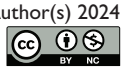
Research Article

China's 'Liquid' Warfighting Shift and Its Implications for Possible Future Conflict

Journal of Asian Security and International Affairs
11(2) 169–189, 2024



DOI: 10.1177/23477970241250100
journals.sagepub.com/home/aia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Abstract

Some suggest that remote, precision strike warfare is a Western phenomenon motivated by aversion to high troop casualties among democratic leaders subject to re-election. Others contend that it is the result of a global transition in the way of modern war towards 'liquid warfare', centred around the disruption of adversary networks in the increasingly integrated and high-tech battlespace. This article advances the debate by applying the liquid warfare hypothesis to China's post-1993 military reforms. It finds (a) that China's development and embrace of its prevailing 'systems destruction warfare' concept constitutes a liquid shift in its warfighting approach, dispelling the contention that such transformations are necessarily linked with democratic political systems; and (b) that the liquidification of China's warfighting approach has immediate implications for possible regional conflict scenarios, particularly those involving the United States, making them mutually costlier and susceptible to rapid escalation.

Keywords

China, military strategy, United States, Taiwan, warfare

Introduction

Intense nuclear arms racing in the 1950s culminated in the new reality of mutually assured destruction, creating credibility problems for strategic postures based chiefly on nuclear deterrence (Powell, 1990). Accordingly, a shift in focus, primarily led by the United States, to building out conventional capabilities took shape in the 1960s (Grant, 2016; Haffa, 1984; Mahnken, 2011). This precipitated a 'revolution' in precision-guidance conventional weaponry that would gain momentum through

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the latter decades of the Cold War (Gillespie, 2009; Mahnken, 2011; Mearsheimer, 1979). By the start of the 1990s, the United States had cultivated a unique capacity for precision-strike warfare on clear display in the First Gulf War, where US-guided munitions decisively defeated numerically superior Iraqi forces (Davis, 1996; Gunzinger & Clark, 2015) in a display of aerial dominance that Fravel (2015) later described as constituting a 'fundamental change in modern warfare'.

This change manifested itself in an increased reliance on remote precision strikes, identified as creating a 'physical and political distance' between attacker and target to minimise attacker's need for ground troops in immediate battle zones (Biegon & Watts, 2020). This brand of remote warfare, effectuated by novel technologies and advanced precision strike weaponry, became a principal modus operandi for the United States and its Western allies in the network of military interventions following 11 September 2001 (Prinz & Schetter, 2016). A primary objective was the debilitation of critical nodes, such as key leaders and command and control centres, with targeted strikes to render adversary forces ineffective without having to directly engage and defeat them on the battlefield (Mutschler, 2016).

Western reliance on these practices led to the hypothesis that the explanation for this observable shift lay in a 'new Western way of war' in which Western states could significantly transfer the risk of warfighting from their own soldiers to adversary combatants by avoiding their own boots on the ground and relying instead on air power (Shaw, 2005). This was seen as particularly attractive to leaders in Western democracies, subject to regular elections and thus particularly sensitive to casualties of their own soldiers and high costs of war (Coker, 2009; Sauer & Schörnig, 2012; Shaw, 2013, 2005). Furthermore, this view suggests that as Western citizenries have become more averse to large-scale military operations in the aftermath of the unpopular Iraq and Afghanistan campaigns, lower-profile remote warfare tactics are essential in 'retooling' the Western approach to force projection in key regions around the world amid rising systemic competition with Russia, China and the Global South (Biegon & Watts, 2020; Hippler, 2017; Neocleous, 2014).

However, as the recent literature on remote warfare illustrates, fighting from a distance and reliance on proxies and precision strikes has not been restricted to Western or democratic countries. In an analysis of the warfighting approach of Saudi Arabia in Yemen, Mutschler and Bales (2024) show that the Saudis were keen to avoid larger deployments of ground troops and, accordingly, relied chiefly on air strikes in carrying out their military intervention in the Yemeni civil war from 2015 onwards. In explaining this result, they draw on Bauman's seminal work on 'liquid modernity' and his recognition of the fast-evolving and variable nature of the contemporary social and geopolitical landscape (Bauman, 2000). According to Bauman, physical occupation of territory 'with its cumbersome corollaries of order-building' inherent in traditional conceptions of power and dominance has 'ceased to be the stake of the global power struggle…' in the ubiquitous, interconnected and globalised world (Bauman, 2001, p. 13).

Mutschler and Bales (2024) suggest that, from such a liquid modernity perspective, the reliance on precision strikes from a distance to destroy the most important nodes of the enemy network without large-scale occupation of territory—a warfighting approach they term 'liquid warfare'—is not the result of the casualty

aversion of democracies, but rather of 'the sheer functionality of this way of war—applying deadly violence at relatively low costs and without responsibilities for order-building' (2024, p. 20). In this view, the increased significance of technological advantage in integrated battle networks, coupled with the decreased utility of traditional wars of territorial domination, is driving a liquidification of modern warfare in which precision strikes to cripple adversary networks is the central objective (Dimitriu, 2020; Engstrom, 2018; Mutchler & Bales, 2024; Mutschler, 2016).

These competing accounts raise the question: which hypothesis reigns? While remote, precision-strike warfare technologies and tactics were largely pioneered by Western democracies, their proliferation and implementation around the globe cast doubt on linkages to any specific polity and, instead, appear indicative of a more foundational shift in the way of modern warfare. Recent analyses have identified and assessed liquid warfighting approaches of non-democratic actors, from the Gulf States and non-state groups in Yemen (Mutschler & Bales, 2024) to Russia and Iran in Syria and around West Asia (Knowles & Watson, 2018; Krieg & Rickli, 2019; Watson & McKay, 2021). Conspicuously absent from the analysis to date, however, is consideration of China, the world's second highest military spender and major military power (Stockholm International Peace Research Institute, 2023).

Though China has not been at war since 1979, its comprehensive military modernisation agenda following the Military Strategic Guideline of 1993 provides a sound case for testing the liquid warfare hypothesis. We conduct a longitudinal analysis, tracing the conception, evolution and implementation of China's 'systems destruction warfare' concept from the early 1990s to 2023, and observe a distinct liquidification of China's warfighting approach in response to its perception of change in the modern battlespace. Following the First Gulf War, China recognised that its prevailing warfighting conception had become outdated and inferior to that of likely future rivals, particularly the United States. It gleaned from diligent study of US campaigns in Iraq and Yugoslavia that modern war was now a high-technology affair between comprehensive battle systems in which information dominance, not physical control of the traditional battlefield, was becoming decisive (Engstrom, 2018; Li et al., 2012; Ping & Yang, 2013). We trace how systems destruction warfare developed as China's carefully crafted approach for this new, high-tech and perceptibly liquid battlespace. Our findings suggest that, even if electoral considerations of democratic leaders once factored in, the transition to a more liquid warfighting approach has become a broader phenomenon linked with the practical nature of modern warfare.

