have tended to shy away from the Western concept of 'preemption'; instead, they have generally preferred to emphasize *'houfa zhiren'*, or "gaining mastery by striking after an enemy has struck", however, Chinese military writings are deliberately ambiguous on the thresholds that, once crossed, would justify a nuclear retaliation - some Chinese analysts suggest, for example, it would include early warning of an imminent nuclear attack. See Morgan, Forrest. E., (Eds.) (2008). *Dangerous thresholds: Managing escalation in the 21st century*. Santa Monica, California: RAND, p.63-64.

[7] The US DOD has described "informatized" conditions as a PLA concept characterized by a "system of systems operations [focus that] requires enhancing systems and weapons with information capabilities and linking geographically dispersed forces and capabilities into an integrated systems capable of unified action." Office of the Secretary of Defense, U.S. Department of Defense, 2014 *Quadrennial Defense Review Report*, U.S. Department of Defense, Washington, D.C. p. 9.

[8] There is no universally agreed definition on what constitutes a "tactical" (or non-strategic) nuclear weapon. This article applies a broad definition of "tactical-theater" weapons defined as: weapons with shorter-range delivery systems; with lower-yield warheads (compared to "strategic warheads"); and usually used by troops or facilities on the battlefield, e.g., short-range missiles, gravity bombs, land mines, torpedoes, as well as short and medium-range ballistic missiles equipped with nuclear warheads. In the context of nuclear deterrence, "tactical" nuclear weapons generally imply a "war-fighting" doctrine, i.e., one that goes beyond the *threat* of punishment that underpins a "minimum deterrence" posture.

[9] Jervis, Robert. (1978) "Cooperation under the Security Dilemma", *World Politics* 30(2), pp.167–214.

[10] Alastair Iain Johnston's article illuminated a Chinese debate about the sort of nuclear posture China should pursue, however, since all the major doctrinal publications and official reports in the subsequent years stressed either a 'minimum' or 'limited' deterrence posture supported by a 'lean and effective' nuclear arsenal, suggests the ideas advocated by the proponents of a more robust nuclear posture were not borne out. Johnston, Alastair. I. (1995-1996) "China's New 'Old Thinking': The Concept of Limited Deterrence", *International Security,* 20(3), p.35.

[11] "Strategic stability" in this context refers where nuclear weapons are unlikely to be used deliberately, accidentally or in an unauthorized fashion by nuclear powers.

[12] Lowering China's threshold in the use of nuclear weapons is *not necessarily* the same as adjusting or lowering its nuclear deterrence. Chinese military writings have tended to stress that the main utility of nuclear deterrence is to impose sufficient psychological fear on the enemy to deter conventional strikes. There has, however, been much debate (within and outside China) on what conditions Beijing may place on the use of nuclear weapons. See, Heginbotham, Eric., (Eds.). (2017). *China's evolving nuclear deterrent*. Santa Monica, C.A.: RAND Corporation, pp. 30-31.

[13] See Norris, Robert S. and Kristensen, Hans M. (2016) "Chinese Nuclear Forces, 2016", The Bulletin of the Atomic Scientists, 72(4), pp.205-211.

[14] See, Yuwen Jingbo and Tang Liwen, "Discussion and Revelation of American 'Quick Global Attack'. Plan," *Journal of the Academy of Equipment Command & Technology*, no. 3 (2013): 60; Chu Shulong, "Maximally Increase Nuclear Deterrence to Deal with the Threat of U.S. and Japan," *People's Daily*, June 4, 2014.

[15] Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," pp. 5-42.

[16] See, Krepon, Michael. 2015. Nuclear postures. *Arms Control Wonk*, 25 February, 2015. http://www.armscontrolwonk.com/archive/404492/nuclear-postures/ (Accessed: July 2, 2016).

[17] Xue Bingjie, "Study on the Development of Contemporary Strategic Warning System," *Military History Research*, no. 3 (2010): 102; Yuwen Jingbo and Tang Liwen, "Discussion and Revelation of American

'Quick Global Attack'. Plan," *Journal of the Academy of Equipment Command & Technology*, no. 3 (2013): 60.

[18] For early Chinese debates on nuclear thinking see, Johnston, A.I. (1995-1996) "China's New 'Old Thinking': The Concept of Limited Deterrence", *International Security,* 20(3).

[19] Heginbotham, Eric, (Eds.). (2017). *China's evolving nuclear deterrent*. Santa Monica, C.A.: RAND Corporation, p.27.

