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Challenges to Creative Thinking

Retaining Female Leaders

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Cover 2 images (top to bottom): U.S. Navy Aircrewman (Helicopter) 1st Class Christopher Allen, assigned to "Eightballers" of Helicopter Sea Combat Squadron 8, looks at Gulf of Alaska from MH-60S Sea Hawk, May 8, 2021, in support of flight operations above Joint Pacific Alaska Range Complex and Gulf of Alaska during exercise Northern Edge 2021 (U.S. Navy/Dylan Lavin); Aviation Machinist's Mate 2nd Class Leah Sample, assigned to "Black Knights" of Helicopter Sea Combat Squadron 4, performs maintenance on MH-60S Sea Hawk in hangar bay of USS *Carl Vinson*, November 5, 2021, South China Sea (U.S. Navy/Russell Lindsey); Army 25th Infantry Division Lightning Academy air assault instructors conduct rooftop insertion during Fast Rope Insertion/Extraction System and Special Patrol Insertion/Extraction System master course, May 26, 2021, at Schofield Barracks, Hawaii (U.S. Army/Lekendrick Stallworth)

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General Colin Powell, Chairman of the Joint Chiefs of Staff, delivers remarks at Sunset Ceremony for Pearl Harbor survivors at Arizona Memorial Visitors Center, commemorating 50th anniversary of Japanese attack on Pearl Harbor, December 7, 1991 (DOD/Gloria Montgomery)

Executive Summary

After nearly 2 years of loss in the pandemic, it seems hard to see where we are, where we have been, and certainly where we are going. For the team that publishes this journal, the loss of General Colin Powell to complications from COVID-19 in October was personal. Without his simple tasking in 1993 to develop and implement a journal, *Joint Force Quarterly* would not exist. Having been the editor in chief now for 11 years, General Powell was on my shoulder every day in spirit, and his vision for what he saw as an important component of jointness has been our team's guiding force. His loss has been recounted globally in every imaginable form of media, but I do have a short story about when our team met him, and about the wisdom he had that I turned to 22 years ago when searching for words when one of my squadron's Airmen died in a car crash.

A few years ago, General Powell was scheduled to visit the National Defense University to speak to the students at the colleges here. It had been a few years since his second autobiography had appeared, but his visit had a bit of a book tour feel to it. I reached out to my friend in the NDU Protocol Office to see if my team might meet him. Feeling like we had scored backstage passes at a rock concert, we waited in the room next to the auditorium in Lincoln Hall for the "after speech" meeting. Applause announced the end of the speech and moments later in walked a former Chairman of the Joint Chiefs of Staff, a former Secretary of State, and the founder of *JFQ*. I greeted him and then introduced him to the team, and he spent time with each of us, shaking hands, telling stories, and treating us like old friends. The engagement was probably much shorter than I remember, but by the end we each knew we had a new friend who understood what we did and was proud of our work. Our Internet Editor, Joey Seich, had brought a GI Joe figure of General Powell, which he signed and with a wink of his eye said, "You need to sell

that on eBay!" Then he turned and moved on to the others in the room, but we all felt blessed to have him as the leader of our *JFQ* extended family.

In a different setting some 22 years earlier, long before I met General Powell, as a squadron commander I turned to his first autobiography *My American Journey* as I sought to find the right words to say at a memorial service for one of my Airmen who had died in a car crash. I barely knew Airman Shaun Anderson, having met him only once as he joined the squadron just a few weeks before his death. But I knew he was from New York City, had joined the military to serve his country, and had come from modest means.

It had been a few years since I first read General Powell's book, but I thought there might be something there. And indeed, there was. Speaking about the United States in the months after President George H.W. Bush lost his bid to be reelected President of the United States, General Powell wrote:

How do we find our way again? How do we reestablish moral standards? How do we end the ethnic fragmentation that is making us an increasingly hyphenated people? How do we restore a sense of family to our national life? On the speech circuit, I tell a story that goes to the heart of America's longing. The ABC Correspondent Sam Donaldson was interviewing a young African-American soldier in a tank platoon on the eve of battle in Desert Storm. Donaldson asked, "How do you think the battle will go? Are you afraid?" "We'll do okay. We're well trained. And I'm not afraid," the GI answered, gesturing toward his buddies around him. "I'm not afraid because I'm with my family." The other soldiers shouted, "Tell him again. He didn't hear you." The soldier repeated: "This is my family and we'll take care of each other."

General Powell's book was seen by many as his way of preparing for a potential Presidential run of his own, which was not to be. But he felt this story was what we as a nation should be seeking, to achieve what he felt as a Soldier, what all of us who have served may have felt at some time, that we were a part of a family, part of something bigger than ourselves. He wrote, "We have to start thinking of America as a family. We have to stop screeching at each other, stop hurting each other, and instead start caring for, sacrificing for, and sharing with each other . . . and get back to the can-do attitude that made America." General Powell saw a better future for Americans more than a quarter-century ago. It remains a worthy goal for all of us.

Turning toward our current issue, concerns about China's military rise have been a consistent theme in *JFQ*, along with how we might gain insights on this activity by improving intelligence methods. Hypersonic missiles present an important addition of both defenses and threats to the world's military capabilities, and Bruce Sugden, who wrote an excellent article recently on nuclear challenges in the *Texas National Security Review*, gives us his views on where these weapons fit in warfighting. James Kwoun next suggests design thinking across the Intelligence Community could increase the value of analysis. Tracking another area of concern about China, we also offer a thoughtful article by JohnRoss Wendler on the impact of China's propaganda during the early days of the pandemic.

Like the general education environment of the United States, our joint professional military education colleges have continued their missions by adapting to the reality of virtual, high-flex, and mask-to-mask methods of teaching. As we use our creative thinking skills to cope, Jeffrey Berejikian, Zachary Zwald, Samantha Jane Daly, and Jeffrey Hannon have done some interesting research into how military officers' beliefs drive decisionmaking when information available to them is limited. Derek Reveron, along with his Naval War College partners James Cook and Ross Coffey, offer some interesting new thoughts on how regional strategy should be developed to address globalized threats.

In Commentary, Kyleigh Cullen suggests several ways the Department of Defense could more fully comply with the Women, Peace, and Security Act, which seems far overdue. As Russia ramps up pressure on Ukraine, the United States has provided support to this partner nation, and a team of experts from U.S. European Command—Gary Espinas, Tigran Mikaelian, and Michael McCarthy—describes how our government can sustain that support through increased institutional capacity-building.

In Features, we present three articles on markedly different subjects. Graham Jenkins offers a valuable primer for planners and those who lead joint operations on the need for securing overflight permissions. As the joint force struggles to attract and retain women in the ranks, Benjamin Ramsey, Ann Bednash, and John Folks see retention of these valuable teammates as essential to readiness. Joel Wuthnow, a close colleague of ours here at NDU, discusses options for Taiwan's defense through a competitive strategy lens. Finally, the team of Samir Deshpande, Amy Adler, Susan Proctor, Vincent Capaldi, James McClung, Toby Elliman, and Deydre Teyhen offers us a look at how the health of the joint force, our preparation for pandemics of the future, and multidomain operations are interconnected.

Our Recall article brings us another excellent contribution to the modern interpretation of one of the least famous of the campaigns of World War II. Jessica Pisano presents a fresh take on the American operations in the Aleutian Islands through the lens of jointness to see how it might have gone better—and in turn leaving today's joint force with a reminder of how difficult fighting in the Arctic region can be, especially without proper planning and execution. With improving jointness in mind, keeping up with developments in joint doctrine is easier with our Joint Doctrine Update. And as we do every issue, we present another excellent set of book reviews. Thank you for being a part of General Powell's *JFQ* family. **JFQ**

—William T. Eliason,
Editor in Chief

In Memoriam

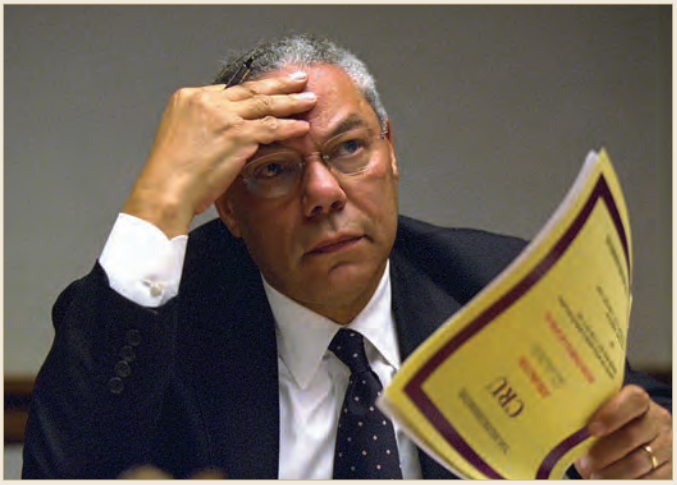
Colin Luther Powell

12th Chairman of the Joint Chiefs of Staff

October 1, 1989–September 30, 1993

In 1993, as the first Black Chairman of the Joint Chiefs of Staff, Colin Powell founded this journal, *Joint Force Quarterly*—or simply *JFQ*, and introduced its inaugural issue that summer. His vision was to create a dynamic publication that would educate and inspire current and future military leaders serving across the joint force and "to provide for a free give-and-take of ideas among a wide range of people from every corner of the military." Nearly 30 years later, and with over 100 *JFQ*s published, our editorial team and contributing authors have consistently strived to carry forward his integrity, leadership, and steadfast commitment to our county's warfighters. We offer this photo retrospective in honor of an extraordinary hero whose vision and determination shaped this journal and our nation. JFQ

General Powell and General Norman H. Schwarzkopf, commander-in-chief, U.S. Central Command, discuss coalition activities during Operation *Desert Shield* (DOD/H.H. Deffner)



Secretary Powell meets with senior George W. Bush administration officials in President's Emergency Operations Center, September 11, 2001 (National Archives and Records Administration/David Bohrer)

President Barack Obama jokes with Vice President Joe Biden and former Secretary of State Powell following their meeting in Oval Office, December 1, 2010 (The White House/Pete Souza)

President George H.W. Bush announces selection of General Powell as Chairman of the Joint Chiefs of Staff, August 10, 1989 (George H.W. Bush Presidential Library)

General Powell with Soldiers from Joint Task Force B during exercise Fuertes Caminos '91, in Honduras, April 1, 1991 (DOD/National Archives and Records Administration/Pablo Tola)

President Ronald Reagan, Chief of Staff Howard Baker, and newly appointed National Security Advisor Powell confer inside Rancho Del Cielo, in California, on November 25, 1987 (Reagan White House/ National Archives and Records Administration)

Airmen with 912th Aircraft Maintenance Squadron line up AGM-183A Air-Launched Rapid Response Weapon Instrumented Measurement Vehicle 2 as it is loaded under wing of B-52H Stratofortress at Edwards Air Force Base, California, August 6, 2020 (U.S. Air Force/Giancarlo Casem)

Analyzing the Potential Disruptive Effects of Hypersonic Missiles on Strategy and Joint Warfighting

By Bruce M. Sugden

Will the potential widespread deployment and employment of hypersonic missiles be a disruptive development for strategy and military operations? That is, will a competitor's use of hypersonic missiles undermine assumptions underlying the Department of Defense (DOD)'s emerging global and regional concepts for joint warfighting, as well as undermine widely held beliefs about strategic stability and how to deter threats to America's most vital interests?[1] Will U.S. hypersonic missiles undermine the assumptions behind Russia's and China's warfighting concepts and beliefs about deterrence, possibly allowing U.S. forces to enhance extant, or obtain new, warfighting advantages?

There are conflicting assertions about the implications of the United States, Russia, and China developing and deploying high-speed maneuvering weapons delivery systems—more commonly referred to as hypersonic missiles (for the remainder of this article, *hypersonic*

Bruce M. Sugden is a Research Analyst in the Joint Advanced Warfighting Division at the Institute for Defense Analyses.

missiles will be used as a generic term) to conduct warfare. The often hyped and much-anticipated technical promise of hypersonic missiles raises questions that go to the heart of long-held U.S. operational and strategic assumptions. Issues about deterrence, offense-defense balance, basing and posture, and command and control (C2) are not likely to be found or analyzed in a program office or laboratory or on a test range.[2]

To better understand military operations featuring hypersonic missiles, and well before the executive and legislative branches debate the affordability of procuring such missiles, DOD should initiate a campaign of experimentation, "a process of discovery about new military operational concepts and capabilities."[3] The underlying purpose of military experimentation is to acquire "knowledge to guide decisions about an uncertain future."[4] Relatedly, as Robert Angevine has noted, the newly acquired knowledge can

> *reduce risk when acquiring new military capabilities or developing new tactics, techniques, and procedures with existing capabilities. In the absence of an effective joint experimentation program, future combatant commands will most likely face the task of figuring out . . . how newly developed Service capabilities are stitched together at the operational level to achieve effective unified action.*[5]

To support such a campaign, a coherent body of research that seeks to understand how the three major military competitors envision deploying and employing hypersonic missiles is required.

This article argues that wargaming, informed by new research, should be at the vanguard of the campaign that explores the implications of the proliferation of hypersonic missiles. This is not to say that wargaming should be conducted at the expense of other tools of experimentation, but that wargaming is a cost-effective way to identify and develop the cognitive and analytic frameworks that could then be explored in more thorough and comprehensive analyses.[6] In the absence of disconfirming evidence from either wartime experience featuring the use of hypersonic missiles or a campaign of experimentation centered on understanding the possible effects of hypersonic missiles on strategy and military operations, DOD and Congress should accept the null hypothesis: the widespread deployment and use of hypersonic missiles by the United States, Russia, and China will not produce strategic and operational effects that diverge from those associated with extant ballistic and cruise missiles.[7] Correspondingly, the United States should not procure and deploy hypersonic missiles as a higher priority than other missile systems.

The article unfolds in eight steps. First, it describes the two types of hypersonic missiles that the Great Powers are developing and the capabilities that distinguish hypersonic missiles from other kinds of missiles. Second, it identifies the major competitors' developmental and current hypersonic missiles. Third, the article sketches the key assertions and issues in the debate about the implications of hypersonic missiles for military operations and defense strategies. Fourth, it explores U.S., Russian, and Chinese warfighting concepts and military doctrines that each will incorporate into its near-term hypersonic missiles. Fifth, the article discusses several broad ways in which hypersonic missiles might be employed in a future U.S.-Russia or a U.S.-China conflict. Sixth, the article unpacks several issues pertaining to defense against hypersonic missiles. Seventh, it makes the case that a campaign of wargames at the frontline of a military experimentation effort could make significant headway in determining whether hypersonic missiles will produce any disruptive effects for strategy and military operations. It also proposes a set of candidate research questions for a campaign of wargames to investigate the array of issues raised in the preceding sections of the article. Finally, the article discusses how the outputs of military experimentation, if they show that hypersonic missiles would indeed produce disruptive effects and could provide an opportunity for the U.S. military to enhance its operational advantages against Russian and Chinese forces, could help DOD develop competitive strategies centered on hypersonic missiles against Russia and China.

Background

A hypersonic missile has two key capabilities: flying at a speed of or above Mach 5.0 and flying at least half its range in aerodynamic flight (that is, as an airplane can rotate in the dimensions of yaw, pitch, and roll). Individually, these capabilities are not novel; it is their combination that makes hypersonic missiles a potentially disruptive innovation.

Discussions of hypersonic missiles usually place them in one of two categories: hypersonic glide vehicles (HGVs) or hypersonic cruise missiles. HGVs are launched into their flights using traditional missile boosters. When separated from their boosters, they begin to glide in the upper atmosphere without motor assistance.[8] Hypersonic cruise missiles are powered by an air-breathing engine.[9] To get these missiles to hypersonic speeds, designers have been working on scramjet engines—a beefed-up version of ramjet engines. In ramjet engines, the air flow through the engine is subsonic. In a scramjet engine, the air flows through the engine at supersonic speed.[10]

The Major Competitors and Developments

The United States, Russia, and China are developing technologies for HGVs and hypersonic cruise missiles. U.S. research and development efforts are looking at hypersonic missiles in both categories that could be launched from the ground, sea, or air and carry conventional payloads. As of late 2020, according to publicly available information, the United States had six lines of effort to develop operational prototypes of hypersonic missiles: one each in the Air Force, Army, and Navy and three in the Defense Advanced Research Projects Agency (DARPA).[11]

The Air Force hypersonic development effort is the AGM-183 Air-Launched Rapid Response Weapon (ARRW), which is an air-launched HGV designed to strike ground targets as far away as 1,600 kilometers within 10 to 12 minutes.

Delivery of first prototype hypersonic hardware to Soldiers of 5th Battalion, 3rd Field Artillery Regiment, 17th Field Artillery Brigade, is completed on October 7, 2021, with ceremony at Joint Base Lewis-McChord, Washington (U.S. Army/Karleshia Gater)

The B-52H is expected to be the primary launch platform for the ARRW.[12] The Army's effort is the Long-Range Hypersonic Weapon. The missile will use the same Common-Hypersonic Glide Body as the Air Force's and Navy's efforts and will first be boosted by a ground-launched two-stage rocket. The missile is intended to have a range greater than 2,775 kilometers and be employed against ground targets.[13] The Navy's Conventional Prompt Strike (CPS) uses the Common-Hypersonic Glide Body mated with a submarine-launched booster system. CPS might achieve initial operational capability on a *Virginia*-class submarine with a Virginia Payload Module in fiscal year 2028.[14] It is being designed for employment against ground targets.

Meanwhile, DARPA is working to develop and demonstrate critical technologies to enable future air- and ground-launched hypersonic weapon systems. Working with the Air Force, one system is the Tactical Boost Glide, which might also be compatible with the Navy's vertical launch system found on a variety of its ships. DARPA's Operational Fires program is another effort that might eventually transition to the Army. Lastly, the Hypersonic Air-Breathing Weapon Concept (HAWC) is a joint effort with the Air Force to develop an air-launched hypersonic cruise missile. Considering HAWC's smaller size relative to other developmental vehicles, it might be compatible with several launch platforms.[15]

Unlike the United States, China and Russia have not declared that they will abstain from deploying nuclear payloads with their systems.[16] In fact, Russia's first SS-19 intercontinental ballistic missile (ICBM) unit equipped with the Avangard HGV, armed with a nuclear warhead, entered combat duty in December 2019.[17] Russia is also developing the Tsirkon hypersonic cruise missile. It is a ship-launched system that may be capable of striking ground targets and naval ships.[18]

Reports suggest that China has several hypersonic missile programs.[19] One is the ground-launched DF-17 medium-range system (flight range of roughly 1,800–2,500 kilometers) designed to carry HGVs for use against ground targets. It might already be operational. A second system is the DF-ZF HGV, which was previously known as the WU-14. It may have a range of roughly 1,930 kilometers. China has also flight tested a third system, the Starry Sky–2 (or Xingkong-2), which might be capable of carrying a nuclear payload. In contrast to HGV designs, the Starry Sky–2 employs powered flight more like a hypersonic cruise missile design. Because it achieves aerodynamic lift from its own shockwaves, the Starry Sky–2 might be considered a hybrid

hypersonic missile design. Finally, China might also deploy intercontinental-range hypersonic missiles to threaten the U.S. homeland, as General Terrence O'Shaughnessy, then commander of U.S. Northern Command and North American Aerospace Defense Command, suggested in testimony before Congress early in 2020.[20] However, the open-source literature does not identify a specific intercontinental-range hypersonic vehicle program.

The Debate

Compared to maneuverable subsonic cruise missiles and nonmaneuvering ballistic missiles with reentry vehicles, the capabilities of hypersonic missiles will improve the ability to elude detection and tracking sensors, penetrate an opponent's air and missile defenses, and strike their targets.[21] As a result, hypersonic missiles could possibly strike targets with little warning and catch an opponent off guard. In fact, Vice Chairman of the Joint Chiefs of Staff (and former commander of U.S. Strategic Command) General John Hyten has stated that conventional hypersonic missiles could "provide responsive, long-range, strike options against distant, defended, and/or time-critical threats when other forces are unavailable, denied access, or not preferred. While conventional hypersonic weapons are not a replacement for nuclear weapons, their unique attributes will increase traditional warfighting advantages and bolster conventional and strategic deterrence."[22] But just how significant will the effects of the deployment and employment of hypersonic missiles actually be relative to extant warfighting advantages and concepts of deterrence?

On one side of the debate, a former National Security Council staff member asserts that "hypersonic weapons, at long last, appear poised to fulfill the promise of air power"—the prompt, accurate, and unstoppable delivery of weapons on an opponent's critical national assets to compel it to give up the fight without the use of ground troops, which have "proved costly, unpopular and generally ineffective."[23] Extending this theoretical vision into U.S. strategy, Michael Griffin, who was the Under Secretary of Defense for Research and Engineering from 2018 to 2020, asserts that an asymmetry in hypersonic missiles that favors America's competitors could, during wartime, result in the United States having to choose nuclear escalation to prevent its adversaries from achieving their war aims. He further suggests that nuclear adversaries may doubt the credibility of a U.S. nuclear threat in response to their use of conventionally armed hypersonic missiles.[24] It is a new twist on a Cold War–era question: Would the United States risk nuclear escalation, including against the homeland, in a response to conventional strikes in a distant theater?

On another side of the debate is the belief that deploying hypersonic missiles will not overturn the logics of deterrence and strategy that have characterized relationships among the United States and its nuclear-armed Great Power competitors for years.[25] Even without hypersonic missiles in its arsenal, the United States will retain an array of effective military responses to China's or Russia's use of hypersonic missiles. Though not explicit, this view might hinge on what Thomas Schelling referred to as "the threat that leaves something to chance"—that is, the inescapable risk of escalating to large-scale, counter-homeland nuclear strikes will make a nuclear adversary's military threat against U.S. allies unlikely in the first place.[26]

Finally, there is a third facet of the debate. Dean Wilkening suggests that hypersonic missiles "could have a profound effect on strategic stability" in two ways.[27] Strategic stability usually encompasses two categories. The first, *crisis stability*, is a situation in which two nuclear competitors cannot limit the damage they might incur in a war by conducting a preemptive counterforce attack, thereby militating against the temptation to strike first to avoid suffering the other's counterforce attack. The second is *arms race stability*—a situation in which the survivability and assured retaliatory capabilities of the competitors' nuclear forces are highly insensitive, or are robust, to qualitative or quantitative changes in each other's nuclear force structure.[28] The first potential effect on strategic stability, according to Wilkening, involves the defender's attack assessment challenge vis-à-vis high-speed maneuvering delivery vehicles. The difficulty of correctly assessing the inbound missiles' likely targets could undermine crisis stability by rendering nuclear escalation "difficult to control."[29] The defender's uncertainty about whether the payloads on the inbound missiles are nuclear or conventional would further reduce crisis stability.

The second potential effect is that a competitor's deployment of a substantial number of hypersonic missiles could increase the risk that a portion of the other's nuclear retaliatory force would suffer a surprise counterforce attack, thereby decreasing arms race stability. The elevated sense of vulnerability could compel a competitor to enhance the capabilities of its nuclear forces or to change their readiness posture, or both.[30]

Competitors' Approaches to Large-Scale Combat Operations

This section briefly examines U.S., Russian, and Chinese warfighting concepts and military doctrines that each will incorporate into its near-term hypersonic missiles. Its purpose is to establish the strategic and operational contexts for the subsequent discussion on the competitors' possible employment concepts for hypersonic missiles.

The United States. The National Defense Strategy calls for the joint force to deter aggression in key regions—the Indo-Pacific, Europe, and the Middle East—and to deter nuclear and nonnuclear strategic attacks and defend the homeland. Among many capabilities required to accomplish these missions, the joint force must be capable of striking a diverse array of targets inside adversary defensive layers to destroy mobile power-projection platforms.[31]

The U.S. military has a well-demonstrated playbook of achieving conventional advantage in large-scale combat operations: to degrade, disrupt, or destroy enemy command, control, and communications (C3) capabilities and to gain air superiority over the theater of operations.[32] Though

U.S. maritime superiority has been a regional battlespace fact at the outset of conflicts since the end of the Cold War, U.S. air superiority—the sine qua non of successful land operations—has had to be achieved in several conflicts beginning with Operation *Desert Storm* in 1991.

Current doctrine states that the joint force commander "must overcome the enemy's A2/AD [antiaccess/area-denial] capabilities to establish and maintain access to OAs [operational areas] where they are likely to operate."[33] The upcoming Joint Warfighting Concept, ostensibly founded on a new American way of war known as All Domain Operations, will possibly echo aspects of current doctrine in calling for an integrated joint force that can deny an adversary's ability to dominate on the land, sea, in the air, space, and cyber domains—and support its own ability to dominate in the same.[34] In light of the breadth and depth of improving Russian and Chinese A2/AD layers extending from the competitors' home territories, the joint force might have to substitute temporary moments of defense penetration and freedom of maneuver utilizing joint all-domain capabilities for widespread and prolonged rollback of A2/AD capabilities that occurred in conflicts over the past 20 to 30 years involving the United States and far less capable military powers.[35] Small numbers of U.S. hypersonic missiles could play a role in producing the temporary moments in which less survivable U.S. platforms and delivery vehicles could penetrate adversary defensive layers and conduct strikes, while larger numbers of hypersonic missiles could possibly help the joint force achieve an outcome closer to the long-lasting rollback of adversary A2/AD capabilities.

Russia. Should war break out, Russia would rely on imposing a level of damage upon its opponent calculated to control escalation and compel its acquiescence to Russia's demands.[36] Assuming that a conflict against the United States originates in a region bordering Russia, Russia would lean on its perceived advantage in the balance of resolve—the willingness to impose and suffer damage to win or safeguard a disputed stake.[37] Should wartime conditions warrant, the ideal Russian strategy would be to conduct conventional precision strikes, while preferably withholding nuclear strikes to deter U.S. nuclear escalation.[38]

Russian strategists understand that deterrence plays out in the perceptions of the adversary's society and its decision-makers and that each set of perceptions can influence the other and in turn constrain an adversary's strategy. To manipulate the adversary's perception of risk, impose costs, and threaten additional costs, the Russian military literature for years has confirmed that the Russian military wants to be able to employ to varying degrees nonstrategic nuclear weapons, strategic nuclear weapons, and long-range conventional precision-strike weapons (not necessarily in this order). The military envisions some or all military tools being employed in conjunction with the Russian government's diplomatic, political, and informational tools.[39]

Russian nuclear weapons are the most numerous and most destructive options. However, Russia has been expanding the size and quality of its conventional precision-strike weapon arsenal to provide more nonnuclear options to control escalation and achieve strategic objectives in regional conflicts. Russian writings discuss using conventional strike forces in the "threatened period of war" and in the early phases of conflict.[40] At the same time, many of Russia's theater-range missiles are dual-capable, meaning the same missile body can carry either a conventional or nuclear warhead. Russia's Tsirkon hypersonic missile program, if deployed, might be a dual-capable system.

The Russian military envisions employing conventional precision-strike weapons in attacks of varying scale and severity: from demonstration or single strikes to "strategic operations for the destruction of critically important targets" (SODCIT).[41] Dave Johnson suggests that what a critically important target is in the context of SODCIT is reflected in Russian government documents on civil defense. Those documents point to a critically important target being an asset that "the destruction or suspension of functionality of which would lead to loss of control of the economy of the Russian Federation, or of the territorial unity of the Russian Federation, her unrecoverable negative change (destruction) or a substantial lowering of the security of the vital functions of the population."[42]

Russian military writings also point to operational and strategic target categories for SODCIT. The operational targets include C2, aerial ports of debarkation, seaports of debarkation, major assembly and staging areas for military forces, and chokepoints along lines of communications. Strategic targets include national C2, strategic strike capabilities, munitions stockpiles, government control centers at national and regional levels, war-supporting industry, and aerial ports and seaports of embarkation.[43]

China. Many China watchers consider that the doctrinal writings of China's military forces (chiefly the People's Liberation Army Rocket Force [PLARF], formerly the Second Artillery Corps) call for using conventional missiles in missions to support combat operations by Chinese ground, air, naval, and information operations units around and near China's periphery. As of 2021, China has deployed missile forces suitable for conducting conventional precision-strike operations against targets in India, East Asia, and the western Pacific Ocean. As Chinese missile capabilities and associated employment concepts evolve, a missile campaign could be designed to conduct strikes against more distant critical targets, such as U.S. military bases in the eastern Pacific and along the west coast that would support a surge of forces to fend off Chinese aggression against U.S. allies and partners.[44]

According to Michael Chase, the 2004 edition of the *Science of Second Artillery Campaigns*, which even in the 2010s China watchers considered essential to understanding PLARF doctrine, recognizes the following potential target types for conventional missile strikes: strategic- and campaign-level C3 centers, radar installations, information-related hubs, missile and air force bases, naval facilities, logistics hubs, chokepoints in lines of communications, energy

infrastructure, and aircraft carrier strike groups. The *Science of Second Artillery Campaigns* describes the missile strike campaign's intent as "paralyzing the enemy's command system; weakening the enemy's military strength and its ability to continue operations; creating psychological shock in the enemy and shaking its operational resolve; and checking the powerful enemy's military intervention activities." Chase observes that Chinese military writings accentuate the importance of achieving surprise in conventional missile strike campaigns and, therefore, seem to see military utility in preempting the enemy.[45]

Possible Employment Concepts

It is quite possible that the three competitors would adopt different hypersonic technologies and procure different numbers of systems, deploy them differently, and incorporate—or perhaps even integrate—them differently into operational plans. The discussion so far suggests five broad ways in which hypersonic missiles might be employed in a future U.S.-Russia or a U.S.-China conflict and highlights possibly different operational and strategic implications of varying arsenal sizes and warfighting approaches for a campaign of wargaming to address.

First, preceding a missile raid, hypersonic missiles might be used to knock out specific missile defense radars or batteries to reduce defense capabilities to ensure that the follow-up missiles reach their targets. Over the past two decades, Russia, for example, has been building up layers of multidomain and dual-capable defenses against perceived military threats around its periphery.[46] In a hypothetical conflict in the Baltic states, Russia's deployment of hypersonic missiles like the Tsirkon could raise the possibility of Russia employing hypersonic antiship conventional or nuclear missiles against a ballistic missile defense

Damage control sailors aboard USS *Gridley*, flagship of North Atlantic Treaty Organization's Standing Maritime Group 1, respond to simulated cruise missile strike during Alliance's Naval Electro-Magnetic Operations 19 exercise, October 31, 2019 (NATO)

University of Maryland Department of Aerospace Engineering doctoral candidate Laura Paquin takes apart High-Speed Aerodynamics and Propulsion Laboratory's hypersonic wind tunnel at University of Maryland, College Park, November 16, 2020 (U.S. Air Force/Perry Aston)

ship, such as an *Arleigh Burke*–class destroyer, or against a U.S. Terminal High Altitude Area Defense missile defense battery defending an aerial port of debarkation for U.S. military reinforcements to the European theater. Likewise, China could employ the DF-17 system against missile defense assets arrayed to defend Kadena Air Base on Okinawa to open the door for less-capable missiles to conduct follow-on strikes against the base. This type of precursor strike might be the most likely use of hypersonic missiles when a competitor has a limited number of them in its arsenal compared to the numbers of more traditional ballistic and cruise missiles.

Second, because both Russia and China see U.S. and allied missile defenses protecting land- and sea-based assets as a formidable obstacle to their nonhypersonic offensive missiles, they might employ hypersonic missiles as part of small missile raids against heavily defended U.S. assets based along their peripheries. Larger numbers of hypersonic missiles available for use might supplant traditional ballistic and cruise missiles and enable competitors to strike key targets without using saturation tactics.

Third, corresponding with General Hyten's views of the roles of hypersonic missiles, U.S. forces could use them to strike time-sensitive, relocatable targets, such as mobile launchers for advanced air-missile defense systems or long-range offensive missiles that are believed to be armed with weapons of mass destruction. However, such U.S. strikes against targets in the homeland of either Russia or China, as Wilkening noted, could lead to nuclear escalation.

Fourth, also in line with Wilkening's concern about crisis stability, hypersonic missiles' ability to complicate and reduce an opponent's missile attack warning assessment and response timeline means that Russia or China could attempt to preemptively decapitate senior leadership. This is one possible use for Russia's Avangard HGV. Even if Russia armed Avangard with a conventional warhead, U.S. decisionmakers might interpret the inbound HGV as a nuclear threat and begin the process of launching a nuclear retaliatory strike.

