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J. Matthew McInnis

RUSSIA AND CHINA LOOK AT THE FUTURE OF WAR

MILITARY LEARNING AND THE FUTURE OF WAR SERIES

ISW
INSTITUTE FOR THE STUDY OF WAR

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Cover: Moscow, Russia - August 27, 2022: Chinese team on a Type 96B (ZTZ-96B) tank pose for a photo during the finals of the tank biathlon at a military polygon, on August 27, 2022, in Alabino, outside of Moscow, Russia. The International Army Games ARMi-2022, organized by Russian Ministry of Defense ran August 13-27, 2022, and took place against the tense backdrop of war in Ukraine. (Photo by Contributor/Getty Images)

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ABOUT THE INSTITUTE

ISW is a non-partisan and non-profit public policy research organization. It advances an informed understanding of military affairs through reliable research, trusted analysis, and innovative education. It is committed to improving the nation's ability to execute military operations and respond to emerging threats in order to achieve the strategic objectives of the US around the globe.

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Table of Contents

Executive Summary

Russia and China share a common modernization objective: achieving dominance in decision-making in future wars. Both states are struggling to improve their military personnel quality and integrate the lessons from the wars of the past two decades. Russia is attempting to innovate within a narrower band of military doctrine and operations while addressing the early failures of its Ukraine invasion. China aims to use new doctrine, technology, and integration of civilian expertise with the People's Liberation Army (PLA) to leapfrog over US military superiority. The United States must assess the threat from China's and Russia's modernization efforts and seek to exploit their respective blind spots and weaknesses.

Russia's views of future war focus on the concept of "superiority of management" and the importance of the information domain. Russian military thinkers emphasize the need for better and faster decision-making than opponents and for shaping the adversary's actions within a Russian decision framework. Russian theorists believe that information superiority is crucial for successful kinetic operations, contrary to the US' conventional concept of information operations. The Russian military views hybrid war as an effort to shape the governance and geopolitical orientation of a target state, combining information campaigns with conventional military actions. The Russian leadership saw the invasion of Ukraine in 2022 as the culmination of a hybrid war but the conflict exposed strategic and operational failures of their military planning. Russia had observed valuable lessons from its experience in Syria and developed concepts such as "limited actions" and coalition operations for future conflicts. The war in Ukraine, however, revealed Russia's limitations and its failure to close the gap in command-and-control capabilities with Western militaries. Despite this, Russia aims to prepare its conventional armed forces for large-scale conventional war in the future while continuing to prioritize the information domain in conflict.

China's military modernization efforts are aimed at achieving decision dominance through a three-pronged approach: doctrinal transformation and ideological rigor; exploitation of advanced technology to shape the character of modern conflicts; and innovation of its training methods to compensate for the lack of wartime fighting experience. China has modernized its military since 1993 to close the capability gap with the United States, with the goal of reaching parity or even superiority by 2049. PRC doctrinal thinking emphasizes "systems warfare," which involves comprehensive contests between highly integrated systems, such as logistics, surveillance, and communications. The objective is to establish information and decision systems dominance over air, maritime, and other domain-centric approaches. Cognitive warfare, including information manipulation and subversive operations against adversary leaders and the population, is seen as crucial for shaping the battlefield before and during conflicts. China is additionally exploring the concept of hybrid warfare and its relationship to systems warfare. Strengthening Chinese Communist Party orthodoxy, loyalty, and control of the state have been central themes for President Xi Jinping since 2012, including bolstering the role of the political commissar in the PLA chain of command and reviving the Maoist concept of "people's war."

Achieving "informatization" and "intelligentization" has also guided the PLA's technological modernization in recent decades. Informatization focuses on information technology to aid precision targeting and disrupting the adversary's command-and-control

systems, while intelligentization involves the integration of artificial intelligence (AI), autonomous weapons, and brain-controlled weapons to enhance the speed and complexity of warfare. Finally, the PLA's lack of engagement in major conflicts since the 1979 Sino-Vietnam War poses a significant training and human capital development challenge. China is studying US and Russian military successes and failures since the end of the Cold War. The PLA tests potential US and Taiwan conflict scenarios by employing realistic opposition forces (OPFOR) in training, exercising against US and allied forces operating in the region, and conducting AI-enabled computerized wargames integrating expertise from technology firms and civilian gaming communities.

Comparing Russia's and China's recent military experiences and modernization efforts reveals several strategic opportunities for the United States and its allies:

- The PRC's modernization effort is more expansive and complex than Russia's. The PLA lacks the testing and refinement that comes from real-world combat, however. Chinese future war concepts and execution are consequently less coherent as a whole and require greater speculative assessments.
- Russia's strategic and operational military deficiencies during the Ukraine campaign exposed systemic weaknesses in training, personnel, and leadership. Lessons learned from campaigns in Syria have not effectively transformed Russian military thinking and Syrian experience within the Russian officer corps has been depleted due to casualties and demotions during the Ukraine war. Russia's efforts to centralize military control and improve command-and-control-systems implementation have also been hindered by issues such as micromanagement and a culture of fear among officers.
- PRC ideological constraints and overconfidence in its ability to integrate AI and other modern technology into military decision-making and fix long-term human capital management challenges will inhibit the level of clarity it seeks in wartime strategy and operations.
- The subsequent Russian military failures after the US campaign of selective intelligence disclosures before the invasion of Ukraine illuminate the effect of over-reliance on information warfare in Russian doctrine. China's more balanced approach employing information and conventional military operations to cognitive and hybrid warfare doctrine will likely prove more challenging for the United States than Russia's.
- Russia's experience in Syria focused on pre-structured coalition operations and expeditionary operations. China's concepts for expeditionary warfare are still under development.
- The PLA's modernization program relies on strong defense and technology industries, but a slowdown in economic reforms and re-prioritization of state control of industry under President Xi Jinping may limit resources and innovation.
- Russian forces have overall struggled with heavy urban combat in Ukraine but are making advances in surveillance and UAV tactics in urban environments. The PLA may face significant challenges in future urban warfare from its overdependence on drones, hesitancy to allow small unit autonomy and misreading of the political environment and public perceptions in operational areas.
- China has likely surpassed the United States in employing modeling, simulation, and OPFOR. The more the PLA relies on gaming and simulations, however, the greater the chance of flawed strategic and operational concepts becoming embedded in PLA doctrine.