[20] Shou Xiaosong, ed., *Zhanlue Xue* (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013, p. 111.

[21] Pollpeter, Kevin L (2012) "Space, Cyber, and Electronic Warfare: Controlling the Information Domain", in Tellis, Ashley J. and Tanner, Travis. (eds.) *Strategic Asia 2012-13: China's Military Challenge.* Seattle and Washington, D.C.: The National Bureau of Asian Research, pp.163-194.

[22] Zhao Xijun (ed.), *She Zhan (Intimidation Warfare): A Comprehensive Discussion on Missile Deterrence* (Beijing: National Defense UP May 2005), p.78. This title is also known by the US DOD as *'Coercive Deterrence Warfare'*.

[23] The 2015 defense White Paper stated that China's military will adopt "a holistic approach will be taken to balance war preparation and war prevention, rights protection and stability maintenance, deterrence and war-fighting, and operations in wartime and employment of military forces in peacetime". Ministry of National Defense, The People's Republic of China 2015 *China's Military Strategy, 2014*, Information Office of the State Council, Beijing, China.

[24] See, Zhang, Bin. (2015) *China's Assertive Nuclear Posture: State Security in an Anarchic International Order.* New York, N.Y., Chap.3; Routledge; Haynes, Susan T. (2016) *Chinese Nuclear Proliferation: How Global Politics is Transforming China's Weapons Build-up and Transformation.* Lincoln, NE: Potomac Books, pp.44-58.

[25] See Norris, Robert S. and Kristensen, Hans M. (2016) "Chinese Nuclear Forces, 2016", The Bulletin of the Atomic Scientists, 72(4), pp.205-211.

[26] Kristensen, Hans M., Norris, Robert S. & McKinzie, Matthew G. 2006 *Chinese Nuclear Forces and U.S. Nuclear War Planning*, The Federation of American Scientists & The Natural Resources Defense Council, Washington, D.C.

[27] Michael S. Chase and Arthur Chan, *China's Evolving Approach to "Integrated Strategic Deterrence"*, RAND Corporation, Santa Monica, California, 2016.

[28] Jervis, Robert. (1978) "Cooperation under the Security Dilemma", *World Politics* 30(2), pp.167–214.

[29] Erickson, Andrew S. (2015). Showtime: China reveals two 'carrier-killer' missiles. *The National Interest,* September, 2015. Available at: http://nationalinterest.org/feature/showtime-china-reveals-two-carrier-killer-missiles-13769 (Accessed: 16 June, 2016).

[30] Office of the Secretary of Defense, U.S. Department of Defense 2017 *Annual Report to Congress: Military Power of the People's Republic of China, 2017,* U.S. Department of Defense, Washington, D.C., p.61.

[31] Ministry of National Defense, The People's Republic of China 2015 *China's Military Strategy, 2014*, Information Office of the State Council, Beijing, China.

[32] See, Xue Bingjie, "Study on the Development of Contemporary Strategic Warning System," *Military History Research*, no. 3 (2010), p.102.

[33] Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013.

[34] Ministry of National Defense, The People's Republic of China 2015 *China's Military Strategy, 2014*, Information Office of the State Council, Beijing, China.

[35] The US DOD reported that China is developing a strategic bomber with a possible nuclear mission, which would "provide CHina with its first credible nuclear 'triad' of delivery systems", Office of the Secretary of Defense, U.S. Department of Defense 2017 *Annual Report to Congress: Military Power of the People's Republic of China, 2017,* U.S. Department of Defense, Washington, D.C., p.61.

[36] 'Countervalue' (and counterforce) is a category of targets of nuclear weapons, rather than anything inherent in the weapons capabilities themselves. Tsao Kuo-chung, "Mainland Can Attack Taiwan with Miniaturized Nuclear Warheads", *Tai Yang Pao*, 19 Jul. 1999, "Cox Report Hurts Sino-US Relations", *China Daily*, 9 Aug. 1999, http://app1.chinadaily.com.cn/static/reportchina/990809/politics.htm (Accessed: December, 12, 2016).