At the same time, it is important to remember that while hypersonic missiles might reduce an opponent's missile attack warning time, they will not necessarily eliminate it. Sensors in geosynchronous orbit around the earth might still detect the initial boost phase of a HGV's booster rocket, thereby providing sufficient time for dispersal of senior leaders and relocatable critical assets, such as on-alert bombers.[47] The greater risk, and one that wargames could investigate further, is that an adversary would orchestrate a hypersonic missile attack in conjunction with a counterspace campaign directed against sensors in geosynchronous orbit to deny an opponent critical information to further reduce or eliminate its warning time of a missile attack.

Fifth, possibly in a more distant future, perhaps even with a larger footprint of operational U.S. missile defenses, Russia or China could use large numbers of hypersonic missiles in deep conventional strikes against U.S.-based rear-area logistics, transportation chokepoints, space-launch facilities, counterspace assets, C3 and intelligence-gathering assets, or war-supporting industry to reduce the U.S. ability to sustain overseas military operations and to impose psychological shock on the American public and leadership. For Russia, these types of strikes using hypersonic missiles would fit squarely within its SODCIT concept and could elicit a U.S. launch-on-warning nuclear response.

Interestingly, some of the hypothetical operational approaches point to the threat of large-scale, conventionally armed hypersonic missile strikes—on the order of several hundred hypersonic missiles—leading to nuclear escalation. In a regional conflict, such as in Europe or the East China Sea, the potential effectiveness of large-scale use of conventional hypersonic missiles in preventing a state from achieving its war aims could drive it to employ nuclear weapons as a last-ditch attempt to turn the tide of the war to its favor. Such a scenario seems consistent with Russia's thinking about nuclear escalation stemming from a regional conventional conflict. In addition, perhaps depending on the conditions and effectiveness of missile defense architectures, large-scale, counter-homeland conventional hypersonic missile strikes could generate a nuclear first-strike incentive between nuclear-armed Great Powers, thereby undermining crisis stability. It is conceivable, though, that the threat of a large-scale hypersonic missile attack between the United States and one of its major competitors will not be seen differently than the threat of large-scale attacks involving traditional ballistic and cruise missiles. As discussed below, wargaming could help identify and characterize the conditions surrounding different hypothetical deployment and employment schemes of hypersonic missiles that are more likely to generate nuclear first-strike incentives across the three major military competitors.

Playing Defense Against Hypersonic Missiles

Proponents and opponents of U.S. hypersonic missiles expect this new technology will exacerbate a defender's task of shooting down an attacker's missiles. It remains true that missiles in boost phase (including missiles carrying HGVs) are more vulnerable to detection and tracking than in other phases of flight. However, boost-phase intercept requires the defender's sensors and interceptor launchers to be located near the attacker's launch sites. Geography and the current state of A2/AD threats have so far precluded the United States from pursuing this intercept option in its terrestrial form. As a result, to defend forward-deployed U.S. forces and regional bases from missile attack, the U.S. military relies primarily on conducting kinetic energy, or hit-to-kill, intercepts in the midcourse (between booster burnout and the beginning of terminal phase) and terminal phases of missile flight.[48] Even U.S. homeland missile defense relies on midcourse kinetic intercept, and it is designed for limited ICBM attacks from North Korea and potentially Iran.[49]

Evasive maneuvers are one of the most effective defense penetration features that could be used on offensive missiles. If designed properly, an evasive maneuver could render the entire defense system ineffective even if all the other defense system elements perform optimally.[50]

High-speed maneuvering delivery systems (like maneuvering reentry vehicles and hypersonic missiles) could wreak havoc for a kinetic missile defense system.[51] First, in some cases, the defense interceptor might be launched before the target vehicle begins to maneuver. If the maneuver is significant enough, the target vehicle could maneuver completely outside the intercept envelope for the defense interceptor. Second, if the intercept were to be attempted while the target vehicle is maneuvering, the defense interceptor must have the kinematic capability to outmaneuver it.

Because of the technical challenges associated with active defense against hypersonic missiles, the proliferation of hypersonic missiles might persuade the United States to reconsider its declaratory policy regarding an adversary's preparations to conduct offensive strikes using hypersonic missiles, especially in the case of long-range hypersonic missiles capable of striking the U.S. homeland. For example, to deter an attack, the United States could declare that if such preparations were detected, then U.S. forces would conduct preemptive strikes to prevent the launch of the hypersonic missiles. One risk of this approach, in an ironic twist, is that the United States misjudges the intelligence on the adversary's activities and becomes the first competitor to use hypersonic missiles in an act of war against a nuclear adversary's homeland, thereby opening the door to retaliation against the U.S. homeland. The consequences of acting on flawed intelligence assessments against a nuclear adversary might preclude the United States from adopting a policy of preemptive attack.

Instead of revising its policy, the United States could pursue potential technological countermeasures to hypersonic missiles, but they are not without their drawbacks. One option for missile defense is directed-energy weapons (DEWs). To successfully engage inbound hypersonic missiles with DEWs, the defender needs to place as much energy on the target as it can for the longest period. For obvious reasons this means the DEW must be sited as far away from the defended asset as possible to maximize the engagement window. Because the surfaces of the target missile were designed to withstand extremely high temperatures, the DEW would likely need more time to engage the target than if it were an aircraft or a low-flying subsonic cruise missile. Furthermore, atmospheric conditions will likely reduce the lethality of DEWs in all but the shortest ranges, which further compresses the potential engagement windows.[52]

Electronic warfare (EW) defenses have the potential to be a long-term solution to the active defense problem. The defender needs to know the frequencies used in the target vehicle's terminal guidance system or arming, fusing, and firing system, for example. But as with DEWs, the EW solution will require enough time to degrade the vehicle's subsystems.

Army Space and Missile Defense Command/Army Forces Strategic Command conducted first flight of Advanced Hypersonic Weapon concept in November 2011 (U.S. Army)

Finally, nuclear-tipped interceptors might be the most effective option for defeating hypersonic missiles. Specifically, the blast wave or radiation output of a tailored nuclear weapon or a low-yield nuclear weapon might produce a lethal radius exceeding that of conventional weapons.[53] The larger lethal radius increases the chance of disabling an incoming maneuvering delivery vehicle without the interceptor scoring a direct hit.[54] This was the basic concept underlying U.S. deployment of nuclear-tipped air and missile defense interceptors from the 1950s through the 1970s. Interestingly, there have been no reports that DOD is considering tailored nuclear weapon designs over nonnuclear intercept technologies for dealing with hypersonic delivery systems, but perhaps it should.[55] The DOD inhibition might be due to the belief that negative political consequences would result from exploring nuclear-armed interceptors. Granted, adversaries could respond to the deployment of U.S. nuclear-tipped interceptors in several ways to mitigate their effectiveness, and the design of U.S. interceptors would have to compensate for such countermeasures.[56]

Even if the United States did not return to nuclear-tipped missile interceptors, Russia is on course to maintain nuclear weapons for select antiair and missile defense systems.[57] Such payloads might be used with Russia's developmental S-500 surface-to-air missile, an interceptor that might be capable against some types of hypersonic missiles.[58] Thus, the design of U.S. hypersonic missiles would need to consider enemy defenses utilizing nuclear weapon effects.

The upshot is that the proliferation of hypersonic missiles might compel the United States to revisit how and where it deploys missile defense interceptors and sensors across space and terrestrial domains. The hypersonic missile threat has already catalyzed the United States to begin investing in a space-based component of its expanding missile defense capabilities aimed at the boost, midcourse, and terminal phases of HGVs and other hypersonic missiles.[59] The Space Development Agency (SDA) has proposed the National Defense Space Architecture (NDSA), consisting of several different layers of satellite constellations to fulfill different mission sets. Two layers would be designed with hypersonic missile defense in mind: the tracking layer, which would "provide global indications, warning, tracking, and targeting of advanced missile threats, including hypersonic missile system"; and the transport layer, which would connect the tracking layer to terrestrial-based interceptor networks.[60] The Missile Defense Agency (MDA) and U.S. Space Force are working with the SDA to develop the Hypersonic and Ballistic Tracking Space Sensor that will populate the tracking layer. Alongside development of the NDSA, MDA and DARPA are exploring new interceptor options that could outmatch the kinematic capabilities of offensive hypersonic missiles in their terminal phases of flight to perform successful intercepts.[61]

U.S. plans for enhanced missile defenses against hypersonic missiles suggest two areas of inquiry for a wargaming campaign. First, as of 2021, U.S.-planned defenses against hypersonic missiles are focused on regional threats to forward-deployed U.S. forces and bases, but China and Russia have always suspected that the ultimate objective behind U.S. advances in missile defense technologies is to deploy a global missile defense architecture that would negate a Chinese or Russian nuclear second-strike against the United States.[62] Thus, according to Chinese and Russian criticisms, U.S. missile defense efforts are sources of instability that could generate nuclear first-strike incentives.

Second, the rise of enhanced space-based missile defense capabilities, possibly across the three major military competitors over the long term, could spawn a more intense offense-defense competition in space. The NDSA's tracking and transport layers might consist of approximately 90 satellites, a number that may not be large enough to deter a competitor from engaging in kinetic or nonkinetic counterspace operations to degrade or destroy the NDSA's ability to provide missile warning and interceptor engagement information.

The issues of nuclear first-strike incentives and counterspace operations directed against the NDSA highlight the need to conduct a campaign of wargames focused on hypersonic missiles that includes multidomain supporting or enabling operations as well as different assumptions about the effectiveness of missile defense systems that have yet to be tested against realistic targets and offensive missile tactics. Wargames could also investigate the use of U.S. hypersonic missiles against the Intelligence Community's estimates of future Chinese and Russian missile defense architectures and systems, including nuclear-armed interceptors. In addition, different missile defense architectures and different numbers of deployed hypersonic missiles could be used in wargames to analyze how the interactions between the two sets of forces might result in different incentives and operational concepts for the three major military competitors, possibly undermining the deterrence beliefs of one or more of the nuclear competitors.

Research Agenda with Wargaming as a Key Analytic Tool

The introduction of arsenals of hypersonic missiles in a future military environment creates an imprecise and complex problem set, which is ideal for wargames to tackle. Wargames can produce knowledge that is indicative: "at its best [wargames] can indicate the possibilities of a projected warfare situation and certain potential cause-and-effect linkages."[63]

Wargaming in general, and a campaign of wargames in particular, offers at least six analytic benefits to understanding a future joint operational environment featuring hypersonic missiles. These benefits make a campaign of wargames an ideal tool to put at the forefront of an experimentation effort that explores the implications of the proliferation of hypersonic missiles. First, populated with technologists, operators, and planners, a wargame would be ideal for generating useful insights into what the proliferation

of hypersonic missiles would mean for a regional conflict and the potential for escalation against homelands.

Relatedly, working with missile defense technologists, wargame designers could posit more effective missile defense systems in a regional or homeland setting to learn about how the competitors might employ their hypersonic missiles and conduct operations differently. For example, would more effective defenses compel competitors to use more hypersonic missiles as part of a strike package to saturate the defense? Or would they turn to more aggressive counterspace operations to degrade space-based missile defense sensors? Game designers and analysts could glean useful insights into how changes in missile defense architectures and technologies could change competitors' approaches to deploying and employing hypersonic missiles as well as how they might think about other military capabilities.

Second, having a live red team that interacts with the blue team could produce insights into the dynamic dimensions of the research issues at hand. That dynamic interaction could expose previously unseen flaws in team analysis and plans. Moreover, the existence of a human "adversary" raises the competitive nature of the wargame, making players work harder to produce products that "beat" their adversary and "win" the war. The advantages live red teams provide, therefore, place a premium on finding good red team players who not only understand the hypersonic missiles and related technologies a particular adversary may possess but also, perhaps more important, understand how they might be employed in the context of the overall campaign and to what end.

Third, the issues surrounding the employment of hypersonic missiles that wargames should address are complex and dense and need analysis and focus to properly address them. Constraints on time and participant interest and energy make it difficult—if not impossible—to adequately address the research questions in a single game. However, wargames are inexpensive compared to field exercises and could thus be repeated more inexpensively to explore different dimensions of the issues. Compounding the analytic difficulties, the issues related to employing hypersonic missiles exist in a setting of *strategic indeterminacy*, meaning that outcomes are determined to a great degree by the interaction of team members and teams' courses of action, much like actual combat operations.[64] A campaign of wargames would also help sort out the problem of strategic indeterminacy.

Fourth, by conducting a campaign of wargames, analysts could adapt future games to consider new issues raised in prior games or to reconsider issues that did not receive enough attention in prior games, resulting in broader and deeper analysis of how employing hypersonic missiles might generate novel operational and strategic issues.[65] Such game evolutions could act as parametric analysis to investigate how military operations might change with modifications to particular offensive and defensive variables, such as a hypothetical rise in effective point-defense technologies against hypersonic missiles.

Fifth, conducting a campaign of wargames also improves the quality of the participants. Good players—those comfortable with "beyond the horizon" scenarios and who think creatively—tend to perform even better after playing several games because they will have learned from previous games and become increasingly familiar with the scenarios, concepts, forces, and game objectives. One possible drawback that should be guarded against, however, is that some repeat participants will attempt to "game" the game.

Finally, wargames could illuminate previously unseen operational issues, complex combat interactions, or strategic dilemmas that result from the employment of hypersonic missiles. Some of these concerns could also result from the combination of hypersonic missiles with other emerging technologies, such as artificial intelligence (AI).[66] Perhaps AI-enabled hypersonic missiles would be used in tandem with other weapons delivery systems in swarming or "cooperative behavior in which uninhabited vehicles autonomously coordinate to achieve a task."[67] One example of such a task might be to strike a group of naval combatants or supply ships dispersed across a large area that has sailed several miles away from the hypersonic missiles' original aimpoint. Such new questions and issues may require other tools of experimentation—perhaps modeling and simulation, workshops, or field exercises and experiments—to yield better insights into how they might affect U.S. operations and strategy.

There are a few research questions around which to organize a wargaming campaign. Candidate questions include:

- How might the competitors deploy hypersonic systems, including the delivery systems, payloads, and launch platforms, as well as their basing modes?
- How might the competitors conduct operations using hypersonic vehicles to achieve war aims? What types of targets, operating concepts, and desired effects will they choose, and why? How might their operations change if the quantities of hypersonic vehicles in their arsenals change?
- What types of active and passive defensive measures might competitors employ to protect their high-value assets against hypersonic missile attack? What level of autonomy might they grant to AI-enabled active defenses against missile attack? How might these defensive measures affect an adversary's deployment and employment of hypersonic vehicles?
- How might the competitors integrate hypersonic vehicles with other kinetic and nonkinetic operations?
- How might deployment and employment of hypersonic vehicles affect competitors' nuclear policies and postures? Will they take measures to enhance their nuclear forces' survivability during different phases of a competition that vary from a world without hypersonic vehicles? What types of hypersonic missile deployments, and on what numerical scales, are more likely to undermine U.S., Chinese, and Russian beliefs about homeland

Paratrooper assigned to 54th Brigade Engineer Battalion, 173rd Airborne Brigade, participates in development of electronic warfare training at Grafenwoehr Training Area, Germany, July 28, 2020 (U.S. Army/Mathew Pous)

deterrence or to generate nuclear first-strike incentives? How would the numbers and types of Chinese and Russian hypersonic missiles affect U.S. beliefs about extended deterrence to allies and partners?

- In what ways, if any, might unique attributes of hypersonic missiles, or characteristics of missile operations featuring hypersonic missiles alongside ballistic and cruise missiles, prompt nuclear escalation in a regional conflict? How might possible changes in U.S. nuclear policy or posture affect nuclear escalatory pressures that China or Russia might perceive in a regional conflict?
- How might competitors integrate hypersonic vehicles with, or use the vehicles to exploit, emerging technologies or enablers for command, control, communications, computers, intelligence, surveillance, and reconnaissance, such as AI and machine learning? How might deployment and employment of hypersonic vehicles affect each competitor's C2 relationships? What strengths or weaknesses of extant C2 relationships will the proliferation of hypersonic vehicles expose? Which of their command echelons do the competitors believe should exercise C2 of hypersonic vehicles? In the case of U.S. operations, for example, how might U.S. Strategic Command's C2 of hypersonic missile operations affect the mission command of U.S. Army units that have their own hypersonic missiles forward deployed if they must reach back across the Atlantic or Pacific Ocean for release authority against a time-sensitive target? What might be the effects of pre-delegating these authorities?[68]
- How might competitors' threats of hypersonic vehicle use affect power projection and other concepts of operations? How might the threat of widespread use of hypersonic vehicles affect the U.S. approach to forward basing and theater force laydown?
- Which potential characteristics of hypersonic vehicles do operators and planners value most and why (for example, speed, precision guidance, range, defense penetration)?

Due to the constraints on time and participant interest, a single wargame should not and could not generate useful answers to all the research questions. The variety of the questions, as well as the complexity of issues they are bound to surface, not only illustrates the value of iterative wargaming but also suggests that at least several wargames that are part of a larger campaign series should be designed as force planning exercises, while others could be designed to focus on joint warfighting. In addition, wargame designers could

structure a game to shed light on how lessons learned from an operational setting could be applied retrospectively to the force-planning phase by including a "move zero." In other words, after wargame participants complete moves one through three, for example, of an operational level wargame, game control could rewind the wargame to a peacetime context where the participants could discuss, with the benefit of hindsight, how they should have designed their forces, posture, and concepts of operations to mitigate the weaknesses and enhance the strengths they observed in moves one through three. Of course, many of the questions and issues that would surface in such a wargame would be amenable to further investigation through other tools of experimentation.

Finally, a word of caution regarding a desire to "impose some order and sequencing" on a multigame campaign focused on fostering better understanding of the implications of hypersonic missiles. Rather than pursue a fool's errand of establishing order and sequencing with the research questions and wargame designs prior to initiating what would likely be a multiyear research project, the wargaming campaign would be more effective for potential DOD sponsor(s) if the sponsor(s) and wargame designers collaborated at each step in the campaign. Such collaboration would entail identifying a sponsor's high-interest research questions and determining the levels of game design and execution complexity required to analyze the questions. At that point, the sponsor would be better positioned to select the first set of questions for the initial tranche of wargames. Further collaboration would involve identifying key insights and observations that came out of a recently completed wargame and figuring out whether the wargame brought to the surface previously unforeseen issues and questions that warrant immediate analysis in the follow-up wargame. Slavish adherence to an early imposition of order and

Members of AGM-183A Air-Launched Rapid Response Weapon Instrumented Measurement Vehicle 2 test team make final preparations prior to captive-carry test flight of prototype hypersonic weapon at Edwards Air Force Base, California, August 8, 2020 (U.S. Air Force/Kyle Brasier)

sequencing would rule out inter-wargame flexibility and rob DOD of immediate learning opportunities on its most pressing areas of research and analysis. This is especially true for hypersonic missiles considering the near-term DOD procurement timeline for the weapon systems.

Conclusion: An Opportunity to Shape Competitors' Choices?

Wargaming, at the frontline of a campaign of military experimentation, could shed light on whether hypersonic missiles would disrupt assumptions underlying the major competitors' strategies and warfighting concepts. Unless DOD establishes a wargaming campaign (where hypersonic weapons are considered as part of a larger military campaign) to investigate the implications of the proliferation of hypersonic missiles, the defense analytic community will probably remain unsure during peacetime about how different the effects of hypersonic missiles would be on combatants' decision timelines, the survivability of their forces, and other aspects of their operations compared to the effects of traditional ballistic missiles and subsonic cruise missiles.

If wargaming were to indicate that hypersonic missiles could produce disruptive effects in warfare, then analyzing their role in military competitions using wargames and other tools of experimentation could help DOD develop a competitive strategy. A competitive strategy is designed to use real and latent military power to purposely shape a competitor's choices and relatively inefficient use of resources in ways that favor U.S. objectives in a protracted peacetime competition.[69] At the DOD level, a competitive strategy would accentuate areas of competitive advantage for the United States that are enduring or could be "made enduring through appropriate research and development, investment, training, etc."[70]

Furthermore, such a strategy would focus on the "interaction among and between defense establishments."[71] As a result of the interaction, the competition might evolve across several decades.

A competitive strategy would establish the bounds and parameters within which DOD decides on its investments in offensive hypersonic systems and associated defenses vis-à-vis particular competitors.[72] It would address how the U.S. military could build or sustain advantages over one or more competitors. Developing the strategy would entail the Intelligence Community focusing collection and analysis to help DOD better understand competitors' decisionmaking processes, procurement, and doctrine; to anticipate adversary responses and long-term investments; and to shape the competition to sustain or enhance the U.S. global strike advantage. JFQ

Notes

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Marines with Ground Combat Element, Marine Rotational Force–Darwin, man fire support command center and process intelligence collected from small unmanned aerial surveillance drone Raven RQ-11B as part of force-on-force training in Mount Bundey Training Area, Northern Territory, Australia, July 20, 2020 (U.S. Marine Corps/Harrison Rakhshani)

Design Thinking at the Enterprise Level

Integrating Defense All-Source Analysis

By James Kwoun

There is no shared understanding within the Defense Intelligence Enterprise about how all-source analytic organizations at different echelons should collaborate to support civilian and military decisionmakers. The enterprise produces assessments at the tactical, operational, and strategic levels to offer tailored support for decisionmakers with specific roles. Although leaders within the enterprise and the broader Intelligence Community (IC) have taken steps in the past few decades to enhance horizontal integration between all-source analytic organizations, insufficient focus on the vertical integration of analysis throughout the Department of Defense (DOD) persists. The all-source analytic workforce in DOD is diverse, consisting

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of smaller communities at different echelons whose members are often unfamiliar with one another. This situation results in vertical misalignment in which analysts are unaware of how their work can impact the mission of their counterparts at other echelons. A design thinking framework applied at the enterprise level should mitigate this problem and encourage the informed interactions necessary to integrate all-source analysis across DOD.

At its core, design thinking is about removing barriers to creativity and promoting an environment that encourages people to experiment with novel ideas. Jeanne Liedtka, a professor at the University of Virginia's Darden School of Business, describes design thinking as overcoming "human biases . . . or attachments to specific behavior norms . . . that time and again block the exercise of imagination."[1] Anthropologist Marcus Griffin defines it as adopting a certain "mindset" and applying "a set of methods" as part of a coherent "system of activities" to promote creativity.[2] Other scholars, such as Ben Zweibelson from the Joint Special Operations University, provide a more abstract definition. He describes design thinking as the use of "one's understanding of yesterday and today to create a different tomorrow by combining established ideas and practices with unexplored or novel ones in emergent ways."[3] Design thinking is an ambiguous concept that scholars and practitioners continue to debate, but many of them agree it is an interdisciplinary field associated with creativity, innovation, and divergent thinking.

The Defense Intelligence Enterprise needs to promote a particular form of creativity that will improve the integration of all-source analysis across tactical, operational, and strategic levels. Creativity in this context involves more than just helping analysts visualize a wider range of possibilities about how adversaries are likely to behave. Analysts must also be creative about how they organize and with whom they collaborate throughout all stakeholder communities. Design thinking is well suited to the goal of pushing people to broaden their horizons and expose themselves to different perspectives through new interactions. Specifically, it can dislodge an analyst's dominant mental models about a national security issue, expanding perspectives on the stakeholders who should assist in future collaborative working groups. It can also address the tendency to habitually interact with the same colleagues using standardized processes that stifle innovation. Ultimately, design thinking encourages curiosity and a culture of inclusion to overcome intellectual stagnation.

To achieve enterprise-wide integration, leaders must apply a design framework beyond the individual level. The purpose is to expand the collective number of mental models, affording unique perspectives for any given issue. Cultivating creativity in individuals, although important, can go only so far because human beings have limited capacity to accumulate new mental models or expand existing ones. Creativity must be thought of as a collective issue for each organization and ultimately for the enterprise as a whole. A design framework at the organizational level should focus on expanding the pool of mental models within the workforce and fostering an environment where analysts can endlessly broaden their horizons. At the enterprise level, it should focus on establishing shared understanding of the DOD all-source analytic community and devising novel ways to facilitate a complex system of interactions between analysts at all levels. In essence, the framework's goal is to yield new insights by merging existing mindsets throughout a large and diverse workforce.

What Is Design Thinking?

Design thinking mitigates two powerful factors that hinder creativity: cognitive biases and institutional norms. Cognitive biases occur when people make inaccurate judgments or visualize a narrow range of possibilities because of a tendency to rely on what Richards Heuer calls a "simplified mental model of reality."[4] Mental models exist at the subconscious level as paradigms people use to filter information and make analytic judgments.[5] Because these subconscious paradigms develop based on the influences of each individual's unique life experiences, they vary considerably in a large community of analysts. Thus, military intelligence analysts may recognize different patterns and arrive at contradictory conclusions when monitoring the same enemy unit on a battlefield. Mental models are valuable as coping mechanisms for complexity and information overload; their downside is that they often lead to cognitive biases as analysts extrapolate insights from previous experiences while subconsciously ignoring important factors in the current environment.

Institutional norms can also impede creative thinking when incentive structures and general expectations result in a high level of conformity. In the military, norms originate from things such as doctrine, culture, rank structure, and a hierarchy. For practical reasons, these norms are necessary to a certain extent, but they also discourage the fresh thinking the military needs. For example, Servicemembers may not offer new ideas during working groups because of doctrinal roles assigned to certain leaders and a reluctance to speak out of turn in front of senior officers. As a result, working groups sometimes become nothing more than a series of isolated briefings by leaders waiting for their turn to speak. In the realm of intelligence, the military's culture of emphasizing battlefield lethality creates incentives that cause all-source analysts to focus on the enemy at the expense of other variables with greater strategic relevance. Over time, an institution's norms will generate cognitive biases in its members, which in turn will further reinforce existing norms.

Design thinking is a paradoxical concept: It is prevalent and ambiguous at the same time. Christopher Paparone from the National Defense University sums up the ubiquitous nature of the concept with a rhetorical question: "Who doesn't do design?"[6] According to Paparone, "If you're applying meaning to situations, you're designing."[7] The problem is that design thinking is difficult to define and

"comes in many flavors, tribes, and forms," as Zweibelson writes.[8] Harold Nelson, former professor at Carnegie Mellon University, calls design thinking "a mystery," despite everyone being "totally immersed in it" in their lives.[9] This situation creates a temptation to simplify and standardize the application of design thinking to maximize the number of people who understand it; however, simplification and standardization promote conformity rather than the divergent thinking required for innovation. For this reason, Zweibelson advises against a "cookie-cutter design approach" and cautions that "no innovation occurs in standardization."[10]

Design thinking is an interdisciplinary field with separate civilian and military movements. It emerged in the 1950s as a tool for civilians to use for industrial purposes.[11] Today, many different methodologies collectively address a wide spectrum of issues. The first attempt to formally apply a design methodology for military purposes was in Israel in the mid-1990s, when Brigadier General Shimon Naveh led the development of systemic operational design (SOD).[12] This Israeli approach was a radical deviation from conventional military planning because it applied a mix of philosophy, architectural design, complexity theory, and operational art.[13] Some SOD proponents even argued that learning ballet dancing could offer a unique mental model with which to think creatively about military issues.[14] According to Zweibelson, SOD was "dense with philosophical language and . . . very abstract concepts," which eventually led to its rejection by the Israel Defense Forces between 2005 and 2006.[15] Zweibelson still considers Naveh "the 'father' of the military design movement" for his role in inspiring subsequent measures in other countries.[16]

The U.S. Army's experimentation with design thinking initially mirrored the Israeli approach, but the final methodologies the Army and joint force adopted in their doctrine ended up being significantly different from those in SOD. In the mid-2000s, the U.S. Army's School of Advanced Military Studies began working with Naveh, resulting in an elective course in SOD by 2006 and its incorporation in the core curriculum in 2008.[17] This initiative started as an attempt to help Army officers generate novel ideas by using theories and tools unencumbered by military planning doctrine. Starting in 2010, however, the Army began simplifying its design methodology, largely abandoning the original SOD-like approach.[18] Furthermore, this new simplified approach incorporated concepts that have long been associated with linear military planning processes, such as decisive points, centers of gravity, and lines of operations. The Army and joint force wrote their current design methodologies for a wider audience by using familiar military terms, including some first referenced a few centuries ago by theorists Carl von Clausewitz and Antoine-Henri Jomini.

Design thinking in a military context involves examining complex issues at an abstract level before engaging in the detailed task of developing executable plans. The design methodologies in Army and joint doctrine are similar; both emphasize the importance of establishing a conceptual foundation that enables the more practical aspects of planning. This foundation will be important, for example, when a joint task force (JTF) receives vague policy guidance and faces ambiguous circumstances as it prepares for combat operations. The JTF may need to undertake careful framing and conceptual thinking about the fundamental nature of its mission. The detailed task of synchronizing forces on the battlefield is relatively straightforward, but design of the overall campaign or operation represents the real creative challenge. After framing the major issues and developing a broad operational approach, JTF leaders can begin translating the abstract concepts produced during design sessions into a comprehensive plan. Plans with a strong conceptual foundation prevent situations in which well-executed operations end up supporting the wrong objectives.

DOD intelligence organizations also apply frameworks and techniques consistent with design principles. The Defense Intelligence Agency (DIA) uses a process called analytic design to help its workforce understand the broader framework within which all-source analysis occurs. This framework "connects the diverse, discrete tasks of analysis into a coherent pathway that encourages focused thinking about the nature of the intelligence problem," according to DIA guidance.[19] It helps analysts appropriately scope and organize their work, while encouraging them to solicit diverse viewpoints from stakeholders inside and outside of government. Intelligence organizations also use design principles in a narrower context through structured techniques that facilitate the execution of specific aspects of analysis. Although not typically associated with design thinking, these techniques mitigate cognitive limitations and enhance one's ability to think expansively about issues in a manner that may not be readily intuitive. Thus, design thinking in an intelligence context is both the larger system of activities within which analysis occurs and the specific techniques that aid in the execution of analysis.

Existing DOD design approaches are useful to an extent, but they do not go far enough in helping people overcome mental limitations caused by cognitive biases and institutional norms. Cognitive biases are so powerful that they remain "compelling even when one is fully aware" of their nature, according to Heuer.[20] Furthermore, DOD enforces norms through a rigid and hierarchical system, making divergent thinking difficult. Scholars use terms such as *disruptive innovation* and *destructive creativity* to emphasize the extent to which people must challenge the status quo before producing truly novel ideas.[21] Therefore, the military's design methodologies are appropriate in their intent but fail to dislodge existing mental models and escape institutional norms. They rely too heavily on conventional military concepts with historical roots in linear planning processes. Additionally, DIA's design process is merely a generic action plan for a specific community of strategic-level analysts. Integration of defense all-source analysis requires an ambitious design framework at a scale that leverages the perspectives of communities across an enterprise.

Airman from 118th Intelligence, Surveillance, and Reconnaissance Group, Tennessee Air National Guard, analyzes imagery from commercial satellites and open-source Web sites to determine extent and location of damage caused by Middle Tennessee tornados, March 4, 2020, Berry Field Air National Guard Base, Nashville, Tennessee (U.S. Air National Guard/Anthony Agosti)

The Need for Vertical Integration of Defense All-Source Analysis

There is a vertical dimension to the challenge of integrating all-source analysis in DOD due to the intricacies involved in simultaneously supporting decisionmakers at the tactical, operational, and strategic levels. As an organization involved in both policymaking and warfighting, DOD maintains a vast intelligence enterprise in support of its civilian officials and military commanders. At each echelon, analysts derive their understanding of complex issues from relatively narrow vantage points. For example, some DIA analysts may possess expertise on the political-military affairs of specific adversaries and primarily focus on satisfying requirements from Pentagon-based policymakers. Meanwhile, analysts in an Army Corps G2 deployed overseas may assess the same adversaries but concentrate only on those issues with operational implications for ground commanders. Most analysts will lack the wide-ranging view necessary to comprehensively understand national security issues in all their dimensions. The key to achieving a more holistic grasp of these issues is to combine the perspectives of stakeholders at every level.