Exploiting adversary vulnerabilities and building on relative strengths will be crucial for the United States to succeed in its long-term military competition with China and Russia. At the operational and tactical level, the United States has battle-tested forces with extensive lessons

learned from recent conflicts. The United States benefits from superior training and a decentralized command structure. However, at the strategic level, the United States struggles with slow and incoherent decision-making processes, making it difficult to establish clear objectives and execute coherent plans. The United States also tends to bifurcate war and non-war operations, unlike Russia and China, which see them as part of a singular conflict. The United States must integrate diplomatic, information, and conventional operations to counter Russian and Chinese hybrid warfare and political campaigns effectively. Despite these challenges, the United States possesses strengths in its alliances, partnerships, transparency, and advanced technologies that can mitigate structural deficiencies and be the foundation for future success.

Introduction

The Institute for the Study of War launched a research project in 2020 to examine how the United States and its primary adversaries, Russia, and China, are learning from recent conflicts and preparing for future warfare. It began with the premise that the United States was too focused on technological innovation and conventional military confrontation scenarios in its shift to Great Power Competition after the 2018 National Defense Strategy.[1] US strategists were underestimating, or misunderstanding, the importance Russia and China placed on information operations, hybrid warfare, gray zone operations, and limited expeditionary and proxy operations in places such as Syria. Continued advances in artificial intelligence, autonomous weapon systems, and other technologies will have significant effects on operational speed and lethality in war. However, the way militaries learn from recent conflicts, develop new warfighting concepts, and leverage their human capital will matter more.

This paper synthesizes the most important insights from this research effort and identifies further implications for US military leaders and analysts. One key theme emerges: China and Russia are pursuing strategies of achieving superiority in decision-making (or "superiority of management") against the United States and its allies in future conflicts. This is what the US military defines as *decision dominance*.[2] They hope to achieve this advantage by exploiting modern technology, learning from the wars of the 21st century, and innovating doctrinally. Both states have distinct strengths and limitations to reach these goals. Russia has been able to evaluate new warfighting concepts in its conflicts in Ukraine and Syria but is a declining military and economic power relative to its NATO rivals. China is now a near-peer competitor to the United States economically and technologically but has not engaged in a conventional military conflict since 1979, long before its current military modernization efforts. Russian and Chinese thinking on decision dominance and future warfare over the past decade has built on these strengths while attempting to mitigate their weaknesses.

The research report series was completed before Russia's invasion of Ukraine in 2022. This paper attempts an initial critique of Russian and Chinese thinking on the future of warfare considering the current conflict. The ongoing war in Ukraine demonstrates Russia has failed so far to implement most of its concepts of modern war and will be severely resource restrained to achieve its transformation goals.[3] The Ukraine conflict has also increased international attention on a potential forceful Chinese takeover of Taiwan and China's larger ambitions in Asia. Ideological constraints and overconfidence in its ability to integrate modern technology into military decision-making and fix long-term human capital management challenges will inhibit the level of clarity it seeks in wartime strategy and operations. It is important that the United States and its allies identify and exploit these limitations to maintain their advantages in future wars.

MILITARY LEARNING AND THE FUTURE OF WAR SERIES

ISW PUBLISHED THREE REPORTS ON RUSSIA, THREE REPORTS ON CHINA, AND ONE REPORT ON THE UNITED STATES AND MODERN WARFARE AS PART OF THE INSTITUTE'S MILITARY LEARNING AND FUTURE OF WAR SERIES FROM 2020 THROUGH 2022. ***ISW first examined Russia's concepts of hybrid warfare; the shift in President Vladimir Putin's strategic calculus following his capture of the Crimean Peninsula and the eastern portion of the Donbass region; and Russia's lessons learned from the war in Syria.[80] There is already a large body of work and vibrant debate on Chinese doctrine and approach to future warfare. ISW explored three less-examined topics in the field that addressed how the PLA was learning and adapting its armed forces without fighting: the PLA's response to the COVID-19 pandemic outbreak; China's use of wargaming, simulations, and training against an opposition force (OPFOR) to compensate for the PLA's lack of recent operational experience against foreign armies; and the PLA's concepts for urban warfare, especially related to a potential seizure of Taiwan.[81] Finally, ISW critiqued the core challenges the US national security system has demonstrated in waging war over the past two decades.[82]***

Russia's Future War Aspiration: Decision Dominance and Limited Actions Abroad

Russian discussions of future wars increasingly posit "superiority of management" as an analog to the US concept of decision dominance.[4] Russian officers and analysts describe the superiority of management as making better decisions faster than the opponent and compelling the opponent to operate within a Russian decision framework.[5] Russian sources assessed that the increase in speed of conventional operations, the precision and range of munitions, and the actions by unconventional forces in modern war require more sophisticated command and control and strategic judgment, assessments all borne out – but not addressed – by Russian operations in Ukraine since February 2022.[6] Russian theorists also argue the information domain has become dominant in warfare. This reverses the traditional US concept of information operations as supporting lines of effort to conventional military campaigns. Russian theorists argue that successful kinetic operations must be enabled by first achieving information superiority against the adversary, and kinetic operations must be planned and executed in the context of supporting the accompanying information campaign.[7]

Russia intended its 2022 invasion of Ukraine to be the final kinetic stage in a hybrid war against Ukraine.

Russian researchers do not assess that a new form of "non-traditional" conflict is emerging, but that the Russian military must adapt to new "non-traditional" means that fundamentally alter the character of conflict. The Russian military assesses these changes in the character of modern conflict will be particularly important in "hybrid wars," defined as a strategic-level effort to shape the governance and geostrategic orientation of a target state in which all actions, *up to and including the use of conventional military forces in regional conflicts*, are subordinate to an information campaign.[8] The United States has mostly misunderstood Russia's use of the term hybrid war. Russian thinkers frame hybrid wars as a *Western* invention used against Russia and other states, and the Kremlin perceives itself as defending against a US hybrid war. In addition, Russian theorists do not perceive hybrid war as their own innovation, but as a type of war, against which they must defend and which they must adapt to conduct themselves. US analysts and military planners have typically framed hybrid war as a set of activities below the threshold of conventional conflicts, such as subversion and disinformation, rather than a new type of warfare that still includes traditional kinetic operations.