An additional reason we look at China to test the liquid warfare hypothesis is the fact that precision strike warfare has generally been assessed in asymmetric settings in which states apply these tactics against non-state actors, as in the case of the US war on terror (Prinz & Schetter, 2016) or the Saudi intervention in Yemen (Mutschler & Bales, 2024). Looking at China's turn towards liquid warfare provides the opportunity to consider the potential consequences of such a warfighting approach in a symmetrical setting, as China's prime military focus has become potential competition with the United States. As tensions between China

and the United States have risen, so too has the prospect of a military clash between the two powers playing out in Southeast Asia (Can & Chan, 2022; Tayloe, 2017). We note that China's liquid transition has important implications for these potential conflict scenarios.

What may well have been a quick victory for the United States at the time of the 1995–1996 Taiwan Strait Crisis (Cunningham, 2022; Work & Grant, 2018) is now predicted to be a 'bloody mess' with 'terrible loss of life' which the United States might 'lose' in the 2020s (Katz & Insinna, 2022; US Department of Defense, 2018). We find that China's embrace of a liquid warfighting approach has played a pivotal role in explaining this remarkable transformation in expected outcomes. While Western analyses have tended to focus on specific Chinese military capability sets (Cliff, 2015; Dobbins et al., 2017; Erickson, 2016; Heginbotham et al., 2015; Kania, 2019; Laskai, 2018), our analysis, encompassing the broader shift in Chinese warfighting approach, enables us to identify two principal factors associated with liquid warfare tactics—(a) degradation of conflict cost[1] management control, and (b) the 'deaf, dumb, blind' effect—that elevate conflict cost by reducing control over risk. This diminution in control, in turn, has the effect of exacerbating escalation potential once conflict is already underway. These findings indicate that any cost or risk transfer benefits identified by the Western way of war thesis in asymmetric settings cannot be expected to apply to a symmetrical China–US conflict in which both parties employ sophisticated liquid warfighting tactics effectuated by advanced precision weaponry.

The article proceeds in four sections. The first elaborates on the debate between the Western-democratic warfare and liquid warfare hypotheses and provides a more detailed account of the latter. The second then tests the liquid warfare hypothesis against the case of China's post-1993 military reforms. Here we suggest that the Chinese shift to systems destruction warfare features an observable liquidification of warfighting approach and thus lends support to the contention that a broader shift in the way of modern warfare lies at the heart of shifting warfighting trend and that any electoral considerations by democratic leaders is secondary. The third section considers the implications of China's liquid shift for regional conflict, particularly with the United States. Here we find that China's systems destruction warfare approach has specific consequences that drive up conflict cost potential such that a possible military confrontation between China and the United States in the region would likely assume catastrophic proportions for both parties. In the fourth section, we summarise our findings and consider their ramifications for regional security dynamics.

Detailing the Liquid Warfare Hypothesis

The liquid warfare hypothesis is derived from the seminal work of Bauman on 'liquid modernity' (Bauman, 2000). He uses the metaphor 'liquidity' to capture the fast-paced and variable nature of the modern social and geopolitical landscape. '[E]scape, slippage, elision and avoidance' have become the 'prime technique of power', which includes the 'effective rejection of any territorial confinement

with its cumbersome corollaries of order-building, order-maintenance and the responsibility for the consequences of it all as well as of the necessity to bear their costs' (2000, p. 11). In solid modernity—reaching its peak with nineteenth century imperialist competition—power was based on direct exploitation of territorial resources. Liquid modernity, by contrast, sees state power as emanating from industrial capacities. 'Ascendancy over a territory, and even more so the administration and the management of its population, has ceased to be the stake of the global power struggle…' (Bauman, 2001, p. 13). Accordingly, the utility of traditional wars of territorial conquest has declined (Dimitriu, 2020).

Based on the insights of Bauman, Mutschler developed the concept of 'liquid warfare', defined as 'a way of war that does not aim to control territory, but aims to destroy the forces and/or infrastructure of the enemy in order to break his will' (2016, p. 13). A central motivation underlying this way of war is the avoidance of responsibilities and costs inherent in the control of territory (Demmers & Gould, 2018; Mutschler, 2016). Mutschler and Bales (2024) further built this conception into a warfighting typology, distinguishing between 'solid' and 'liquid' warfare. The former is closely linked with the aim of territorial control. It can be defined as organised violence by military means to control a particular piece of land, principally through the deployment of military forces across the broader area, be it land or sea, forming a medium- to long-term presence. By contrast, liquid warfare seeks to destroy or destabilise critical adversary networks by targeting pivotal nodes therein—often by means of precision strikes from a distance (Mutschler & Bales, 2024).

To be clear, the liquid warfare perspective neither postulates that liquid warfare is a new phenomenon nor contends that warfare has been transforming in an ever more liquid direction over the course of history. As Mutschler and Bales (2024) point out, elements of both liquid and solid warfare should be expected across the history of war. What lies at the core of the liquid warfare hypothesis, however, is that the reliance on strikes from a distance to destroy the most important nodes in an adversary's network without large-scale occupation of territory does stem primarily from the reduced significance of territorial conquest in the growingly high-tech and interconnected modern world (Mutschler, 2016; Mutschler & Bales, 2024). The functionality of this way of war, effectuated by sophisticated precision weaponry, permits the benefits of power projection without the traditional responsibilities for order-building.

This challenges the view that the desire to minimise the costs of war by leaders in Western democracies, concerned with re-election prospects, is the prime motivation for the observable changes in modern warfare tactics (Coker, 2009; Sauer & Schörnig 2012; Shaw, 2005). Shaw (2005), for example, speaks of a 'new Western way of war' that he also calls 'risk-transfer war', as Western governments transfer the risks of military intervention from their own soldiers to enemy adversary combatants and, to a lesser degree, civilians in adversary lands. While this risk-transfer perspective appears plausible, it cannot explain why non-democratic states appear also to be transitioning to a way of war that shifts the focus from ground troops and territorial control towards precision strikes against enemy battle networks. By contrast, the liquid warfare hypothesis offers an account that explains this shift across the board.

The China Test Case

Shifts in warfighting approach have generally been understood in terms of precipitating external factors. Scholarship in this area has developed a well-established external cause model, explaining transitions within a given state as the result of immediate external threats for which existing strategy is insufficient, changes in a target adversary's strategy, the advent of novel roles or mission types for the military, the presence of new warfighting capabilities, and a general competitive drive between states (Fravel, 2018; Rosen, 1994; Waltz, 1979). Scholars considering China's military overhaul from the 1990s onwards have drawn from these factors, pointing to, inter alia, advancements in American weapons technology and strategy (Ferguson, 2000; Nacht et al., 2018; Turner Haynes, 2016; Zhang, 2015) and perceptions of threat (Nathan & Scobell, 2012; Roy, 2003; Work & Grant, 2019).

While these accounts contribute pieces to the puzzle, Fravel explains that traditional external cause model explanations 'remain incomplete' (2018, p. 43). He contends that '[a]nother possible motivation for a change in strategy is a shift in the conduct of warfare in the international system…' that 'demonstrate[s] the importance or utility of new ways of fighting or reveal[s] new vulnerabilities that need to be addressed'. He notes that 'shifts in the conduct of warfare should be especially powerful if a gap exists between a state's existing strategy and the requirements of future warfare' as in the case of China in the early 1990s (2018, p. 43). We suggest that this 'shift in the conduct of warfare' was the transition towards greater liquidity in modern warfighting. In the 1990s, China recognised that this shift was taking place and that its contemporaneous warfighting approach was becoming outdated and inferior in the modern battlespace. This awareness spurred large-scale military modernisation efforts and foundational reforms, leading to China's embrace of its perceptibly liquid systems destruction warfare approach.