To blend these perspectives, leaders must first understand all-source analysis at different levels. Strategic-level DOD analysts belong to the Defense Intelligence All-Source Analysis Enterprise (DIAAE), which consists of DIA, Service intelligence centers, and combatant command (CCMD) Joint Intelligence Operations Centers.[22] Elements of the DIAAE, namely DIA and the Service intelligence centers, represent the DOD analytic component of the national IC. The military Services also have intelligence personnel who predominantly operate below the CCMD level and outside the DIAAE. They are funded and managed separately under the Military Intelligence Program, which is overseen by the Under Secretary of Defense for Intelligence. Thus, the Defense Intelligence Enterprise includes all-source analytic organizations that have a strategic-level focus as well as those that are primarily designed to support tactical and operational commanders.

Leveraging the collective wisdom of an entire enterprise is a creativity challenge that design thinking is well suited to address. Despite a common affiliation with a Cabinet-level department, defense all-source analysts belong to a diverse array of smaller organizations that have unique cultures and missions. This diversity affords an opportunity to harness the viewpoints of a workforce with a wide range of professional backgrounds, such as engineers, microbiologists, regional

experts, and military Servicemembers, among many others. The pool of valuable perspectives is even greater when factoring in the varying degrees of abstract thinking needed at different echelons. The mindset that analysts use in supporting the practical requirements of tactical commanders will be considerably different from the mindset necessary to support national policymakers. At any given time, there will be analysts throughout the tactical, operational, and strategic levels viewing the same issue through their own mental filters. The enterprise-level design challenge is in facilitating informed interactions that merge existing mental models in new ways to generate novel ideas.

These interactions must occur across all boundaries, but the emphasis, at least initially, should be on vertical integration, as it represents the most significant deficiency. Many DOD analysts are unfamiliar with the role their counterparts play at different echelons, hindering the vertical fusion of assessments required to holistically understand national security issues. That said, leaders have already taken steps, however imperfectly, throughout the past few decades to enhance horizontal integration. The Director of National Intelligence employs various leaders—such as national intelligence managers and national intelligence officers—to coordinate across interagency lines and conduct outreach with nongovernmental experts. Defense intelligence officers and senior defense intelligence analysts perform coordinating roles

Human intelligence collector with Bravo Company, 341st Military Intelligence Battalion, listens to role player during field training exercise Panther Strike Lite, on February 7, 2020, at Joint Base Lewis-McChord, Washington (U.S. National Guard/Joseph Siemandel)

similar to those of national intelligence managers and national intelligence officers, respectively, when it comes to strategic-level issues within DOD. Additionally, the increasing emphasis on joint operations since the Goldwater-Nichols Department of Defense Reorganization Act of 1986 has created a generation of military leaders, including intelligence personnel, who routinely work with other Services. The problem is that there are no corresponding efforts to coordinate intelligence activities occurring simultaneously at the tactical, operational, and strategic levels.

Recurring disagreements between military commands and national intelligence organizations attest to vertical integration problems. Intelligence staffs in military headquarters tend to produce more optimistic assessments than do national agencies. For example, during the Vietnam War, the U.S. military intelligence staff in the field estimated total enemy strength in 1966–1967 as 277,000 to 300,000 regular and irregular fighters.[23] DIA argued the total number was approximately 500,000, while the Central Intelligence Agency (CIA) estimated 600,000 enemy troops.[24] Two decades later, President George H.W. Bush learned of significant discrepancies in battle damage assessments right before the U.S.-led coalition initiated ground operations during Operation *Desert Storm*. As of February 23, 1991, U.S. Central Command (USCENTCOM) was reporting 39 percent of Iraqi tanks destroyed, much higher than the 16 percent and 12 percent estimates provided by DIA and CIA, respectively.[25] During both conflicts, these analytic incongruities were controversial at the time, requiring intervention by national-level leaders. The biggest divergence occurred between analysts assigned to military commands and their counterparts in national agencies in Washington, DC.

Military and national intelligence organizations continued giving conflicting assessments in the 21st century. The commander of U.S. Forces–Afghanistan disseminated a written assessment in 2011 that was "significantly more positive and upbeat" than were the views of the IC, according to the National Intelligence Council chairman at the time.[26] Three years later, in 2014, General Martin Dempsey, USA (Ret.), then–Chairman of the Joint Chiefs of Staff, learned of substantial differences between USCENTCOM and the IC regarding their outlooks on Afghanistan.[27] This disparity occurred as the United States was conducting a review of its Afghanistan mission in anticipation of troop withdrawal decisions by the President. Disagreements also arose between tactical and operational units below the CCMD level. In his memoirs, General James Mattis, USMC (Ret.), describes as "odd" the different ways the 82nd Airborne Division, V Corps, and USCENTCOM were characterizing the insurgency in Iraq when he was a division commander in late 2003.[28] Whenever contradictory assessments exist across various echelons, it is imperative to understand why all-source analysts interpret the same circumstances differently.

Analytic disagreements are healthy in many cases, but they are problematic without transparency and mutual understanding. The IC embraces a concept called competitive analysis, which induces continuous improvement by encouraging dissenting viewpoints.[29] However, this concept is primarily focused on horizontal integration among national-level organizations that consistently acknowledge and debate competing analytic positions. The cases cited earlier did not involve meaningful collaboration across vertical boundaries between analysts at different echelons. During the 1991 Gulf War, for example, it took White House–level intervention to adjudicate the dispute involving USCENTCOM, DIA, and CIA.[30] In 2014, General Dempsey directed an examination of contradictory USCENTCOM and IC assessments on Afghanistan prior to a National Security Council meeting.[31] These circumstances suggest there are vertical integration problems rooted in a lack of mutual awareness between national organizations and military intelligence staffs at the tactical and operational levels. Some former IC leaders even believe that policymakers should receive military intelligence assessments separately from those produced at the national level, rather than integrating the two perspectives.[32]

Recommendations

All-source analysts at every level need comprehensive education on human cognition to fully appreciate their mental limitations. Most strategic-level analysts learn about cognitive biases when they receive instruction on analytic tradecraft, such as in DIA's Professional Analyst Career Education course. Similar education must occur at all levels within the Defense Intelligence Enterprise, not only in strategic-level organizations. Furthermore, strategic-level organizations must expand on existing curriculums by providing basic instruction on such topics as philosophy, cognitive psychology, and cultural studies. This interdisciplinary approach is consistent with the underlying purpose of design thinking: helping people to understand and leverage the wide spectrum of mental models underpinning how they think. Aaron Jackson from the Australian Defence Department cautions against "shallow or simplistic design methodologies," as they are insufficient in developing the intellectual self-awareness required to overcome deeply entrenched barriers to creativity.[33] He argues for "more philosophically grounded methodologies" that enable "genuine reframing" and the "questioning of core beliefs."[34] Rigorous education that includes such approaches is necessary for a profession in which the mere act of thinking is considered a core competency.

This education should be supplemented with cross-training in different analytic techniques used throughout the Defense Intelligence Enterprise. Civilian analysts working in national organizations may already be familiar with the techniques used by their counterparts operating at the same level. National IC organizations routinely collaborate and debate competing analytic positions on various issues; however, this same level of familiarity does not exist in all parts of the enterprise. For example, the DOD inspector general concluded in 2018 that

military analysts assigned to CCMDs "lacked formal training" on analytic tradecraft and were "less proficient . . . than their civilian counterparts" in this regard.[35] The military Services must ensure their intelligence analysts are able to think about complex issues using tools other than Joint Intelligence Preparation of the Environment (JIPOE) and Intelligence Preparation of the Battlefield (IPB). Conversely, many civilians often deploy to augment JTF intelligence staffs without appreciating JIPOE and the other doctrinal frameworks essential to military operations. For meaningful interactions throughout all levels of the Defense Intelligence Enterprise, leaders should ensure a sufficient level of cross-training.

Leaders should leverage this interdisciplinary approach to instruction to build a DOD all-source analytic community capable of exhibiting empathy for colleagues in other organizational boundaries and vertical echelons. This tactic would help analysts develop self-awareness, intellectual humility, and the patience to interact with colleagues who think using fundamentally different mental paradigms. Empathy is a key component in many civilian design methodologies and equally relevant in an intelligence context. The empathy challenge lies in understanding the opportunities inherent in the vast differences between analysts throughout the entirety of the Defense Intelligence Enterprise. If properly managed, disagreements and tensions within the enterprise have tremendous creative potential. In his book, General Dempsey describes the importance of turning disagreements between intelligence analysts into "creative friction."[36]

DIAAE analysts can generate this type of creativity by integrating the perspectives of their counterparts at the tactical and operational levels when framing high-priority issues for senior decisionmakers. As the backbone of the DIAAE, civilian analysts are leaders in supporting the development of national policies and strategies. It is important that they interact with military intelligence staff in units responsible for implementing these policies and strategies. Service intelligence centers already have strong relationships with warfighting units of common Service affiliations, but many civilians across DOD still lack familiarity with intelligence activities below the CCMD level. As a result, strategic assessments do not always consider the different mindsets that exist throughout DOD. In 2002, as USCENTCOM was preparing for Operation *Iraqi Freedom*, the Deputy Secretary of Defense at the time asked military planners, "We have a brigade on the ground. Why can't we go now?"[37] The obvious unfeasibility of this suggestion illustrates the importance of presenting policymakers with strategic assessments, whether intelligence or otherwise, that are informed by tactical realities.

The DIAAE must also empathize on a deeper level with warfighters—especially military intelligence personnel at lower echelons—who rely on strategic analysis. A production category called foundational military intelligence is one of the primary ways the DIAAE supports warfighters. Lieutenant General Robert Ashley, USA (Ret.), former DIA director, called it the "core mission" of the agency in January 2020.[38] Service intelligence centers are also significant producers of what many would label as *foundational military intelligence*. The phrase itself is loosely defined, but DIA leaders commonly associate it with database entries on foreign units, equipment, facilities, and installations.[39] It also includes standardized products containing profiles of foreign military leaders, overviews of foreign defense forces, and assessments of adversary capabilities. While important, foundational military intelligence lacks empathy; it is narrow in scope and assumes that standardized products can satisfy the diverse needs of all warfighters. DIAAE leaders currently view foundational military intelligence as merely reference products rather than comprehensive knowledge tailored for commanders and their intelligence staffs in uniform.

Strategic analysts should tailor complex issues for military units at the tactical and operational levels. Civilians in particular could introduce divergent viewpoints within the joint force based on their interactions with policymakers, interagency colleagues, academic scholars, and foreign partners. Commanders and their intelligence staffs need the help of civilian experts who have wider perspectives about the complex issues facing units in the field. General Michael Hayden, USAF (Ret.), contends that the role of national intelligence is setting "the right- and left-hand boundaries for any rational policy discussion."[40] This same type of intelligence could be repurposed to frame ambiguous issues that military units at lower echelons may not fully comprehend without assistance. This repurposing would require familiarity with the military's existing intelligence architecture and operational frameworks. The joint force already has tens of thousands of intelligence personnel in uniform who are organic members of warfighting units. The key for civilian analysts throughout the DIAAE is to more consistently contribute strategic insights during operational and even tactical forums.

Military intelligence staffs below the CCMD level must do their part by being proactive in soliciting these insights—to counter the joint force's tendency to view topics through a narrow enemy-centric perspective. This perspective is the result of the military's self-identity as a force whose primary mission is to exercise lethality on the battlefield. In the U.S. Army, IPB is the primary analytic process employed by tactical and operational formations; JIPOE is the equivalent joint process used by JTFs and CCMDs. Both IPB and JIPOE are structured processes that culminate in multiple enemy courses of action. In effect, they treat assessments of nonmilitary factors as subordinate to and merely tools in understanding the physical actions of an enemy force. Although useful in some circumstances, IPB and JIPOE are inadequate for addressing complex issues in a holistic manner. Joint and Service intelligence staffs at lower echelons could benefit from exposure to divergent thinking when assessing difficult topics beyond an enemy's physical activities.

The intelligence staffs in CCMDs, JTFs, and Service component commands should establish forums for analysts at all levels to converge and collaborate based on common interests. These

Intelligence analyst assigned to D Company, 326th Brigade Engineer Battalion, 1st Brigade Combat Team, 101st Airborne Division (Air Assault), plots named areas of interest on map, April 14, 2021, during MITS II at Johnson Field, Fort Campbell, Kentucky (U.S. Army/Vonnie Wright)

headquarters are ideally positioned in the DOD hierarchy to integrate multiple perspectives spanning the entirety of the Defense Intelligence Enterprise. Collaborative forums already exist, but many of them do not go far enough in affording analysts the occasion to interact with colleagues more than one echelon removed from their organizations. Many civilian analysts are unfamiliar with the vast military intelligence apparatus below the CCMD level. Furthermore, they may not be familiar enough with operational frameworks to truly empathize with commanders throughout DOD. Conversely, many analysts in uniform are largely unaware of intelligence capabilities at higher echelons and may lack the broader perspective required to assess issues beyond their local operational environments. Shared understanding of the DOD all-source analytic community will enable deeper interactions across all levels. As Heuer argues, "New ideas result from the association of old elements in new combinations."[41]

All-source analysts should leverage what their counterparts at different echelons are already doing and contribute insights in ways that complement others' work. At the national level, DIA and Service intelligence centers deliver analytic continuity for DOD by maintaining a large civilian workforce with deep expertise on every major issue. For this reason, these national organizations are predominantly responsible for the database records and products composing foundational military intelligence. CCMDs, JTFs, and Service components operationalize and expand on existing foundational military intelligence products. At lower echelons, warfighting units employ organic intelligence capabilities to dynamically track and assess foreign forces, relying on work conducted at national and theater levels as starting points. During a March 2020 presentation, Lieutenant General Scott Berrier, the Army G2 at the time, described the job of his Service's tactical and operational intelligence elements as "turning gray icons red."[42] Berrier was referring to gray icons as suspected enemy locations and red icons as confirmed enemy units. At any given echelon, all-source analytic organizations have their own comparative advantages that must be understood for integration to occur.

Conclusion

Cognitive biases and institutional norms exert such powerful influences that they routinely limit the ability of all-source analysts to think imaginatively about national security issues. People often frame problems so narrowly that they end up predetermining the range of desirable solutions avail-

Hawaii Air National Guardsman and his Tentara Nasional Indonesia counterparts review intelligence portion of exercise scenario for operational design workshop portion of exercise Gema Bhakti, September 17, 2021, Jakarta, Indonesia (U.S. Air National Guard/Andrew Jackson)

able for decisionmakers. Thus, military intelligence staffs will fail in alerting commanders of larger situations if they constantly describe problems based only on the enemy's physical actions. Civilian analysts are equally vulnerable to narrow framing based on each person's dominant mental models and resultant biases. Subconscious biases commonly direct people toward certain solutions when they seek to understand a problem. For example, analysts will form vivid memories of their involvement in past operations that were successful in a foreign country. They may develop a tendency to describe problems in other countries using familiar terms, which suggests they are drawing parallels between the new issue and previous experiences. Many analysts will not realize they are subconsciously replicating past efforts—instead of objectively examining each situation—until they understand how mental models work.

The design framework proposed in this article could generate tremendous creativity without requiring changes to legislation, DOD policies, or organizational authorities. It provides a roadmap for leaders to introduce divergent perspectives in organizations that otherwise would be relatively insular. Analysts could coalesce around existing processes and forums, allowing the Defense Intelligence Enterprise to maintain continuity and momentum in meeting its current obligations. An emphasis on interdisciplinary education and cross-training would help analysts become aware of the cognitive factors that cause people to reach different conclusions about the same set of data. Leaders should not let anecdotes and local successes convince them that effective collaboration, particularly across vertical echelons, is already occurring. Integration of all-source analysis must be consistent and widespread throughout the entirety of the Defense Intelligence Enterprise. The all-source analytic profession is easily the most diverse in DOD and consists of members with a wide range of professional backgrounds. There is enormous creative potential in ensuring that members of this diverse profession interact across vertical and horizontal boundaries. **JFQ**

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Liang Wannian, co-leader of World Health Organization–China joint expert team, attends news conference in Beijing, March 31, 2021, on WHO-China study on origins of COVID-19 (Reuters/Thomas Suen)

Misleading a Pandemic

The Viral Effects of Chinese Propaganda and the Coronavirus

By JohnRoss Wendler

The COVID-19 pandemic has had a significant impact on the world, including strained diplomatic ties and blurred perceptions of who or what is responsible for its origins. In response to allegations, China crafted an intricate social media campaign to clear its name. This campaign gained notoriety in June 2020 when Twitter removed 150,000 malicious Chinese accounts.[1] The accretion of fictitious accounts suggests that China has emboldened its efforts to spread propaganda on Twitter in favor of Chinese Communist Party (CCP) objectives. Although previous Chinese propaganda campaigns had focused on demeaning the protests in Hong Kong, a massive wave of social media rhetoric promoting the Chinese government's response to the coronavirus

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outbreak as a form of Great Power competition—initially downplaying the pandemic's severity while seeking praise for the government's draconian efforts to contain its spread—is a narrative that underscores the changing character of war.

It seems the information that the CCP passed through Twitter is more mendacious than originally perceived, resembling stratagems from Russia's 2014 disinformation playbook in Crimea. The concept of *disinformation* is distinct from *misinformation*, meaning not only false but also false as part of an intentional effort to mislead, deceive, or confuse.[2] These intentions are consistent with previous observations by the Department of Defense (DOD) and Intelligence Community about communications from the Chinese state and nonstate actors.[3] Despite China's denial of these allegations, often blaming Western governments, social media propaganda toward Western countries has become increasingly complex, systematic, and effective. The joint force should examine this campaign as an opportunity to better understand the changing character of war and the deliberate weaponization of social media among Great Power competitors.

Through a quantitative content analysis, this article applies communication theory to investigate how the CCP responded to the novel coronavirus of 2020. It also examines social media virality (number of shares) and popularity (number of likes) effects to gain insights into the relationship between Chinese government narratives and social media users. Results indicate that governmental and diplomatic Twitter accounts with the presence of disinformation had a statistically significant impact ($p < 0.001$) on virality and popularity. Additionally, this article presents an analysis of China's disinformation campaign as competing narratives with the United States in the wake of the pandemic. Twitter will be the primary platform for content analysis because it continues to be an effective and widely used tool for mass media dissemination in the United States. This article begins by examining scholarly literature concerning the history of Chinese propaganda, current research on virality and popularity in social media, crisis communication theory, and this theory's application in pandemic response.

A Brief History of Chinese Propaganda

Propaganda, censorship, and disinformation are pillars of the CCP's grand strategy, allowing governmental officials to control the flow of information in and out of China.[4] Adopted from Soviet-era tactics, government-sanctioned propaganda campaigns are designed to make the state and its objectives look favorable to the world—most importantly, by making state competitors (largely the United States) appear weak, corrupt, and abusive. In February 2016, on a tour of Chinese media outlets, CCP General Secretary Xi Jinping announced, "All of the work by the Party's media must reflect the Party's will, safeguard the Party's authority, and safeguard the Party's unity."[5] In other words, the job of the Chinese media machine is not to *inform* the public and seek out the truth, but rather to *report* stories favorable to Party leadership and censor those that are not. Media should support the state and strengthen the state. Truth is not valuable if it weakens the state.

In recent years, the CCP has created a titanic propaganda and censorship apparatus, controlling the most dangerous threat to Party unity and authority—truth.[6] Incorporating a robust and systematic means of controlling information, the CCP has constructed an elaborate Internet censorship program—the Great Firewall, also referred to as the Golden Shield Project—designed to rapidly censor Internet content produced within the People's Republic of China.[7] Developed and operated by the Ministry of Public Security, the program aims to restrict content to its citizens, identify and locate individuals, and provide the state with immediate access to personal records.[8] Today, the Golden Shield Project is one of the most controversial programs in the world—and it is being exported and adopted by other like-minded states, such as Cuba, Zimbabwe, and Belarus.[9] Once he was installed as Party chief, Xi's governmental agencies, diplomats, and state-run media outlets began ramping up their use of social media accounts, including on Twitter, Facebook, and YouTube—platforms that are banned inside of China—in order to reach a larger audience abroad.[10]

Relying on the extensive use of new technology, President Xi has succeeded in imposing a social model in China based on the control of news, information, and online surveillance of its citizens. According to the Reporters Without Borders (Reporters sans frontières, RSF) 2021 World Press Freedom Index, China scores among the worst in the world, at 177 out of 180, on the country index for freedom of speech and expression. RSF conducts yearly summaries of almost all countries by utilizing a comprehensive methodology that examines physical violence; numbers of journalists murdered, attacked, detained, or threatened; harassment and access to information; censorship and self-censorship; control of media; and judicial, business, and administrative pressure.[11]

More than 100 journalists and bloggers are currently detained by China in life-threatening conditions. Liu Xiaobo, a Nobel peace laureate and winner of the RSF Press Freedom Prize, and Yang Tongyan, a dissident blogger, both died in 2017 from cancers that were left untreated while they were detained.[12] China's state-owned and privately owned media are now under the CCP's close control, and foreign reporters attempting to work in China are encountering more and more obstacles.[13] At the same time, President Xi has been attempting to export this oppressive model by promoting a "new world media order" under China's influence.

Today, China analysts widely agree that the CCP's propaganda overseas has seen a significant resurgence under President Xi.[14] Incorporating modern disinformation tactics to "weaponize culture and ideas" as a form of soft power techniques, CCP's image-building activities involve social media, digital networks, and hybrid and nonlinear conflict strategies.[15] This branding is part of a larger undertaking during Xi's

watch to reinvigorate the Party, firmly establish its leadership in the pursuit of the "China Dream" and "the great rejuvenation of the Chinese nation," and garner greater international respect and acceptance of the CCP.[16] Also, ProPublica and others have documented the increasing use of fake Twitter accounts by the People's Republic of China and CCP members, especially since 2019, to generate an illusion of widespread support for their policies.[17]

China and Manipulated Messaging on COVID-19

China has been modifying its reports of COVID-19 since December 2019, displaying a range of themes on social media and state-controlled news outlets. In large part, propaganda efforts shaped the narrative around the origin of the virus and the management of the outbreak.[18] Both China and Russia have used media to manipulate and exploit uncertainties in the origin of COVID-19, bolstering conspiracy theories that the disease was a deliberately engineered creation brought to China by the United States rather than a naturally occurring phenomenon.[19]

According to a Congressional Research Service report, there is reason to believe that Chinese officials and state-controlled media initially downplayed the severity and scope of the outbreak, releasing incomplete information on the spread and prevention of the disease and blocking access to some Chinese and foreign news reports. Several individuals who attempted to share early information were reprimanded by public security officials for "spreading rumors" and creating "negative social influence."[20] As containment issues began to circulate to international news agencies, Chinese officials and media shifted to public claims of successful crisis management, with official numbers released to media outlets showing the epidemic coming under control. As other countries began to see signs of the disease and struggle with infection rates, China promoted the narrative of the country as a world leader and the Chinese government as superior in combating the virus.[21]

Tensions between the United States and China escalated when Zhao Lijian, a Chinese Foreign Ministry spokesperson, tweeted two manufactured conspiracy theories: that patient zero was a U.S. Soldier who visited Wuhan to participate in the October 2019 Military World Games, and that the virus broke loose from the U.S. Army's laboratory at Fort Detrick, Maryland.[22] Then–Secretary of State Mike Pompeo expressed "strong U.S. objections" to China's efforts to shift blame for the virus to the United States, ordering Yang Jiechi, the director of the General Office of the Central Affairs Commission, to stop spreading "disinformation and outlandish rumors."[23] Chinese reactions departed further from diplomacy when Pompeo began referring to the pandemic as the "China virus" and "Wuhan flu," inciting Hua Chunying, another Foreign Ministry spokesperson, to tweet that Secretary Pompeo should "stop lying through [his] teeth."[24]

Tensions began to subside in the summer of 2020 when China withdrew its inflammatory comments about the virus's origins. China's Twitter response, while now less pugnacious, continues to elicit notoriety and debate. Because the COVID-19 pandemic is unique in how quickly it has affected the world, the rhetorical response made on social media would likely benefit from being grounded in communication theory, specifically a crisis response theory known as the Situational Crisis Communication Theory (SCCT).

Crisis Communication and Response: SCCT

Crisis response strategies represent the words and actions managers employ in dealing with crises.[25] In crisis communication, there are two strategies for managing outcomes: managing information and managing meaning. *Managing information* pertains to critical findings related to the crisis. To that end, information is collected, categorized, and disseminated to stakeholders—that is, citizens—for their benefit. This can be as simple as advising citizens to wear face masks and engage in social distancing guidelines. *Managing meaning*, on the other hand, focuses on efforts to influence how people *perceive* the crisis and the organization involved in the crisis.[26] In the case of the pandemic, China manages meaning by using social media through censored accounts to influence people's perceptions of responsibility and attitudes toward the CCP's reputation.

Social media has become one of the main vehicles for information dissemination and situational sense-making during the coronavirus pandemic, so it is no surprise that governments utilize its capabilities as a tool for controlling information. Current research suggests that instructing information (for example, informing the public on the dangers associated with a crisis), adjusting information (downplaying the severity of the issue), and repairing organizational reputation (boosting stakeholder opinion of the organization) are three crisis response strategies that affect stakeholder perceptions.[27] Focusing on the latter two, adjusting information and reputational repair, will assist in understanding why China may resort to propaganda in an attempt to better its situation.

Reputation management seeks to reduce the negative effects a crisis has on an organization's related assets and, most important, its reputation.[28] Reputation repair strategies commonly work through four options: deny, diminish, rebuild, and reinforce.[29] Crisis communication theory offers a prediction of the reputational threat presented by a crisis and prescribes crisis response strategies designed to defend reputational assets.[30]

The effects of China's COVID-19 propaganda on social media were calculated using quantitative content analysis methods. Twitter's application programming interface allowed data on Chinese government accounts, Chinese diplomatic accounts, and state-censored news media accounts to be collected. Based on previous research, these three types of accounts have the highest probability of representing the CCP's approved narratives.[31] An artificial intelligence–powered computer program, Hamilton 2.0, categorized tweets in the test data set.[32] The Hamilton 2.0 dashboard is a research

project developed by the Alliance for Securing Democracy at the German Marshall Fund of the United States. It provides a summary analysis of the narratives and topics promoted by Russian, Chinese, and Iranian government officials; state-funded media on Twitter, YouTube, and state-sponsored news Web sites; and official diplomatic statements at the United Nations. The purpose of the dashboard is to increase knowledge of the focus and spread of state-backed government messaging across various information media.

Partnership with the Hamilton research team enabled the cultivation of critical message data, examining Chinese tweets from December 1, 2019, to September 30, 2020. The test data set included key phrases—*#covid*, *#coronavirus*, *#wuhan*. The #covid hashtag also allows for multiple hashtags that begin with the word *covid* (for example, *#covid*, *#COVID*, *#Covid19*, *#covid-19*). The data set consisted of 133,987 tweets from Chinese news and media accounts (for example, Xinhua News Agency, *Global Times*, *China Daily*), Chinese government officials and diplomats (Lijian Zhao, Ambassador Xu Hong), and Chinese government accounts (the Chinese embassy in Prague). Governmental accounts are identified as "Chinese government official" under the Twitter username, while media accounts are labeled "Chinese state-affiliated media."

Random sampling methods narrowed down the data set to a testable quantity. The design of a coding protocol examined Twitter account type, presence of disinformation, and reputational repair strategy. Coding involved dichotomous methods for the presence of all indicators in each message—that is, 1 or 0—where the frequency of each indicator helps to minimize possible subjective decisions of coders. PolitiFact, Snopes, and other fact-checking organizations determined if disinformation was present. Intercoder reliability checks using statistical analysis software yielded a 0.91. Since methodologists agree that reliability coefficients of 0.7 or greater are generally accepted, intercoder reliability was deemed strong and acceptable. The data investigation utilized

On left monitor, clockwise, United Nations Secretary-General António Guterres launches COVID-19 Global Humanitarian Response Plan together with Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization; Mark Lowcock, Under-Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator; and Henrietta Fore, Executive Director of the UN Children's Fund, March 25, 2020 (UN Photo/Mark Garten)

regression analysis, multivariate analysis of variance, analysis of variance, and *t*-tests.

Virality represents the distribution and overall effect size of each tweet. As tweets are increasingly shared and retweeted, the message footprint enlarges, increasing the chances that it is seen outside the sender's normal sphere of influence based on platform algorithms. Social media sites such as Facebook and Twitter incorporate algorithms to analyze words, phrases, or hashtags to create a list of topics—that is, a trend list—sorted in order of popularity. According to a 2011 study on social media, a trending topic "will capture the attention of a large audience" for a short period.[33] The more a message is shared and retweeted, the larger the audience and the more viral the effect.

Popularity has similar effects on Twitter algorithms; more "likes" from other users push the message higher on the trend list. For the purposes of this article, an increase in popularity among Twitter users is categorized as an increase in acceptance levels. From a crisis communication perspective, an increase in popularity equates to a reduction in anger and the associated likelihood of negative word of mouth.

Building on current literature, research findings suggest China's coronavirus propaganda campaign incorporates disinformation to strengthen its reputation and blame its competitors. The research findings highlight three important takeaways from a national security perspective: China's coronavirus propaganda campaign incorporates modern disinformation tactics as a form of soft power through social media, China uses specific Twitter account types to better manipulate virality and popularity, and virality leads to an increase in popularity.

Disinformation Tactics as a Form of Soft Power

Findings show that governmental and diplomatic accounts are more likely to utilize disinformation or misinformation compared with news and media accounts. These tactics also have a statistically significant effect ($p < 0.001$ level) on virality and popularity, with an average of 20 times more retweets and 13 times more likes compared with fact-based information on a similar topic. This effect has successfully allowed China to increase target audience size—further supported by current research findings on targeting specific audiences through social media.[34]

To that end, the weaponization of ideas may have proved effective at generating media hype in Western audiences—likely bolstering the CCP's willingness to use similar tactics in the future, especially against Western competitors, both commercial and diplomatic.

The notion of social media warfare is supported for three reasons: The language is targeted, the time of tweet transmission is purposeful, and Twitter is banned inside China. Across the entire data set, an alarming 73 percent of all tweets from China were in English. Regardless of whether the tweets originated from a Chinese embassy in India or a news anchor in Hong Kong, the language denotes the targeting of Western audiences. Even more concerning, most tweets were posted midmorning or midevening U.S. East Coast time, even though these times correlate to untraditional social hours in Hong Kong. These combined stratagems indicate intentional weaponization of information.

According to a study by Shimon Kogan, Tobias Moskowitz, and Marina

Defense Department spokesperson Air Force Lieutenant Colonel Carla Gleason moderates telephone briefing with Laura Cooper, Deputy Assistant Secretary of Defense for Russia, Ukraine, and Eurasia; Chad Sbragia, then Deputy Assistant Secretary of Defense for China; and Michael Ryan, then Deputy Assistant Secretary of Defense for European and NATO Policy, about international COVID-19 support and combating disinformation, the Pentagon, Washington, DC, April 9, 2020 (DOD/Lisa Ferdinando)

Niessner, there are disproportionate effects of disinformation on the relationship between fake news and financial markets.[35] According to this study, fake articles had, on average, nearly three times the impact of real news articles on the daily price volatility or absolute return of the manipulated stocks in the 3 days after the publication of fake news. In other words, misleading and false tweets attract more retweets and thus have a more significant skyward trend on virality.[36]

According to another study by Soroush Vosoughi, Deb Roy, and Sinan Aral, false news spreads significantly further, faster, deeper, and more broadly than does the truth—sometimes by an order of magnitude.[37] While truth rarely diffuses to more than 1,000 people, the top 1 percent of false news cascades routinely diffuse to as many as 100,000 people. This study also found that truth took approximately 6 times as long as falsehood to reach 1,500 people and 20 times as long to travel 10 reshares from the origin tweet in a retweet cascade.[38] Although research findings such as these corroborate the results from this article, they do not address why certain account types were more successful at spreading disinformation.

Account Types Matter

The enhanced effects from governmental and diplomatic accounts can be explained by examining the perceived authority that these accounts may have with certain audiences. Recalling that Chinese government tweets are labeled as a "government official," it is logical to suggest this badge enhances the perception of an authoritative figure. The audience must then form its own opinions on whether the information presented is false because the presence of a credible source (for example, a Chinese ambassador to the United States) may lead to peripheral processing via heuristic principles—that is, cognitive shortcuts—in the belief that "statements by credible sources can be trusted."[39] This likely explains why diplomatic accounts had larger effects on virality and popularity even with the presence of disinformation. See figure for illustrations of how disinformation affected virality.