Prior to Russia's full-scale invasion of Ukraine in 2022, Russia likely saw its limited war in Ukraine as a continuation of an ongoing hybrid war against Ukraine in competition with the United States and NATO to determine the future of Ukraine's geopolitical orientation.[9] Putin hoped to regain the upper hand by restoring dominant influence in Ukraine and to revive the perception of a powerful Russian state that is modernizing its military and could defend itself against domestic instability and disruptive foreign influence.[10] The Kremlin sought to leverage asymmetric means in this hybrid war over economically and militarily advanced adversaries, such as the United States and NATO. The Kremlin also sought to use information efforts as cheaper and potentially more effective means to achieve decisive military effects than traditional conventional military build-ups like China is pursuing.[11]

Russia intended its 2022 invasion of Ukraine to be the final kinetic stage in a hybrid war against Ukraine. Russian thinkers assert that hybrid wars often conclude with the deployment of conventional forces after information operations and asymmetric actions have set conditions to change the government and geopolitical orientation of a target

state.[12] Russia's initial conduct of the February 2022 invasion and subsequent insights into Kremlin decision-making indicate the Kremlin expected to achieve exactly this effect – with Russian conventional forces facing minimal opposition from a collapsing Ukrainian military, and being greeted by collaborators and Ukrainian civilians as liberators.[13] The United States' selective intelligence disclosures of the Kremlin's intent to invade Ukraine and create pretexts for that invasion through false flag operations undermined Russia's ability to shape the information environment in 2021 and early 2022.[14] The United States likely helped defeat Russia's planned information campaign against the Ukrainian people, leadership, and NATO which was central to its overall strategy. The Kremlin additionally fundamentally misunderstood the shallowness of its influence in Ukrainian society and the willingness of the Ukrainian people to resist invasion. The Kremlin, therefore, entered the war generally perceived as an unprovoked aggressor, cohering a firm strategic response from the United States, NATO, European countries, and other allies and partners such as Japan.[15] The Russian military is now fighting a protracted conventional war it did not plan to execute.[16] Its strategic and operational failures in Ukraine will force Russia to re-evaluate how to design and execute successful hybrid wars.

Prior to the full-scale invasion of Ukraine, Russia observed necessary lessons from its wartime experience in Syria to develop its military modernization concepts, but largely has not had the time or the capability to implement these observed lessons. Russia developed the concept of "limited actions" by flexible expeditionary forces working in a coalition with partner and proxy units (in the case of Syria, Syrian and Iranian units) as a model for future conflicts.[17] The Syrian theater provided Russia the opportunity to evaluate new doctrines and capabilities to use both in future local conflicts and in a major conventional war against NATO. Russia

trained a new generation of officers through deployments and lessons learned in the Syrian theater as well.[18] Russia also expanded its integrated coalition operations and command and control concepts into all major domestic and multinational military exercises since 2017, including exercises with the Collective Security Treaty Organization (CSTO) and Shanghai Cooperation Organization (SCO), based on their Syrian campaign templates.[19]

However, the war in Ukraine casts doubt on whether the Russian military successfully implemented observed lessons from Syria in the seven years before the full-scale invasion of Ukraine. Russia exposed extensive limitations to its current capabilities and prospects for achieving its future warfare objectives. Russian armed forces did not have the time and resources to adopt or execute the necessary changes at scale. The Russian military's performance in Ukraine demonstrates it has not begun to close its gap in command-and-control capabilities with Western militaries or gain superiority in management.[20]

Several of the Russian military's observations in Syria have been proven valid during the war in Ukraine, though implementation of the necessary requirements varied. The Russian military correctly assessed the need to improve their own unmanned aerial vehicle (UAV) capabilities for artillery spotting and reconnaissance, as well as the need to develop electronic warfare (EW) to disrupt enemy UAVs – both of which they have implemented to varying degrees in Ukraine.[21] US modernization efforts must account for the increasing sophistication of Russian UAV and counter-UAV capabilities augmented by growing cooperation with the Iranian military in this field.[22] Similarly, Russian officers correctly observed requirements for effective urban combat (including close armor support, higher quality infantry, and night fighting capabilities) that Russian forces have been largely unable to implement in Ukraine.[23] The Russian military likely lacked the time and resources necessary to implement these observed lessons across the force, a situation exacerbated by the poor deployment of Russian forces throughout the invasion.

The Russian Ministry of Defense (MoD) appears to be pivoting its focus towards preparation for large-scale conventional war based on the experience of its disastrous invasion of Ukraine in 2022. Defense Minister Defense Minister Sergei Shoigu announced on January 17, 2023, his intent to implement a series of large-scale military reforms between 2023-2026 to expand Russia's conventional armed forces, including large-scale force restructuring, the forming of new divisions, and constructing more training grounds.[24] These reforms demonstrate Russia's intent to restructure the Russian military to conduct large-scale conventional warfighting in general and not just for the current war against Ukraine. However, Russia's ability to generate large-scale rapid change in its military capacity depends on Putin's willingness to redirect substantial portions of the federal budget to a military buildup and put Russia on something like a war footing for several years. Russian military development will be strongly altered by the invasion of Ukraine, but the Kremlin is unlikely to abandon its focus on the information space. Many Russian observations of modern war and necessary new capabilities in Syria will also remain important.