Conception of a New Warfighting Approach

'Political power grows out the barrel of a gun'. With these famous words, Mao Zedong expressed the significance of military strength to the newly established People's Republic of China in protecting the fledgling nation from conquering powers. The first five military strategic guidelines, spanning from 1956 to 1980, had 'defence of the motherland', first from the United States and then from the Soviet Union, as the primary focus (Fravel, 2019). Deng Xiaoping's vision for future development saw a shift in orientation away from military might to economic growth as a means of growing China's international influence and, accordingly, embraced a lower-profile military strategy (Vogel, 2013).

A series of incidents in the 1990s, however, led China to re-evaluate this approach. The first significant event was the First Gulf War of 1990–1991. It was here that the United States first demonstrated the extraordinary power of advanced military technologies. Despite clear numerical inferiority, American forces made use of precision-guidance weaponry to decimate Iraqi defences in what has been

described as an 'unprecedented development in aerial warfare' (Correll, 2010). This was a frightening incident for China, as Iraqi forces were at the time comparable, if not superior, to those of the Chinese and China had long placed an emphasis on numerical superiority in its warfighting approach (Nacht et al., 2018).

China's military command was particularly perturbed and, following the war's conclusion, the Central Military Commission (CMC), China's highest national defence body, was convened to discuss what had just been witnessed. Lui Huaqing, Vice Chairman of the CMC, provided that, in light of apparent advancements in military capabilities, China must consider 'how to fight a future war', using the Gulf War as a primary case study (Liu, 2008). The CMC's assessment arrived at several key conclusions. The first was a recognition of the central role that high technology had now assumed in modern warfare. The second was that the Gulf War was likely emblematic of the type of future conflict scenarios in which China could find itself. The third was that China was miserably ill-prepared to wage such wars, 'lag[ging] far behind in weapons and equipment…' (Ming, 2011, p. 145).

A 'major change' in China's military strategy followed (Fravel, 2018). The 1993 Military Strategic Guideline envisioned a fundamentally new strategic direction. Predecessor guidelines had been concerned with countering foreign invasions of the Chinese homeland by means of a territory-centric warfighting approach. These traditionally solid tactics included 'positional warfare', involving the defence of specific fortifications, and 'luring the enemy in deep' before wearing it down with 'guerilla' tactics (Fravel, 2018). Jiang Zemin, General Secretary of the Chinese Communist Party and chair of the CMC, made explicit that this approach had become outdated and inferior, explaining that future war is 'likely to be a high technology confrontation' and that any party lacking this capability would find itself in a 'passive position' (Ming, 2011, p. 285). Accordingly, the focus must be placed on battle 'under modern high technology conditions' (Ming, 2011, p. 285).

This new agenda would be propelled by two additional events. The first of these was the 1995–1996 Taiwan Strait Crisis. Enraged by the issuance of a visa to Taiwanese President Lee Teng-hui in June 1995, a perceived deviation from the US One China Policy, President Jiang ordered missile tests and the mobilisation of troops. The United States responded with an impressive flex of its military muscle, sending a succession of battleships through the Taiwan Strait. In response to an additional round of missile tests in March 1996, the United States sent a second convoy through the strait, this time forcing China to relent and exposing its military inferiority. The incident confirmed for China that Taiwan could someday lead precisely to the new kind of war for which it was now preparing (Allison & Glick-Untenman, 2021).

The second incident was the North Atlantic Treaty Organization's military intervention in Kosovo. The operations again featured the use of advanced American weaponry, providing further case study material in high technology modern warfighting for Chinese strategists to study. It was, however, the readiness of a US-led military coalition to initiate proceedings outside of the United Nations—and the spectre of such an intervention in Taiwan—that sounded alarm bells in Beijing (Nacht et al., 2018). Furthermore, the 1999 US bombing of the

Chinese embassy in Belgrade, though professed to be accidental, was construed as a message putting China on notice.[2]

The new military course was thus set with winning 'local wars under high technology conditions' as the ultimate destination. Though the overtly low-profile posture would not dissipate until the arrival of Xi Jinping, the 1993 Military Strategic Guideline pointed the strategic compass towards creation of an elite force prepared to succeed on the modern battlefield.

The Shift to 'Systems Destruction Warfare'

Chinese strategists discerned how precision US strikes on key operational nodes 'limited, deprived and rendered useless' the functioning ability of both Iraqi and Yugoslav forces. They concluded that modern war was no longer a strict confrontation between forces on a battlefield, but instead had become a contest between competing adversary 'operational systems' [作战体系] (Li et al., 2012; Ping & Yang, 2013). The key to victory in modern high-tech war, labelled 'systems confrontation' [体系对抗], lay no longer in traditional notions of dominion over the physical domains of air, land and sea, but rather in superiority in the non-physical cyberspace, electromagnetic and psychological realms, necessitating multidimensional, multifunctional force capabilities to disrupt key nodes in integrated adversary battle networks (Engstrom, 2018; Zhang & Yi, 2010).

China revamped its warfighting approach accordingly in what Work and Grant (2019) term an 'offset strategy with Chinese characteristics'. They articulate 'five reinforcing lines of effort' serving as the structural buttresses:

(1) developing 'industrial and technical espionage and civil-military fusion' to expeditiously close the gap with the United States,
(2) cultivating 'capabilities and concepts' needed to implement new strategic initiatives,
(3) ensuring an effective first strike ability to penetrate United States battle network defences by 'amassing an arsenal of long-range precision missiles and advanced targeting systems',
(4) securing 'assassin's mace' or 'black capabilities' to be held secret for surprise use in battle, and
(5) becoming the 'world leader in artificial intelligence' with heavy military application (2019, pp. 5–6).

These 'reinforcing lines' ultimately merge in the tactical warfighting approach of 'systems destruction warfare' [体系破击战] (Dang & Zhang, 2009). Where Chinese military strategists saw previous military operations as 'linear' and proceeding from 'front to the rear, from outside to inside, from forward positions to deep positions, and unfold[ing] based on an order from first to last' with clear frontlines, they recognised that success in modern battle necessitated 'nonlinear' joint operations, spanning warfighting domains and occurring continuously throughout battle (Dang & Zhang, 2009, pp. 98, 122).

China's systems destruction warfare approach to this modern way of systems confrontation war was built around the distinctly liquid tactic of 'strik[ing] the enemy's [critical] nodes to destroy his network' and 'degrade or disrupt the flow of information within an adversary's operational system' (Engstrom, 2018, p. x; Peng & Yao, 2001, p. 464). Just as was demonstrated by targeted US strikes on Iraqi and Serbian command and control infrastructures, Chinese strategists contended that disabling pivotal nodes in an adversary's integrated battle system would 'paralyse the enemy' resulting in it 'los[ing] the will and ability to resist' (Dang & Zhang, 2009; Engstrom, 2018). These targeted attacks would be carried out by an 'integrated combat force… employed to prevail in systems-to-systems operations featuring information dominance, precision strikes and joint operations' (State Council Information Office, 2015; Zhang & Yi, 2010).