Moreover, governmental and diplomatic accounts seem to use denial strategies the most, commonly targeting the United States and other Western critics of China's mishandling of and reluctance to share information during the initial phases of the virus's life span. China's narrative began with ignoring strategies (downplaying how dangerous the virus is), followed by denial strategies (suggesting the virus originated in the United States or was created by the U.S. Army), until, finally, attacking-the-accuser strategies (by calling out the United States for referring to the virus as the China virus or Wuhan flu).

These active reputation repair messages seemed successful in the short term as the frequency in the usage of the terms *Chinese flu* and *Chinese virus* reduced after March 2020. March, coincidently, had the highest amount of denial options utilized in the test data set. This fact underscores the effectiveness of targeted and synchronized soft power tactics in social media warfare.

Virality's Leads on Popularity

During the final analysis of virality and popularity, a curious pattern kept emerging during statistical calculations. Post hoc examination illuminated the presence of a phenomenon where virality enhances popularity. In other words, when China uses a nefarious narrative from an authoritative diplomatic account laced with falsehoods, a spike in the number of retweets typically occurs—strengthening its impact on virality. However, as time goes on, this large audience that has now been exposed to the narrative begins to like and comment on it more, increasing its popularity. This delayed effect may be caused by persuasion theory effects, namely, the *liking heuristic*.

People typically agree with people they like, and people they like typically have "correct" opinions.[40] When people interpret data they do not completely understand, the mind takes mental shortcuts through its interpretation of peripheral data or heuristics.[41] This observed liking effect[42] in the test data resembles a large-scale randomized experiment conducted on Facebook by a Massachusetts Institute of Technology research team.[43] The team found that personalized referrals to other Facebook members were three times more effective at generating adoption compared with normal advertising. Thus, a tweet that is shared and liked among strong-tie relationships on social media increases the adoption of the narrative.

A simple like of a tweet does not mean complete message consensus. A Western social media user who likes a Chinese propaganda tweet, for instance, does not become a Party agent. However, if exposure continues to occur from multiple data sources, it may begin to persuade that user's trust and position on the topic at hand. More pointedly, viral messages that gain popularity run the risk of cultivating consensus: "If other people believe it, then it is probably true."[44]

Future Research

Although this research has multiple implications, it also is limited by several factors. First, this study on China's response to the coronavirus pandemic was conducted primarily in the United States. Future research could compare findings to a comparative study of other countries, which would provide valuable insights into cultural differences in managing a similar crisis. Moreover, the study examined only Twitter as a social media platform. Although Facebook would likely have similar results, a social media platform that is not banned in China—for example, WeChat—could help the Intelligence Community understand how China uses propaganda on its citizens compared with Western audiences.

Future research should also utilize experimental design to isolate the three most influential variables: disinformation, account type, and reputational response strategy. Additionally, a network analysis of the data set would help DOD and the Intelligence Community better predict the effects of virality on popularity by examining the depth of dispersion and acceptance of narratives. A network analysis would also help discern how many Western social media users encountered

Norwegian actress and director Liv Ullmann reads from Liu Xiaobo's *I Have No Enemies: My Final Statement*, when he was awarded 2010 Nobel Peace Prize but imprisoned in China and unable to accept award, December 10, 2010, Oslo, Norway (Norwegian Ministry of Foreign Affairs/Marta B. Haga)

targeted nefarious tweets. This would likely help social media corporations understand the effects of false information, perhaps reducing its spread. Despite these limitations, this article provides significant lessons for understanding China's disinformation campaign on social media.

Conclusion

The COVID-19 pandemic led China to successfully deflect the damage to its international reputation by utilizing a specific and intentional weapon: information. China's capacity and capability to manipulate information on a broad, global scale under a compressed timeline highlight not only the changing character of war but also how woefully behind the United States is at competing against targeted social media narratives. Today, 6,000 tweets are posted on Twitter every second, corresponding to more than 350,000 tweets per minute, 500 million tweets per day, and roughly 200 billion tweets per year.[45] As countries and organizations become more adept at utilizing social media to coerce audiences and outpace their competitors, it will become increasingly important for gatekeepers to protect the culture and ideas of their citizens.

China has demonstrated its freedom of maneuver in the information battlespace on a scale and timeline that the United States cannot accomplish. Recognizing this is the first step in adjusting how the United States handles the weaponization of social media. The joint force must tailor a robust response: recognizing disinformation, suppressing it, and countering it to U.S. advantage. Developing this response enterprise will also require an examination of how the United States interprets and values truth. Continued research and development on social media trends will allow gatekeepers to focus efforts on disinformation that appears to be trending. Early identification in a tweet's lifecycle would significantly slow the dispersion across users and ultimately expand decision space for defense and policymakers. As we saw in the Crimean conflict of 2014, the weaponization of disinformation is one of the most insidious threats to democracy.

Eight years later, it appears the threat has grown more dangerous and resolute. China's utilitarian relationship with truth enables it to bend and break the truth to maintain control. To regain advantage, the United States cannot ignore nefarious social media actors. To win, we must reaffirm our American values—defend truth, promote the sanctity of free speech and expression, and protect the principles of our people. **JFQ**

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Naval War College students in National Security Affairs Department participate in Theater Security Decision Making Final Exercise in Spruance Auditorium, November 6, 2019, in Newport, Rhode Island (U.S. Navy/Tyler D. John)

Challenges to Creative Thinking

Identifying Officer Background Beliefs in Limited Information Environments

By Zachary Zwald, Jeffrey Berejikian, Samantha Jane Daly, and Jeffrey Hannon

The nature of the current threat environment presents a challenge to U.S. national security that necessitates creative thinking by military officers. In 2020, the Joint Chiefs of Staff released a guidance document stating that the "profound and rapidly changing character of war and conflict" requires "the development of strategically minded joint warfighters who think critically and can creatively apply military power to inform national strategy."[1] This article conveys the results of the first empirical analysis of the background beliefs, or *operative theories*, that officers employ when applying military power to inform national strategy. It then outlines the implications of these findings and recommends ways to develop strategically minded military officers.

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Decision environments with incomplete and ambiguous information, such as military crises, present officers with irreducible uncertainty about both the nature of the threat at hand and the eventual costs and benefits of pursuing one course of action (COA) over another. In response to such uncertainties, all decisionmakers, regardless of intelligence or level of substantive expertise, necessarily decide how best to proceed by relying on an existing set of beliefs about how the world works to provide context and fill in gaps about what is unknown at the moment.[2] Existing research suggests that an officer's capacity to think creatively under such circumstances requires both self-awareness about one's own prevailing operative theory and flexibility in interpreting new information in the context of multiple competing theories.[3] Here, the term *flexibility* refers to the ability to employ an operative theory while remaining open to new information—and alternative interpretations of that information—to arrive at a nuanced and conditional judgment about which COA to pursue.

This study, therefore, takes a necessary initial step toward improving officers' capacity for self-awareness and flexibility by empirically examining the content and impact of their operative theories during a military crisis marked by limited information. We presented a multi-Service sample of officers (O4 through O7) attending a professional military education (PME) institution with one of three decisionmaking experiments that varied according to conflict domain (conventional, nuclear, or cyber). This approach allowed us to empirically answer a few critical questions: To what extent do military officers engage in discernible patterns of theory-driven thinking during crises? Do those patterns of thinking correspond to the COA these officers recommend? Do the theories employed vary by conflict domain? Does an officer's Service branch affect the pattern of theory-driven thinking exhibited?

In brief, our findings demonstrate that military officers display distinct patterns of theory-driven thinking to arrive at COA recommendations. Officers predominantly employ realpolitik beliefs, but more than a third of respondents justified their decisions in terms of either classic liberalism or moral reasoning. Most important, the theory an officer expressed correlates with whether he or she recommended the "stand firm" or "limited military strike" COA as the most effective response to an adversary's ambiguous provocation. Yet the content of an officer's theory-driven thinking does not correlate with either the conflict domain or the officer's Service branch. These results suggest that standard methods for improving creative thinking, such as increasing an officer's substantive knowledge base (via PME and assignment diversity) or relying on the diversity of technical knowledge and operational experience in decisionmaking groups (via an increased emphasis on jointness), are necessary but insufficient measures to foster the cognitive diversity and develop the creative options required to tackle complex problems. Instead, our findings point to the value of encouraging officers to periodically interact with well-informed individuals employing a variety of operative theories. Existing research indicates that such situations can induce surprise in officers, akin to "battlefield shocks," which subsequently allows them to confront their assumptions and the existence of other valid ways to make sense of a given information environment.[4]

Overview

This study was funded by a grant from the Defense Threat Reduction Agency's Project on Advanced Systems and Concepts for Countering Weapons of Mass Destruction to evaluate decisionmaking in a multidomain deterrence crisis. During the 2017–2018 and 2018–2019 academic years, 479 Active-duty officers attending a PME facility participated in a series of deterrence decisionmaking survey experiments. Participants were drawn from across a range of PME institutions: the Air War College (a senior Service school for lieutenant colonels and colonels) and the Air Command and Staff College (an intermediate Service school for captains and majors), both of which are located on Maxwell Air Force Base in Montgomery, Alabama; the Naval Postgraduate School (an intermediate Service school for captains and majors), located in Monterey, California; and several colleges at the National Defense University (intermediate and senior Service schools as well as a general officer program), located in Washington, DC.[5]

For the portion of the study presented here, we randomly gave respondents one of three short vignettes that had limited information about an emerging deterrence crisis. The underlying premise and fact pattern in each scenario were identical and represented a traditional extended deterrence crisis. Specifically, U.S. troops were stationed on allied soil with a publicly declared purpose to deter rival aggression. The scenarios described mounting tensions between the U.S. ally and the rival, precipitating a crisis and requiring a U.S. response. The only substantive difference across the scenarios was the conflict domain (conventional, nuclear, or cyber).

The vignettes described only the outlines of a plausible deterrence scenario, but they did not explicitly mention actual adversaries. This omission was deliberate and designed to limit the degree to which context-specific beliefs might influence an individual's decision in a limited information scenario. Participants were also explicitly told that the scenarios "were deliberately general and not about a specific issue in the news today." In one sense, this approach represents an extreme condition, as any real-world circumstance would include information about an adversary's motivation, capabilities, and national characteristics; however, as our interest was to tap officers' underlying operative theories, we sought to prevent preexisting knowledge about specific scenarios from contaminating our results. In addition, we were deliberately ambiguous about the adversary's ultimate motivations.

After describing the military provocation, we informed subjects that "intelligence analysts say they are unsure about what the action signals about the rival government's intentions." Specifically, subjects were told the adversary had mobilized forces, which could represent a political signal intended to

communicate dissatisfaction with the status quo or an "intention to take that territory from the ally." By deliberately withholding critical information about the adversary's intentions, our study forced participants to rely on their core beliefs and inclinations about conflict as a conceptual starting point to evaluate the competing COAs. We informed subjects that U.S. officials were considering two military responses to the adversary's actions: "stand firm," which reaffirms the deterrence commitment by materially enhancing the current military posture, or "limited military strike," which signals commitment via escalation by eliminating the specific capability deployed in the provocation. We then asked all participants to select one of the two COAs and explain the underlying rationale of their choices.

After the study, we developed a data coding framework to derive operative theories from respondents' written rationales. The open-ended explanations of how subjects arrived at their chosen COAs were categorized into one of three operational theories, each of which advances a distinct logic concerning the use of military force: realpolitik, classic liberalism, and moral reasoning. A team of coders independently evaluated and categorized each response. Explanations that included elements of multiple theories were coded only for the primary theory; the coders identified and resolved any coding discrepancies. We discarded a small number of responses either because they did not provide sufficient information to make an assessment or because it was impossible to determine the primary operative theory. Table 1 displays a summary description and an example of each concept.

Explanations were coded as realpolitik whenever participants arrived at their decision based on primarily military security considerations. Such explanations included references to risk and/or analysis of the military costs and benefits as well as comparisons of the two options' relative battlefield effectiveness. When officers employed classic liberalism, they explained decisions in terms of concern for international rules and norms; these responses often included discussion of legitimacy, diplomacy, negotiation, allies, precedent, and so on. When officers explained their decisions in terms of moral reasoning, the justification described how the United States should or should not behave considering the value of human life and objective notions of "right" and "wrong."

This research design facilitated the empirical examination of three questions: What is the relationship between an officer's operative theory and recommended COA? Does the distribution of operative theories expressed by the officers sampled vary by conflict domain (conventional, nuclear, or cyber)? Is there a relationship between the distribution of theories and variation in officers' Service branch? The following section overviews our findings on these questions.

Data Analysis

First, we examined the overall distribution of how respondents arrived at their chosen COA in terms of the three operational theories described above. As table 2 demonstrates, officers are not monolithic about operative theories when making decisions in limited information environments. Specifically, although most officers expressed realpolitik thinking in explaining how they arrived at their recommendation, nearly 40 percent of officers instead exhibited thinking based on either classic liberalism or moral reasoning.

Table 1. Summary Description and Example of Each Concept

Operative Theory	Logic	Example
Realpolitik	Explains decision in terms of military security considerations, including an instrumental assessment of the risks of incurring costs versus the potential for mission success.	"If we are certain that 2,000 of our people will be killed if we do nothing other than stand firm, we should attempt to save all of our people at the risk of losing some or else risk even greater losses in the future."
Classic Liberalism	Explains decision in terms of the potential consequences for broader nonmilitary concerns, such as international organizations, alliances, treaties, and economic arrangements.	"The future legitimacy and credibility of the United States (international reputation, national will, and other elements of national power are tied to this) may be jeopardized by an unprovoked attack."
Moral Reasoning	Explains decision in terms of the officers' personal sense of morality and values, where assessments of costs and benefits reflect their view of appropriateness.	"It would not be morally correct to conduct an attack unless the rival had intent, capability, and were highly likely to conduct an attack."

Table 2. Operative Theory Distribution

Theory	Percentage	Raw Total
Realpolitik	58	267
Classic Liberalism	28	130
Moral Reasoning	11	53
Unable to Categorize	1.9	9

Marine Corps officer candidate with Recruiting Station Riverside, 12th Marine Corps District, notes key factors from five-paragraph order before briefing his fire team on how to overcome Leadership Reaction Course obstacle at Marine Corps Base Camp Pendleton, California, April 10, 2021 (U.S. Marine Corps/Tessa D. Watts)

Second, we needed to determine whether the content of a person's theory-driven thinking corresponds to the COA he or she recommends. To do so, we examined the relationship between a subject's foundational beliefs or theory and the substantive recommendation (limited strike versus stand firm). The results summarized in table 3 reveal a substantively meaningful and statistically significant relationship between operative theory and recommended COA. Specifically, though realpolitik was by far the dominant framework for those recommending limited strike (89 percent), it was less influential (55 percent) for those who recommended stand firm. In addition, officers who relied on classic liberalism were more than three times as likely (32 percent versus 10 percent) to recommend standing firm over a limited strike. Finally, although the logic of appropriateness exhibited in moral reasoning was the least frequently employed, it was associated with the most significant percentage difference between those who recommended stand firm versus limited strike. Notably, the relationships conveyed in table 2 meet accepted levels of statistical association and are therefore unlikely to be an artifact.[6]

Third, we asked whether the operative theory an officer employs to make sense of limited information varies based on the conflict domain. Table 4 addresses this question by presenting the relationship between the fundamental beliefs one employed and the conflict domain presented in the decision experiment. In short, the answer is *no*. Officers tend to employ realpolitik the most across all three conflict domains. And while data do show greater reliance on classic liberalism in the cyber

Table 3. Operative Theory by Recommendation

Theory	Limited Strike (%)	Stand Firm (%)
Realpolitik	88.5	54.8
Classic Liberalism	9.8	31.9
Moral Reasoning	1.6	13.4

Table 4. Operative Theory by Domain (%)

Theory	Nuclear	Cyber	Conventional
Realism	60	52	65
Liberalism	29	36	23
Constructivism	11	13	12

Military Academy at West Point held its graduation and commissioning ceremony for Class of 2021 at Michie Stadium in West Point, New York, May 22, 2021 (U.S. Army/Tyler Williams)

domain—specifically, subjects showed concern about the legal status of the adversary's cyber attack—this relationship does not reach commonly accepted levels of statistical significance.[7] In sum, the consistency of officers' theory-driven thinking employed across all three domains suggests a lack of flexibility, as we have defined the term. Although each domain—conventional, nuclear, and cyber—presented a distinct set of facts on the ground that should inform how one evaluates the COAs, it appears that those domain-specific facts did not elicit any variation in the operative theory officers employed.

Finally, we wanted to determine whether the operative theory an officer employed varied based on his or her branch of military Service. We answered this question by calculating the distribution of operational theories across Service branches. Table 5 shows that most officers in each branch relied on realpolitik reasoning to arrive at their recommended COA, which was followed in turn by classic liberalism and moral reasoning. Although officers do exhibit some minor within-framework differences across Service branches, these differences are not statistically significant.[8] In other words, we do not observe across the Service branches substantive variation concerning the distribution of operative theories deployed in limited information environments. This finding suggests that ensuring jointness in decisionmaking groups will not necessarily provide the diversity in operative theories required for critical and creative thinking when officers evaluate competing COAs.

Together, the results from tables 2 and 3 establish an empirical link between the diversity of operational theories and the breadth and substance of the recommended COAs. Consistent with previous research on the role of background beliefs, these results confirm the initial belief framework that individuals bring with them to confront a new circumstance powerfully shapes their substantive recommendations.[9] It follows that critically and creatively evaluating competing COAs in situations of limited information requires employing a diverse set of operative theories. Moreover, harnessing those diverse perspectives requires a decisionmaking group composed of individuals who are both self-aware about the theory motivating their thinking and flexible in their capacity to make sense of the same information environment in the context of multiple theories.

Implications

In the opening stages of a deterrence crisis, an officer's operative theory shapes the COA recommended. There is also strong evidence that the theories officers employ remain consistent across conflict domains, which is to say that officers do not appear to exhibit different patterns of theory-driven thinking as conflict shifts between conventional, nuclear, and cyber. Moreover, data show no relationship between variation in operative theories and Service branch.

What are the implications of these findings? How can they shape strategies to improve creative thinking capacity within the officer corps? Three critical implications follow from this study. First, teaming is paramount. Deterrence challenges are complex and defy any single model, and results suggest that individuals tend not to leverage multiple operative theories. Therefore, critically and creatively evaluating potential COAs requires a *group* of individuals who possess both an awareness of their own operative theory and an ability to deliberate with those working from different theories. Second, even when a group's members engage with different operative theories, they will tend to engage in a "dialogue of the deaf" about the nature of the threat at hand and how best to proceed. Commonly employed strategies to improve a group's capacity to generate and evaluate COAs—for example, PME, assignment diversity, and jointness—do not necessarily foster the self-awareness and flexible use of operative theories required for individuals to deliberate with others operating from different theories. Third, experiences that simulate surprise, in which a person must confront both the assumptions driving his or her thinking on an issue and the existence of other valid ways to understand that issue, can foster the self-awareness and flexible thinking needed to deliberate with other group members.

Decisionmaking teams are essential to evaluating COAs during a deterrence crisis. Optimally, a military officer could respond to the incomplete and ambiguous information that typifies such situations by engaging in flexible thinking that examines the risks accompanying each potential COA comprehensively. Recall that in this context *flexibility* refers to the capacity to employ an operative theory while remaining open to new information and alternative interpretations of that information to arrive at a nuanced and conditional judgment about which COA to pursue. It follows that the key to creative thinking lies in making officers more self-aware about the theories driving their own views as well as better able to recognize and engage the relative merits of judgments arrived at by processing information through the lens of different theories.

Unfortunately, existing research demonstrates that, regardless of intellectual ability or level of subject matter expertise, all people tend to fall short of these ideals to some degree. For example, even foreign policy experts tend to arrive at judgments on how best to proceed by persistently employing a single operative theory, and they typically ignore other viable ways of viewing the situation.[10] Judgments that result from inflexible theory-driven thinking tend to narrowly interpret some portion of the information available, disregard seemingly contradictory information, and dismiss interpretations of information that proceed from different operative

Table 5. Operative Theory by Service Branch (%)

Theory	Army	Marines	Navy	Air Force
Realpolitik	55	58	65	54
Classic Liberalism	33	30	21	36
Moral Reasoning	11	12	13	10

theories.[11] These tendencies—which buttress resolve but erode flexibility—hinder creative thinking at both the individual and group decisionmaking levels.

Moreover, a group populated by individuals operating according to a single operative theory has little capacity to fully assess adversary threats and select the most effective COA. Like-minded theory-driven thinkers tend to coalesce and succumb to the framing bias, advancing a single, narrow interpretation of the incomplete information at hand.[12] To the limited extent that such groups engage in conversation with others who use differing frames, a dialogue of the deaf about the nature of the threat at hand and how best to proceed tends to result. Consequently, a state beset by such thinking risks responding to an adversary's provocation inefficiently, erroneously, or with such delay that it misses its window of opportunity.

Commonly employed strategies to improve a group's capacity to critically and creatively evaluate COAs (for example, PME, assignment diversity, jointness) do not necessarily foster the required levels of self-awareness and flexible thinking. PME can improve an officer's historical knowledge, understanding of operational concepts, and critical thinking. Ensuring that officers experience a range of assignments broadens their understanding of the problem and the various components of a military response; likewise, ensuring jointness within decisionmaking groups helps them comprehensively assess the operational strengths and weaknesses of COAs. Yet none of these strategies necessarily increases the diversity of operative theories expressed or aids teams with devising creative options required to tackle complex geopolitical challenges. Specifically, our findings show that the content of an officer's theory-driven thinking does not correlate with either conflict domain or Service branch. For this reason, leaders should not assume that different operational experiences or Service perspectives will aid them in flexibly employing multiple theories to understand the full range of consequences of an adversary's ambiguous provocation.

Finally, capacity for self-awareness and flexibility can be improved by presenting officers with situations that generate surprise. General David Petraeus, USA (Ret.), advocated for initiating conditions that mimic the effect of battlefield surprise to improve the ability of officers to identify their operative theory and recognize the merits of perspectives generated by employing different theories. Consider Petraeus's reasoning for sending military officers to public graduate schools: "It teaches you that there are seriously bright people out in the world who have very different basic assumptions about a variety of different topics and therefore arrive at conclusions on issues that are very, very different from one's own and very different from mainstream thinking, particularly in uniform."[13] In short, interaction with people from other communities encourages individuals to reflect on their own heretofore unstated assumptions about how the world works.

It follows that a diverse group of self-aware theory-driven thinkers stands to improve the creativity of decisionmaking by facilitating *joint evaluation*. Existing research attests that joint evaluation, or the simple step of presenting a person with multiple sets of beliefs or theories, to frame the same set of information at the same time, can, at minimum, make people more attuned to information that contradicts their own operative theory. This approach inoculates decisionmakers against various forms of framing[14] and minimizes the tendency toward overconfidence that theory-driven thinking often produces.[15] In this vein, one way of encouraging officers to practice joint evaluation could be for the Department of Defense to host recurring closed-door, not-for-attribution workshops with an array of people. Introducing military officers to people from other groups with whom they may not be familiar (for example, scientific and strategic experts from the arms control community) can generate that sense of battlefield surprise described by Petraeus. The objective is for participants to become more self-aware about the critical role operative theories play in shaping human judgment, inoculate policymakers from the effects of narrowly framed assessments, and facilitate the creation of a wider array of options. Meeting the Joint Chiefs of Staff 2020 directive entails, in part, understanding the limits of human cognition and working around those limits to build teams that think critically and creatively to apply military power to the rapidly changing 21st-century threat environment. **JFQ**

Notes

[1] Jim Garamone, "Joint Chiefs Vision Changes Military Education Philosophy," *DOD News*, June 1, 2020, available at <https://www.defense.gov/Explore/News/Article/Article/2204041/joint-chiefs-vision-changes-military-education-philosophy/fbclid/IwAR3Sr_PiufeQnpBItwlBHKCAqL4pi__s5a_68vtSTje4_5O4WhYtLYkbD-Y/>.

[2] Philip E. Tetlock, "Theory-Driven Reasoning About Plausible Pasts and Probable Futures in World Politics: Are We Prisoners of Our Preconceptions?" *American Journal of Political Science* 43, no. 2 (April 1999), 335–366.

[3] Philip E. Tetlock and Dan Gardner, *Superforecasting: The Art and Science of Prediction* (New York: Broadway Books, 2016).

[4] Ibid.

[5] Participants from the National Defense University included CAPSTONE fellows as well as students from National War College, Dwight D. Eisenhower School for National Security and Resource Strategy, and students from intermediate-level education programs at the Joint Forces Staff College.

[6] X^2 (2, N = 450) = 25.2, p = 0.00.

[7] X^2 (4, N = 450) = 6.58, p = 0.160.

[8] X^2 (6, N = 450) = 9.41, p = 0.151.

[9] See, for example, Robert Jervis, *Perception and Misperception in International Politics: New Edition* (Princeton: Princeton University Press, 2017).

[10] Richard K. Herrmann and Jong Kun Choi, "From Prediction to Learning: Opening Experts' Minds to Unfolding History," *International Security* 31, no. 4 (Spring 2007), 132–161.

[11] Tetlock, "Theory-Driven Reasoning."

[12] See, for example, Irving L. Janis, *Victims of Groupthink: A Psychological Study of Foreign-Policy Decisions and Fiascoes* (Boston: Houghton Mifflin Company, 1972).

[13] Tetlock and Gardner, *Superforecasting*, 225.

[14] Dennis Chong and James N. Druckman, "Counterframing Effects," *The Journal of Politics* 75, no. 1 (January 2013), 1–16.

[15] Hal R. Arkes, "Overconfidence in Judgmental Forecasting," in *Principles of Forecasting: A Handbook for Researchers and Practitioners*, ed. J. Scott Armstrong (New York: Springer, 2001), 495–515.

UH-1Y Venom crew chief with Marine Medium Tiltrotor Squadron 164 (Reinforced), 15th Marine Expeditionary Unit, fires Gun Aircraft Unit-17 machine gun during live-fire close-air support training event for Operation *Octave Quartz*, in Somalia, December 22, 2020 (U.S. Marine Corps/Kassie McDole)

Competing Regionally
Developing Theater Strategy

By Derek S. Reveron, James L. Cook, and Ross M. Coffey

The past two decades have been tough for strategists. Large-scale efforts in Central Asia and the Middle East did not bring the successes policymakers demanded, despite considerable blood and treasure expended, and though free of U.S. combat casualties, the record in both Europe and the Indo-Pacific is not much better. U.S. attempts to reset relations with Russia did not prevent invasions of its neighbors or stop significant Russian intelligence operations in cyberspace. The U.S. military buildup in the Indo-Pacific and clear redlines did not deter the People's Republic of China (PRC) from militarizing the South China Sea, undermining U.S. alliances in the region, or from using the power of trade to reinforce China's national security positions. In Latin America and the Caribbean, both Russia and the PRC made inroads with their traditional partners, muting efforts to unify the region's commitment to democracy, cooperation, and transparency. And in Africa, U.S. and European efforts to squelch terrorism, aid developing economies, and become the partner of choice ran up against alternative proposals from Moscow and Beijing, as they continue to strengthen their positions beyond their regions. The limits

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of the United States' ability to preserve its hegemony and restrain competitors have compelled the national security community to refocus on Great Power competition to inform strategy development at the regional level.

Russia's invasion of Ukraine in 2014 and China's military modernization convinced U.S. allies to spend more on defense. While budget deficits have yet to condition U.S. strategic decisions, it has never been clearer that the United States requires renewed efforts to improve strategic thinking, particularly at the regional level. As such documents as the National Security Strategy and National Military Strategy attest, the United States attempts to shape the international security environment by balancing threats in key regions of the world, assisting partners in addressing security deficits, and supporting allies to solve their own security dilemmas against regional challengers. Although overarching security strategies are driven by the national security advisor and key Federal departments, combatant commands must translate national objectives into theater strategy.

The last 20 years of incomplete counterterrorism, counterinsurgency, and postconflict reconstruction efforts underscore Hal Brands's argument that strategy "should flow not from mere reactions to day-to-day events, but from a judgment of those enduring interests that transcend any single crisis."[1] In general, the United States consistently attempts to defuse situations before they become crises through a strategy of prevention and improving partner capacity and capabilities to control security challenges.[2]

As the numerous defense and national documents suggest, strategies are relatively easy to develop, but Carl von Clausewitz is instructive here: "Everything in strategy is very simple, but that does not mean that everything is very easy."[3] The challenge for the strategist is to coordinate the various levers of national power in a coherent way and implement at the country and regional levels. Taken from a budgetary and policy perspective, the Department of Defense (DOD) tends to dominate U.S. national security. Former Secretary of Defense Robert Gates argues that "the American government had become too reliant on the use of military power to defend and extend our interests internationally, that the use of force had become a first choice rather than a last resort."[4] To avoid this pitfall, some advocate "rebalancing" the U.S. approach to national security through greater investment in nonmilitary tools, and the chorus continues to call for interagency efforts, whole-of-government solutions, and primacy of public-private partnerships.[5]

To be effective in a differentiated world—through holistic approaches—strategists must answer three basic questions: What do we wish to achieve, or what are the desired *ends*? How do we get there, or what are the *ways*? And what resources are available, or what *means* will be used? Though the first question is largely the domain of civilian policymakers, military officers are expected to advise and ultimately implement strategy. As former Chairman of the Joint Chiefs of Staff General Martin Dempsey notes, "Strategic coherence . . . does not just happen. Rather, it results from dialogue and debate."[6] With regular interactions with their counterparts throughout the world, combatant commanders are key national security actors in the strategy development and implementation process.

Defining Strategy

At a minimum, strategy should link ends, ways, and means. For DOD, *strategy* is "a prudent idea or set of ideas for employing the instruments of national power in a synchronized and integrated fashion to achieve theater, national, and/or multinational objectives."[7] Strategy is also about *how* leadership can use the *power* available to the state to influence people, places, things, and events to achieve *objectives* in accordance with national interests and policies. In fact, Brands describes *grand strategy* as a "discipline of trade-offs: it requires using the full extent of national power when essential matters are at stake, but it also involves conserving and protecting the sources of that power."[8] Nina Silove further states that grand strategy "includes consideration of the use of all the state's resources, not just military force."[9]

Henry Bartlett visualizes strategy as an *interaction* among key variables: the security environment, ends, ways, means, resource constraints, and risk.[10] As figure 1 shows, strategy is shaped simultaneously by the very same security environment that it is attempting to mold. Just as no plan remains intact after first contact with the enemy, no strategy can exist outside the real world. Allies, partners, and adversaries can impede successful strategy implementation by

Figure 1. The Shaping of Strategy

Marines with 1st Battalion, 7th Marine Regiment; British Royal Marines with 40 Commando; Australian Army with 3rd Royal Australian Regiment; and Japan Ground Self-Defense Force soldiers conduct amphibious landing during exercise Talisman Sabre 21 in Ingham, Queensland, Australia, July 30, 2021 (U.S. Army/ Matthew Mackintosh)

balking at U.S. demands, imposing caveats on forces in coalition operations, and engaging in efforts that outright undermine U.S. objectives. These examples simply constitute friction, and it should come as no surprise that sovereign countries will make strategic decisions that are not always congruent with U.S. interests.

At the same time the international security environment affects strategy, so do resource constraints. As Colin Dueck argues, the U.S. approach to strategy is flawed: "Sweeping and ambitious goals are announced, but then pursued by disproportionately limited means, thus creating an outright invitation to failure."[11] Since the 1990s, the limits of (and frustration with) U.S. grand strategy tend to be explained by an expansive view of security challenges that includes subnational and transnational challenges. Because burden-sharing through coalition operations is a norm, combatant commands are key to train and equip partners to address their security deficits, sponsor regional exercises, and employ military forces.