China's Future War Aspiration: Decision Dominance through Doctrine, Technology, and Training

The People's Republic of China (PRC) has rapidly modernized its military since 1993 after observing the significant gaps in capability with the United States during the first Gulf War. The People's Liberation Army (PLA) is striving to develop modernized equipment, doctrine, and force capacity by 2035 and reach parity with if not superiority over, the United States or any competing power by 2049, the 100th anniversary of the PRC. China hopes to achieve these ambitious objectives with a three-pronged approach: doctrinal transformation and ideological rigor; exploitation of advanced technology to shape the character of modern conflicts; and innovation of its training methods to compensate for the lack of wartime fighting experience. The PRC's modernization effort is more expansive and complex than Russia's. The PLA has also not experienced the testing and refinement that comes from real-world combat. China's future war concepts and execution are consequently less coherent as a whole and require greater speculative assessments.

Doctrine and Ideology

The PRC began framing modern conflict as "systems warfare" after observing US advances in doctrine, targeting, and precision-guided munitions during the 1991 Gulf War and the coercive air campaigns in the Balkans. Warfare in the 21st century is no longer a "single confrontation of a certain force…or weapon." War is now a "comprehensive contest between highly integrated systems" such as a state's logistics, surveillance, or communications systems.[25] The PLA must seek to destroy the enemy's system through corruption and degradation of its component systems. PRC theorists argue establishing information and decision systems dominance has precedence over air, maritime, or other domains.[26] This systems confrontation also exists at the strategic level among states. The PRC must build its comprehensive national strength – the regime's political, economic, technological, and military system-of-systems – to deter, compete, and eventually defeat the US, Taiwanese, and other allies' systems.[27]

PRC theorists argue establishing information and decision systems dominance has precedence over air, maritime, and other domains.

The PRC's prioritization of the information domain within systems warfare drives its current focus on manipulating adversary perception through cognitive warfare. Information, psychological, deception, cyber, and subversive "fifth column" operations against opponent governments and populations feature prominently in PLA exercises and emerging doctrine.[28] China views these activities as necessary condition-setting prior to the war and as co-equal lines of effort with conventional military operations once hostilities commence. China's thinking on cognitive conflict draws from the PLA's long tradition since the Chinese civil war of marrying political-ideological and military action to achieve operational effects, i.e., political warfare.[29] The PRC's distinctions between public opinion warfare intended to have cognitive effects and political warfare needs further exploration.

These legacy concepts are also tied to the PRC's debate on hybrid warfare. Chinese defense academics have viewed hybrid warfare as a relatively new form of conflict conducted by the United States or other powers. Perceived US sponsorship of "color revolutions" in former Soviet states drove fears of potential vulnerabilities to information warfare and subversion in the Chinese system.[30] The PRC not only needs to improve its defenses

against hybrid warfare but also learn how to effectively employ hybrid warfare campaigns in the future. Hybrid warfare may be conducted as part of larger systems warfare using all tools of statecraft against a peer like the United States or by more tailored military-enabled cognitive campaigns against weaker adversaries like its rivals in the South China Sea disputes. One PLA writer argues that hybrid warfare will take their systems integration in conflict to a "new and higher stage."[31] The difference between hybrid war concepts and those of traditional PLA political warfare for achieving victory through cognitive effects is unclear, however.

Chinese leaders view the ideological health of the PLA to be just as critical for their system as modern technology, doctrines, or training for success in future war. Strengthening Chinese Communist Party orthodoxy and control of the state have been central themes for President Xi Jinping since his ascension to power in 2012. Xi believes the weakening of ideological commitment within the Red Army under the late Soviet leader Josef Stalin sowed the seeds of the Soviet Union's eventual demise. The replacement of the political commissar position in the Red Army's chain of command with a less powerful political officer was the inflection point for the USSR from Xi's perspective.[32] The PLA retains the political commissar in its command structures. These officers have a dual-key command-and-control role shared with the operational commander of a unit. They also look after the morale and political commitment of the forces serving below them. Ideological training and empowerment of the political commissars will co-exist with new doctrine and technology to prepare the PLA to meet the changing character of warfare.

China is betting that integrating AI with ever-improving intelligence, surveillance, reconnaissance, autonomous weapons, and precision munitions capabilities will not only be the key to find, fix, and finish targets more rapidly but to also outthink their opponents during wartime.

Xi is also reviving Mao's concepts of "people's war." Mao saw the mobilization of the rural population as central to his success in the Chinese Civil War. PRC leaders have used the idea of "people's war" since then to generate participation and popular support for their military, political, and disaster relief campaigns.[33] Xi frequently described China's massive national response to the COVID-19 pandemic as a "people's war" and claimed the idea was an "important magic weapon" for the PRC.[34] Including students and other private citizens in wargaming competitions also fits into this framework. Xi may see "people's war" and party loyalty as the ideological backbone needed to ensure the PLA and the Chinese people have the necessary will to fight in any coming conflict with the United States and its allies.

Technology and Intelligentization

The PLA believes improvements in the use of information technology over the past three decades have driven most progress in modern warfare, a process described as "informatization." Victory in warfare depends on speed and effective communications and command while disrupting the adversary's decision-making by targeting their command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR). US performance in the wars of the 1990s and the 2003 invasion of Iraq drove the PLA's early modernization push to achieve a fully mechanized and informatized force capable of conducting "local wars under high technology conditions" and "network-centric warfare" on par with the US military. [35]

While China attempts to achieve and maintain parity with the US military through informatization, Xi Jinping views the emerging phenomenon of "intelligentization" as key to surpassing the US system-of-systems.[36] PLA personnel will work alongside artificial intelligence (AI), autonomous weapons, and brain-controlled weapons to rapidly expand the speed and complexity of warfare. The PLA discerned the intelligentization trend through scientific research; observation of US operations in Iraq, Afghanistan, and Libya; assessment of the US "third-offset strategy;" and advances in autonomous weapon systems in the late 2010s.[37]

The PRC's 2020 Science of Military Strategy states that "breaking through on key and core AI technologies" will directly affect the PLA's success in developing intelligentized competition. The technological demands of intelligentization also require the PLA to persuade or co-opt the private sector to support its activities as part of the PRC's military-civil fusion (MCF) national strategy. ISW has assessed new military-civil partnerships for China's mobilization efforts, including using private companies for logistics support during exercises and operations and for developing new big-data platforms such as the National Defense Mobilization Potential Index System, for example.[38]

China likely anticipates intelligentization and cognitive warfare will allow it to shape future battlefields to its benefit and achieve decision dominance over the United States. China is betting that integrating AI with ever-improving intelligence, surveillance, reconnaissance, autonomous weapons, and precision munitions capabilities will not only be the key to find, fix, and finish targets more rapidly but to also outthink their opponents during wartime. The superiority of information leads to the superiority of decision-making which then leads to the superiority of military action that destroys the adversary's system. The practical effects intelligentization will have on political, cognitive, and hybrid war concepts within systems warfare will be a rich field of future research.