In studying US operational systems in the Gulf and Kosovo wars, Chinese analysts isolated pivotal US battle network nodes, described by Work and Grant as the 'interlocking grids' facilitating joint operations. The first is the sensor grid, a network of sensors from the deep sea to outer space that enables comprehensive observation of the battlespace. The command, control, communication, computers, intelligence, surveillance and reconnaissance (C4ISR) grid then processes these observations from the sensor grid and determines which specific actions are needed to advance campaign objectives. Orders are then relayed to the effects grid, which effectuates kinetic and non-kinetic strikes in accordance with C4ISR determinations. Together these grids collectively 'form theater "kill chains" to find, fix and finish intended targets' (2019, p. 7). Chinese strategists noted that disruption of these grids 'results in the [US] carrying out isolated instead of concerted campaign operations, thus degrading [its] overall combat capabilities' and creating force vulnerabilities that could then be exploited (Cliff et al., 2007, p. 37).

Implementation

To implement systems destruction warfare, China has gone about acquiring the precision strike capabilities needed to put its liquid warfighting approach into practice. Project 995, or the 'New Type High Technology Weapons Plan' [新型高科技武器计划, 995计划], was launched in May 1999 to rapidly achieve parity with the United States in precision guidance (Cheung, 2017). The instrumentalisation of these new capacities has made the Chinese ballistic missile development programme 'the most active and diverse… program in the world' (US Defense Intelligence Ballistic Missile Analysis Committee, 2017, p. 3), significantly expanding the Chinese arsenal. China now possesses large stores of ground-launched ballistic and cruise missiles with impressive ranges between 500 and 5,500 km (US Office of the Secretary of Defense, 2020). These extensive stocks of conventional guided munitions undergird China's robust A2/AD envelope, currently covering Taiwan and the First Island Chain, and anticipated to encompass the Second Island Chain by 2025 (Allison & Glick-Untenman, 2021; Office of the Secretary of Defense, 2020). China is also in the process of enhancing its arsenal

of intercontinental ballistic missiles capabilities, including development of novel conventionally-armed within this range class (US Department of Defense, 2023).

China has also cultivated advanced hypersonic capabilities (Sayler, 2023). These weapons are the ultimate facilitator of remote precision warfare 'by providing the ability to strike targets more quickly, at greater distances, and with greater firepower' (Ashley Jr., 2018). China has successfully tested hypersonic glide vehicles, such as its solid-fuelled, ballistic Dongfeng-17 missile, along with its advanced, nuclear-capable Fractional Orbital Bombardment System, described by former Vice-Chairman of the US Joint Chiefs of Staff, General John Hyten, as 'stunning' (Duster, 2021). Such advancements place China 'years' ahead of the United States (Allison & Glick-Unterman, 2021).

In addition to its kinetic achievements, China has invested heavily in counter-battle network capabilities for use in 'informatised' battle, the object of both the 2004 and 2014 strategic guidelines, entailing use of 'electronic warfare, cyber, computer network attack, information operations, and deception to destroy the integrity of any US battle network' (Cheng, 2016; Work & Grant, 2019, p. 8). US dependence on space-based support for its expeditionary ground forces has also led to large-scale development of counter-space systems, including directed energy and co-orbital weapons (Harrison et al., 2018). Collectively, China's comprehensive military modernisation efforts have seen it considerably close the military gap to the United States and become one of the most advanced and capable militaries in the world (Heginbotham et al., 2015).

Test Case Summary

The liquid warfare hypothesis suggests that Fravel's identified 'shift in the conduct of warfare in the international system' can be understood as a general shift towards more liquid conceptions of warfare. This is not to say that traditional solid warfighting tactics have been entirely replaced by liquid ones, but instead that the US employment of liquid warfare in the Gulf and Kosovo wars precipitated a sea change in modern warfare that has subsequently driven international approaches to warfighting in a liquid direction. Our review of China's post-1993 military modernisation agenda indicates that the strategic reforms, guided by the question of 'how to fight a future war' against the United States and other high technology adversaries, reflect this transition and, accordingly, lend support to the liquid warfare hypothesis.

This finding contributes further evidence for the position that development and acquisition of precision strike technology by non-democratic states not only impacts their warfighting capabilities, but also transforms their warfighting approach, moving it in a liquid direction. We suggest that this result is significant, as we find that liquid warfare has the effect of driving up conflict cost and heightening rapid escalation risk in the context of symmetrical conflict between militarily advanced state adversaries, like China and the United States. In the next section, we draw from recent wargame simulation data to show how China's systems destruction warfare approach could play out in regional conflict with the United States and illustrate how our identified conflict cost factors operate in elevating cost potential and escalation risk.

Implications for Potential China–US Conflict in Southeast Asia

China's cultivation of an advanced liquid warfighting approach has immediate implications for potential regional conflict scenarios in which it might become involved. One potential context that is receiving much attention is a possible military confrontation with the United States over Taiwan. Widely acknowledged is the high anticipated cost of such a conflict, should it eventuate, and the observation that these likely costs have steadily risen from the 1990s onwards (Brose, 2020; Gompert et al., 2016; Ochmanek, 2019). While extensive Western analysis of this phenomenon has tended to focus on advancement of Chinese capabilities as a principal explanation (Cliff, 2015; Dobbins et al., 2017; Erickson, 2016; Heginbotham et al., 2015; Kania, 2019; Laskai, 2018), we suggest that, above and beyond this preoccupation with specific weapon systems, macrolevel consideration of China's shift to a liquid warfighting approach helps elucidate this higher expected battle toll. We identify two specific cost increase factors associated with liquid warfare—(a) degradation of cost management control, and (b) the 'deaf, dumb, blind effect'—and show how their combined effect increases conflict escalation risk. Figure 1 illustrates the relationship between these factors.

Degradation of Cost Management Control

Throughout much of the history of warfare, commanders of belligerent parties enjoyed wide discretion over which forces and assets to send into battle and, accordingly, risk

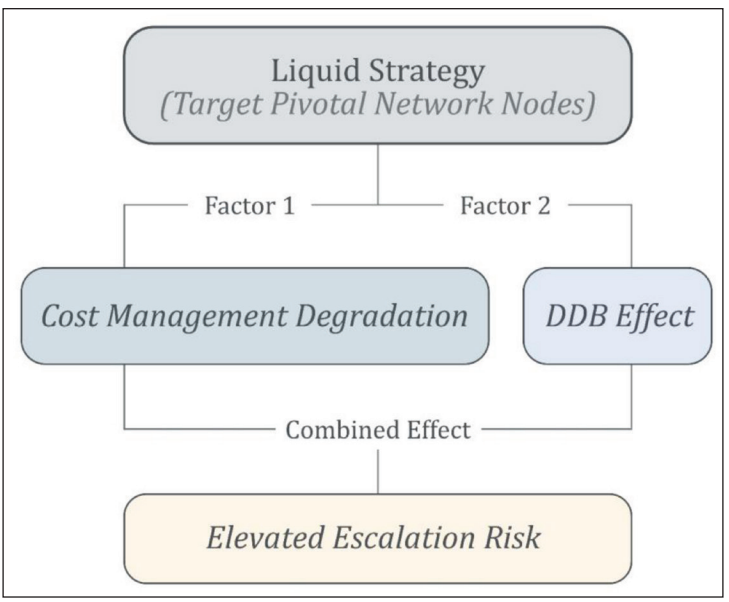

Figure 1. Liquid Conflict Cost Increase Factors.

losing. Under solid warfare conditions, battles centred around frontlines and contested places. The further forces were removed from these locations, the less prone they usually were to attack. Controlling the placement of forces relative to the frontlines of battle was thus a means of managing the costs of conflict. However, under warfighting conditions where the parties are employing liquid strategies effectuated by long-range precision strike capabilities, control over possible losses becomes much more difficult. Critical assets not deployed in the immediate proximity of battle can nonetheless become targets of attack, while the efficacy of advanced modern weaponry makes defence of these assets difficult or impossible.