The strategist can look to national interests as a starting point—to set priorities and to determine ends, because they help identify the reasons countries employ military forces. National interests can be universal and enduring, such as ensuring the security of the state and its people. National interests can also be the product of national policies, such as advancing democratic institutions or protecting the environment. Ranking national interests is important to setting priorities. Hans Morgenthau distinguishes between vital national interests and secondary interests; the latter are more difficult to define.[12] Presidential policy, which can be spelled out in the National Security Strategy, is one source for discerning vital from secondary interests, but when Presidents involve the United States in the international system, strategy is also driven by policy considerations that examine risk to the U.S. reputation and treasury and to the lives of U.S. national security practitioners. Along these lines, Peter Liotta observes that national interests should assist leaders in answering a fundamental question: "What are we willing to *die* for?"[13] That is, where is the United States willing to put lives at risk? To this we add, "What are we willing to kill for?" and "What are we willing to fund?" One relatively simple approach to these rather complex and somewhat ambiguous questions is to stratify national interests:

- Vital interests: What are we willing to die for (for example, invade Afghanistan with ground forces to destroy al Qaeda, or deploy forces to Syria to disrupt the Islamic State)?
- Important interests: What are we willing to kill for (for example, participate in a North Atlantic Treaty Organization air campaign to prevent genocide in Libya, or engage in unilateral airstrikes against terrorists in East Africa)?
- Peripheral interests: What are we willing to fund (for example, support the Afghan National Security Forces through the U.S. defense budget, or support a global vaccination campaign by a nongovernmental organization)?

The United States has many ways to advance its national interests through friendly surrogates. For example, the Joseph R. Biden administration's *Interim National Security Strategic Guidance* states that "we will reinvigorate and modernize our alliances and partnerships around the world."[14] In other words, the Nation is willing to fund others to provide humanitarian assistance, conduct peacekeeping operations, and support international military coalitions. For example, the Global Peace Operations Initiative was designed to train and equip foreign peacekeepers for global deployment. Such a program seeks to limit the impact of regional crises, while providing the international community a ready pool of international peacekeepers. Along these lines, Washington was willing to fund African militaries to operate in Somalia, but it was not willing to deploy ground forces or establish a no-fly zone. This kind of tactic is likely to increase in an era of burden-sharing, where "building partner capacity is an essential military mission and an important component of the U.S. Government's approach to preventing and responding to crisis, conflict, and instability."[15] Moreover, collaboration and cooperation are especially important during periods of fiscal austerity. By developing new partnerships that advance U.S. interests and maintain favorable regional balances of power, combatant commands are critical to this effort.[16]

After ends are defined, policymakers and national security professionals devise the ways to achieve national interests. Ways can be thought of as concepts, which are activities that define how elements, systems, organizations, and tactics combine to accomplish national objectives or tasks.[17] By specifying ways or concepts, the military departments can then develop required capabilities and attempt to limit redundancies. Concepts also propose necessary changes for the joint force to improve its ability to fight and win across all warfighting domains in future conflicts.[18] For example, the 2012 Capstone Concept for Joint Operations drove the development of joint operating concepts designed to achieve operational access as well as fight and win against advanced peer competitors in contested environments and across multiple domains. These concepts also identified several required capabilities, including the ability to conduct forcible entry operations, defeat enemy targeting systems, conduct and support operational maneuver over strategic distances, and conduct electronic attack and computer network strikes, while being able to detect and respond to such attacks by an adversary.[19] The means to provide these capabilities range from cyber units to submarine-launched missiles and long-range bombers, but the concept gives specific guidance on what the joint force actually needs.

As Presidential administrations evaluate ways to advance and defend national interests, criteria emerge suggesting conditions for military force employment. Gates argues that "as essential as it is to build and maintain a strong military, it's just as—or more—important to know when and how to use it."[20] Not all crises around the world warrant the commitment of U.S. forces, so leaders must also be willing to answer the following question: What are we willing to live with? The

Soldier stands watch next to M2 Bradley infantry fighting vehicle in Syria, October 30, 2020, in support of Combined Joint Task Force–Operation *Inherent Resolve* (U.S. Army/Jensen Guillory)

2020 Chicago Council Survey found that, despite fatigue from fighting the "forever wars" and enduring a global pandemic, 68 percent of the public maintains that the United States should take an active part in world affairs, and 54 percent say that the Nation should be more involved, not less, in addressing global problems.[21] The military, however, favors a conservative approach to force employment that traces its roots to the Vietnam experience, is embodied in the Weinberger Doctrine, and was reinforced by operations in the Middle East and Central Asia.[22]

Strategists should analyze suitability, acceptability, and feasibility: Is the action suitable or likely to achieve the desired ends? Also, is it an acceptable choice given ethical, legal, political, and organizational constraints? At tactical levels, planners must ensure their ideas are feasible or can be carried out with the resources granted; at the strategic level, feasibility is more complicated, as strategists have the dual task of identifying resource gaps to guide future investments while not relying on concepts whose resource demands will never plausibly be met. This is one reason the Bartlett model of figure 1 shows never-ending iteration.

If *ways* provide the framework or concepts identifying how elements of national power will be used to promote ends, then *means* are the specific tools or capabilities available for carrying out those concepts. Raw resources such as money and people are not means until they are considered and prioritized within the context of strategy. Overall, the United States has a complex system for prioritizing and developing defense capabilities. Details and processes change over time, but essentially DOD first aims to identify gaps between the capabilities it already has and those needed to carry out desired strategies. Next, DOD prioritizes those gaps given likely resource constraints and develops programs to create needed capabilities. Finally, DOD works within the executive branch and with Congress to fund the programs.[23]

As the eventual consumers of DOD capabilities, combatant commands give important support to concept and capability development, at times serving as executive agents. The Goldwater-Nichols Department of Defense Reorganization Act of 1986 formalized this process to "utilize the significant experience and knowledge of [combatant commands] in the validation of critical capabilities and the development of future forces in U.S. defense planning."[24] One of the ways combatant commanders accomplish this objective is by producing an Integrated Priority List (IPL) that sends a formal "demand signal" to the Pentagon by identifying capability gaps and providing the commander's "highest priority requirements, prioritized across Service and functional lines. IPLs define shortfalls in key programs that may adversely affect the combatant commander's mission."[25] Additionally, combatant commands offer input into the Joint Requirements Oversight Council, which is critical to determining and validating DOD capability requirements.[26]

Although intuitive and rational in theory, effective combatant command

F-15C Eagles assigned to 48th Fighter Wing conduct aerial operations in support of Bomber Task Force Europe 20-2, over North Sea, March 16, 2020 (U.S. Air Force/Matthew Plew)

participation in practice has proved challenging given competing perspectives and interests. For example, tension exists between the capability requirements of combatant commands that are focused on the immediate challenges within their areas of operation and the Services that take a more global and long-term view. The differing perspectives between the "warfighters" and "force providers" are understandable but introduce a level of friction in a resource-constrained environment. The Joint Requirements Oversight Council serves as a collaborative forum in which these issues are considered as part of the decisionmaking process. Annual combatant command testimony also provides Congress with a voice from the field—one it may not hear inside the Beltway.

Overall strategic success is based on how well ends, ways, and means are balanced. Julian Corbett observes that one must constantly keep in view the politico-diplomatic position of the country (on which depends the effective action of the military instrument) and its commercial and financial position (by which the energy for working the military instrument is maintained).[27] Although Corbett's advice is clearly not ideal, commanders are well advised to heed it. In its simplest form, defense budgeting is a key variable that impacts strategy implementation. For example, Kathleen Hicks argues that the 2018 National Defense Strategy (NDS) requires the military to "navigate the painful trade-offs among readiness, investment, and structure, since all three types of spending are needed to keep pace with China and Russia."[28] Because decisions about these tradeoffs directly impact the ability of the joint force to successfully carry out the strategy, they should be made according to clearly defined priorities.

A strategy is not considered complete until a risk analysis determines the ability of the organization to carry out the tasks and missions specified and implied by that strategy. Risk results from a mismatch among ends, ways, and means. With military strategy, the strategist considers four dimensions of risk.[29] *Operational risks* are associated with the current force's ability to execute the strategy within acceptable costs. *Future challenges risks* involve the military's capacity to execute future missions against an array of prospective challengers. *Force management risks* are those that pertain to recruiting, training, equipping, and retaining personnel. Finally, *institutional risks* relate to organizational efficiency, financial management, and technology development.[30] To identify and measure risk, DOD uses exercises, scenarios, and experimentation.[31]

As the preceding discussion suggests, strategy is developed in the context of the international security environment, and tactics must be reviewed as they are used in the real world. Again, strategy is an iterative process. Reevaluation and interpreting surprise recalls Sun Tzu's famous exaltation, "Know the enemy and know yourself; in a hundred battles you will never be in peril."[32] Ideally, perfect knowledge ensures success, but history

is replete with evidence to the contrary. Because "[w]ar is . . . an act of force to compel our enemy to do our will," the enemy has a vote too.[33] War is characterized by fog and friction. Winston Churchill understood this, noting, "The statesman who yields to war fever must realize that once the signal is given, he is no longer the master of policy but the slave of unforeseeable and uncontrollable events."[34] The preceding discussion applies to the development and evaluation of strategy in general, but national security professionals are primarily concerned with three specific levels of strategy: national or "grand" strategy, military strategy, and theater strategy.

Levels of Strategy

Grand strategy is the highest level of strategy and encompasses all elements of national power—diplomatic, informational, military, and economic.[35] Basil Liddell Hart correctly notes that "whereas strategy is only concerned with the problem of winning military victory, grand strategy must take the longer view—for its problem is winning the peace. Such an order of thought is not a matter of putting the horse before the cart, but of being clear where the horse and cart are going."[36] Walter Russell Mead reminds, "Tactics . . . was about winning battles; strategy was about winning campaigns and wars. Grand strategy was about deciding what wars to fight."[37] Although the Nation has always followed a grand strategy (for example, containment during the Cold War), Congress requires the President to publish a National Security Strategy. As required by the Goldwater-Nichols Act, this strategy describes:

the worldwide interests, goals, and objectives . . . the foreign policy, worldwide commitments, and national defense capabilities of the United States necessary to deter aggression . . . the proposed short-term and long-term uses of the political, economic, military, and other elements of national power of the United States to protect or promote the interests . . . the adequacy of the capabilities of the United States to carry out the national security strategy.[38]

Since the statutory requirement, more than a dozen national security strategies have been released by U.S. Presidents responding to particular security challenges during their tenures, with many persisting today: the ending of the Cold War for Presidents Ronald Reagan and George H.W. Bush, the rise of nationalist conflicts and global terrorism for Presidents Bill Clinton and George W. Bush, a focus on the Indo-Pacific region for Presidents Barack Obama and Donald Trump, and the global pandemic and climate change for President Joseph Biden. There have been continuous policies related to trade, America's leadership in global affairs, and the promotion of international organizations to unify action. For example, Paul D. Miller argues that "contrary to widespread belief, the United States has been pursuing at least one pillar of an implicit grand strategy since the end of the Cold War: building the democratic peace."[39]

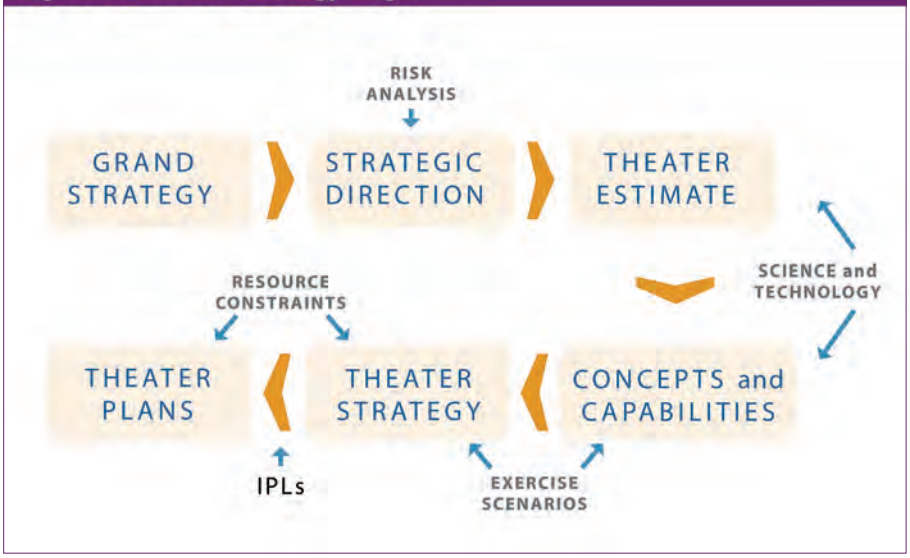
Deriving strategic guidance from the country's grand strategy, DOD has regularly produced a National Military Strategy (NMS) since the 1990s. In 2003, Congress required the Chairman of the Joint Chiefs of Staff to submit a biennial review of the NMS in even-numbered years. The NMS outlines the strategic direction for the Armed Forces by providing guidance for force planning, force employment, posture, and future force development; it also acts a strategic framework to prioritize planning, resource allocation, and risk management, by looking beyond the near term to identify long-range operational requirements for the joint force.[40]

The 2017 National Defense Authorization Act replaced the Quadrennial Defense Review with a mandated NDS that articulates the highest priority missions for DOD and major investments in defense capabilities to address the most critical and enduring threats to U.S. national security interests. The NDS is required to be produced every 4 years and include a strategic framework to guide DOD prioritization regarding the "force size and shape, force posture . . . organization and other elements of the defense program necessary to support the strategy."[41] Though their number can be overwhelming, strategic documents in the United States are intended to work together to provide "nested strategic direction" supporting the tasks, missions, and intent of the next higher strategy. As an example, the 2017 National Security Strategy marked a departure from the almost-two-decade-long war on terror and emphasized the growing challenge of "revisionist powers" such as Russia and China that "want to shape a world antithetical to U.S. values and interests."[42] This change in strategic priorities was acknowledged and echoed in the 2018 NDS that proclaimed, "Inter-state strategic competition, not terrorism, is now the primary concern in U.S. national security."[43] This priority carried through the Biden administration. With this "nesting of strategy" in mind and an understanding of how to develop strategy, the following section focuses on how to develop theater strategy.

Theater Strategy

Using national strategy as a guide, combatant commands develop theater strategies that are "an overarching construct outlining a combatant commander's vision for integrating and synchronizing military activities and operations with the other instruments of national power in order to achieve national strategic objectives."[44] Theater strategy is the bridge between national strategic guidance and joint operational planning, as it guides the development of the Combatant Command Campaign Plan (CCP). Although discrete documents with unique purposes, theater strategy and the CCPs are simultaneously mutually dependent. The CCP operationalizes the theater strategy and offers a more detailed and integrated approach to achieving security objectives including engagement, security assistance, and presence activities that support contingency plans (for example, securing access to bases or improving partner capabilities). More broadly, theater strategies should seek to make conflicts less likely, by achieving U.S. ends through security cooperation and other tools of national power.[45]

Figure 2. Theater Strategy Logic



A major challenge in developing theater strategy is the requirement to coordinate theater security cooperation activities with other U.S. Government agencies and activities. These activities can cover the entire spectrum of conflict—from peace operations to major combat operations—and often occur simultaneously, adding another level of complexity for the commander's staff to consider. The strategy must therefore be broad and flexible enough to encompass a wide variety of political-military activities across a combatant command's area of responsibility (AOR).[46] As a result, combatant commands are encouraged to involve their interagency counterparts in the crafting of these strategies to secure buy-in from these stakeholders, as these individuals bring different perspectives that enrich the planning process.

Theater strategy must also consider other countries' activities. General Rick Hillier, former chief of the Canadian Defence Staff, remarked, "International cohesion is usually the first casualty of having tactics without a strategy to guide you."[47] Consequently, military diplomacy is essential for combatant commands; they must coordinate their activities with regional partners and allies to approach unity of effort. Such collaboration also happens at the country team level, where defense attachés and ambassadors interact with their counterparts.

Despite the complexity and criticality of theater strategy, there exists relatively little doctrine or other guidance on developing it. Perhaps this dearth is a contributing factor in Charles Bouchat's observation that "no two combatant commands follow the same process, format, or procedures for developing theater strategy. Each combatant command has adapted its method to the peculiarities of its region and the personalities of its commanders."[48] As part of the unifying effort, the Chairman of the Joint Chiefs of Staff has directed professional military education institutions to teach officers to "discern the military dimensions of a challenge affecting National interest; frame the issue at the policy level; and recommend viable military options within the overarching frameworks of globally integrated operations."[49] Additionally, to bring rigor to theater campaign plan development, Joint Publication 5-0 includes a detailed chapter on the subject of campaigning and the differences between CCPs and contingency plans.[50]

While acknowledging the complexity of developing and aligning the various strategies and operational planning efforts, we offer a logic model designed to translate grand strategy and associated strategic direction into theater strategy and associated plans.[51]

The model begins with national (grand) strategy, which defines U.S. security interests, objectives, and priorities and offers guidance to all who are charged with its execution, including combatant commands. Using the National Security Strategy for direction, DOD and the Joint Staff produce strategic guidance that, through several critical documents, focuses on the military instrument of national power and provides direction for combatant commanders. In addition to the NDS and NMS, the Unified Command Plan (UCP) "sets forth basic guidance to all unified combatant commanders; establishes their missions, responsibilities, and force structure; delineates the general geographical AOR for [combatant commanders with physical areas of responsibility]; and specifies functional responsibilities for [the other] combatant commanders."[52]

DOD reviews the UCP every 2 years, and the plan is changed as conditions and circumstances require. Though many changes are relatively mundane, some are more strategically significant. For example, the 2020 UCP shifted Israel from its longstanding position in U.S. European Command to U.S. Central Command. This change was an acknowledgment of the "easing of tensions between Israel and its Arab neighbors after the Abraham Accords" and offers an opportunity for the United States "to align key partners against shared threats in the Middle East."[53] It also allows U.S. European Command to focus on Russia and the North Atlantic Treaty Organization problem set.

In addition to the NMS, strategic direction is furthered in the Joint Strategic Campaign Plan. Operationalizing the NMS, this plan with a 5-year outlook is "the Chairman's primary document to guide and direct the preparation and integration of Joint Force campaign and contingency plans."[54] It aims to integrate joint force global operations, activities, and investments from the day-to-day campaign up to and including contingencies. In addition to directing global and functional campaign plans, the Joint Strategic Campaign Plan also directs regional campaign plans (with global implications) and CCPs.

Armed with national strategy and strategic direction as well as the

Guardsmen from Puerto Rico Army National Guard Aviation assist USAID personnel with loading provisions to UH-60 helicopter, Port-au-Prince, Haiti, August 24, 2021 (U.S. Army National Guard/Agustin Montanez)

commander's guidance, the staff is prepared to begin formulating theater strategy. One of the most critical steps is to conduct a thorough theater estimate, which is "the process by which a theater commander assesses the broad strategic factors that influence the theater strategic environment, thus further determining the missions, objectives, and courses of action throughout their theaters."[55] The estimate includes a mission analysis that derives specified, implied, and essential tasks as well as theater-strategic objectives (ends) and desired effects. It is important to note there is a reconciliation between what *can be* identified as a threat and what *is* identified as an object for U.S. national security—and the theater estimate requires continuous refinement. In addition to a detailed analysis of the combatant command's mission, capabilities, and limitations, the estimate should:

- Identify in the security environment any states, groups, or organizations that might challenge the combatant command's ability to advance and defend U.S. interests in the region. Examined through a national interest lens, this analysis should include an appreciation for relevant geopolitical, geo-economic, and cultural considerations within the region.
- Broadly assess the risks inherent in major uncertainties in the depiction of the security environment. Identify the major strategic and operational challenges facing the combatant command to inform plans.
- Identify known or anticipated opportunities the combatant command could leverage, including those states, groups, or organizations that could assist the command in advancing and defending U.S. interests in the region.
- Identify opportunities to partner with other U.S. Government entities or international partners in support of larger U.S. Government objectives in the region.

The theater estimate is crucial to set the context for the combatant command's mission analysis. Commanders articulate their intent through a vision that describes how the theater strategy supports U.S. goals and objectives. The vision should discuss the general methods to achieve those objectives, including international assistance and diplomacy as well as military means. Additionally, it may describe where the combatant commander is willing to accept risk. Finally, it should introduce and describe the appropriate strategic and operational concepts for the military instrument of power.

A good vision must be compelling to a broad audience. A coherent and credible vision serves as a communication tool that provides essential continuity and integrity to the everyday challenges and decisions within the combatant command's theater. For instance, if

the combatant commander's vision is embraced by coalition partners, regional leaders, the U.S. country teams in the region, the associated Department of State regional bureaus, and Congress, then there is a good chance that the strategy will be successful.

Once the theater estimate is complete, the strategist must write concepts that articulate the ways to achieve the theater strategy objectives or ends. First, the strategist must develop and consider strategic alternatives that can be expressed either as broad statements of what is to be accomplished or as lines of operations. The concepts often draw from preexisting examples guided by the Joint Staff and influenced by the capabilities developed by the military Services.

These concepts also form the basis for subsequent planning efforts that include combat operations, security cooperation, and other types of support.[56] Additionally, they identify the means necessary for the command to attain its identified theater-strategic and national objectives. The means normally include interagency and multinational capabilities as well as the full spectrum of U.S. military resources. In many cases, combatant commanders identify capability gaps that can be filled with resources that already exist within DOD but are not assigned to that theater or do not exist in sufficient capacity. In other cases, the command may identify capabilities—from across the spectrum of doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy, not just hardware—that must be created, modified, or accelerated. Such capability requirements are submitted from the combatant command to DOD through an IPL. In either case, sound and clear strategic concepts are invaluable in articulating those capability needs to senior leaders.

Theater Strategy and the U.S. Country Team

Of the many lessons from the past decades of military operations, Gates's argument of overreliance on the use of military power deserves special attention. The Goldwater-Nichols Act's establishment of combatant commanders' direct reporting and accountability to the Secretary of Defense, and Congress's predilection to support the defense budget, might have signaled an irreversible militarization of U.S. national security policy. Moreover, by 1986, DOD developed and procured preeminent hard power capability through the so-called Reagan buildup[57] that has only grown since the end of the Cold War and enabled the United States to be a global power with worldwide interests, rather than a regional hegemon focused on territorial defense.

What does this mean for the development of theater strategy today? As previously discussed, theater strategy should not be viewed as a separate element of foreign policy; rather, it should be considered an important element of it. And one way to realize this ambition is by understanding Department of State strategic planning and development of foreign policy objectives down to the country level.

The Department of State uses a parallel strategic planning structure to create and resource foreign policy objectives.[58] Developed in Washington, the Joint Strategic Plan outlines agency-level goals and objectives shared by the State Department and the U.S. Agency for International Development. Of increasing interest to theater strategists, the six regional bureaus establish priorities and coordinate U.S. foreign relations within their respective geographic areas.[59] Each of the chiefs of mission accredited to countries and international organizations maintaining diplomatic relationships with the United States develops an Integrated Country Strategy (ICS) that sets forth U.S. priorities, a mission strategic framework, the mission's objectives, and management aims.

An examination of foreign policy at the country level as stated in these publicly available documents reveals considerable interest in the military instrument of power. Many countries around the world face challenges from neighboring states and subnational and transnational groups; thus, a recurrent thread in these strategies includes building capacity for partners to provide for their own security, establishing a resilient security environment, and developing strong institutions. Country-level foreign policy often places a high demand on military capabilities, and theater strategists should plan to provide security cooperation and other military support as communicated in the ICS.

The fact that security is a common thread in many ICSs rebuts the criticism that foreign policy has become increasingly militarized; rather, it reflects an environment where the goals of combatant commanders and U.S. ambassadors interconnect. Security cooperation activities are important U.S. deliverables to a partner country. While combatant commanders might not know all the details in these strategies, they are mindful of the goals these documents identify and the foreign policies they represent. Shoon Murray and Anthony Quainton explored this by interviewing dozens of ambassadors, concluding that combatant commanders are "savvy team players who respected their civilian ambassadorial authority . . . [and] a discordant relationship between a commander and ambassador is the exception."[60]

To coordinate these activities, combatant commanders might spend two-thirds of their time outside of their headquarters equally split between their regional AOR and Washington meeting with prominent actors responsible for devising the national strategies described earlier in this article. When visiting another country, the combatant commander often first calls on the U.S. chief of mission to affirm defense support for diplomatic efforts and to promote unity of effort. Moreover, combatant commanders and chiefs of missions often jointly engage not only host-country military and defense leadership but often its civilian political leadership as well. This use of time speaks to the value combatant commanders place on foreign policy integration.

The differing alignment of the six DOD combatant commands with territorial areas of responsibility and the six Department of State regional bureaus induces friction into comprehensive approaches to foreign policy challenges.[61] For example, both

U.S. Northern Command and U.S. Southern Command share equities with the State Department's Bureau of Western Hemisphere Affairs; U.S. Africa Command has equities with two regional bureaus; and there is a separate South and Central Asian Affairs regional bureau straddling U.S. Central Command and U.S. Indo-Pacific Command (USINDOPACOM). Depending on the viewpoint, there are either military or diplomatic rationales for the divergence, but the fact remains that the working relationship of combatant commanders and chiefs of mission requires thoughtful coordination to overcome these long-standing territorial challenges.

Within the embassy, the senior defense official (SDO) plays an important role in overcoming this bureaucratic obstacle. SDOs range widely in rank; most are also accredited as the defense attaché, and others serve as the commander of the military group, chief of the office of defense cooperation, or the chief of the military liaison office. Although these officers are also responsive to Washington, they are the bridge between the chief of mission and the combatant commander.[62] Theater strategists should therefore engage the SDOs and solicit the views of the U.S. country teams to better understand the foreign policy objectives in the AOR and to infuse interagency unity of effort into theater strategy from the start.

DOD fulfills an important component of U.S. foreign policy and one that is highly valued by its interagency counterparts. The resources available to combatant commands provide options for U.S. diplomats who often have a broader view of how those resources are best applied in countries within the AOR. In addition to reflecting national strategies and strategic direction, effective theater strategy must therefore recognize the importance of these different foreign policy perspectives. Theater strategy should also convey how the military instrument of power supports diplomacy and where the military capabilities of the combatant command advance U.S. foreign policy goals.

Implementation

Once the theater strategy is complete and approved, the next step is implementation, or executing the strategy. Without the means, competencies, and informed thinking to carry out the commander's intent, the strategy is just an idea.[63] For example, designating USINDOPACOM as the DOD priority theater[64] without the commensurate resources negatively affects deterrence operations, undercuts the meaning of

Soldiers of 3rd Battalion, 7th Field Artillery Regiment, and mortarmen from 2nd Battalion, 35th Infantry Regiment, conduct familiarization class with their counterparts from 6th Field Artillery Regiment, 23rd Battalion, Royal Thai Army, during Hanuman Guardian 20, February 26, 2020, in Korat, Thailand (U.S. Army/Angelo Mejia)

Marine with Marine Rotational Force–Europe 19.2, Marine Forces Europe and Africa, fires MK 19 automatic grenade launcher during exercise Platinum Eagle, in Babadag Training Area, Romania, September 18, 2019 (U.S. Marine Corps/Larisa Chavez)

defense reassurances, increases uncertainty in contested areas, and risks defeat in a major military conflict.

The theater strategy should also outline the structures, policies, technology, and people necessary to carry it out. As previously discussed, in today's complex security environment, theater strategy implementation requires the cooperation of multiple governmental and nongovernmental organizations as well as international allies and partners. One of the most challenging tasks for the combatant command is ensuring that there is a credible commitment among all participants to accomplish the common goals.

With theater strategy playing a key role in U.S. foreign policy, it is important to know how to evaluate the strategy. In pure combat terms, it is easy to measure whether the military disrupts, degrades, or destroys enemy forces, and it is easy to see when combat operations fail to achieve national security objectives. In permissive environments, the objectives are less clear and broader than military objectives. Former Chairman of the Joint Chiefs of Staff Admiral Mike Mullen noted that the effects may never be clearly calculable and that cultural sensitivities might preclude measurement.[65]

At a minimum, a strategy is designed to change the security environment by promoting a favorable balance of power and preventing the emergence of a peer competitor, increasing the number of democracies in the world, and preventing the spread of nuclear weapons. In a broader sense, as this article makes clear, strategy develops and employs all tools of national power to advance and defend national interests. Consequently, when evaluating strategy, one must examine the strategy's concept of national interests, view of the security environment, strategic priorities, role of power, impact on resources, required means, risk, feasibility, suitability, and acceptability.

A theater strategy should contain measurements to calibrate its progress toward achieving goals and objectives. There are three broad categories of measures: input, output, and outcome. Resources (funds, personnel, and equipment) are typical examples of input. Interagency or coalition support might be another resource prerequisite. Outputs are performance measures that directly track progress toward goals and objectives. Outputs depend on adequate resources, such as securing an area or building infrastructure, and are accomplishments over which the combatant command has considerable direct control. These measures are usually quantifiable and have associated time frames. In contrast, outcomes are often qualitative and are therefore more difficult to measure; they are usually only influenced and not directly controlled by the combatant command. Examples may include participation in coalition operations or the

relative receptivity to U.S. forces within the partner country. Outcomes are often referred to as strategic *effects*, the ultimate goals of the theater strategy and combatant commander's intent.[66]

The practical value of performance measurement systems is that they enable the combatant command to evaluate the strategy's progress in achieving desired and clearly identified goals and objectives. Most theater strategies have a hierarchy of performance metrics starting with high-level outcome metrics that are supported by more detailed and granular performance (output) metrics. Recognizing that measurability might be challenged, high-level outcome metrics should nevertheless also consider the goals of the aforementioned parallel diplomatic strategies. The essential point is that performance measurement systems must be consistent and aligned with strategic goals.

Conclusion: Evaluating Strategy

In practice, strategic decisions must always compete with the demands of domestic politics, or what Samuel Huntington has called "structural decisions" or choices "made in the currency of domestic politics."[67] But we cannot overlook that strategic decisions and funding strategy represent choices for both Congress and the President within a larger context. Modern strategists are not locked away in bunkers developing the ideal; they are working for institutions that compete with other institutions for space on the national agenda and for resources. The most important structural decision concerns the size and distribution of funds made available to the Armed Forces. The strategic planner can never ignore the fiscal constraints that link domestic politics and national security. Indeed, political reality sometimes dictates that budgetary caps will constitute the primary influence on strategy and force structure, which requires new ways to think about advancing and defending national interests. Michèle Flournoy argues that "the imperative is clear: the U.S. military must reimagine how it fights," which will require a wholesale shift in mindset. While acknowledging that changing organizational cultures is "far harder than revising a defense strategy," we attest that inertia presents the greater risk—that "ultimately, the strategy will fail unless these operational changes succeed."[68]

Further, Simon Reich and Peter Dombrowski point out that "bureaucratic and organizational impediments—and the occasionally tendentious relationship between civilian and military leaders—complicate the Nation's ability to respond to the plethora of threats, differing actors, and various forms of conflict. The cumulative effect obstructs the Nation's ability to implement any single grand strategy, no matter how sound its overarching principles or how carefully it prioritizes particular threats and allocates resources."[69] We are less sanguine about the importance of strategy but are mindful of the importance of organizational, domestic, and international influences on national security.[70] Potential mismatches create risks. If the risks resulting from an ends-ways-means mismatch cannot be managed, then ends must be reevaluated and scaled back, means must be increased, or the strategy must be adjusted. That said, when done correctly, theater strategy enables the combatant command to synchronize available resources and achieve theater objectives. **JFQ**

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Air Force Senior Master Sergeant Laquetta Spann, 374th Operations Support Squadron chief radar approach controller, Yakota Air Base, Japan, provides remarks as panel speaker during Pacific Air Forces' first Women, Peace, and Security symposium, hosted from Joint Base Pearl Harbor–Hickam, Hawaii, March 30, 2021 (U.S. Air Force/Nick Wilson)

The Women, Peace, and Security Act

Implementation Strategies for a Modern Department of Defense

By Kyleigh Cullen

Peace negotiations are more likely to succeed and achieve longer lasting results when women are involved in the process. Women's civil society groups and the first all-woman United Nations (UN) peacekeeping team were notably active in the peace process following Liberia's civil conflict.[1] Moreover, three women—Helga Schmid, Federica Mogherini, and Wendy Sherman—were recognized by their peers for their roles in negotiating the 2015 Joint Comprehensive Plan of Action to curb Iran's nuclear program. The Graduate Institute in Geneva conducted an in-depth analysis of 40 post–Cold War peace processes, revealing that negotiators reached an

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agreement more often when women's groups had a prominent role in the negotiation process.[2] Acknowledging the benefit of female involvement, the UN passed Security Council Resolution 1325 (UNSCR 1325). Subsequently, more than 80 nations, including the United States, have developed their own National Action Plans on Women, Peace, and Security (WPS).[3] The U.S. National Action Plan makes a statement on policy related to WPS and identifies objectives, actions, and reporting criteria for Federal agencies and departments. Approximately a year after the U.S. National Action Plan was published, the Department of State and U.S. Agency for International Development created formal implementation plans, including integration strategies and planned actions to accomplish national objectives.