Training and Peace Disease

The PRC's third major modernization effort is training a military for intelligentized warfare that has not seen major conflict since the 1979 Sino-Vietnam War. The PLA labels this challenge the Peace Disease since its forces have been unable to hone their skills in realistic environments in more than a generation.[39] China is acutely aware that its military personnel must compensate for the lack of experience that its NATO, Russian, and even Iranian counterparts have from recent wars. PLA leaders have worried that their officers at all echelons will not be able to execute the complex joint operations needed for informatized and systems war. The "Five Cannots" statement in 2015 prominently captured this fear. PLA commanders are supposedly unable to judge situations, understand their commanders' intent, make operational decisions, deploy troops, or manage unexpected situations.[40] The PLA seeks to teach, train, and develop its forces to overcome these military decision-making deficiencies in the absence of real-world warfighting experience.

The foundation of the PLA response to this challenge has been learning from other militaries, especially the US performance during and since the first Persian Gulf War.[41] US long-term failures to counter non-state actors like Iranian-backed proxies and partners in Iraq and the Taliban in Afghanistan are sources of insight into asymmetric warfare for the PLA.[42] The PRC more recently drew on past disaster relief to improve its mass mobilization capacity during the COVID-19 pandemic.[43] Russia's military campaigns in Chechnya, Syria, and Ukraine also provided the PLA with new perspectives on modern urban warfare that could be used in scenarios with regard to Taiwan.

The PLA has invested in more realistic training environments for their forces to prepare for modern war. PLA leaders exploited opportunities

to visit the US Army Training and Doctrine Command at Fort Leavenworth, KS, and the U.S. National Training Center at Fort Irwin, CA, to understand, and then duplicate, US adversarial training employing a realistic opposition force (OPFOR).[44] The Zhurihe Training Base in Inner Mongolia contains multiple buildouts of potential PLA conflict environments. PLA commanders have steadily increased the realism of urban combat training against an OPFOR in a mock city at Zhurihe since 2009 in order to more closely match a potential assault and seizure of Taiwanese cities, for example.[45] The PLA has adopted a "comprehensive" firepower approach to potential urban campaigns in Taiwan as a result. This concept integrates drone, rotary-wing aviation, and artillery operations – supported by advanced reconnaissance and intelligence activities tailored for dense urban environments – with clandestine deception psychological operations to confuse, disrupt, and fracture defending forces.[46]

Finally, the PLA trains directly against US and allied forces for greater realism. Chinese submarine crews have attempted to track and evade foreign naval vessels and aircraft since at least 2006, echoing US-Soviet interactions during the Cold War.[47] PLA leaders must judge whether such tactics are worth the risk of significant miscalculation. The anti-submarine and anti-surveillance skills acquired through the PLA's "using the enemy to train" approach could erode the advantage the United States retains in sub-surface warfare.

China wants not only to train the PLA for potential conflicts but to also design the character of future wars to its advantage through computer wargaming and intelligentization.[48] The PLA created a large-scale wargaming exercise

system in 2007 that has trained thousands of military officers in subsequent years, including operating in the information, diplomatic, and economic domains.[49] Computerized wargames are a key medium for PLA intelligentization through experimentation and integration of AI into military campaigns. PLA-affiliated universities have evaluated algorithms for operational decision-making in human-versus-machine wargaming competitions since 2017.[50] Computer wargaming is also a major vehicle for China's military-civil fusion (MCF) efforts. The PLA has partnered with several technology companies to improve wargaming sophistication and co-opted Chinese students and the larger gaming community to contribute their skills in the national wargaming competitions as part of the MCF strategy.[51]

Evaluating Areas of Competition in Future War

Russia and China share a common modernization objective: achieving decision dominance in future wars. Making better decisions faster is the mantra in Moscow and Beijing. Both are struggling to improve their military personnel quality and integrate the lessons from the wars of the past two decades. China aims to use new doctrine, technology, and integration of civilian expertise with the PLA to leapfrog over US military superiority. Russia is attempting to innovate in a narrower band of military doctrine and operations. The United States must assess the threat from China's and Russia's modernization efforts and seek to exploit their respective blind spots and weaknesses.

Training, Personnel, and Leadership

Future competition among Russia, China, and the United States centers as much on military training, quality of personnel, and strength of senior leader decision-making as it does on potential major technological advances. Russia's botched 2022 Ukraine campaign reinforces this observation. The military materiel advantage that Russia held over Ukraine could not compensate for the Russian army's significant deficits in strategy development, operational planning, training, mobilization, troop morale, and command and control.[52]

Russia's cadre of combat-experienced officers from Syria has not transformed Russian military thinking and effectiveness. Russian officer deployments in Ukraine, including cadets and training elements deploying to replace high officer casualties, have hollowed out the Russian officer corps and likely degraded its ability to distribute learning throughout the force. Many of the senior Russian military officers that possessed experience from Syria have been killed or fallen out of favor due to their failures in Ukraine.[53]

The PLA's greatest challenges extend from its efforts to rapidly modernize over the past three decades while lacking significant real-world opportunities to hone doctrine and operational concepts. These circumstances have likely created many distortions in military planning and capabilities and an overreliance on technology to compensate for deep organizational, personnel, doctrinal, and training flaws.[54]

There is little evidence that PLA reforms have addressed systemic personnel and leadership decision-making problems such as those identified in the "Five Cannots."[55] Improvements in these areas are likely to be uneven across the PLA. The difficulties for the PLA in readjusting strategy and campaign operations based on conditions are likely to fester even as technology improves battlespace awareness.