At the time of the 1995–1996 Taiwan Strait Crisis, the United States sent two carrier battle groups through the strait with confidence that the Chinese were 'incapable of even tracking US naval surface groups, let alone possessing the means to stop a US intervention to defend Taiwan' (Work & Grant, 2019, p. 4). Had an armed conflict broken out, Chinese 'sensor grids were incapable of long-range targeting; their [command and control] grids were incapable of sensor fusion and directing effects-based operations; and their effects grid relied almost entirely on unguided or unsophisticated guided weapons' (2019, p. 5). Today, China's comprehensive systems destruction warfare approach, effectuated by a suite of advanced precision capabilities, would hold a lot more than just these dispatched fleets at risk. 'US military bases and logistics networks, even including those located within the US itself', would be susceptible to largely indefensible and debilitating attack (Beckley, 2019).

A 2022 open-source wargame simulation of China–US conflict over Taiwan conducted by the Center for Strategic and International Studies (CSIS) graphically bears this out with 'devastating' Chinese attacks on remote US bases in Japan and Guam. The simulation assumes that Japan remains neutral, but permits the United States to station troops and supplies at bases in Kadena, Iwakuni, Yokota and Misawa. These bases, though removed from the frontlines of battle, are of 'tremendous value' for the conduct of US combat operations. Indeed, CSIS suggests that the 'ability to operate US bases in Japan is so critical to US success that it should be considered a sine qua non for intervention'. US aircraft based in Japan can 'escort bombers coming from Alaska or Hawaii' and 'spend more time over Taiwan conducting air superiority operations' with less frequent aerial refuelling (Cancian et al., 2023, pp. 112, 116).

Precisely because of the significance of these bases within US battle networks, they become an important target in China's liquid warfighting approach. The CSIS simulation shows that the Chinese team repeatedly attacked the Japanese bases with debilitating remote strikes. Chinese precision capabilities, including tactical ballistic missiles, ground-launched cruise missiles and air-launched cruise missiles, augmenting ground-based systems, can 'blanket all of the military air bases in Japan' in conducting 'highly effective' attacks, 'destroying hundreds of massed US and Japanese aircraft on the ground' (Cancian et al., 2023, p. 113). Furthermore, this result is indefensible. 'China's inventory of missiles means that even if active defenses are highly effective… the sheer volume of [Chinese] fire [can] overwhelm US active defenses' (Cancian et al., 2023, p. 127). The Chinese team also struck the US

Andersen Air Force Base in Guam in every iteration of the simulation, 'crippling' the outpost with missile strikes and effectively 'negating it as a base' (Cancian et al., 2023, pp. 87, 98).

US naval assets, another critical network node, also fell victim to devastating Chinese attack. In all base simulations, the United States lost two aircraft carriers and 'between 7 and 20 other major surface warships' (e.g., destroyers and cruisers). While 'these losses were partly an artifact of US forward deployment…', they also reflect the 'vulnerability of surface ships to large [Chinese] salvos of modern anti-ship missiles'. Even 'with the base case assumption that shipborne missile defense works very well…', Chinese 'salvos exhausted the ships' magazines of interceptors' as there were 'simply too many attacking missiles to intercept' (Cancian et al., 2023, p. 88).

Though in the CSIS simulation, the effect of the 'new domains' of space and cyber was 'relatively static' (Cancian et al., 2023, p. 115),[3] insights from recent classified wargames indicate that the Chinese side used cyberattacks to unexpectedly debilitate US capabilities (Allison & Glick-Unterman, 2021). Additionally, cyber operations could have substantial economic and social costs, above and beyond military costs. The CSIS simulation suggests that the United States could 'suffer damage to civilian and economic infrastructure' with catastrophic cost potential, should conflict escalate (Cancian et al., 2023, p. 143).[4]

Deaf, Dumb and Blind Effect

C4ISR capacities play a central role in modern combat operations. Hence, they are among the pivotal nodes subject to targeting in liquid warfighting strategies. Disruption of a belligerent party's command, control and communication networks, as well as its intelligence standing, directly undermines its ability to carry out its objectives and creates critical vulnerabilities. One of these is protection of deployed forces, rendering them more susceptible to costly attack. This was graphically exemplified in the First Gulf War when the United States nullified critical Iraqi battle networks, rendering Iraqi troops ineffective and exposed to debilitating strikes. China's systems destruction warfare approach centres around the attainment of 'comprehensive dominance', or advantage in all domains of battle with particular focus on information superiority (Engstrom, 2018; Zhang & Yi, 2010). In executing this approach, China has developed sophisticated means, including electronic, cyber and kinetic attacks, for frustrating adversary C4ISR. With specific regard to the United States, China has cultivated the means to carry out crippling strikes on 'command and control networks that manage the flow of critical information to US forces…' with the result that they are left 'deaf, dumb and blind' (Allison & Glick-Unterman, 2021, p. 15).

Wargame simulations indicate that China's disruption of US C4ISR infrastructure would be disastrous for the United States. Commenting on a classified wargame from late 2020, US General John Hyten stated that the United States 'failed miserably' in simulated conflict with China because of targeted Chinese

attacks on pivotal communications networks (Vandiver, 2021). He further provided that the 'red team', playing the role of China, 'ran rings around us' because 'they knew exactly what we were going to do before we did it'. Speaking to other classified games, Brose noted that these key US communications systems were 'shattered by [Chinese] electronic attacks, cyberattacks and missiles', exposing critical vulnerabilities and frustrating both offensive and defensive actions (Brose, 2020, p. xiii).

The CSIS simulation illustrates the conflict cost consequences of China's ability to challenge US information dominance with its systems destruction warfare approach, indicating the United States 'would suffer tremendous damage to its military' (Cancian et al., 2023, p. 143).[5] Forward deployed troops incur 'crippling losses from Chinese missile attacks' to such an extent that the United States would 'sustain as many personnel casualties in a month of such a conflict as in 20 years of wars in Iraq and Afghanistan', creating a 'shock' for the US population 'unaccustomed to significant military losses', and potentially causing 'strategic disillusionment' (Cancian et al., 2023, pp. 115, 144). In terms of military equipment, the losses would also be 'high'. In all 24 iterations of the CSIS simulation, the United States loses two aircraft carriers and 'between 7 and 20 other major surface ships', as well as an 'average of 200 to 500 aircraft' (Cancian et al., 2023, pp. 88, 144). Such losses, particularly the naval assets, would take more than a decade to rebuild and would 'damage the US global position for many years' to follow (Cancian et al., 2023, p. 1).