As an envoy of U.S. policy, the Department of Defense (DOD) plays a significant role through its extensive interaction with joint and partner-nation militaries in the WPS agenda. Still, DOD waited until June 2020 to publish its implementation plan, 9 years after the original U.S. National Action Plan, and it has generally fallen short of achieving plan objectives. Thus far, DOD's reluctance and half-hearted implementation of WPS have proved insufficient to achieve the National Action Plan's stated goals. In contrast, the United Kingdom (UK) Ministry of Defence (MOD) has played a leading role in the country's WPS agenda, assisting the Foreign & Commonwealth Office (since replaced by the Foreign, Commonwealth & Development Office [FCDO]) and the Department for International Development to develop the UK National Action Plan as early as 2006.

By considering and integrating best practices used in the UK MOD, DOD could meet the U.S. National Action Plan's objectives and enact meaningful progress. Following a brief background discussion of WPS, this article compares UK and U.S. defense establishment implementation of WPS, identifies best practices, and makes recommendations for improvements to DOD strategy toward WPS.

Background

The UN officially implemented the WPS plan on October 31, 2000, acknowledging that women often bear a significant burden during times of conflict and thus have a unique perspective. The goal of UNSCR 1325 was to expand the role of women at all levels in decisionmaking processes for preventing and resolving conflict.[4] Since then, statistical analysis has shown that peace agreements are 35 percent more likely to last at least 15 years and 64 percent less likely to fail when women participate in the negotiation process.[5] The statistics are compelling, considering that half of all peace agreements fail within 5 years.[6] Despite such overwhelming evidence, women's participation has remained unmistakably low, with women making up only 13 percent of negotiators, 4 percent of signatories, and 3 percent of mediators in major peace negotiations from 1992 to 2018.[7]

To date, more than 80 nations have implemented their own National Action Plans to address the critical issue of WPS based on UN guidance. The United States developed its first National Action Plan in 2011 and subsequently revised it in 2016. The plan tasked Federal agencies with reporting annually on their efforts to meet five high-level objectives on WPS: national integration and institutionalization, participation in peace processes and decisionmaking, protection from violence, conflict prevention, and access to relief and recovery.[8] On October 6, 2017, the WPS Act was signed into law, making the United States the first nation to do so. Public Law 115-68 mandates the development of a government-wide strategy within 1 year and requires specific implementation plans from all "relevant Federal agencies," including DOD.[9] In June 2019, the White House released a National Strategy on WPS, and DOD only just expanded on its 2013 implementation guide by publishing a Strategic Framework for Implementation in June 2020.

Senior Leader Commitment

Achieving meaningful change within any organization requires engaged and invested leadership. The global study on WPS identified strong governance and effective coordination as one of the five critical features of a high-impact National Action Plan.[10] There is little doubt that the highest levels of U.S. leadership support the National Action Plan, but this backing has not translated to DOD. The 2017 National Security Strategy does not explicitly mention WPS, but it acknowledges its importance and commits to the fair treatment and empowerment of women and girls. However, the National Defense Strategy makes no mention of WPS, and it does not integrate WPS concepts into the strategic approach.[11] The Secretary of Defense and the Joint Chiefs of Staff's failure to acknowledge this issue, which the United States signed into law before the release of the National Defense Strategy, sends a message to commanders and defense personnel about where WPS stands in priorities.

To an extent, the WPS agenda seems to be gaining traction at the U.S. geographic combatant command level. Although to some the idea of a military implementing WPS concepts may seem contradictory to the policy's feminist ideals, the U.S. military's global presence offers an excellent opportunity to promote WPS principles and makes the geographic combatant commands' backing of this policy vital. Combatant commanders have incorporated WPS objectives into theater campaign plans, and some commands train new personnel on WPS during the check-in process.[12] U.S. Africa Command has added a WPS briefing to its orientation course. U.S. Northern Command incorporated a module on WPS into the USNORTHCOM 101 class for all new personnel.[13] These actions seem promising, but without appropriate evaluation and reporting—another element of a high-impact National Action Plan—DOD cannot hope to achieve success.[14] Of the six geographic combatant commanders, only two reported progress on WPS initiatives during their annual posture statement before the Senate Armed Services Committee. General Joseph Votel, USA, commander of U.S. Central Command, noted Kazakhstan's

Army Captain Jessica Campion, registered nurse, Civil Affairs Functional Specialty Team, Southern European Task Force–Africa, hands out school supplies and toys to teachers with Association des Femmes de We'a after conducting oral hygiene class in We'a, Djibouti, August 11, 2021, as part of Department of Defense's Women, Peace, and Security initiative (U.S. Air Force/Andrew Kobialka)

contribution to support programs for women. General Thomas Waldhauser, USMC, commander of U.S. Africa Command, reported directly on the success of training exercises that provided opportunities for integrating women into peacekeeping operations.[15] The commitment of geographic combatant commanders to the WPS policy suggests progress, yet lack of accountability and explicit support from the Secretary of Defense and Joint Chiefs has caused the implementation of WPS within DOD to move at a glacier's pace.

In contrast, the United Kingdom's highest leadership levels show full support for integrating WPS into policy and military operations. The United Kingdom was among the first nations to enact a National Action Plan on WPS, and it is now on its fourth iteration of the document, making marked improvements with each revision. The FCDO, MOD, and Department for International Development jointly own the UK National Action Plan, which directs work with nine focus nations on seven strategic outcomes: decisionmaking, peacekeeping, gender-based violence, humanitarian response, security and justice, preventing and countering violent extremism, and UK capabilities.[16] High-level leaders were actively involved in these three key agencies, which resulted in clearly delineated areas of responsibility and monitoring criteria. Leaders report annually to Parliament, creating a unified, whole-of-government approach to WPS. The National Security Strategy and Strategic Defence Review, along with the International Defence Engagement Strategy, are additional documents that demonstrate the MOD commitment to the WPS agenda by reinforcing the UK National Action Plan and outlining specific WPS goals.[17] In addition to taking an active role in developing national-level plans and strategies on WPS, high-level leaders show buy-in by being seen at the forefront of enacting WPS initiatives. For example, the UK Secretary of State opened the inaugural Military Gender and Protection Advisers Course at the Defence Academy, and the Secretary of State for Defence met with civil society groups in London and women's groups in Nigeria to solicit recommendations. The United Kingdom also took a leadership role on the world stage, chairing the WPS Chiefs of Defence Staff Network in its inaugural year.[18] High-level buy-in and visibility of principal agencies' leadership have indicated the implementation of WPS is a priority for the United Kingdom and have prompted measurable success.

Relevant Doctrine

A bureaucracy as large as DOD will need more than just supportive leader-

Lieutenant Clare Fitzpatrick, judge advocate general assigned to Singapore Area Coordinator, makes opening remarks during virtual Women, Peace, and Security subject matter expert exchange as part of Cooperation Afloat Readiness and Training Brunei 2020, Singapore, October 6, 2020 (U.S. Navy/Greg Johnson)

ship to implement WPS; DOD must provide a written instruction that clearly defines roles and responsibilities within the department. In August 2012, less than 1 year after the White House released the initial WPS National Action Plan, the Department of State published its 83-page implementation plan, including evaluation criteria and a departmental responsibilities matrix. DOD and the Joint Staff waited until early 2018 to form a synchronization group that met monthly to discuss best practices and lessons learned.[19] In June 2020, DOD published its WPS Strategic Framework and Implementation Plan, which provides defense objectives but lacks specific guidance for how the department will achieve them.[20] Although the plan identifies interagency milestones and metrics, it lacks concrete goals, fails to specify timelines, and does not identify entities responsible for monitoring progress.

The United Kingdom, however, has set out a clear, written policy statement to all MOD personnel. Version 1 of Joint Service Publication (JSP) 1325 was published in January 2019 in two parts, with a foreword by the Secretary of State for Defence. JSP 1325 aims to provide personnel with direction on integrating WPS into military activity and delineating responsibilities for implementation. Part 1 is directive in nature; part 2 includes guidance and best practices to assist personnel with compliance. Additionally, JSP 1325 lists educational opportunities, related documents, and an individual point of contact to field questions or take feedback.[21] The MOD has succeeded in creating a roadmap and providing resources for its personnel to implement WPS—while setting an excellent example for DOD to follow.

Education Across the Chain of Command

A WPS instruction will provide a framework for implementation but has the potential to get lost among the other hundreds of instructions and doctrinal publications that DOD personnel must regularly review and comply with. Establishing joint instruction and educating military personnel will be the most effective means for implementation. A survey by the New America Foundation in 2016 found that national security practitioners knew little about issues relating to WPS.[22] All WPS guiding documents—including UNSCR 1325, the U.S. National Action Plan, Public

Law 115-68, and the U.S. National Strategy—have emphasized education; however, DOD WPS educational opportunities are minimal and remain focused on only a small group of personnel. For example, commands with a gender advisor billet ensure that planners consider gender perspectives, and these advisors attend a weeklong course.[23]

Halfhearted DOD efforts to educate personnel may stem from weak language in guiding national documents. For example, the U.S. National WPS Strategy directs that military personnel will be trained "as appropriate," and courses that historically attract only male international students should "consider ways to incentivize the inclusion of female students."[24] Thus far, the National Defense University offers the only professional military education (PME) elective directed specifically at WPS. The Naval War College and Air University offer electives that address gender issues more generally.[25] Although it is not a hard requirement, the significance of WPS—and the success it has shown when implemented—should be reason enough for DOD to incorporate education on the subject into PME and for deploying personnel.

Spearheading education, the United Kingdom has created training and educational programs to reach a broader and more diverse military personnel body. All deploying UK troops now receive training on WPS and prevention of sexual violence in conflict. Additionally, the United Kingdom has training modules for deploying personnel from other countries.[26] As stated, the Defence Academy conducted its first annual Military Gender and Protection Advisers Course in 2018, providing in-depth training to UK- and FCDO-funded international students.[27] To ensure they gained a diverse perspective on integrating WPS into military planning, students were trained by government personnel and civil society groups with a vested interest in the subject matter, such as the nongovernmental organization Gender Action for Peace and Security.[28] The MOD has yet to fully realize the benefits of these recently implemented training and education opportunities. Nevertheless, military personnel who are more knowledgeable on WPS issues will undoubtedly be better equipped to address them.

Improving DOD Strategy Toward WPS

Before and since the United States released its first National Action Plan on WPS, the U.S. military has been preoccupied with fighting wars in multiple theaters and managing countless other obligations. DOD is stretched thin. With national security concerns focused on remaining competitive with near-peer nations while also reforming for improved affordability, the lackluster efforts to implement WPS within DOD are not surprising. To this point, DOD has interpreted the use of Marine Female Engagement Teams and Special Operations Cultural Support Teams as a success in integrating women into combat roles, furthered by the December 3, 2015, lift of the ban on U.S. women in combat occupational specialties.[29] These steps forward have improved the U.S. military's operational effectiveness; however, the United States will not realize positive gains in domestic and global security unless DOD joins the interagency community by comprehensively integrating WPS initiatives. Change takes time and can require significant funding, especially for an organization as large as DOD. Regardless, implementing WPS needs to be prioritized—not only because it is the law but also because of the potential benefits to U.S. and global security that remain untapped.

Using the example set by the United Kingdom and with a little initial investment, DOD can significantly improve its implementation of WPS by showcasing committed leadership, setting clear policies and goals, and increasing educational opportunities for military personnel. Success in this arena starts with leadership at the most senior levels. The Secretary of Defense, Joint Chiefs, and combatant commanders should make WPS a topic that regularly appears in policy, strategy, and posture statements. Such acknowledgment of the importance of this crucial issue will cascade WPS through the ranks and ensure it becomes an important initiative for all personnel. DOD should build on the June 2020 WPS Strategic Framework and Implementation Plan and publish an instruction with well-defined guidance and monitoring criteria. If DOD gives specific and clear guidance to Service branches and individual commands' roles and responsibilities, it could successfully integrate WPS into joint and multinational operations. To maximize the reach and effectiveness of the WPS agenda within DOD, all PME institutions should integrate WPS into their core curriculum, and DOD should develop WPS training for all deploying personnel. In fiscal year 2019, the National Defense Authorization Act allotted $4 million in specific funding for implementing the WPS Act.[30] If DOD were to dedicate this funding and a bit of time to develop a detailed WPS instruction, education curriculum, and training plan, it would realize significant improvements in the WPS initiative.

It has been nearly 20 years since the UN passed UNSCR 1325, 9 since the first U.S. National Action Plan was released, and 2 since the United States signed WPS into law. Nevertheless, DOD, the largest and most well-funded defense department in the world, still lags in implementation. It is time for the U.S. military to realize it does not have all the answers and to look to other examples. The UK MOD began implementing WPS after its first National Action Plan in 2006, 5 years before the first U.S. National Action Plan and 14 years before the formal DOD implementation plan. By examining and adopting policies and best practices of the United Kingdom, DOD stands to meet the WPS Act and national strategy requirements while also enacting meaningful change that can have lasting effects on global security. **JFQ**

Notes

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Air Force Staff Sergeant Jalah Patten, 86th Operations Support Squadron air traffic control tower watch supervisor, left, shows members of Ukrainian armed forces tower simulator system during their visit to Ramstein Air Base, Germany, August 5, 2021 (U.S. Air Force/John R. Wright)

Building Institutional Capacity in the Ukrainian Armed Forces

Sustainment Planning for U.S.-Provided Equipment

By Gary D. Espinas, Tigran Mikaelian, and Michael McCarthy

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Plans to sustain equipment provided by the United States to partner nations usually do not generate much attention or interest. The Total Package Approach used in the foreign military sales system ensures that most gear deliveries come with required spare parts, tools and test equipment, and other necessary items, but it generally assumes the partner nation has the necessary institutional capacity to incorporate and provide upkeep with a reasonable amount of effort in a reasonable amount of time. This is not always the case, however, as was demonstrated following the illegal incursion by

Soldiers from Ukrainian armed forces use vehicle for cover when advancing on objective during fire team movement and room clearing demonstration as part of Rapid Trident 2019, in Yavoriv, Ukraine, September 20, 2019 (U.S. Army/Kyle Larsen)

Russian forces into eastern Ukraine in 2014 and the subsequent surge in security assistance and security cooperation. The Ukrainian armed forces (UAF), which never had a substantial technical relationship with the Department of Defense (DOD), were suddenly receiving large quantities of vehicles, radars, radios, night-vision devices, and other equipment for their frontline combat units. The UAF maintenance, logistics, and procurement systems, geared toward sustaining Soviet-legacy equipment via state-owned defense enterprises, were unprepared—and unable—to sustain over the long term these new capabilities provided by the United States. Over a 3-year period (2017–2019), a combined team from U.S. European Command (USEUCOM) and the Institute for Security Governance (ISG) worked closely with their Ukrainian counterparts to establish a simple but effective sustainment planning process, embedded in the Ministry of Defense (MOD) down to the unit level, which provides comprehensive upkeep for U.S.-provided equipment. This process has been institutionalized through MOD directives, has led to the establishment of new sustainment units and practices throughout the armed forces, and has resulted in the potential savings of tens of millions of dollars in U.S. security cooperation and security assistance funding, which is being directed toward the acquisition of new combat capabilities. The USEUCOM-ISG Ukraine Sustainment Planning Team has been recognized for this achievement with the 2019 DOD Sustainment Train, Advise, and Assist of Foreign Forces (Ministerial Level) Award from the Office of the Secretary of Defense (OSD).

An imperative of the 2018 National Defense Strategy is to "strengthen alliances and attract new partners."[1] The strategy explains that "by working together with allies and partners we amass the greatest possible strength for the long-term advancement of our interests, maintaining favorable balances of power that deter aggression and support the stability that generates economic growth."[2] To this end, Ukraine is an important U.S. strategic partner that has been at the forefront of DOD engagement activities since the 2014 Revolution of Dignity in Kyiv and the Russian aggression in Crimea and eastern Ukraine that followed. Since 2014, the United States has committed approximately $2 billion in security assistance to help Ukraine defend its territorial integrity, deter further Russian aggression, and make progress toward interoperability with the North Atlantic Treaty Organization (NATO).[3] A key program employed by DOD to bolster Ukrainian defense resilience in support of U.S.

national interests is institutional capacity-building: security cooperation projects that enhance the partner nations' ability to exercise responsible civilian control of their national security forces; contribute to collective security; and absorb, apply, and sustain national security competencies.[4]

Sustainment Planning

The USEUCOM-ISG Sustainment Planning Project has been a crucial component of DOD's institutional capacity-building efforts in Ukraine. By assisting the MOD and UAF in creating maintenance plans for military equipment provided by the United States, the project boosts capacity and resilience at the ministerial and strategic levels while enhancing operational capabilities and readiness at the unit level. The sustainment planning project is nested within Ukraine's broader defense reform goals, which are intended to achieve NATO interoperability targets while making the UAF more capable and effective. As outlined in Ukraine's 2016 Strategic Defense Bulletin, which the MOD uses as a roadmap for defense reform, the establishment of efficient logistics systems and effective resource management systems is a key operational objective.[5]

The USEUCOM-ISG Sustainment Planning Project began in 2016 through a request from OSD and the Office of Defense Cooperation in Kyiv, Ukraine, for the MOD and General Staff to establish long-term upkeep plans for the equipment provided to Ukraine through various U.S. security assistance and security cooperation programs. At the time, sustainment requirements were consuming an increasing portion of U.S. funding, limiting the ability to deliver new capabilities, so the U.S. policy objective was to ensure Ukrainian ownership of the maintenance burden. Because the UAF were not integrating U.S.-provided equipment into organic operational and logistics pipelines alongside organic equipment, they had remained dependent on these assistance programs—and thus they were not fully using the gear in ongoing military operations. The UAF were also remaining highly reliant on U.S.-provided sustainment including spare parts, training, and field services. In 2016, USEUCOM initiated a detailed financial analysis that demonstrated that such maintenance costs were consuming a progressively greater share of U.S. security assistance funds each year. The analysis showed that, if the situation were left to continue, tens of millions of dollars per year—as much as $40 million to $80 million over a 5-year period—would be needed to keep the UAF systems operational. U.S. funds and effort expended on sustaining existing items were detracting from the ability to provide new and more advanced capabilities to Ukraine.

To remedy these snowballing costs and in response to OSD and Office of Defense Cooperation requests, the Multinational Joint Commission, a body that oversees international military assistance, training, and advisory efforts, directed the execution of the first sustainment workshop in February 2017. Since then, 14 additional workshops have been held, the most recent in June 2020. The sustainment planning project is designed so that USEUCOM focuses on security assistance programs while ISG addresses the institutional changes required for maintenance-related self-sufficiency. Through the synergy of both organizations, the project has resulted in significant cost savings in U.S. security cooperation and security assistance dollars by transferring sustainment costs to the UAF while also increasing operational readiness rates and combat utilization of U.S.-provided equipment. The project also presents opportunities to facilitate reform in military logistics, procurement, resource management, weapons system life cycle management, and other related areas.

HMMWVs: A Sustainment Success Story

The HMMWV (High Mobility Multipurpose Wheeled Vehicle) was the pilot effort within the sustainment planning project. The UAF currently has more than 200 HMMWVs, with plans to increase this number by hundreds more. The Auto-Transport Directorate in the General Staff is responsible for maintaining the HMMWVs as well as other military rolling stock. Generally, the HMMWVs are serviced at the 5th Joint Electro-Gas Welding and Automobile Center in Zhytomyr. As the HMMWV inventory grows, the General Staff intends to distribute the maintenance burden by potentially recreating this capability at regional automotive depots aligned with the four military operational commands, while delegating simpler upkeep and servicing functions to the unit level. Based on its engagements with USEUCOM and ISG, the General Staff is now developing maintenance manuals for the HMMWV fleet as well as the employment of HMMWVs based on experiences from combat operations and on training ranges, especially for special operations and airborne forces. Overall, the UAF HMMWV fleet has an operational readiness rate of 86 percent—close to that of the U.S. HMMWV fleet. This rate is a considerable achievement given that Ukraine has been engaged in an ongoing military conflict for the past 5 years.

The HMMWV repair facility at Zhytomyr is a visible demonstration of the resource commitment the Ukrainians have made toward maintaining the fleet of HMMWVs and other light tactical vehicles. It serves as a depot conducting level 3 and level 4 repairs as well as training operators and maintenance personnel. One unique solution that the Ukrainians devised was creating a mobile repair unit that routinely travels throughout the combat zone to provide onsite maintenance and arrange for the transit back to Zhytomyr of any HMMWV that cannot be fixed in the field. The sustainment plans developed with support from USEUCOM and ISG helped develop such solutions. Additionally, the sustainment workshops conducted by USEUCOM and ISG have supported the MOD in developing a planning directive and methodology that includes operational, maintenance, training, and sustainment concepts. The General Staff has operationalized this directive (Military Standard 14.040.006).

Among other major and impactful sustainment workshop projects is Ukraine's several-thousand-strong inventory of secure radios manufactured by

a leading U.S. defense technology firm. The Ministry of Internal Affairs National Guard of Ukraine uses them exclusively as its combat radio of choice, has already established a program of instruction within its existing communications training program, and has trained personnel to operate specialized radio diagnostics and maintenance equipment. The MOD program is not only significantly larger and therefore more complex but also on track to institutionalize the secure radio capability. As of May 2019, then–Chief of the General Staff Main Communications Directorate Major General Volodymyr Rapko requested that all future radio assistance be procured without including any U.S. funding for training, field services, or spare parts. These responsibilities are in the process of being absorbed by the UAF, which built a level 3 radio maintenance facility on the outskirts of Kyiv. Spare parts procurement is done via direct commercial purchases using Ukraine's national budget funds, while field maintenance is planned to be conducted by trained Ukrainian military personnel and a local radio subcontractor. Precise budgetary outlays and staffing to support this plan are under discussion with the newly formed General Staff J6 structure. This major achievement, reached after 2 full years of work and planning, means that several million dollars of U.S. assistance funds are being repurposed annually toward purchases of additional quantities of new radios. All the while, Ukraine's radio readiness is at an estimated 97 percent—despite rigorous ongoing combat operations.

The mechanics of sustainment planning are becoming more complicated as the United States gives increasingly sophisticated systems and the Ukrainian capabilities for sustaining them grow and improve. Recent examples include Ukraine's acquisition of two *Island*-class patrol boats through the U.S. Excess Defense Articles program on November 13, 2019, and the planned procurement of Mark VI patrol boats using a mix of security assistance authorities.[6] The USEUCOM-ISG effort is already supporting sustainment plans for the two former U.S. Coast Guard cutters.

The Value of Institutional Capacity-Building

Since 2017, the ISG and USEUCOM (ECJ5/8) jointly executed sustainment planning has helped the UAF in appropriately maintaining the weapons systems and military equipment provided by the United States. Initial attempts to work directly with the armaments department of the MOD and the Directorate of Logistics of the General Staff proved unsuccessful, as neither organization had sufficient desire or incentive to systematically address the issue. Instead, ISG and ECJ5/8 employed a disaggregated bottom-up approach, working directly with the units and organizations that owned or managed the equipment. These units then put upward pressure on the Ukrainian military logistics system through requirements and requests. This method has been successful in transferring responsibility for sustainment to the UAF—a primary U.S. policy objective.

Sustainment planning has now become an accepted institutional activity within the UAF units using U.S.-provided equipment and, increasingly, the MOD and General Staff. Ukrainian officers no longer question the necessity of sustainment planning; rather, these officers can typically describe the new MOD Military Standard on Sustainment Planning (derived from the ISG-USEUCOM Sustainment Planning Methodology) and what it means for their activities.

Conclusion

The UAF have demonstrated a commitment to dedicating significant resources to sustaining the equipment provided by the United States. There are now dedicated enterprises for maintaining gear: units for training and maintenance, unit- and depot-level repairs, and mobile and fixed upkeep capabilities with manageable throughput capacities. The UAF are continuing to work toward systemic improvements, many of which require implementing other institutional defense reforms. The goals for many equipment programs include a functional foreign military sales procurement system to reliably acquire military and dual-use spare parts, fabrication facilities for a variety of components, appropriate contractor technical support and interaction with manufacturers, training programs with a steady student throughput, and, perhaps most importantly, reliable funding streams within the normal budgeting procedures. Some of these efforts have already been partially achieved, while work is ongoing in other areas. However, Ukrainians are now capable of autonomously sustaining most capabilities provided by the United States.

The 2019 DOD Sustainment Train, Advise, and Assist of Foreign Forces (Ministerial Level) Award not only recognizes the important contribution made by ISG and USEUCOM to the UAF but also acknowledges that institutional capacity-building is a critical and effective security cooperation tool that DOD can employ to improve the capabilities of our strategic partners while meeting our own national security objectives. **JFQ**

Notes

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Air Force B-1B Lancer, on multilateral mission including Bahrain, Egypt, Israel, and Kingdom of Saudi Arabia air forces, flies over Persian Gulf on presence patrol above U.S. Central Command's area of responsibility, October 30, 2021 (U.S. Air Force/Jerreht Harris)

Above or Beyond

Overflight Considerations for U.S. Military Aircraft

By Graham William Jenkins

One of the most valuable attributes of airpower in warfare is the ability to fly to anywhere from anywhere, avoiding terrain and hostile forces alike. But despite this seeming omnipresence, straightline "crow's-flight" distances are illusory. A complicated patchwork of bilateral arrangements, open-skies regimes, and international legal frameworks divides the sky into national airspaces and flight information regions, projecting into low-Earth orbit itself in a straight line from territorial borders on the ground.

What this means for current and future aerial platforms is that aerospace engineers and designers must consider not only the most likely conflicts and use cases but also the respective basing options for those conflicts. It means that tracing a path from point A to target B does not tell the whole story and that political considerations may well lead to requirements for longer range aircraft or alternative rotation schema. International law offers answers to most overflight scenarios, but where these laws might conflict with perceived national interests

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Sailor assigned to USS *Iwo Jima* signals AV-8B Harrier, attached to Marine Medium Tiltrotor Squadron (VMM) 162 (Reinforced), to take off, Gulf of Oman, August 21, 2021 (U.S. Navy/Jessica Kibena)

in wartime, U.S. military planners will be forced to consider alternatives to otherwise "simple" mission routing.

Overview

Despite the global access it has enjoyed since the end of World War II, the United States has nevertheless been challenged on numerous occasions and denied the use of even friendly airspace for overflight. A RAND study on U.S. military basing overseas summarized some of these instances:

In 1958, Greece, Libya, and Saudi Arabia refused the U.S. overflight and basing rights for its intervention in Lebanon. . . . In 1962, Portugal and France denied U.S. overflight and base access because of Washington's involvement in the Congo crisis; in 1967, Spain denied the United States use of its bases to evacuate U.S. nationals during the 1967 Arab-Israeli war; in 1973, Spain, France, Italy, and Greece refused to grant base access and overflight rights to U.S. planes lifting supplies to Israel; in 1986, Italy, Germany, France, and Spain refused to cooperate with a U.S. air strike on Libya by denying the U.S. basing rights or overflight for Operation El Dorado Canyon.[1]

Further access restrictions ranged from "limited overflight rights for U.S. Navy combat aircraft in the Persian Gulf region during the 1987–1988 *Earnest Will* escort operations to a rather tortuous negotiation process to gain Indian approval for transport aircraft overflight (and emergency divert airfield access) in support of Operations *Desert Shield/Storm* in 1990–1991."[2] In addition, throughout the spring of 2003, the United States engaged in a "will-they/won't-they" debate with the government of Turkey before the execution of Operation *Iraqi Freedom*. Although eventually the Turkish parliament voted to allow use of their airspace, the Turkish general staff refused to allow U.S. special operations forces to enter Iraq via Turkish airspace. Instead, U.S. MC-130 aircraft turned to a route over "SAM Alley" in northern Iraq, and after one was hit by enough antiaircraft fire to require emergency diversion to Incirlik Air Base, the Turks relented and fully allowed overflight.[3] These difficult negotiations reflect the general pattern of Turkish attitudes toward airspace permissions: begrudging at best and hostile at worst.

The United States has occasionally attempted to circumvent likely denials: In 2002, during the leadup to Operation *Iraqi Freedom*, the United States received permission to fly a KC-10 tanker over Austria but hid a pair of F-117 Nighthawks beneath its wings, within the tanker's radar signature. After two fighters of the *Luftstreitkräfte* visually identified the presence of the F-117s, a diplomatic furor ensued.[4] This move proved especially counterproductive: within a year, Austria was also denying U.S. forces in Germany use of the Austrian rail network and airspace to move troops closer to Iraq.[5]

The best-known U.S. airspace violation is certainly Operation *Neptune Spear*, the May 2, 2011, raid on Osama bin Laden's compound in Abbottabad, Pakistan. The historical consensus, even at this close remove, has been that Pakistani authorities were notified of neither the raid nor the use of Pakistan's airspace to insert Navy SEALs. In the aftermath, opinion polling showed near-universal condemnation for American unilateralism, with 85 percent of Pakistanis disapproving of the operation's execution without Islamabad's knowledge.[6] The Abbottabad Commission, tasked with identifying the Pakistani shortcomings that had allowed U.S. forces to so thoroughly penetrate Pakistani airspace, heard from Pakistan's deputy chief of the air staff that "the Abbottabad incident was indeed one of the most embarrassing incidents in the history of Pakistan" and that a combination of peacetime posture and trusting attitude toward the United States—which "was never expected to commit such a dastardly act"—had led to the incident.[7] Such a mistake would not be permitted to happen again.

In short, the United States has been willing to violate sovereign airspace before—and will likely do so in the future—but whenever it has done so, the move has come with a cost.

International Law

Laws between nations are relatively clear on the issue of sovereign airspace. The 1944 Convention on International Civil Aviation, better known as the "Chicago Convention," defines *state aircraft* as "aircraft used in military, customs, and police services" and explicitly declares that "no state aircraft of a contract-

ing State shall fly over the territory of another State or land thereon without authorization by special agreement or otherwise, and in accordance with the terms thereof."[8] Thus, military aircraft must receive explicit permission from another country before flying over or landing in its territory. Note that there is no exception made or distinction drawn between peacetime and wartime, nor the intent of the aircraft. However, as some legal scholars point out, this "fundamental" principle is "subject to a few exceptions . . . such as right of transit passage, archipelagic sea lanes passage, entry in cases of distress, and force majeure."[9]

Transit passage and archipelagic sealine passage are relevant to future missions and are also enshrined in the United Nations Convention on the Law of the Sea (UNCLOS), which expands the definition of *sovereignty* out from the shoreline: "The sovereignty of a coastal State extends, beyond its land territory and internal waters and, in the case of an archipelagic State, its archipelagic waters, to an adjacent belt of sea, described as the territorial sea. This sovereignty extends to the air space over the territorial sea" and further defines the *territorial sea* as up to 12 nautical miles from the coastal baseline.[10] Beyond that are the high seas, over and through which aircraft and vessels have full freedom.

Thus far, the application of UNCLOS to overflight remains a simple matter: Military aircraft must obtain permission before overflying another country's territory, including the territorial sea up to 12 nautical miles from the coast and any internal waters. However, it is one of the exceptions to this clause that is most interesting here: archipelagic sealine passage.

The United States, in its UNCLOS signing statement, interpreted that, in international straits and archipelagic sealines, "military aircraft may overfly in combat formation and with normal equipment operation." Even more important, "a State bordering an international strait may not suspend transit passage through international straits for any purpose, including military exercises," and "the right of archipelagic sea lanes passage cannot be impeded or suspended by the archipelagic State for any reason."[11] This has particular importance for future operations in the Western Pacific Ocean, home to the two archipelagic states—Indonesia and the Philippines—as well as a likely arena of coming military competition.