[37] Office of the Secretary of Defense, U.S. Department of Defense 2016 *Annual Report to Congress: Military Power of the People's Republic of China, 2016,* U.S. Department of Defense, Washington, D.C., p.25.
[38] China is also expected to add MIRVs to its new SSBM launched short-range submarine-launched ballistic missiles (SLBMs) missiles (the JL-2 and JL-3), and its legacy DF-31 ICBM (known as DF-31B). Gertz, Bill. (2016) "China Flight Tests New Multiple-Warhead Missile", *Freebeacon,* 19 April, 2016. http://freebeacon.com/national-security/china-flight-tests-multiple-warhead missile/?utm_source=Freedom%20Mail&utm_campaign=b3e952a4c7WFB_Morning_Beacon_04_19_164_18_2016&utm_medium=email&utm_term=0_b5e6e0e9ea-b3e952a4c7-46005157
(Accessed: July 2, 2016).
[39] Ibid.
[40] See Norris, Robert S. and Kristensen, Hans M. (2016) "Chinese Nuclear Forces, 2016", The Bulletin of the Atomic Scientists, 72(4), pp.205-211.
[41] In December 2015 U.S. DoD officials confirmed China has commenced its first submarine (SSBMs) nuclear deterrence patrols; but they could not confirm whether these SSBMs were armed with nuclear payloads. Office of the Secretary of Defense, U.S. Department of Defense 2015 *Annual Report to Congress: Military Power of the People's Republic of China, 2015,* U.S. Department of Defense, Washington, D.C., p.9.
[42] Office of the Secretary of Defense, U.S. Department of Defense 2016 *Annual Report to Congress: Military Power of the People's Republic of China, 2016,* U.S. Department of Defense, Washington, D.C., p.26.
[43] Ibid. p.26 and p.38.
[44] Pollack, Joshua H. (2015) "Boost-glide Weapons and US-China Strategic Stability", *The Nonproliferation Review,* 22(2), pp.155-164.
[45] U.S. National Air and Space Intelligence Center assessments concluded that the developments of Chinese HGVs are closely associated with its nuclear modernization program.
[46] Ferris, Stephen P. and Keithly, David M. (1999) "Auftragstaktik, or Directive Control in Joint and Combined Operations", *Parameters,* Autumn (3), pp. 118-133.
[47] Jervis, Robert. (1978) "Cooperation under the Security Dilemma", *World Politics,* 30(2), p.187.
[48] China still appears willing to accept an ongoing quantitative inferior position in it nuclear arsenals vis-à-vis the U.S. and Russia (but less so India), as Beijing prioritizes building up its conventional forces, and making qualitative enhancements to its nuclear forces.
[49] The PLA Second Artillery Force (PLASAF) was considered an independent branch and was treated (albeit non-officially) as though it were a military "service". The Commander of the PLASAF became a CMC member in 2004 - together with the respective PLA Navy and PLA Air force Commanders.
[50] Li Xuanliang, Zhang Xuanjie, Li Qinghua, "Xi Jinping Confers Military Banners to Army, Rocket Force, Strategic Support Force Units of the People's Liberation Army and Delivers Speech," Xinhua. Jan. 1, 2016. http://news.xinhuanet.com/politics/2016- 01/01/c_1117646667.htm. (Accessed: March, 2 2016).
[51] Ibid.
[52] Yang, Yujun. (2016). Senior Colonel Yang Yujun, spokesman for the ministry of national defense (MND) of the People's Republic of China, answers reporters' questions at a regular press conference. *Ministry of National Defense, The People's Republic of China,* 30 November, 2016. Available at: http://eng.mod.gov.cn/DefenseNews/2016-12/01/content_4765258.htm (Accessed: 10 June, 2016).
[53] The cyber and space military domains are believed be controlled by the newly commissioned PLA Strategic Support Force (PLASSF).
[54] Chase S., Michael. & Chan, Arthur. 2016 *China's Evolving Approach to "Integrated Strategic Deterrence"*, RAND Corporation, Santa Monica, California. pp. 50-52.
[55] Kang Hao "Meijun shinian zhanzheng qijian de wuqi zhuangbei fazhan" (The development of U.S. military combat capabilities over the next ten years), *Waiguo junshi Xueshu*, No. 6 (2013), pp. 30-33.
[56] Zhang, Hui. (2010) "China's Perspective on a Nuclear-Free World", *The Washington Quarterly,* 33(2), p.147.
[57] The Chinese 'lean and effective concept' differs from the English or French concepts in that it does not require specific thresholds levels of destruction to populations or industrial capacity of adversaries. Rather, China's conceptualization is more subjective and implies a lower threshold; derived in part from the related

concept of 'mutual fragility', see Heginbotham, Eric., (Eds.). (2017). *China's evolving nuclear deterrent*. Santa Monica, C.A.: RAND Corporation.

[58] Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013, pp.233-234.