Increased Escalation Risk

The combined effect of the first two factors drives an increase in the risk of escalation, which, in the case of nuclear armed adversaries, like China and the United States, bears enormous cost potential. One escalation pathway exacerbated by liquid warfare tactics is inadvertent escalation through the crossing of red lines. Acton (2018) describes how strikes on C4ISR assets can generate 'escalation through entanglement' if 'dual-use' installations—namely, those that also facilitate nuclear command and control functions—become subject to attack (Talmadge, 2019). Furthermore, a second pathway stems from significant loss of a belligerent party's operational capacity due to a lack of cost management control. This can drive the belligerent into a corner, leaving it with no choice but to back down or escalate. If the former is not a viable option for political or other reasons, the belligerent might intentionally proceed up the escalation ladder to escalate-to-de-escalate and, thereby, ward off defeat.

This elevated escalation risk was graphically born out in a 2022 open-source simulation of a China–US conflict over Taiwan by the Center for a New American Security (CNAS), which involved just a single game iteration that culminated in the detonation of a nuclear weapon. A 'key insight' from the game was that 'a conflict over Taiwan may quickly lead to consequences far beyond what Beijing and Washington intend' (Pettyjohn et al., 2022, p. 1). The report authors note that 'before they knew it, both Blue [US] and Red [China] had crossed key redlines', inducing

an escalation that 'was less of a gradual and controlled climb to the top [of the escalation ladder] than a quick race to the bottom, where both teams had fallen off their ladders and ended up in unchartered territory' (Pettyjohn et al., 2022, p. 7).

The degradation of cost management control factor played a pronounced role in propelling this quick escalatory progression:

> After Red attacked Blue forces on bases in Japan and Guam, the conflict spiraled in a series of tit-for-tat escalations, as each team attacked the other's territory more aggressively in response to prior attacks… In response, the Blue team used bombers to launch cruise missile strikes at Red ships in port… The situation quickly increased the scope and intensity of hostilities (Pettyjohn et al., 2022, p. 6).

The risk of one side 'thwarting' the other's operational capacity—through indefensible attacks on critical battle network nodes—encouraged pre-emptive strikes. As a result, 'escalations increased with each passing turn' with, for instance, China 'launching a cruise missile strike at US bases in Hawaii in retaliation for Blue attacks on its ports' (Pettyjohn et al., 2022, p. 6). Efforts to 'degrade… command and control and targeting'—or attacks on C4ISR infrastructure to induce the deaf, dumb, blind effect—also had escalatory implications. US attacks on China's Eastern Theater Command and early warning radars on Chinese territory provoked intended Chinese strikes on the continental US homeland (Pettyjohn et al., 2022, p. 6).

The CSIS simulation also addresses the inextricable link between liquid warfare and conflict escalation risk. The summary report considers the 'ongoing debate about whether the US would strike targets on mainland China during a conflict' (Cancian et al., 2023, p. 71). While implementing the liquid tactic of attacking 'high-value' network nodes, such as 'over-the-horizon radar, satellite uplink stations, and high-value aircraft', with precision strikes and high-tech means would significantly disrupt the operability of Chinese battle systems, it would unavoidably 'create grave risks of escalation' as played out in the CNAS simulation (Cancian et al., 2023, pp. 71, 122).

Summary of Implications for Potential Regional Conflict

China's embrace of the systems destruction warfare approach has immediate implications for regional conflict. In the context of a military clash with the United States, possibly over Taiwan, we suggest that the liquidity of China's warfighting approach, not just its advanced precision capabilities, is an important factor in driving up anticipated conflict costs. Should a China–US war develop, the likely reality would be very different today than it was in the mid-1990s before China's strategic overhaul. In addition to the range of key assets that would be vulnerable to precision Chinese strikes, including those far removed from the battlefield, the United States would find the information dominance it enjoyed in the Gulf and Yugoslav campaigns directly challenged, impeding its ability to effectively implement its military objectives and safeguard its combat forces. Furthermore, it would find hostilities rapidly intensify with grave escalation risk. In short, our

identified cost increase factors would feature prominently in a clash between advanced militaries employing liquid warfighting strategies.

Conclusion

The initial US lead in precision strike weapons technology, coupled with the heavy reliance on remote precision warfare tactics by Western powers in the post-9/11 military interventions, led to the contention that a 'new Western way of war' had taken shape—one guided principally by the risk aversion of Western leaders subject to democratic electoral processes. While plausible, this narrative fails to account for the proliferation of comparable warfighting approaches among non-Western, non-democratic state and non-state actors. Here, the liquid warfare hypothesis offers an alternative account, postulating a broader shift in the way of modern war away from cumbersome territorial dominion to effective power projection through disruption of adversary networks and information dominance in the fast-paced and interconnected digital age.

In this article, we have endeavoured to advance this debate by first addressing the case of China's post-1993 military transformation which had not previously been examined from a liquid warfare perspective. We conduct a longitudinal analysis to observe a liquid shift in China's warfighting approach with its contemplation, embrace and implementation of systems destruction warfare over the period from 1990 to 2023. We find that this approach followed from a recognition by Chinese strategists that the key to success in the modern battlespace against a high-tech adversary now hinged on the ability to win a 'systems confrontation' war. This, in turn, necessitated a distinctly liquid warfighting approach, centred around disruption of pivotal nodes within the adversary's battle system.

Second, we consider the implications of this liquidification of China's warfighting approach for possible regional conflict, in particular with the United States. Here we draw from recent wargame simulation data to identify how the employment of liquid approaches might play out. In so doing, we provide a systematic analysis of symmetrical conflict, albeit hypothetical, in which states practicing liquid warfare with advanced precision capabilities square off against one another. We identify two liquid conflict factors—degradation of cost management control, and the deaf, dumb and blind effect—which we find combine to increase conflict cost potential and, ultimately, exacerbate the risk of expeditious conflict escalation.

Together, our findings (a) lend further support to the notion that remote precision warfare is a global phenomenon, independent of any one particular type of political system, and (b) indicate that future wars between militarily advanced actors under liquid warfighting conditions will likely be costly escapades laden with escalation danger. As tensions have risen since the August 2022 visit by a US congressional delegation to Taipei, there is real cause for concern surrounding the possible outbreak of a China–US conflict over Taiwan. Such a clash between advanced militaries employing liquid warfighting approaches can be expected to

entail enormous mutual costs, both in terms of personnel and equipment, with the prospect of a culmination in nuclear weapons use.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

This work was funded by grants from the Gerda Henkel Foundation (Project: AZ 10/KF/22) and the German Research Foundation (Project-ID: 441237472). We express our gratitude to these organisations for making the research that led to this article possible.