Current Challenges

Having established the legal foundations of military overflight, there remain several areas of current interest and future concern. Both operational planning and materiel procurement will have to account for the possibility—if not likelihood—of denied access in the future, adding distance to flight routes and challenges to aircraft recovery, as well as requiring longer range capabilities. Several countries crop up in the literature regularly as "repeat offenders"—those "proven to be access problems time and time again."[12] These countries have been more likely than others to deny the United States overflight permission or otherwise challenge its access. Of greatest relevance in the coming years will be Turkey, Indonesia, and the Philippines, as well as much of Southwest and South Asia.

Turkey. Turkey is a perennial disappointment in U.S. (and North Atlantic Treaty Organization) strategy, and as the Erdogan administration has grown more assertive and less deferential to its allies, it has begun weaponizing its airspace, which lies at a crucial crossroads for international aviation. Between 1945 and 2014, Turkey denied U.S. contingency access requests 16 times.[13] And in just the past 5 years, Ankara has

- refused overflight to allied French and British airborne warning and control system aircraft in 2015[14]
- closed the airspace around Incirlik Air Base following the coup attempt against President Erdogan in 2016, stranding U.S. aircraft on the ground[15]
- denied overflight permission to a Chinese medical aircraft chartered by Cyprus to deliver COVID-19 relief supplies to Nicosia in May 2020.[16]

All of this, however, is well within Turkey's sovereign rights—meaning that, without any legal solutions, the safest course of action is to plan on having no access to Turkish airspace, especially in peacetime and likely even wartime (barring involvement by allied Turkish forces themselves). This poses challenges for missions originating in the Mediterranean and North Africa, particularly those flying north and northeast (toward the Black Sea). The relationship with Turkey is due for revision as-is, and the present lack of access ought to be a prime consideration for future statecraft.

Western Pacific. With the U.S.-China competition poised to take center stage in the coming decades, access to the Western Pacific has assumed prime importance for defense planning. In addition to its traditional bases in Japan and Guam, the United States has explored new (or expanded) partnerships with the Philippines, Vietnam, Australia, Thailand, and Singapore. Yet all these partnerships face the same challenge: distance.

The closest current basing partners to the South China Sea are the Philippines and Vietnam; however, U.S. relations with Manila have been severely strained in recent years, and Hanoi—though contesting the Paracel Islands with China—is unlikely to have any interest in a wider regional conflict (for instance, in the eastern Spratly Islands closer to Luzon). In the East China Sea, South Korea has no appetite for a war with China, and Taiwan would of course do everything possible to avoid unnecessary provocation.

The availability of specific bases throughout the region will determine the distances aircraft would have to travel to reach target areas. In recent years, U.S. planning has tended to assume universal access to bases and airspace alike, but as history and international law demonstrate, the United States might well be more constrained than it has previously believed.[17] This reality must be factored into future capability requirements.

The United States faces the distinct possibility that China would place undue pressure on other regional partners to deny it overflight and access, necessitating complicated routes across much longer distances. The challenges presented by

this problem are numerous, and their solutions increasingly unpalatable:

It is not too much of a stretch to imagine that nonbelligerents, under PRC [People's Republic of China] *pressure and having curtailed access to their territory, might conceivably restrict permission to overfly their country as well. This would severely limit the avenues of approach of airpower and reinforcements flowing into theater as they are forced to detour around the airspace of erstwhile partners. This in turn would allow the PRC to concentrate its forces—backed up by a mainland-based reconnaissance strike complex—on these narrow vectors, such as the Luzon and Singapore straits. . . . The United States will have to examine the difficult prospect of violating the sovereignty of nonbelligerents in a time of war. There may well come a point when the joint force will have to seize key positions along the South China Sea periphery—for example, in the Philippines, Indonesia, or Malaysia—for short durations in order to facilitate operations.*[18]

All these challenges will affect design and capabilities of future aircraft. Even with unfettered base access, denial of overflight would force aircraft flying from Guam to divert north (or south) around the Philippines, from Australia over Papua New Guinea (or even further east), or from Singapore (northwest and then east), to try and obtain Thai and Vietnamese airspace permissions. Such access cannot be taken for granted. While U.S. defense planning may have been able to overlook or assume Southeast Asian access in the past, its increasing reliance on Australian bases will make that an oversight it can ill afford.

Australia. Australia's defense relationship with the United States has become closer in recent years. Canberra is increasingly alarmed by China's growing assertiveness and willingness to engage in confrontation, and to that end it has taken steps that increase U.S. access to Australian military bases. The most prominent among these bases are Darwin, home to both the Royal Australian Air Force (RAAF) and the Robertson Barracks (itself hosting a rotational 2,500-strong U.S. Marine Air-Ground Task Force), and RAAF Base Tindal, 175 nautical miles southeast of Darwin, quickly emerging as one of Australia's most critical air bases.[19] The U.S. air presence in Australia has been steady, with the Enhanced Air Cooperation program putting on numerous U.S.-Australian exercises each year, primarily involving manned fighter and lift aircraft.[20]

As the U.S. presence in Australia continues to grow, it is likely that unmanned aircraft would constitute part of

Four Air Force F-22 Raptors assigned to 90th Fighter Squadron fly in formation in skies above Royal Australian Air Force Base Tindal, Australia, March 2, 2017, as part of first Enhanced Air Cooperation initiative between United States and Australia (U.S. Air Force/Alexander Martinez)

Air Force B-1B Lancer from 9th Expeditionary Bomb Squadron, Dyess Air Force Base, Texas, flies Bomber Task Force mission alongside two British and two U.S. F-35 Lightning IIs from UK Carrier Strike Group's HMS *Queen Elizabeth*, over Camp Lemonnier, Djibouti, November 11, 2021 (U.S. Air Force/Andrew Kobialka)

future rotational deployments and thus would be operating toward targets to the north. The same also applies to the growing U.S. presence in Singapore at Changi Air Base. Missions from Tindal or Changi would, at a glance, need to traverse Indonesian airspace, which is not as straightforward as one might hope—despite the relative clarity of international law on the subject.

Indonesia. Indonesia has taken a hard nationalist line on its airspace for years, to the point where it has refused to join regional open skies regimes. Jakarta has a longstanding debate with Singapore over who should manage the Riau Islands flight information region (FIR), which includes Singapore as well as large portions of Indonesia and has been under Singaporean administration since 1946, when granted by the International Civil Aviation Organization. Over the past decade, Indonesia has been increasingly vocal about taking control of the Riau Islands FIR on the grounds of sovereignty, which would essentially give it veto power over U.S. (and Singaporean) operations from Singapore.[21] Given its recent history of intercepting aircraft straying even a few nautical miles over Indonesia territory—including the Riau and Natuna Islands themselves—it is unlikely that the United States would find leniency from Jakarta.[22]

Indonesia's airspace ambitions do not end with the FIR. In 2018, Indonesia issued regulations over airspace management that included an assertion that "the Government could establish an Air Defense Identification Zone/ADIZ" encompassing a much broader swath of territory than otherwise provided for by international law.[23] As Evan Laksmana writes:

Article 9 defines an ADIZ as "specific air spaces above the land and/or waters established to identify aircraft for the purposes of state defense and security." It identifies Indonesia's "Airspace" and "Jurisdictional Airspace" as areas where the ADIZ could apply. The former refers to the "sovereign airspace" above Indonesia's territory, while the latter is defined as the airspace above the exclusive economic zone, continental shelf, and contiguous zone, where it has "sovereign rights" prescribed by international law.

This last claim may raise eyebrows, as no specific international law grants

sovereign rights to the airspace above an exclusive economic zone, nor is there one delimiting ADIZs.[24]

It is unclear how enforceable such an ADIZ would be or, indeed, how Indonesia would treat its archipelagic sea lines under such a regime. From a capabilities standpoint, Indonesia lacks both the radar network and airpower required to detect, much less intercept, all aircraft above such an enormous area. But if Jakarta were to ignore international legal precedent and require permission—or even just notification—for military aircraft flying above international sea lines, the implications would be troubling. (Indeed, the political consequences would be deleterious: It might provide sufficient cover for China to declare its own ADIZ in the South China Sea.[25]) The United States would be faced with the unpalatable options of cooperating with illegal restrictions, ignoring them, or avoiding Indonesian airspace altogether, necessitating a thousand-nautical-mile detour over Papua New Guinea (assuming it is willing to grant overflight rights—a dubious assertion in light of longstanding China–Papua New Guinea ties).

Even without an ADIZ, the UNCLOS archipelagic sea line regime has never been put to the test in wartime. While peacetime transit of military aircraft might be relatively unobjectionable to Jakarta—and to this date, the United States has not flown combat missions from Australia—the use of that airspace for long-range strike or other kinetic missions may engender a wholly different reaction. Indonesia may fear the reaction of China should it "allow" its airspace to be used. For the purposes of future Singaporean- and Australian-based aircraft, it will be critical in the coming years to pay attention to Indonesia's stance on its airspace and to react accordingly. The distinct possibility of no Indonesian overflight should be taken seriously.

Southwest Asia. Having completed its withdrawal from Afghanistan, the United States has extremely limited air-basing options in South and Southwest Asia, whether in pursuit of nonstate actors or in support of an interstate conflict. With access to Bagram and Kandahar out of the question, it is now necessary to consider alternatives in case of future contingencies in the region.[26] From where, for instance, would the bin Laden raid have been launched if not from Afghanistan? While Gulf bases provide a possible launch location for strike and intelligence, surveillance, and reconnaissance missions, they are less useful (and likely, their host nations less willing) as mobilization points for special operations forces and other ground troop incursions, particularly given the probability of traversing hostile terrain.

One of the current regional success stories can be found in Oman. To avoid the Strait of Hormuz and close proximity to Iran when traveling eastward from Gulf bases in Qatar, Bahrain, and the United Arab Emirates, U.S. aircraft must overfly Oman. This overflight regime has been a tremendous success, with former U.S. Central Command Commander Joseph Votel testifying to Congress that there were more than 5,000 aircraft overflights a year over Oman.[27] But this success story also points to a vulnerability: Were Oman to begin denying overflight, the United States would be forced either to risk a confrontation with Iran or to take an incredibly circuitous route every time it wished to move an aircraft in or out of the theater.

Without U.S. access in Afghanistan, Gulf bases are the closest option to the Indo-Pakistani border. And without Omani overflight permission, that already-lengthy route becomes outright perilous, especially if the contingency being supported involves a less-than-friendly Pakistan. Clearly, if the United States wishes to continue playing a persistent role in this region, it must either find alternative bases or develop very-long-range aircraft that can operate from locations like Diego Garcia with only limited aerial refueling.

"Freedom" of the Skies

Even with numerous geographic restrictions on U.S. access and overflight, it is arguable that there is no need for concern: If the shortest path for American aircraft means the United States must violate a country's airspace, it can and will do so with impunity. While not necessarily incorrect from a capability standpoint, such a move still poses severe reputational risks to the United States. Failure to uphold international law and its own word would not endear the United States to any future partners, and running roughshod over the rights of smaller powers would give any adversary an advantage in the global struggle for influence. Violating a country's airspace could even have the effect of diminishing the cause of the United States in the eyes of its own citizenry—often the death knell for successfully prosecuting any conflict.[28] Even where a state does grant overflight permission, the deceptive assertion of a denial can be cited in the court of international opinion, such as Russia's false claim that Poland blocked overflight rights for a planeload of medical equipment bound for Italy.[29] Should the converse be used as a tool of influence—falsely claiming, for example, that a country allowed the United States use of its airspace—sufficiently negative reactions might dissuade others from actually doing the same.

Likewise, while the United States is virtually unparalleled in military capability, it is not omnipotent, and other states are not remaining idle in their antiair capabilities. Several U.S. partners are acquiring sophisticated air defense systems like the Russian S-400, including Turkey, India, and Saudi Arabia, while in Southeast Asia, Israel has been supplying Vietnam and the Philippines with modern air defense radars.[30] Should the United States attempt to ignore airspace restrictions and forge ahead with combat missions regardless, the consequences might well be destructive. This would be especially true if the United States employed older, less stealthy platforms—and be doubly devastating if those platforms were manned.

Thus, to avoid having to make an impossible choice, most of the airspace solutions will lie in the realm of the diplomatic. Such actions as securing basing and overflight rights on a bilateral basis, amending existing status of forces agreements, and strengthening existing

mutual defense treaties will have to be the cornerstone of any successful approach. Preparing messaging campaigns and adequate explanation for those rare instances in which diplomacy is insufficient will be another valuable tool.[31] But perhaps it would be more useful to assume the worst and plan for it accordingly. Assuredly U.S. global supremacy will not last forever, and neither will its unchallenged rule of the skies. If new aircraft have longer ranges, more versatile basing options, and more flexibility in their operational areas, the challenge of overflight and airspace in the coming years and decades can indeed be surmounted. **JFQ**

Notes

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Soldiers from 25th Infantry Division Artillery completed Jungle 5K and swim test train-up at Lightning Academy Schofield Barracks, Hawaii, May 14, 2021, as practice for upcoming Jungle Operations Training Course (U.S. Army/ Jessica Scott)

Retaining Female Leaders
A Key Readiness Issue

By Benjamin Ramsey, Ann Bednash, and John Folks

America's joint force is at a difficult crossroads where the pressure of the "fight tonight" readiness mentality conflicts with long-term strategic competition with peers. The 2018 National Defense Strategy describes the changing character of war and the new challenges the joint force will face during "the reemergence of long-term strategic competition, rapid dispersion of technologies, and new concepts of warfare and competition that span the entire spectrum of conflict."[1] An enduring mission of the Department of Defense (DOD) is to provide combat-capable, technically proficient personnel, but there is a readiness issue undermining the joint force.

In 2020, the Government Accountability Office (GAO) found that the high attrition of women from the joint force threatens the necessary diversity and operational capability that constitute a ready force.[2] For example, women represent 20 percent of newly commissioned officers, but they separate from the military 28 percent faster than men and represent only 7 percent of U.S. generals and admirals.[3] The lack of equal representation throughout the ranks is a key readiness issue because female Servicemembers are a critical core and highly trained component of DOD. Maintaining women in the ranks is a vital element of continuing readiness and

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Soldier with U.S. Army Southern European Task Force, Africa, 207th Military Intelligence Brigade, completes hand-release pushup event in Army Combat Fitness Test as part of Best Warrior Competition at Caserma Del Din, Vicenza, Italy, May 25, 2021 (U.S. Army/Meleesa Gutierrez)

operational effectiveness in a complex environment that focuses on the current battlespace while preparing for the fight over the horizon.

A ready joint force is one that actively fosters the inclusion of women and their commensurate representation in senior leadership roles. In responding to crises, studies find that female leaders and diverse groups with broad perspectives outperform homogenous groups.[4] For women to lead crisis prevention and resolution from within the military, their careers must be long enough to qualify for senior rank. However, the higher annual attrition rate means a disproportionately small number of women will serve long enough to compete for senior ranks.

In a landmark effort to improve gender inclusivity, the United States passed the Women, Peace, and Security Act of 2017, establishing as policy the "meaningful participation of women in conflict prevention, management, and resolution, and postconflict relief and recovery efforts."[5] The action followed United Nations Security Council Resolution 1325 in 2000, which urged all actors to increase the participation of women and incorporate gender perspectives in peace and security efforts.[6] These efforts have demonstrated some success, but the percentage of women in the U.S. military increased less than 2 percent between 2004 and 2020 and remains below 17 percent across all Services.[7]

For any Servicemember, the decision to hang up the uniform and transition to civilian life is momentous. The GAO report also found six broad factors that led women to separate from the military: sexual assault, deployments, work schedule uncertainty, organizational culture and inconsistent standards, family planning, and dependent care.[8] DOD has taken concerted action in recent years to raise awareness of and to prevent sexual assault. Nevertheless, DOD reported no decline in the rate of sexual assaults during 2019, and a great deal of effort is still needed.[9] Sexual assault is an important and challenging issue for DOD that goes beyond the scope of this article, as are perennial challenges resulting from deployments and dynamic work schedules. However, DOD can judiciously address aspects of the remaining three factors: organizational culture, family planning, and dependent care. Further examination of these three factors highlights their quantifiable nature and negative demonstrable effects on readiness and operational effectiveness.

Women leave military service earlier in their careers than do men largely because current policies do not yet adequately address specific barriers to continued service.[10] Surveys of women separating from the military report workplace harassment and inconsistent fitness policies.[11] DOD policy currently limits maternity leave to 3 months, while the World Health Organization and other national

movements endorse exclusive breastfeeding and paid maternity leave for 6 months to achieve optimal health outcomes for both mother and child.[12] Finally, access to childcare is increasingly inadequate in the wake of changing demographics and a nationwide shortage of providers. Improved access to childcare is the most fundamental and urgent requirement to retain women in the military because, if the household cannot afford or access childcare, it is most often the mother who ends up leaving the workforce.

Organizational Culture and Inconsistent Standards

In 2019, RAND published a study on why women separated from the Coast Guard, and the GAO issued a similar study for all the Armed Forces.[13] Both studies concluded that shortcomings in organizational culture (for example, sexism, flawed fitness testing) proved a significant factor that led women to separate from the military.[14] Women leaving the Coast Guard cited perceptions that male leaders were reluctant mentors and were unaware of female-specific policies or interpreted policies inconsistently.[15] First-term attrition of women from the Army was especially large—more than twice that of the Marine Corps and five times that of the Navy—which implies that the "Army most differs from the other Services in the integration of females into its units once training has concluded."[16]

One issue that has raised concerns and that negatively impacts the retention of women is inconsistent physical fitness and weight standards.[17] Every military member is required to pass a Service-specific physical fitness test and meet height and weight standards. Physical fitness tests are designed to assess body composition, muscular strength and endurance, and cardiovascular fitness. There are notable inconsistencies, however, among the military Services with respect to height and weight standards for women and testing timelines following childbirth.[18] Furthermore, the 2019 annual report from the Defense Advisory Committee on Women in the Services concluded that current "body fat guidelines are based on outdated science and result in some female Servicemembers being unfairly evaluated."[19] Not only are the standards inconsistent, but the science the standards are based on also do not reflect or benefit from recent studies on enhanced readiness.

Soldiers who do not meet height and weight standards have their waists measured for further analysis by taping, which is the practice of assessing the Servicemember's waist circumference with a measuring tape while trying to minimize physical contact between tester and testee. One flaw in this approach is that women of color have wider hips on average compared with white women, which leads to institutionalizing bias against some minorities.[20] An investigation into why women leave the Coast Guard likewise identified widespread concerns regarding body fat composition measurements through taping.[21] Military circumference equations consistently overestimate body fat, ending military careers without merit.[22] The Air Force permanently discontinued waist taping in December 2020, but the other Services continue the practice.

The inherent goal of fitness testing is to ensure force readiness, but gender-neutral fitness testing has inadvertent negative impacts on military culture and organizational standards. The concept of a singular fitness testing standard for both men and women is attractive for its simplicity, but studies demonstrate the approach can be unfair.[23] When fitness tests are conceived without regard to the physiological differences between men and women, the failure rate for healthy women is much higher than for healthy men.[24] For example, after police forces in the United Kingdom implemented a gender-neutral timed obstacle course, the failure rates for men and women were 7 percent and 42 percent, respectively.[25] Similarly, reported failure rates for the gender-neutral Army Combat Fitness Test (ACFT), when introduced in 2019, were 30 percent for men and 84 percent for women. (In May 2021, ACFT failure rates remained skewed at 7 percent for men and 44 percent for women.[26]) Fitness testing scores currently impact promotion prospects within the Army, so the new ACFT performance scores adversely and disproportionately impact women. Emma Moore, a research associate for the Center for a New American Security, succinctly summarized the problem, noting that female Soldiers and those in noncombat arms fields will feel the change most acutely.[27] Unfair policies are exacerbated by insufficient gender diversity among senior Army leadership, and changes under the ACFT, if not carefully considered, could be a key factor when women self-select out of service.[28]

The link between organizational culture and readiness, especially as culture is shaped through policies and standards, offers leaders and policymakers a direct means to improve readiness and retention of women in the force.

Family Planning

Family planning among military personnel quickly becomes a readiness issue due to deployment cycles and frequent moves and changes in duty station. Recent studies have focused on the varying degrees to which Active-duty members are affected by infertility, particularly women, due to stressful and dangerous situations experienced during military service.[29] The National Defense Authorization Act for Fiscal Year 2020 authorized additional research into infertility and other health concerns as well as additional female personal protective equipment.[30]

Furthermore, childbirth is a life-changing event with long-term physical and emotional effects on the mother that require months for full recovery. Women who give birth score lower on their fitness tests up to 2½ years postpartum compared with those who do not give birth, with a demonstrable impact on promotion.[31] Standards vary from 6 months to 1 year among the military Services on how long postpartum women must recover before taking fitness tests. Despite the need to fully recover after childbirth, female Servicemembers are expected to meet physical fitness standards as outlined in Service regulations. The pressure to resume rigorous exercise affects women of all ranks. For instance,

Command Sergeant Major Jamila Smith, USA, shared that, after the birth of one of her children, she tried to resume training to meet workplace expectations and, in the process, damaged her cesarean incision badly enough to require medical attention.[32] This anecdote illustrates how insufficient recovery times and the implicit pressures from the Services following birth can negatively impact Servicemember readiness even at senior levels.

Pregnancies that end in a miscarriage also have powerful physical and mental health effects that negatively impact readiness, if not adequately addressed. Miscarriages are often accompanied by long-term grieving that requires support from medical professionals, families, and the military chain of command. Despite this medical fact, most female Servicemembers have no minimum grace period before having to resume fitness testing following a miscarriage. In August 2020, the Air Force introduced a sliding scale of fitness grace periods following pregnancies of various lengths.[33] While the policy change is an improvement over having no minimum recovery period, the fact that the policy quantifies miscarriages in callous categories including "less than 12 weeks" (which garners a 60-day grace period) and "at least 12, but less than 20 weeks" (which garners a 6-month grace period) demonstrates a lack of empathy for women who are suffering from a tragic loss. In February and March 2021, the Army and Marine Corps extended their postpartum fitness exemptions to 1 year, but they still do not account for miscarriages. Forcing women who are not mentally and physically prepared to return to Active duty invites deleterious effects to readiness and operations.[34]

Adequate maternity leave during the first year after birth leads to lower infant mortality rates, health benefits for the mother, an increase in female labor force participation, and an increase in breastfeeding rates.[35] Companies that have increased the length of paid maternity leave beyond 12 weeks have seen dramatic increases in worker retention. Google, for instance, halved the attrition rate of new mothers by increasing its maternity leave from 12 to 18 weeks, and Accenture decreased attrition by 40 percent by increasing its maternity leave from 8 to 16 weeks.[36] The World Health Organization recommends exclusive breastfeeding until 6 months of age for a host of health benefits.[37] It is not surprising, therefore, that at least 6 months of paid maternity leave is optimal for "the health and development of children, gender equality, and women's careers."[38] The preponderance of military recruits come from families that have parents who served; therefore, policies that lead to improved family life and reduce infant mortality directly correlate to increased recruitment and readiness as a long-term policy issue.[39]

Current DOD guidelines fall short of the recommended 6 months of maternity leave: the Federal Employee Paid Leave Act, signed in 2019, caps maternity leave at 12 weeks. Marine Corps Commandant General David Berger stated in September 2020 that the 12 weeks of maternity leave Marines receive is insufficient and that he would consider extending the maternity leave policy to a full year.[40] When women do return to duty earlier than 6 months after giving birth and continue to pump breastmilk as recommended, many face discrimination for taking breaks every 3 or 4 hours, despite being authorized and encouraged to do so by DOD policies.[41] Female Servicemembers who become pregnant need adequate time to recover, physically and emotionally, so they can return to service both ready and encouraged to continue their career in the joint force.

Childcare

A major barrier to the retention of women is insufficient access to affordable and accessible childcare. Even before the COVID-19 pandemic, the number of childcare centers and childcare availability across the United States was steadily declining due to an aging workforce and few incentives to enter the career field.[42] Across the United States, 39 percent of women are solely responsible for staying home when their children are sick, and only 53 percent of women with elementary school–age children are employed full time.[43] Directly associating childcare availability with joint force readiness, DOD policy regards childcare as critical to "mission readiness, retention, and morale of the total force during peacetime, overseas contingency operations . . . and other emergency situations."[44]

Access to affordable and adequate childcare is a critical requirement for Servicemembers whose jobs are subject to changing shift work, long hours, overnight duties, and deployments. Insufficient childcare has been proved to affect military families "with single parents and dual military couples reporting more missed duty time after the birth of a new child or when moving to a new installation."[45] Over half of Servicemembers surveyed report that the unavailability of childcare had negatively impacted their pursuit of employment or education and was often linked to the cost of care.[46]

In response to the critical requirements for childcare, DOD "operates the largest employer-sponsored childcare program in the United States, serving approximately 200,000 children and employing over 23,000 childcare workers, at an annual cost of over $1 billion."[47] Even though the childcare system has considerable support from senior leadership, it has not been able to keep up with demand. In 2019, DOD officials testified that "more than 8,000 children of Sailors and 3,000 children of Airmen" were on DOD waiting lists for on-base childcare.[48] As of 2020, DOD could accommodate only 78 percent of demand for childcare services.[49] The shortfall is in large part due to rapid changes in Servicemember demographics and an increasing number of women joining the workforce.

As DOD recruited greater percentages of women, Active-duty female officers increased from 4 percent in 1973 to 16 percent in 2019.[50] Today there are almost twice as many dual military married couples and single parents serving on Active duty compared with in 1985.[51] While the number of childcare options has grown to include on-base Child Development Centers, 24-hour facilities, regulated in-home care, and subsidies for

civilian care, DOD has struggled to meet the increased demand.

While shortcomings in childcare affect all military families with dependents, data suggests that women are more affected when childcare is unavailable. A 2020 Congressional Research Service report found that a "larger percentage of female Servicemembers and veterans have cited childcare issues as a major stressor associated with their time in service relative to their male counterparts."[52] Similarly, a 2019 Blue Star Family report found that "44% of female Servicemember respondents with children reported that a lack of childcare was a top stressor, compared to 20% of male Servicemember respondents with children."[53]

The COVID-19 pandemic further ravaged an already overburdened system. Many childcare centers were forced to operate intermittently or close indefinitely. Childcare availability on Marine Corps facilities decreased by "about 50% . . . depending on the conditions in the installation community."[54] In the wake of the pandemic, childcare responsibilities have fallen predominantly on a female member of the household, with 44 percent of women being the only parent providing childcare compared with only 14 percent of men.[55] DOD reports estimate that due to COVID-19, 1.2 million children under the age of 13 in military families will now require childcare, about 18,000 military children remain on

Air Force Colonel Cat Logan, commander of Joint Base Anacostia-Bolling and 11th Wing, leads Staff Sergeant Jaquisha Wright, assigned to 11th Civil Engineer Squadron, through reenlistment ceremony during halftime event at D.C. United soccer game, Audi Field, in Washington, DC, October 16, 2021 (U.S. Air Force/Kayla White)

Lieutenant Jessica Grupp, pilot assigned to Helicopter Maritime Strike Squadron 49, performs preflight check on MH-60R Seahawk in preparation for first all-female crew MH-60R training flight, San Diego, April 20, 2021 (U.S. Navy/Winter Griffith)

waiting lists nationwide, and nearly 40 percent of Active-duty military members may be in desperate need of childcare.[56] Childcare setbacks have negative impacts on careers, particularly for women, and COVID-19 has exacerbated the issue.

Continuing Challenges and Recommendations

Joint force readiness requires deliberate efforts to address personnel needs. The U.S. military must proactively address the distinct needs of women to improve retention and ensure the joint force is able to draw from all segments of the society it serves, in line with DOD diversity and inclusion strategic plans.[57]

Policymakers must realize that gender equality does not mean identical fitness standards for men and women, who have distinct physiological differences. Fitness tests with disparate pass rates for men and women unhelpfully distort military readiness metrics. Congress recognized the disparity and in the 2021 National Defense Authorization Act ordered that the Army halt further implementation of the ACFT until its fairness could be determined by a non-DOD study. However, individual units are still testing their personnel based on current AFCT standards. As a 2018 RAND study stated, the intention must be that physical fitness test scores are "useful in predicting success in critical physical requirements of the job" and applied equitably.[58] Instead of applying a waist measurement to equate Servicemember fitness, DOD should consider accurate caliper skinfold measurements, which could be completed in a similar amount of time.[59]

Scientific data clearly points to the importance of postpartum recovery time for readiness. While most Services have deferred postpartum physical fitness testing policies for up to a year after a birth event, inconsistencies remain regarding physical testing after pregnancy loss. Every woman in military service should be exempt from fitness testing for 6 months following pregnancy loss. In addition, every military Service should consider granting mothers at least 6 months of paid maternity leave. The implications for long-term readiness—readiness over generations—adds to the weight of the more immediate problem. Military recruits predominantly come from families with a history of service, and failure to reduce infant mortality among the families of its existing ranks could mean fewer recruits in the future.

Access to childcare must systematically expand to meet the ever-growing demand of military families; an increasing number of military families are single parent or dual military. Meeting demand will require deliberate increases in investment and development over the long term. DOD could more rapidly expand access to childcare through a combination of public-private partnerships, increased use of vouchers, and negotiated discounts with local providers. An equitable expansion of childcare access will be costly, but even if the budget steadily doubled to $2 billion per year, less than one-third of 1 percent of annual U.S. military spending, the implications for readiness suggest that the United States cannot afford to underinvest in childcare. If women are forced to choose between raising children and continuing a career in the U.S. military, the majority will continue to separate too soon to lead peace and security efforts in our increasingly volatile world. **JFQ**

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Ships and aircraft from U.S. Navy, Royal Navy, Japan Maritime Self-Defense Force, and Royal Australian Navy, led by USS *Carl Vinson*, HMS *Queen Elizabeth*, and JS *Kaga*, transit in formation during Maritime Partnership Exercise 2021, October 17, 2021, in Bay of Bengal (U.S. Navy/Haydn N. Smith)

Defending Taiwan in an Expanded Competitive Space

By Joel Wuthnow

Taiwan's defense has always been precarious, and the dangers are only likely to grow as China's power increases.[1] Chinese economic inducement since the 1990s has done little to persuade Taiwan's citizens to embrace China's vision of a "one country, two system" model for cross-strait relations, prospects that are even lower with China's recent steps to erode political freedoms in Hong Kong. To deter Taiwan independence and to pressure Taiwan's leaders to accept Beijing's proposals, China's People's Liberation Army (PLA) has amassed significant forces across the Taiwan Strait, including more than 600 short-range ballistic missiles opposite the island.[2] Taiwan's will to resist Chinese pressure depends, in part, on the speed and efficacy of U.S. intervention in a conflict. China's military has thus built an arsenal of long-range missiles and supporting capabilities to try to keep the United States out of the fight.

China's basic advantages in any Taiwan scenario include a high level of political will—reunification is a "core interest" for the Chinese Communist Party (CCP), which aspires to resolve the problem on its own terms by the centennial of the People's Republic of China in 2049—and a local military balance that pits a regional heavyweight against a small island with few diplomatic allies and limited resources. Taiwan's proximity to the mainland and the "tyranny of distance" facing an attempt to surge U.S. forces across the Western Pacific are liabilities for the defense.

Much can still be done to address the threat head-on, but a prudent U.S. approach should also consider ways of shifting the competition to areas where China is at a disadvantage. Multiple pressures on the PLA, driven by China's unfavorable geostrategic environment, provide the basis for a competitive strategy. In peacetime, the United States

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Security Forces Airmen assigned to 28th Security Forces Squadron from Ellsworth Air Force Base, South Dakota, patrol near Air Force B-1B Lancer taxiway at Andersen Air Force Base, Guam, in support of Bomber Task Force mission, December 26, 2020 (U.S. Air Force/Tristan Day)

should create headaches for the PLA in other areas bordering China by increasing military assistance and training to China's other rivals. This approach would leverage the demand that many states have for better capabilities to resist Chinese coercion and play to preexisting Chinese concerns about threats suddenly appearing in secondary theaters. A PLA that is simultaneously having to counter many different challenges will be less able to focus on Taiwan.

Looking at Taiwan's defense through a competitive strategy lens also suggests different options for confronting the PLA in wartime. China's military structure is built on the notion that the PLA must be prepared to fight in many theaters at once. By necessity, it contains a centralized command and control and logistics system designed to manage and reallocate forces in a war. Targeting those critical links would complicate Chinese decision-making, reduce the PLA's capacity to mass forces, and support U.S. and Taiwan operations in the main theater. To limit escalation risks, those operations should rely, wherever possible, on nonkinetic means. Ensuring Taiwan's defense is no easy feat but will be easier with operations that defray China's local advantages and keep the PLA off balance.