The PRC's response to the COVID-19 pandemic exposed serious flaws in its centralized decision-making system. On the one hand, the PLA's ability to mobilize once the PRC leadership made critical response decisions was a testament to years of experience and lessons learned from natural disasters and previous outbreaks like SARS.[56] The political leadership decision-making process at the beginning of the crisis was ponderous, paranoid, and short-sighted, however, which fueled the spread of the virus beyond Wuhan and China. More recently, the PRC held onto its zero-COVID strategy for many months after most observers assessed it as unsustainable and then reversed the policy with little warning or apparent planning after anti-lockdown protests spread.

The effectiveness of Xi Jinping's attempt to renew ideological fervor within the PLA and the larger population is unclear. He has invoked Maoist "people's war" and ideas of collective struggle for fighting the COVID-19 pandemic, for challenging the Western and aligned powers, and for preparing the PRC for a more difficult geostrategic environment.[57] Xi may not be able to synthesize people's war concepts with technology-driven reforms like intelligentization to transform the PLA and bring about national rejuvenation. His efforts will likely paper over fundamental organizational flaws instead.

Centralized versus Distributed Control

The Russian MoD and the PLA are attempting to harness their increasing centralized control with improved C4ISR systems and technology-aided decision-making to execute more coherent whole-of-government strategies and campaigns. The Russian military observed the need for a single interconnected headquarters controlling all kinetic and non-kinetic lines of effort, with a clear understanding throughout the force of overall objectives allowing officers flexibility where needed. The Russian MoD established the National Defense Control Center in 2014 to enable this coordination and claimed in 2017 to have successfully used it in Syria.[58] The Kremlin promptly ignored these tenets in Ukraine and exacerbated its own command difficulties through the initial failure to appoint a theater commander, rapid turnover among senior officers, and extensive micromanagement by Putin.[59] However, Putin's prioritization of loyalty over competence, the increasing use of irregular forces such as Wagner led by semi-independent actors, and the seeming inability or unwillingness of Russian military professionals to resist his disastrous orders show the risks to effective command and control in authoritarian systems.[60]

These problems will likely compound over time. Many of the Russian officers who could have theoretically benefitted from the Russian military's identified need for a generational effort to introduce initiative and creativity into the Russian officer corps have suffered high casualties in Ukraine.[61] Russian command culture remains stilted and inflexible, and Russian officers appear on the whole unwilling to tell their superiors bad news due to a culture of fear, inhibiting both sound operational planning and learning for future war.[62] The Russian military also has not made rapid progress towards developing the modernized networked command systems (referred to in the Russian parlance as "automated control systems") it needs to achieve its superiority of management objectives and is unlikely to do so while it remains decisively committed to conducting combat operations in Ukraine.[63]

The PRC has struggled to balance the political need for greater control with the operational need for its military to adapt to rapidly changing conditions in modern warfare. The PLA created the regional theater commands and joint operation command centers to help resolve this problem and facilitate modern command and control for future joint campaigns as part of Xi's 2015 military reforms. These new organizational structures have not been tested. Xi's priority of ensuring the PLA's loyalty will likely increase pressure to centralize control rather than enable more distributed decision-making.

Whether the role of the political commissar (PC) changes significantly will also be a key indicator of the impact of reform on PLA command and control (C2). The dual-key C2 role the PC shares with the operational commander at multiple echelons affects flexibility in decision-making and innovation in operational concepts and tactics. The centrality of political

warfare in PRC thought and Xi's intent to keep a strong PC structure will likely restrain the rapid battlefield decision-making envisioned by intelligentization if the alignment of political aims and ideological intent are not well-maintained in conflict.

Expeditionary and Proxy Coalition Warfare

The Kremlin intentionally deemphasized learning about conducting operations through partners and proxies in Syria in favor of a focus on pre-structured coalition operations, but it is increasingly leveraging irregular forces such as Yevgeny Prigozhin's Wagner Group and Ramzan Kadyrov's Chechen fighters. These forces must be managed as semi-independent partners more similar to operations in Syria than as fully integrated coalitions.[64] The Russian military took steps to prepare for coalition actions with partner states based on lessons in Syria but has not yet demonstrated these capabilities.[65] The Russian military's need to coordinate multiple proxies that compete with each other and with government forces compounds this problem in Ukraine. The invasion of Ukraine has also undermined the Collective Security Treaty Organization (CSTO) and the willingness of member states in Central Asia and the Caucasus to support Russian actions.[66] Lessons learned from the war in Ukraine will supersede many of the Syria-based concepts for expeditionary coalition deployments.

China does not appear to have developed concepts for expeditionary war comparable to the Russian military yet. The PRC buildup and use of island bases in the South China Sea and the recent expansion of the PLA Navy Marine Corps demonstrate China's intent to improve traditional expeditionary mission capability.[67] Whether the PLA plans and trains for working with partisan, proxy, or other non-traditional forces during an amphibious invasion of Taiwan, for example, is another key area of inquiry.

Decision Superiority and Artificial Intelligence

Russia and China see decision dominance as the main task in future warfare, though Russia in a less technologically sophisticated manner. The Russian General Staff wants the achievement of "superiority of management," enabling Russian commanders to make correct decisions in combat faster than the opponent and forcing the adversary to work within a Russian decision framework, to be their commanders' main task in future wars. The failed management of Russia's campaign in Ukraine reveals this objective remains aspirational. Russian decision-making organizations, structures, and norms under Putin have fundamental flaws that will be difficult to rectify barring significant reforms and the breathing space necessary to allow such reforms to take root beyond testbed applications.

Artificial intelligence (AI) poses the greatest challenge to the character, and perhaps even nature, of war by reducing the human role in combat decision-making. China looks to push the limits of AI in its effort to match and surpass the US military's C4ISR and targeting capabilities. How far an authoritarian state like the PRC is willing to delegate military decision-making to AI-enabled systems is unknown. Xi Jinping and other Chinese leaders' lack of confidence in the loyalty of the PLA may drive them to accelerate the employment of AI and autonomous systems to remove more decision authority from the ranks instead.