[59] Yuwen Jingbo and Tang Liwen, "Discussion and Revelation of American 'Quick Global Attack'. Plan," *Journal of the Academy of Equipment Command & Technology*, no. 3 (2013): 60; Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013.

[60] Yu Xijun (ed), Di Er Pao Bing Zhanyi Xue (The Science of Second Artillery Campaigns), Beijing, PLA Press 2004, pp. 298-299.

[61] Christensen, Thomas J. (2012) "The Meaning of the Nuclear Evolution: China's Strategic Modernization and US-China Security Relations", *Journal of Strategic Studies,* 35(4), 450-453.

[62] China modified and subsequently dropped its position on banning anti-satellite weapons (ASATs) in response to the U.S. weaponization (or "counter-space operations") of space.

[63] Fravel, Taylor M. and Medeiros, Evan. (2010) "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure", *International Security,* 35(2), pp.48-87.

[64] Zhao Xijun (ed.), *She Zhan (Intimidation Warfare): A Comprehensive Discussion on Missile Deterrence* (Beijing: National Defense UP May 2005). This title is also known by the US DOD as *'Coercive Deterrence Warfare'*, p.173; Yu, Rong. and Guangqian, Pang. (2009) "Nuclear No-First-Use Revisited", *China Security,* 5(1), pp.81-90.

[65] Ibid. pp.81-90.

[66] Yao, Yunzhu, "China's Perspective on Nuclear Deterrence", *Air and Space Power Journal*, Vol.24, No.1, (Spring, 2010), pp.27-30; Sun Xiangli, "The Development of Nuclear Weapons in China", in Li, Bin. and Zhao, Tony. (eds.) (2016) *Understanding Chinese Nuclear Thinking.* Washington, D.C.: Carnegie Endowment for International Peace, p.92.

[67] This position could be reconciled if China maintained its no-first-use policy, whilst signaling that it would respond to a first strike with limited nuclear war-fighting tactics.

[68] Schelling, Thomas C. (1966) *Arms and influence.* London; New Haven: Yale University Press, pp.69-78.

[69] Li, Bin. and Zhao, Tony. (eds.) (2016) *Understanding Chinese Nuclear Thinking.* Washington, D.C.: Carnegie Endowment for International Peace, p.10.

[70] For recent views from Chinese scholarship on the evolution of Chinese nuclear thinking see, Li, Bin. and Zhao, Tony. (eds.) (2016) *Understanding Chinese Nuclear Thinking.* Washington, D.C.: Carnegie Endowment for International Peace.

[71] Office of the Secretary of Defense, U.S. Department of Defense 2016 *Annual Report to Congress: Military Power of the People's Republic of China, 2016,* U.S. Department of Defense, Washington, D.C., p.4.

[72] Peng Guangqian and Yao Youzhi (eds.) (2005) *The Science of Military Strategy.* English Edition edn. Beijing, China: Military Science Press. p.222.

[73] Glaser, Bonnie, S. & Funaiole, Matthew P. 2016 *China Power: Does China have an effective sea-based nuclear deterrent?* Center for Strategic and International Studies, Washington, D.C.

[74] Norris, Robert.S. and Kristensen, Hans M. (2016) "Chinese Nuclear Forces, 2016", The Bulletin of the Atomic Scientists, 72(4), pp.205-211.

[75] Lewis, John and Litai, Xue. (1994) *China's Strategic Sea-power.* Stanford, C.A.: Stanford University Press, pp.234-235.

[76] External analysts have been unable to verify with any precision whether China has produced tactical nuclear warheads, but the evidence suggests the PLA has made significant progress in the capabilities and support systems necessary to develop nuclear capable cruise and ballistic missiles. U.S.

[77] Chinese strategists have historically referred to these military (or soft) targets as "key-point counterstrikes" and "close defense".

[78] Wilson, Jordan (2016). *China's expanding ability to conduct conventional missile strikes on Guam.* Washington, D.C.: U.S.-China Economic and Security Review Commission, p.7-9.

[79] Zhao Xijun (ed.), *She Zhan (Intimidation Warfare): A Comprehensive Discussion on Missile Deterrence* (Beijing: National Defense University, May 2005). This title is also known by the US DOD as *'Coercive Deterrence Warfare'*.

[80] Ibid. p.17-18.

[81] China successfully tested a ground-based midcourse interceptor in 2010 and 2013.