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Notes

1. For purposes of this article, we focus on military losses, understood in a recent RAND study as 'losses relative to pre-war capabilities, losses of each side compared with the other, and residual warfighting capabilities, all of which would bear on both the ability and will to continue fighting' (Gompert et al., 2016, p. 33).
2. China and the United States had essentially been allies through the latter stages of the Cold War since the establishment of diplomatic relations in 1979; China's expanding regional and global influence set the stage for tensions.
3. The simulation report authors specifically 'caution' that the wargame 'did not explore either of these domains [of space and cyber] with classified information' and that 'classified information might have an impact' (Cancian et al., 2023, p. 115).
4. For a more detailed discussion of possible economic costs of following from US–China conflict, see Gompert et al. (2016).
5. It should be duly noted that China is envisioned in the CSIS simulation and other simulations to also suffer extensive losses. A full-blown conflict scenario would, by all accounts, prove devastating for both sides. We emphasise the potential costs to the United States to highlight the effects of China's liquid shift and underscore the point that a liquid strategy is not likely to confer the benefits identified in the literature on remote warfare when employed against a symmetrical adversary, employing a similar strategy with advanced remote warfare capabilities.

References

Acton, J. M. (2018). Escalation through entanglement: How the vulnerability of command-and-control systems raises the risks of an inadvertent nuclear war. *International Security*, *43*(1), 56–99.

Allison, G., & Glick-Unterman, J. (2021). *The great military rivalry: China vs the U.S.* Harvard Kennedy School Belfer Center. https://www.belfercenter.org/publication/great-military-rivalry-china-vs-us

Ashley Jr., R. P. (2018). *Statement for the record: Worldwide threat assessment*. Senate Committee on Armed Services. https://www.dia.mil/Articles/Speeches-and-Testimonies/Article/1457815/statement-for-the-record-worldwide-threat-assessment-2018/

Bauman, Z. (2000). *Liquid modernity*. Polity.
Bauman, Z. (2001). Wars of the globalization era. *European Journal of Social Theory*, *4*(1), 11–28.
Beckley, M. (2019). *In future wars, the US military will have nowhere to hide*. Foreign Policy.
Biegon, R., & Watts, T. F. A. (2020). Remote warfare and the retooling of American primacy. *Geopolitics*, *25*(4), 948–971.
Brose, C. (2020). *The kill chain: Defending America in the future of high-tech warfare*. Hachette Books.
Can, C. M., & Chan, A. (2022). Preventative or revisionist challenge during power transition? The case of China-USA strategic competition. *Journal of Asian Security and International Affairs*, *9*(1), 7–25.
Cancian, M. F., Cancian M., & Heginbotham, E. (2023). *The first battle of the next war: Wargaming a Chinese invasion of Taiwan.* Center for Strategic and International Studies. https://www.csis.org/analysis/first-battle-next-war-wargaming-chinese-invasion-taiwan
Cheng, D. (2016). *Cyber dragon: Inside China's information warfare and cyber operations*. Praeger.
Cheung, T. M. (2017). *US–China military technological competition and the making of Chinese weapons development strategies and plans*. Study of Innovation and Technology in China Research Brief, UC San Diego. https://escholarship.org/uc/item/43m5m3gp
Cliff, R. (2015). *China's military power: Assessing current and future capabilities*. Cambridge University Press.
Cliff, R., Burles, M., Chase, M. S., Eaton, D., & Pollpeter, K. L. (2007). *Entering the dragon's lair: Chinese anti-access strategies and their implications for the United States*. RAND Corporation. https://www.rand.org/pubs/monographs/MG524.html
Coker, C. (2009). *War in an age of risk*. Polity.
Correll, J. T. (2010, March 1). *The emergence of smart bombs*. Air & Space Forces Magazine.
Cunningham, F. S. (2022). Strategic substitution: China's search for coercive leverage in the information age. *International Security*, *47*(1), 46–92.
Dang, C., & Zhang, Y. (Eds.). (2009). *Science of joint operations*. People's Liberation Army Press.
Davis, R. G. (1996). *Decisive force: Strategic bombing in the Gulf War*. Defense Technical Information Center. https://apps.dtic.mil/sti/citations/ADA439962
Demmers, J., & Gould, L. (2018). An assemblage approach to liquid warfare: Africom and the 'hunt' for Joseph Kony. *Security Dialogue*, *49*(5), 364–381.
Dimitriu, G. (2020). Clausewitz and the politics of war: A contemporary theory. *Journal of Strategic Studies*, *43*(5), 645–685.
Dobbins, J., Scobell, A., Burke, E. J., Gompert, D. C., Grossman, D., Heginbotham, E., & Shatz, H. J. (2017). *Conflict with China revisited: Prospects, consequences, and strategies for deterrence*. RAND Corporation. https://www.rand.org/pubs/perspectives/PE248.html
Duster, C. (2021, November 18). *Top military leader says China's hypersonic missile test 'went around the world'*. CNN Politics. https://edition.cnn.com/2021/11/17/politics/john-hyten-china-hypersonic-weapons-test/index.html
Engstrom, J. (2018). *Systems confrontation and system destruction warfare: How the Chinese people's liberation army seeks to wage modern warfare* (RR-1708-OSD). RAND Corporation. https://www.rand.org/pubs/research_reports/RR1708.html

Erickson, A. S. (Ed.). (2016). *Chinese naval shipbuilding: An ambitious and uncertain course*. Naval Institute Press.

Ferguson, C. (2000). Sparking a buildup: US missile defense and China's nuclear arsenal. *Arms Control Today*, *30*(2), 13–18.

Fravel, M. T. (2015). China's new military strategy: 'Winning informationized local wars'. *China Brief*, *15*(13), 3–7.

Fravel, M. T. (2018). Shifts in warfare and party unity: Explaining China's changes in military strategy. *International Security*, *42*(3), 37–83.

Fravel, M. T. (2019). *Active defense: China's military strategy since 1949*. Princeton University Press.

Gillespie, P. G. (2009). *Weapons of choice: The development of precision guided munitions*. University of Alabama Press.

Gompert, D. C., Stuth Cevallos, A., & Garafola, C. L. (2016). *War with China: Thinking through the unthinkable*. RAND Corporation. https://www.rand.org/pubs/research_reports/RR1140.html

Grant, R. (2016, June 24). *The second offset*. Air & Space Forces Magazine. https://www.airandspaceforces.com/article/the-second-offset/#:~:text=Thus%20arose%20what%20became%20known,quantity

Gunzinger, M., & Clark, B. (2015). *Sustaining America's precision strike advantage*. Center for Strategic and Budgetary Assessments. https://csbaonline.org/uploads/documents/Sustaining-Americas-Precision-Strike-Advantage.pdf

Haffa, R. (1984). *The half war: Planning U.S. rapid deployment forces to meet a limited contingency, 1960–1983*. Westview Press.

Harrison, T., Johnson, K., & Roberts, T. G. (2018). *Space threat 2018: China assessment*. Center for Strategic and International Studies. https://aerospace.csis.org/space-threat-2018-china/

Heginbotham, E., Nixon, M., Morgan, F. E., Heim, J. L., Hagen, J., Li, S., Engstrom, J., Libicki, M. C., DeLuca, P., Shlapak, D. A., Frelinger, D. R., Laird, B., Brady, K., & Morris, J. L. (2015). *The U.S.-China military scoreboard: Forces, geography, and the evolving balance of power 1996–2017*. RAND Corporation. https://www.rand.org/paf/projects/us-china-scorecard.html

Hippler, T. (2017). *Governing from the skies: A global history of aerial bombing*. Verso.