The PLA may also risk over-reliance on AI-enabled weapons systems and decision-making tools and avoid addressing their organizational and leadership problems. The PRC will not achieve the decision superiority it seeks in future warfare without fixing the human element flaws in its system. Another critical challenge for the PLA's potential large-scale use of AI-enabled autonomous systems will be their ability to respond to surprise. Can PLA programmers build algorithms that can anticipate, synthesize, and respond to changing conditions in warfare?

Intelligentization and the PLA's overall modernization program rely on the backbone of strong PRC defense and technology industries. However, Xi Jinping has slowed down reforms of state-owned enterprises (SOEs) and indicated his willingness to sacrifice growth for greater state control and stability during the 20th Party Congress in 2022.[68] The military will continue to take a high priority in the PRC's industrial policy but the resources and space for innovation are likely to shrink in the coming years.

AI and other technological advancements also rely on China's national strategy for military-civil fusion (MCF). MCF is aspirational and largely untested. MCF draws from a long history of state-private sector integration starting under Deng Xiaoping but is currently more driven by a desire to catch up to the US defense industry ecosystem and organizations like DARPA.[69] Xi's SOE reform policies are likely exacerbating these problems. The PRC struggles with how to incentivize or coerce skilled civilians to work with PLA-affiliated enterprises as part of MCF initiatives. PRC licensing barriers limit Chinese firms with multinational exposure from working with PLA. These factors will inhibit an environment that fosters innovation. The PLA will still pursue and attempt to integrate innovation important to their modernization priorities, whether from domestic or foreign industry. The PRC will likely develop at least pockets of excellence, such as in hypersonic weapons.

Hybrid, Information and Cognitive Warfare

Both Chinese and Russian concepts for information operations have deep historical roots but they view dominance in information warfare from different perspectives. Russian thinking increasingly argues that information operations have greater effects than kinetic operations. Russian thinkers further note that superiority in the information domain is crucial to enabling battlefield successes, which it notably failed to do at the outset of, or at any point during, its full-scale invasion of Ukraine. Russian forces also have failed to use kinetic operations to enable information successes, as they have discussed as necessary.

Russian thinking increasingly argues that information operations have greater effects than kinetic operations.

The greater centrality of information operations in Russian concepts of future war relative to China could reflect the PRC's stronger confidence in its conventional capabilities and systems warfare against the United States and its allies. Russia plays a weaker military hand that can incentivize riskier approaches to war against assessed superior adversaries. Russia's full-scale invasion of Ukraine is not an appropriate representation of such an approach, however, as Putin violated several Russian doctrinal concepts as part of his interference in running the war. The Kremlin also fundamentally overestimated the depth of its control of the Ukrainian information space. Analysts must be careful not to draw incorrect conclusions about Russian hybrid warfare and the relation of information operations to kinetic actions from Russia's 2022 full-scale invasion of Ukraine.

The subsequent Russian military failures after the US campaign of selective intelligence disclosures before the invasion of Ukraine illuminate the effect of over-reliance on information warfare in Russian doctrine. The United States should accelerate the development of counter-information operation strategies for future conflicts. China's more balanced approach employing information and conventional military operations to cognitive warfare doctrine will likely prove more challenging for the United States than Russia's.

The recent erosion of China's narratives for its regional and global political, economic, and security policies will undermine the PRC's attempts to manipulate adversary perception through cognitive

warfare. The excesses of wolf-warrior diplomacy, suppression of dissent in Hong Kong, expansion of aggressive military activities, and its pandemic management failures have contributed to growing counter-China cooperation among regional states, the United States, and Europe.[70] China's faltering image will likely empower regional states' counter-information campaigns, which the United States should encourage. The PRC can partially mitigate this challenge by exploiting the significant economic interest and dependencies of potential US-led coalition supporters. China's initially successful information operations to portray the January 2024 Taiwan presidential elections as a choice between candidates representing peace or war also indicate the PRC can still influence a mostly hostile Taiwanese public.[71]

The PRC's vulnerability to selective intelligence disclosures or counter-information campaigns in response to PLA political or hybrid warfare will likely depend on the nature and scale of the operation. The massive military buildup expected in a canonical Taiwan invasion scenario will invite many opportunities to expose PRC intentions and damage CCP information and political warfare operations. Those efforts will likely be more effective in energizing potential coalition partners than weakening PRC domestic support and leadership cohesion. The preparation and execution of a hybrid war-like PLA quarantine, blockade, or air and missile coercion campaign, for example, will have a smaller signature and fewer opportunities for exposure on the scale that will motivate other states to aid in Taiwan's defense.

Urban Warfare

Russian forces have overall struggled to apply lessons learned in Syria to heavy urban combat in Ukraine. Russian forces are making further adaptations in Ukraine at the tactical level that they may not be able to to institutionalize due to high casualties and fragmented unit structures. Putin has advocated further proliferating and integrating tactical UAVs into Russian units down to the team, platoon, and company levels after studying Russian experience in Ukraine.[72] The Russian army is likely to continue to make advances in surveillance and UAV tactics in urban environments, though further assessment is required.

China's modern urban warfare capabilities for Taiwan scenarios are still nascent and untested outside of exercises and simulations. Areas where the PLA is likely to face significant challenges in the future include:

- *Overdependence on drones.* The PLA sees swarming drones and other autonomous systems leading urban combat operations as the long-term trend after observing US, Israeli, and even Azerbaijani campaigns in recent years.[73] The PRC's enthusiasm for drone-led operations could lead to relative underinvestment in ground unit urban warfare doctrine and training. A future PLA urban warfare campaign could be vulnerable to significant disruption as counter-drone measures and platforms improve in the future.

- *Small unit control challenges.* The PLA recognizes the importance of small units for urban warfare campaigns going back to their civil war.[74] Will the PLA allow for the autonomy required for small, ad hoc, or special forces units to operate effectively in urban combat or will the need for centralized control prevent success?