[82] China still faces several technical challenges in deploying an effective BMD system, most notably space-based early warning systems. Li Bin, "China and the New U.S. Missile Defense in East Asia" (Washington, D.C.: Carnegie Endowment for International Peace, September 6, 2012.
[83] Perrett, Bradley; Sweetman, Bill,;and Fabey, Michael. (2015) "U.S. Navy Sees Chinese HGV as Part of a Wider Threat", *Aviation Week,* 27 January, 2015. http://aviationweek.com/awin/us-navy-sees-chinese-hgv-part-wider-threat (Accessed: April, 6, 2016).
[84] Li, Bin. and Zhao, Tony. (eds.) (2016) *Understanding Chinese Nuclear Thinking.* Washington, D.C.: Carnegie Endowment for International Peace, p.13.
[85] Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013, pp.79-81; Liu Chong, "The Relationship Between Nuclear Weapons and Conventional Military Conflicts", in Li, Bin. and Zhao, Tony. (eds.) (2016) *Understanding Chinese Nuclear Thinking.* Washington, D.C.: Carnegie Endowment for International Peace, pp.149-169.
[86] Kazianis, Hans J. (2015) "Why China Fears US Missile Defenses", *The National Interest,* 28 April, 2015 http://nationalinterest.org/feature/why-china-fears-us-missile-defenses-12449 (Accessed: July 8, 2016). It is difficult from open-sources to ascertain whether these developments were specific reactions to THAAD, or if they were envisaged before THAAD was announced.
[87] Sun Xiangli, *He shidai de zhanlue xuanze: Zhongguo he zhanlue wenti yanjiu* (Strategic choices of the nuclear era: Research on issues in China's nuclear strategy), Beijing: Zhongguo gongcheng wuli yanjiusuo zhanlue yanjiu zhongxin, 2013, p.104.
[88] Johnson, James S. 2017. Washington's perceptions and misperceptions of Beijing's anti-access area-denial (A2-AD) 'strategy': Implications for military escalation control and strategic stability. *The Pacific Review* 30 (3) (4 October, 2016), pp. 271-288.
[89] Chinese strategists still consider the risk of a war over Taiwan's unification as "relatively high" and future conflict would likely be high-intensity "against the background of nuclear deterrence". Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013, pp.99-100.
[90] Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013, p.79.
[91] According to IR theorists one of the main preconditions for the existence of a "genuine" security dilemma between states is that *both* sides harbor non-malign (or "security seeking") intentions.
[92] Butterfield, Hubert. (1951) *History and Human Relations.* London: Collins, p.21.
[93] Jervis, Robert. (1976) *Perception and Misperception in International Politics*. Princeton, N.J.: Princeton University Press, pp.58-117.
[94] Yu Xiaopeng, "Meijun'Konghai Yiti Zhan' jinru zuzhi shishi xin jieduan" (U.S. "Air-Sea Battle" enters a new phase of organization and implementation), *Waiguo Junshi Xueshu*, No. 10 (2013), pp. 1-7.
[95] Erickson, Andrew S., Chase, Michael S. and Yeaw, Christopher. (2012) "The Future of Chinese Nuclear Policy and Strategy', in Holmes, James R. and Yoshihara, Toshi. (eds.) *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon.* Washington, D.C: Georgetown University Press, pp.73-74.
[96] Lebow, Richard N. (1984) "Windows of Opportunity: Do States Jump Through Them?" *International Security,* 9(1), pp. 147-186.
[97] Posen, Barry R. (1992) *Inadvertent Escalation: Conventional War and Nuclear Risks.* Ithaca, NY: Cornell University Press.
[98] Shou Xiaosong, ed., Zhanlue xue (The Science of Military Strategy), Beijing: Jiefangjun chubanshe, 2013, p.101; Friedberg, Avery L. (2014) *Beyond Air-Sea Battle: The debate over US military strategy in Asia.* Abingdon: Routledge for the International Institute for Strategic Studies.
[99] In a recent visit to Seoul U.S. Vice President Mike Pence stated that U.S. missile strikes in Syria and Afghanistan signaled America's resolve on North Korea, and its 'iron clad' security commitment to its regional allies. These reassurances were in part calibrated to cajole Beijing to play a larger role in dealing with North Korea; thus far, the bellicose exchanges between Washington and Pyongyang have not involved U.S. nuclear-armed bombers on nuclear signaling missions.
[100] Yu Xijun, ed., Di'er pao bing zhanyi xue (The Science of Second Artillery Campaigns), Beijing: Jiefangjun Chubanshe, 2004, pp.282-296.