Kania, E. B. (2019). Chinese military innovation in the AI revolution. *The RUSI Journal*, *164*(5), 26–34.

Katz, J., & Insinna, V. (2022, August 11). *A 'bloody mess' with 'terrible loss of life': How a China–US conflict over Taiwan could play out*. Breaking Defense. https://breakingdefense.com/2022/08/a-bloody-mess-with-terrible-loss-of-life-how-a-china-us-conflict-over-taiwan-could-play-out/

Knowles, E., & Watson, A. (2018). *Remote warfare: Lessons learned from contemporary theatres*. Remote Warfare Program, Oxford Research Group. https://www.saferworld.org.uk/resources/publications/1280-remote-warfare-lessons-learned-from-contemporary-theatres

Krieg, A., & Rickli, J. M. (2019). *Surrogate warfare: The transformation of war in the twenty-first century*. Georgetown University Press.

Laskai, L. (2018). Civil-military fusion and the PLA's pursuit of dominance in emerging technologies. *China Brief*, *18*(6), 43–44.

Li, Y., Li, Y., & Wang, Y. (Eds.). (2012). *Lectures on the science of joint campaigns*. Military Science Press.

Liu, H. (2008). *Liu Huaqing's selected works on military affairs*. Jiefangjun Chubanshe.

Mahnken, T. G. (2011). Weapons: The growth & speed of the precision-strike regime. *Daedalus*, *140*(3), 45–57.

Mearsheimer, J. J. (1979). Precision-guided munitions and conventional deterrence. *Global Politics and Strategy*, *21*(2), 68–76.

Ming, B. S. (2011). *Selected works of Jiang Zemin*. Foreign Languages Press.

Mutschler, M. (2016). *On the road to liquid warfare? Revisiting Zygmunt Bauman's thoughts on liquid modernity in the context of the 'new Western way of war'* (BICC Working Paper 3\2016). Bonn International Centre for Conflict Studies. https://www.bicc.de/Publikationen/wp_3_2016_030316.pdf~dr885

Mutschler, M., & Bales, M. (2024). Liquid or solid warfare? Autocratic states, non-state armed groups and the socio-spatial dimension of warfare in Yemen. *Geopolitics*, *29*(1), 319–347.

Nacht, M., Laderman, S., & Beeston J. (2018). *Strategic competition in China-US relations* (Livermore Papers on Global Security, No. 5). Center for Global Security Research. https://cgsr.llnl.gov/research/livermore-papers

Nathan, A. J., & Scobell, A. (2012). How China sees America: The sum of Beijing's fears. *Foreign Affairs*, *91*(5), 32–47.

Neocleous, M. (2014). *War power, police power*. Edinburgh University Press.

Ochmanek, D. (2019, April 8). *How the US military fights wars today and in the future* (event transcript). Center for a New American Security. https://www.cnas.org/publications/transcript/transcript-how-the-u-s-military-fights-wars-today-and-in-the-future

Peng, G., & Yao, Y. (Eds.). (2001). *The science of military strategy* (2nd ed.). Military Science Press.

Pettyjohn, S., Wasser, B., & Dougherty, C. (2022). *Dangerous straits: Wargaming a future conflict over Taiwan.* Center for a New American Security. https://www.cnas.org/publications/reports/dangerous-straits-wargaming-a-future-conflict-over-taiwans

Ping, M., & Yang, G. (Eds.). (2013). *Joint operations research*. National Defense University Press.

Powell, R. (1990). *Nuclear deterrence theory: The search for credibility*. Cambridge University Press.

Prinz, J., & Schetter, C. (2016). Conditioned sovereignty: The creation and legitimation of spaces of violence in counterterrorism operations of the 'war on terror'. *Alternatives*, *41*(3), 119–136.

Rosen, S. P. (1994). *Winning the next war: Innovation and the modern military*. Cornell University Press.

Roy, D. (2003). China's reaction to American predominance. *Survival*, *45*(3), 57–78.

Sauer, F., & Schörnig, N. (2012). Killer drones: The 'silver bullet' of democratic warfare? *Security Dialogue*, *43*(4), 363–380.

Sayler, K. (2023). *Hypersonic weapons: Background and issues for congress* (R45811). Congressional Research Service. https://sgp.fas.org/crs/weapons/R45811.pdf

Shaw, M. (2005). *The new Western way of war: Risk-transfer war and its crisis in Iraq*. Polity.

Shaw, I. G. R. (2013). Predator empire: The geopolitics of drone warfare. *Geopolitics*, *18*(3), 536–559.

State Council Information Office. (2015). *China's military strategy*. The State Council. http://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm

Stockholm International Peace Research Institute. (2023). *Trends in world military expenditure, 2022*. Sipri. https://www.sipri.org/sites/default/files/2023-04/2304_fs_milex_2022.pdf

Talmadge, C. (2019). Emerging technology and intra-war escalation risks: Evidence from the Cold War, implications for today. *Journal of Strategic Studies*, *42*(6), 864–887.

Tayloe, S. C. (2017). Crossover point: How China's naval modernization could reverse the United States' strategic advantage. *Journal of Asian Security and International Affairs*, *4*(1), 1–25.

Turner Haynes, S. (2016). China's nuclear threat perceptions. *Strategic Studies Quarterly*, *10*(2), 25–62.

US Defense Intelligence Ballistic Missile Analysis Committee. (2017). *Ballistic and cruise missile threat* (NASIC-1031-0985-17). Air Force National Air and Space Intelligence Center. https://www.nasic.af.mil/Portals/19/images/Fact%20Sheet%20Images/2017%20Ballistic%20and%20Cruise%20Missile%20Threat_Final_small.pdf?ver=2017-07-21-083234-343

US Department of Defense. (2018). *Providing for the common defense: The assessment and recommendations of the National Defense Strategy Commission*. National Defense Strategy Commission. https://www.usip.org/sites/default/files/2018-11/providing-for-the-common-defense.pdf

US Department of Defense. (2023). *Military and security developments involving the People's Republic of China*. https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF

US Office of the Secretary of Defense. (2020, September 1). *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

Vandiver, J. (2021, July 27). *US military vulnerabilities exposed during classified war game, top general says*. Stars and Stripes.

Vogel, E. F. (2013). *Deng Xiaoping and the transformation of China*. Belknap Press.

Waltz, K. N. (1979). *Theory of international politics*. Waveland Press.

Watson, A., & McKay, A. (2021). Remote warfare: A critical introduction. In M. McKay, A. Watson, & M. Karlshøj-Pederson (Eds.). *Remote warfare: Interdisciplinary perspectives*. E-International Relations.

Work, R., & Grant, G. (2019). *Beating the Americans at their own game: An offset strategy with Chinese characteristics*. Center for a New American Security. https://www.cnas.org/publications/reports/beating-the-americans-at-their-own-game

Zhang, B. (2015). *China's assertive nuclear posture: State security in an anarchic international order*. Routledge.

Zhang, X., & Yi, L. (Eds.). (2010). *Research of operational capabilities based on information systems-operations.* Military Affairs Yiwen Press.