- *Misreading the political warfare battlefield*. Intelligence, fifth column, propaganda, and sabotage operations are part of the political warfare that was central to disintegrating the enemy from within during the Battle of Shanghai and other civil war urban conflicts.[75] The PRC builds on this legacy in its modern political and cognitive warfare efforts that will attempt to coopt and subvert the Taiwan leadership in a crisis. The PRC is unlikely to misread local perceptions and leadership determination as poorly as Russia did in Ukraine, but the ability of the CCP to accurately assess and shape Taiwan's leadership and public perceptions is increasingly uncertain as anti-mainland sentiment grows in the Xi Jinping era.

Modeling, Simulation, and OPFOR

China has likely surpassed the United States in employing modeling, simulation, and opposition force (OPFOR) training to strengthen PLA capabilities. Their success is due in large part to coopting civilian video game developers and players to improve PLA simulations and by mimicking OPFOR training they observed during visits to the United States. Whether modeling, simulation, and OPFOR training can overcome the PLA's lack of real-world operational experience compared to the US military is uncertain.

China's achievements in modeling, simulation, and OPFOR capabilities also hold risks. It will be difficult for the PLA to fully capture the complexity of modern warfare through these methods without additional real-world experience.[76] The more the PLA relies on gaming and simulations, the greater the chance of flawed strategic and operational concepts becoming embedded in PLA doctrine.

China has likely surpassed the United States in employing modeling, simulation, and opposition force training.

The PLA simulation and wargaming activities are also reliant on continued MCF efforts with Chinese technology firms and gaming communities.[77] It is uncertain how innovative these partnerships will remain under Xi Jinping's more restrictive industrial, economic, and social policies.

Russia's efforts in simulation and OPFOR are not currently significant, though they may look to leverage Chinese capacity in these areas to help rebuild their military after the failures of the Ukraine War.

Conclusion: Implications for the United States

US success in its long-term military competition with China and Russia will depend on exploiting adversary vulnerabilities and building on relative strengths. The United States has an advantage at the operational and tactical level, at least in the areas examined above. The US military has a more battle-tested force and access to more extensive lessons learned from 21st-century warfare. Its wealth of knowledge from recent counterinsurgency, counterterrorism, and urban warfare campaigns could help Taiwan defend itself and blunt the PLA's superiority of numbers and materiel in potential invasion scenarios, for example.

US military personnel training remains superior with a non-commission officer (NCO) corps backbone that neither Russia nor China possesses. That is likely a key flaw for the PLA from a systems perspective. US command and control is not hampered by dual-key political military control that the PLA retains with its political commissar system. Both the PLA and the Russian military are resistant to the decentralization of command needed for flexible operations. The United States should use technological advances to expand the advantage its decentralized command provides for adept and flexible military operations while mitigating the friction from bureaucratic and compartmented policy processes. The United States could also benefit from re-investing in OPFOR training and crowdsourcing innovation in simulation and virtual reality.

The United States cannot assume efforts intended to counter China in future wars are applicable to countering Russia and vice versa.

The United States has a more entrepreneurial technology sector and flexible supply chain to generate and sustain innovation, though China appears to be able to tap ambitious civilian talent more systemically than the US military. The United States and its allies should retain an advantage in depriving Russia and China of the resources necessary to implement costly modernization and acquisition programs through sanctions and export controls.

The United States cannot assume efforts intended to counter China in future wars are applicable to countering Russia and vice versa. Russia is still learning from its high-intensity conventional war in Ukraine. The Kremlin has not abandoned its emphasis on the information domain, and Western study and understanding of Russian actions in the information space – both in their own right and to support kinetic operations – remains essential. Further combat experience in Ukraine will likely refine many Russian adaptations and modernization efforts, especially over the long run. China is closely observing the war in Ukraine as well while continuing to study more successful Russian hybrid campaigns such as Crimea in 2014. Both conflicts have significant relevance for PRC planning against Taiwan.

The picture is more mixed at the strategic level. The US capacity to make and execute effective strategic decisions in conflict – its war-waging ability – has faced significant difficulties in the post-9/11 era. Successful war waging requires clearly establishing objectives and coherent plans for the use of force, creating the organizational capacity to translate strategic decisions, and ensuring military activities retain legitimacy and support from the American people and key international actors, depending on the circumstances of the conflict.[78] It is difficult for the United States to formulate clear objectives and execute plans that require extensive coordination between the Department of Defense and the rest of the government. US national security decision-making is slow, often incoherent, and encumbered by powerful stakeholders in the bureaucracy compared to more centralized authoritarian regimes. The United States also does not

conduct long-term planning of its government institutions on the scale of the PRC. Chinese observers would argue these are critical weaknesses in the US "system-of-systems."

The United States' biggest disadvantage may be its preference for making a binary distinction between war and operations other than war. Russia and China view political, economic, informational, and covert shows of force and other activities before commencing major conventional operations as part of a singular conflict. US leaders struggle to see war holistically, however, which can inhibit their ability to respond to Chinese political and coercive campaigns or Russian hybrid warfare.[79] Russian information campaigns may yet return the Ukraine conflict into a successful hybrid war. Deterring major conventional and nuclear war with Russia may not be sufficient to preserve US interests in the face of Russian hybrid war efforts.

The United States has war-waging and systemic strengths as well. US alliances and partnerships provide deep networks of competence and the ability to collaborate and innovate on a global scale. The US national security decision-making system has greater transparency and a better ability to integrate alternative viewpoints than Putin's or Xi's regimes. US advanced technologies and the professionalism of its military and civil service help offset many of its bureaucratic deficiencies. The United States and potential coalition partners may be more adept at strategic and operational decision-making than the PRC in a future crisis if they can overcome bureaucratic flaws in their respective national security systems and adopt more comprehensive views of how warfare is evolving.

Institutions, organizations, personnel, and training are essential for making technological advantages effective in modern combat. Adaptation in theory, doctrine, or warfighting concepts does not necessarily equate to better execution. The United States must continue to retain and regain its comparative advantages across doctrine, organization, training, materiel, logistics, personnel, facilities, and policy (DOTMLPFP) – not just superiority in technology. It has and must retain its advantages that come from years of experience fighting full-spectrum wars and training with a fully professional armed force.

US alliances and partnerships provide deep networks of competence and the ability to collaborate and innovate at a global scale.

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