A New Lens for an Old Problem

Most discussions on improving Taiwan's defenses focus on two issues. First is modernizing Taiwan's military and equipping it with the means of resisting Chinese aggression. This is the subject of Taiwan's "overall defense concept," which focuses on asymmetric weapons such as sea mines and coastal defense cruise missiles needed to blunt an invasion.[3] Taiwan's limited ability to weather a Chinese offensive even with advanced equipment has led to a second focus: preserving a credible U.S. intervention capability so that the United States would be able to meet its obligations under the Taiwan Relations Act to "maintain the capacity" to resist China's use of force (acknowledging that any military intervention would ultimately be a political decision).[4] In recent years, all the services have rolled out revised operational concepts designed to allow U.S. forces to operate within China's antiaccess/area-denial envelope, such as using stealthier ships more, reducing reliance on large bases, operating more from austere airstrips, and exploiting long-duration unmanned technology.

Both approaches are helpful in instilling doubt in the Chinese leadership about the PLA's prospects in an amphibious invasion. Nevertheless, a problem for the defense is that China has built large advantages in most categories of conventional power across the Taiwan Strait—in submarines, for instance, the ratio is 34 Chinese submarines assigned to the relevant theaters versus 2 for Taiwan—forcing Taipei to rely on U.S. intervention to ensure its ability to resist a blockade and successive waves of amphibious and airborne assaults. Yet this is a gamble, if one credits reports that wargames consistently show U.S. forces losing to China, due in part to China's impressive counter-intervention capabilities and in part to the vast distances

that U.S. forces need to traverse. Some concepts of intervention also envision extensive strikes on the mainland, which would carry a high risk of retributive Chinese strikes on U.S. targets, such as military bases in Japan or Guam.[5]

Given those limitations, more thought is needed on how to move the competition to different playing fields where China has fewer advantages (reflecting the logic of the "competitive strategies" approach pioneered by Andrew Marshall in the early 1970s).[6] Adopting this philosophy, the 2018 National Defense Strategy encourages U.S. policies that "expand the competitive space, seizing the initiative to challenge our competitors where we possess advantages and they lack strength."[7] U.S. doctrine has emphasized a related point: that adversary decisionmaking should be complicated by presenting it with "multiple dilemmas," overwhelming its capacity to reach timely decisions on the use of force.[8] Both tenets encourage U.S. strategists to think creatively about our adversary's constraints while taking a more holistic view of our own comparative strengths.

The PLA's Fundamental Dilemma

The basis of a competitive strategy is the tension in Chinese military strategy between preparing for a war with Taiwan and fulfilling the dizzying array of other requirements with finite resources.[9] A war with Taiwan has been the PLA's top planning scenario since the early 1990s. The rise of a new generation of Kuomintang leaders who had less interest in a political union with the mainland, combined with a Taiwan electorate largely opposed to unification, meant that the PLA needed to prepare to seize and occupy the island. This led to investments in short-range ballistic missiles, submarines, and amphibious capabilities, as well as training in what used to be called the Nanjing Military Region, recently rebranded as the Eastern Theater Command, focused on capturing offshore islands. The possibility of U.S. intervention, underscored by the involvement of two U.S. aircraft carriers in the 1995–1996 Taiwan Strait Crisis, sparked an emphasis on developing long-range antiship missiles and other capabilities to forestall U.S. intervention in a conflict.

The PLA could not, however, fully commit to preparations for a war with Taiwan and the United States. The crux of the problem is a highly unfavorable geostrategic environment. Within China itself, the western third of the country is occupied by ethnic Uighurs and Tibetans who have their own dreams of independence. Regionally, China shares land borders with 14 countries and maritime borders with an additional 7, including states that are either unstable, such as North Korea and Afghanistan, or that have territorial disputes with China, including Japan, India, the Philippines, and Vietnam.[10] Defending China's long borders and dissuading other countries from asserting their sovereignty claims put competing demands on China's finite military resources. U.S. military presence and the specter of U.S. involvement in conflicts ranging from Korea to the South China Sea also mean that the PLA must prepare for high-end conflicts outside the Taiwan Strait.

An additional problem, from the PLA's perspective, is the fear that China's rivals—both within the region and domestic forces opposed to Chinese Communist Party rule—could take advantage of a war with Taiwan to challenge the regime or seize Chinese territory. Chinese strategists write of the possibility of a "chain reaction" of wars cascading across China's frontiers. Such concerns are not new. Mao himself reputedly warned the PLA not to overlook problems outside the main theater. Indeed, Chinese historians note that none of the wars that China fought during the Cold War was in an area then designated as the "main strategic direction."[11] In the PLA's jargon, the military should not overemphasize the main strategic direction (the southeast coast; and the Taiwan Strait, in particular); it also needs to prepare for combat in other theaters.[12]

Combined, these competing concerns mean that the PLA has needed to generate capabilities less relevant to island landings, widely disperse its resources across the country (including allocating advanced fighters and other modern capabilities to other regions), balance the three naval fleets, and develop plans and train for a variety of contingencies.[13] The theater command system itself, as noted below, is optimized for smaller border clashes and not a single major conflict of the sort that would be prosecuted on Taiwan. Compounding the problem is the PLA's personnel system in which officers spend most of their careers in a single theater and are thus less fungible across different contingencies than, for instance, their American peers who frequently rotate to new assignments.

The June 2020 escalation with Indian troops along the disputed Himalayan border illustrates the countervailing pressures on PLA resources and attention.[14] The area is what the PLA refers to as a "secondary strategic direction," where the threats facing China are less intense than in the main strategic direction, but still require significant forces to deter or defeat a rival. To counter India and perform other missions such as defending China's Central Asian borders and deterring uprisings in ethnic majority regions, the PLA has allocated roughly a quarter of its ground forces to the Western Theater Command and the Tibet and Xinjiang military districts, complemented by eight fighter/ground attack brigades and four missile brigades.[15] These forces train for missions such as counterterrorism and high-altitude warfare and against the capabilities of particular adversaries that have little bearing on the operations China would conduct in a war with Taiwan.

Concerns about flare-ups in other regions and a broad distribution of capabilities have not prevented the military balance across the strait from shifting gradually in China's favor. PLA capabilities have regularly been used to intimidate Taiwan's leaders—for instance, by a steady rhythm of H-6 bomber flights around the island—and are sufficient for a range of cross-strait operations, including missile bombardments and a blockade.[16] Moreover, there are some circumstances in which Beijing might accept a high degree of risk to its

other interests to launch a war against Taiwan. For instance, a Taiwanese declaration of independence could generate a high degree of domestic pressure on the CCP to act. However, Taiwanese leaders have been careful to avoid such provocations, meaning that the likeliest scenario for China would be a calculated war of choice.[17] Yet competing considerations reduce China's ability to mass its forces in wartime and make the task of Taiwan's defense more manageable for Taipei and Washington.

A Chain of Porcupines

China's force planning dilemma provides options for thinking differently about Taiwan's defense prior to and during a conflict initiated by Beijing. Applying a competitive strategies approach, U.S. defense strategy in peacetime should aim to reduce China's ability to focus on Taiwan by maximizing the range and complexity of challenges facing the PLA in other theaters. This requires, in part, that the United States maintain a strong presence at many points along China's periphery, voice support for the defense of allies, and conduct high-end exercises with China's other rivals. Such activities, which are central to the current Indo-Pacific strategy, play into Chinese concerns about encirclement and add to the pressure to divide up resources among many theaters.[18]

Expanding security cooperation with other states would enhance those effects. Using Michael Beckley's twist of a phrase coined by William S. Murray, an explicit goal of U.S. strategy should be to ring China with "prickly porcupines" by supplying other states with the military tools necessary to resist coercion.[19] Providing additional training and advanced weapons and equipment, like antiship missiles, to states such as Vietnam, the Philippines, Indonesia, and Malaysia, would serve their interests in maintaining sovereignty while also ramping up the challenges the PLA Navy, Marines, and Air Force would have to counter outside the Taiwan Strait. By pursuing their own ends, these countries could indirectly contribute to Taiwan's defense without requiring them to be actively involved in cross-strait affairs.

From this perspective, expanded security cooperation with states far from China's southeast coast is particularly useful. India is a prime example. Upgrading defense ties with New Delhi has been a goal of the last few U.S. administrations, pursued most recently through renewed efforts to expand defense industry cooperation; approval of $3 billion in arms sales, including high-end items like air defense radars, MK 54 torpedoes, and Harpoon missiles; an agreement on the sharing of military intelligence; and combat-focused exercises in the Indian Ocean featuring India and Japan. Further arms sales and other assistance would not only serve India's interest in countering Chinese coercion, which has been piqued because of the 2020 border crisis, but also draw PLA resources away from the Taiwan Strait.

As Andrew Marshall explained regarding the Soviet Union, competitive strategies should also leverage bureaucratic fissures in the target country. Relevant here are China's tendency to carve up the budgetary pie with as many "winners" as possible, contestation between different parts of the PLA for scarce resources, and the lack of a strong central mechanism to adjudicate bureaucratic disputes. Increasing threats from smaller rivals in the South China Sea would not only take up time and capacity for the Southern Theater Command but also provide an argument for that theater to demand resources, which might otherwise go to the Eastern Theater Command. Deepening defense cooperation with India, for instance, would serve as a powerful rationale for the Western Theater Command to argue for more resources.

Selling more advanced arms to China's other neighbors in a bid to take pressure off Taiwan would probably not dissuade China from using force—any decision to use force assumes a high risk and cost tolerance and would be undertaken only in exigent circumstances. But it does encourage the PLA to spread out its limited resources, which ultimately works in favor of Taiwan's defense.

Critical Targets

U.S. strategy could also try to move the competition in new directions during a conflict. Such moves are typically discussed under the label of "horizontal escalation," involving attacks on an adversary's interests in a secondary theater.[20] In a Taiwan scenario, it is tempting to imagine U.S. forces leveraging their maneuverability to pose problems that tie up PLA resources elsewhere. However, opening a second front would be difficult because of the near certainty that India or other countries in the region would stay out of the conflict and the likelihood that U.S. leaders, attuned to the costs of a wider regional conflagration, would also try to avoid a larger war. As the congressionally mandated National Defense Strategy Commission argued, "It is unlikely that the United States could force its adversary to back down by applying pressure—military or otherwise—in secondary areas."[21]

In an indirect way, however, China's geostrategic circumstances give the United States additional warfighting options that do not rely on kinetic strikes or futile diversions. The starting point is that the PLA has adopted an organizational structure attuned to many small conflicts, and not to a single large contingency. This preference for smaller contingencies is reflected in the PLA's theater command system (which replaced the former military regions as part of the broad restructuring of the military that began in late 2015).[22] The Eastern Theater Command lacks all the capabilities that would be necessary to execute a war: amphibious and airborne units are based in adjacent theaters and space and cyber assets are under the Strategic Support Force. Countering U.S. intervention would require long-range missiles that are likely under the direct control of the Central Military Commission. In addition to mobilizing reinforcements, frontline commanders may have to request ammunition and equipment based in other theaters if major losses are sustained at the war's outset.

The limitations of China's theater command structure mean the war would

be centrally managed, most likely by the Joint Staff Department in Beijing. Logistics operations would rely on a distributed network of depots controlled by the Joint Logistic Support Force in Wuhan.[23] Then, rather than focusing mainly on the Taiwan Strait, U.S. operations should try to sever the command and control and logistics networks critical to Beijing's ability to manage the war (while preserving critical U.S. networks that would be targeted by the PLA). Such operations would leverage what one RAND study deems potential Chinese weaknesses in cyber defense,[24] and may benefit from recent investments, such as the U.S. Army's creation of information operations detachments within its multidomain task force concept, which include both cyber and electronic warfare capabilities.[25] Even if the PLA is able to reconstitute those systems, the disruption could frustrate China's decisionmaking process and buy valuable time for U.S. forces to intervene, without the need for kinetic strikes. An added virtue is that this approach exploits a PLA organizational culture that emphasizes centralization, in contrast to the U.S. "mission command" philosophy of empowering commanders to implement approved policy aims without precise direction and intensive management oversight.

Generating those effects would also benefit from information operations that try to exploit cleavages in Chinese civil-military relations. During a conflict, the PLA would likely argue that it is fully capable of managing the conflict while adequately defending China's security in secondary theaters. However, civilian leaders, prone to years of PLA dissembling and obfuscation, would approach those assurances with at least some skepticism.[26] Information operations that raise questions about the PLA's competence—such as misinformation suggesting that key systems may not be completely reliable—would exacerbate those doubts and potentially lead to additional delays as problems are investigated. This would create new opportunities for U.S. forces to seize the initiative and sustain a higher decision tempo than PLA leadership can operate within.

Conclusion

Taiwan benefits from regional disturbances, such as the recent clash with India, in direct and indirect ways. The possibility of a conflict with other rivals forces China's constrained resources to be broadly dispersed and its troops trained and equipped for diverse scenarios. Such contingencies have also produced a theater structure not well suited to a war. These are systemic weaknesses for the PLA that could be leveraged to shift the competition to areas beyond the Taiwan Strait, rendering the task of countering Chinese operations in the main theater more manageable. Playing to existing concerns among Chinese strategists, U.S. alliances could be deepened to overextend PLA assets, while critical links in the PLA's command structure could be targeted in a conflict

Sailor stands spy radar system control watch aboard USS *Barry* during routine transit of Taiwan Strait, September 17, 2021 (U.S. Navy/Justin Stack)

to reduce its capacity to mass force. Success depends on prudent stewardship of U.S. defense relations and smart investments, including greater resources for U.S. Cyber Command to pursue electronic warfare capabilities.[27]

This approach, however, comes with a key caveat: U.S. assistance to Taiwan itself should remain focused on vital areas, such as capabilities necessary to thwart an invasion.[28] Flashy upgrades in U.S.-Taiwan defense cooperation envisioned in recent U.S. legislation, such as high-level visits or port calls, would spark the ire of the Chinese public and shine a spotlight on problems in the Taiwan Strait, reducing attention to the Himalayas, the East China Sea, or the Korean Peninsula. Such activities, though intended to deter Chinese adventurism, could paradoxically make it more likely. **JFQ**

Notes

[1] For a longer version of this assessment, see Joel Wuthnow, *System Overload: Can China's Military Be Distracted in a War Over Taiwan?* China Strategic Perspectives No. 15 (Washington, DC: NDU Press, June 2020), available at <https://inss.ndu.edu/Media/News/Article/2232448/system-overload-can-chinas-military-be-distracted-in-a-war-over-taiwan/>.

[2] *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2020* (Washington, DC: Office of the Secretary of Defense, 2020), 166.

[3] For a summary, see Drew Thompson, "Hope on the Horizon: Taiwan's Radical New Defense Concept," *War on the Rocks*, October 2, 2018, available at <https://warontherocks.com/2018/10/hope-on-the-horizon-taiwans-radical-new-defense-concept/>.

[4] Specifically, the Taiwan Relations Act states that U.S. policy is to "maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan." See U.S. Congress, *Taiwan Relations Act*, Public Law 96-8, 22 U.S.C. 3301 et seq., 96th Cong., 1st sess., January 1, 1979, available at <https://www.ait.org.tw/our-relationship/policy-history/key-u-s-foreign-policy-documents-region/taiwan-relations-act/>.

[5] Kathy Gilsinan, "How the U.S. Could Lose a War with China," *The Atlantic,* July 25, 2019, available at <https://www.theatlantic.com/politics/archive/2019/07/china-us-war/594793/>.

[6] Andrew W. Marshall, *Long-Term Competition with the Soviets: A Framework for Strategic Analysis*, R-862-PR (Santa Monica, CA: RAND, 1972). For a recent discussion, see Thomas G. Mahnken, ed., *Competitive Strategies for the 21st Century: Theory, History, and Practice* (Stanford: Stanford University Press, 2012).

[7] *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge* (Washington, DC: Department of Defense, 2018), 4.

[8] Terrence J. O'Shaugnessy, Matthew D. Strohmeyer, and Christopher D. Forrest, "Strategic Shaping: Expanding the Competitive Space," *Joint Force Quarterly* 90 (3rd Quarter 2018), 10–15.

[9] For instance, the growth of China's official defense spending has slowed in recent years. The 2020 budget was approximately $178 billion, though experts believe the true number is somewhat higher. U.S. defense spending in 2020 was approximately $722 billion, which was needed to support global obligations. See Yew Lun Tian, "China Defence Spending Rise at Three-Decade Low, Still to Grow 6.6%," Reuters, May 21, 2020, available at <https://www.reuters.com/article/us-china-parliament-defence/china-defence-spending-rise-at-three-decade-low-still-to-grow-6-6-idINKBN22Y081>.

[10] For a broad overview, see Andrew J. Nathan and Andrew Scobell, *China's Search for Security* (New York: Columbia University Press, 2012).

[11] For instance, during the Korean War, the main strategic direction was in the southeast; during the 1979 border war, it was in the north.

[12] Wuthnow, *System Overload*, 8–11.

[13] See Andrew Scobell et al., eds., *The People's Liberation Army and Contingency Planning in China* (Washington, DC: NDU Press, 2015).

[14] M. Taylor Fravel, "China's Sovereignty Obsession," *Foreign Affairs,* June 26, 2020, available at <https://www.foreignaffairs.com/articles/china/2020-06-26/chinas-sovereignty-obsession>.

[15] Frank O'Donnell and Alexander K. Bollfrass, *The Strategic Postures of China and India: A Visual Guide* (Cambridge, MA: Belfer Center for Science and International Affairs, March 2020), available at <https://www.belfercenter.org/publication/strategic-postures-china-and-india-visual-guide>.

[16] Derek Grossman et al., *China's Long-Range Bomber Flights: Drivers and Implications*, RR-2567-AF (Santa Monica, CA: RAND, 2018).

[17] Most recently, Tsai Ing-wen has lowered the barriers to an independence referendum but "strategically left out plebiscites on constitutional change," including on sovereignty issues. See J. Michael Cole, "Now Is Not the Time for a Referendum of Taiwanese Independence," *The National Interest*, February 19, 2019, available at <https://nationalinterest.org/feature/now-not-time-referendum-taiwanese-independence-45037>.

[18] Joel Wuthnow, *Just Another Paper Tiger? Chinese Perspectives on the U.S. Indo-Pacific Strategy*, INSS Strategic Forum No. 305 (Washington, DC: NDU Press, June 2020).

[19] Michael Beckley, "The Emerging Military Balance in East Asia," *International Security* 42, no. 2 (Fall 2017), 117; William S. Murray, "Revisiting Taiwan's Defense Strategy," *Naval War College Review* 61, no. 3 (Summer 2008), 2–27.

[20] Michael Fitzsimmons, "Horizontal Escalation: An Asymmetric Approach to Russian Aggression?" *Strategic Studies Quarterly* 13, no. 1 (Spring 2019), 95–133.

[21] *Providing for the Common Defense: The Assessment and Recommendations of the National Defense Strategy Commission* (Washington, DC: United States Institute of Peace, 2018), available at <https://www.usip.org/sites/default/files/2018-11/providing-for-the-common-defense.pdf>.

[22] See Phillip C. Saunders et al., eds., *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms* (Washington, DC: NDU Press, 2019).

[23] The Joint Logistic Support Force was central to the PLA's COVID-19 response in the city of Wuhan in early 2020. See Joel Wuthnow, "Responding to the Epidemic in Wuhan: Insights into Chinese Military Logistics," *China Brief* 20, no. 7 (April 13, 2020), available at <https://jamestown.org/program/responding-to-the-epidemic-in-wuhan-insights-into-chinese-military-logistics/>.

[24] Eric Heginbotham et al., *The U.S.-China Military Scorecard: Forces, Geography, and the Evolving Balance of Power 1996–2017* (Santa Monica, CA: RAND, 2015), 266–268.

[25] Sean Kimmons, "Army to Build Three Multi-Domain Task Forces Using Lessons from Pilot," U.S. Indo-Pacific Command, October 15, 2019, available at <https://www.pacom.mil/Media/News/News-Article-View/Article/1989387/army-to-build-three-multi-domain-task-forces-using-lessons-from-pilot/>.

[26] On problems in civil-military relations, see Phillip C. Saunders and Joel Wuthnow, "Large and in Charge: Civil-Military Relations Under Xi Jinping," in *Chairman Xi Remakes the PLA*, Saunders et al., 519–555.

[27] Mark Pomerleau, "Does Cyber Command Need More Electronic Warfare Tools?" *Fifth Domain*, May 21, 2019, available at <https://www.fifthdomain.com/dod/2019/05/21/does-cyber-command-need-more-electronic-warfare-tools/>.

[28] Such a strategy complements Taiwan's "overall defense concept," which focuses primarily on ways to counter a prospective Chinese invasion. For a discussion, see Thompson, "Hope on the Horizon."

Hawaii National Guardsman assigned to Task Force Hawaii administers COVID-19 vaccine to Department of Education employee at Kealakehe High School, March 6, 2021, Kona, Hawaii (U.S. Army National Guard/John Schoebel)

Health, Pandemic Preparedness, and Multidomain Operations

By Samir S. Deshpande, Amy B. Adler, Susan P. Proctor, Vincent F. Capaldi, James P. McClung, Toby D. Elliman, and Deydre S. Teyhen

Historically, infectious disease has been one of the most significant threats to U.S. Servicemembers on the battlefield, constituting the largest source of mortality through World War I and a significant source of casualties and nonbattle injury through the present day.[1] During World War II, General Douglas MacArthur famously expressed his frustration with malaria's operational impact: "It's going to be a very long war if for every division I have facing the enemy, I have one sick in hospital and another recovering from this dreadful disease."[2] More recently, David Matson, an infectious disease clinician, vividly described the impact of diarrheal disease: "I expect that our imaginations cannot fathom the problems attendant from the absolute urgency for relief

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from explosive vomiting and diarrhea when experienced within an armored vehicle under fire and at ambient temperature of >40°C."[3]

To manage infectious disease domestically, the United States developed a robust public health system that supported sanitation, water treatment, and vaccinations, effectively reducing the risk for the population. The inadvertent consequence of these successful efforts is that the modern American warfighter is at an immunological disadvantage in certain locations; Servicemembers do not necessarily share the acquired immunity to endemic diseases that locally based forces may, creating a gap in force health protection.

Besides traditional diseases, some emerging infectious diseases pose an even greater danger to Servicemembers and local communities. Poor understanding of disease transmission mechanisms, unknown durability of immunity, and a dearth of effective diagnostics or countermeasures can stress medical systems to a breaking point—as has been the case during the COVID-19 pandemic, which has had broad impacts on military operations, ranging from altered training schedules to the diversion of the USS *Theodore Roosevelt* to Guam due to a shipboard outbreak.[4]

Even limited epidemics of emerging diseases can cause significant disruption. In 2012, Middle East respiratory syndrome coronavirus (MERS-CoV), a cousin of SARS-CoV-2, led to outbreaks in Saudi Arabia and South Korea, resulting in a fatality rate of nearly 40 percent of those infected.[5] Critically, these outbreaks could have spread to the thousands of U.S. Servicemembers deployed to both areas. Moreover, to date, there is still no approved vaccine against MERS-CoV.

Viral infections such as SARS-CoV-2 are not the only threats; bacterial infections can significantly complicate recovery from wounds sustained during combat. Traumatic combat injuries alter human physiology by disrupting the body's first line of defense—skin—and inducing contamination, significantly increasing the risk of infection. When combat injury is sustained in the context of blast exposure, the immune response is also suppressed and may limit the efficacy of antibiotics.[6] Already a major concern during previous conflicts, the risk of combat wound infection is forecasted to grow during future conflicts and multidomain operations (MDOs) as antibiotics grow increasingly ineffective due to multidrug-resistant organisms. Moreover, the anticipated difficulty in battlefield evacuation limits treatments options.

In the MDO environment, Servicemembers will likely not be able to follow traditional health guidelines, such as quarantining, regular handwashing, physical distancing, and receiving advanced medical care. These limitations heighten the risk of sickness and underscore the necessity of pathogen surveillance, new countermeasure development, and low-tech strategies to enable Servicemembers to remain in the fight.

Additionally, military assets are sometimes called on to respond directly to infectious disease crises. While these noncombat missions afford greater opportunity for the use of appropriate risk-mitigation strategies, Servicemembers are still at risk when deployed to these environments. Servicemembers are playing an active role in the response to COVID-19, supplementing civilian medical infrastructure and supporting mass vaccination campaigns in addition to facing exposure to the virus at Department of Defense (DOD) installations and hospitals.[7] This support is not unique to COVID-19. In 2014, approximately 2,500 Servicemembers deployed to West Africa as part of Operation *United Assistance*. As part of their work to construct treatment units, train healthcare workers, and provide laboratory testing capacity, these individuals were at risk from not only the ongoing Ebola outbreak but also endemic diseases, notably malaria.[8]

A Perpetual Challenge

Countless factors indicate that the threat of infectious disease will only worsen, underscoring the need for a robust military capability to address outbreaks and ensure force health protection. One major factor driving this increased threat is climate change, which was listed in a 2019 DOD report as a national security issue with potential impacts to missions, operational plans, and installations.[9]

Both climate and weather are significant factors regulating the life cycles of mosquitoes, ticks, and other vectors of diseases such as Lyme, dengue, yellow fever, or Zika. Warmer conditions could increase the geographic range and number of months in the year where diseases and vectors are viable, allowing infection to spread more freely.[10] Consistent with this concern, a recent study found that a broad range of insects can migrate hundreds of kilometers on wind currents—potentially spreading disease while they travel.[11] Diarrheal disease, listed as the Military Infectious Disease Research Program's number-one infectious disease threat to deployed Servicemembers, is also likely to worsen because of climate change. Higher temperatures will create more favorable conditions for disease-causing agents, and more extreme weather events, such as severe rainfall or hurricanes, can damage or overwhelm water treatment systems, raising the risk of contaminated water.[12] As David Matson has described, diarrhea has the potential to wreak havoc on small military teams operating in confined environments.[13]

Beyond climate change, many emerging infectious diseases originate in animals. The H1N1 influenza outbreak of 2009 (the so-called swine flu) originated from pigs; certain coronaviruses, such as SARS-CoV-2 and MERS-CoV, are often traced to bats.[14] New pathogens can emerge in areas with limited public safety, health care, and regulatory infrastructure, spreading from a local emergency to an international disaster. Though medical countermeasure development is ongoing at government, academic, and industry laboratories around the world, this process can be slow. Vaccines typically require 7 to 10 years for design, preclinical and clinical testing, and Food and Drug Administration approval. A massive investment of time and more than $15 billion at the beginning of the COVID-19 pandemic shortened this timeline, with the government accepting financial risk to manufacture millions of doses before

Servicemembers converse between treatment of COVID-19 patients at monoclonal infusion site in St. George, Utah, November 4, 2021 (U.S. Army/ Timothy Hughes)

clinical trials proved vaccines safe and effective.[15] Though this gambit yielded three vaccines within approximately 1 year, a global end to this pandemic is expected to take several years.

In the absence of any incentive, however, industry and academia often focus on diseases with the largest potential customer base—typically treatments for chronic health conditions. Even when developing countermeasures for infectious disease threats, researchers may not factor in the unique needs of the warfighter unless they are working directly with a military medical laboratory. Given that the far-forward warfighter needs to deploy rapidly to and operate in any context—including dense urban and subterranean environments, jungles, forests, and other locations that could serve as disease reservoirs—tailored strategies are needed. Even effective vaccines can require time or multiple injections to induce a protective response. For example, the vaccine against yellow fever, a disease commonly found in South America and sub-Saharan Africa, requires approximately 10 days to induce an immune response. A Servicemember who must deploy prior to that 10-day period risks infection.

Thus, military medical research institutions around the world are working to identify, prevent, and overcome known and unknown disease threats to ensure force health protection. In particular, the Walter Reed Army Institute of Research (WRAIR) and Naval Medical Research Center address disease threats globally through surveillance, medical diplomacy, partner capacity-building, and product development. These DOD assets include WRAIR's overseas directorates in Southeast Asia (Armed Forces Research Institute of Medical Sciences), Africa (U.S. Army Medical Research Directorate–Africa), and Europe (U.S. Army Medical Research Directorate–Georgia). These laboratories are strategically positioned to support international efforts to develop medical countermeasures that address established and emerging diseases.

Protecting the Joint Force

In the absence of medical countermeasures, what strategies can leaders and warfighters employ to help safeguard force health? Sleep and psychiatry researchers at WRAIR, working alongside nutrition and performance researchers at the U.S. Army Research Institute of Environmental Medicine, have identified that the strategies used to ensure units are fit and deployable can also help mitigate risk of infection. These strategies are an integral part of readiness and include "domains" of adequate sleep, physical activity, healthy diet, and stress management. Indeed, in explicit recognition of the importance of leveraging these factors collectively, the Army has developed Holistic Health and Fitness (H2F), a comprehensive system to optimize Soldier and unit performance by integrating best practices in these physical and nonphysical domains.[16] These same integrated strategies may also help mitigate risk of infection.

Physical Activity. Physical fitness is a basic requirement for military service and can be the difference between life and death in contested operational environments. Underscoring its importance, a growing body of evidence suggests

that regular physical activity can be beneficial to the immune system. For example, higher levels of physical activity are associated with a 10 percent lower risk of COVID-19 infection; similarly, physical inactivity prior to the pandemic period was a strong risk factor for severe COVID-19.[17] While physical activity is not a panacea, it can provide at least some force health protection when considered at the population level.

After a single bout of exercise, the body experiences a marked increase in immune system activity. Researchers believe this increase marks the movement of elements of the immune system to the body's frontlines (the lungs, gut, and so forth) to meet and overcome invading pathogens.[18] Similar data exists for long-term training, with one study demonstrating that athletes show lower rates of upper respiratory tract infections compared with more sedentary individuals.[19] While a range of factors associated with exercise governs and complicates the immune response, including type (endurance, resistance, stretching) and character (intensity, duration, frequency, recovery), the majority of evidence points toward a positive effect.

It is important to note that, just as overtraining or excessive exercise—a common occurrence during military training—can cause musculoskeletal injury, overtraining has also been linked to a *suppressed* immune system.[20] Maintaining appropriate exercise regimens that are vigorous, challenging, and sustainable is one way that military leaders can support fitness, readiness, and resilience in the warfighter.

Sleep. Responding to the growing understanding of sleep's role in military performance, Major General William Burleson, director of operations for U.S. Forces Korea, coined the saying, "Sleep is ammunition for your brain." For decades, studies have demonstrated that sleep loss negatively affects emotion regulation, psychological resilience, learning and memory, judgment, cognitive performance, and reaction time. In one study, after 3-day field exercises the ability to identify and accurately target the enemy decreased by 220 percent, while errors in decisionmaking increased by 86 percent and reaction time worsened by 22 percent.[21]

Recent evidence also suggests that sleep is just as important for healthy immune function and the ability to fight off infection. In one study, volunteers without previous exposure to the common cold were exposed to a live cold virus. Researchers found that no variable predicted whether a participant would fall sick better than sleep duration—not even age or stress level.[22] In other words, those who habitually slept less were more likely to fall ill with a cold virus. A follow-on study identified a "sleep threshold," noting that individuals who slept less than 6 hours per night were at significantly greater risk of cold infection compared with those who slept 7 to 9 hours.[23] In addition, there is now limited but compelling evidence from preclinical studies using animal models that suggests sleep not only helps protect against initial infection but also plays a direct role in aiding recovery from infectious illness and response to immunization.[24]

Despite the importance of sleep in keeping Servicemembers healthy, studies show that approximately 62 percent of Soldiers get less than 6 hours of sleep per night.[25] While mission requirements do not always allow for a full 7 to 9 hours of sleep, there are strategies to mitigate performance decrements associated with inadequate sleep. Sleep banking, or increasing sleep prior to a period of limited sleep, builds resilience to the negative effects of sleep loss.[26] Other warfighter-focused strategies have been developed to mitigate the risk of performance decline during nocturnal operations, high-altitude missions, and long-distance travel.[27] Under garrison conditions, it is also critical that leaders allow Servicemembers time to get enough sleep or recover from sleep loss due to mission requirements. These strategies that promote sleep may in turn benefit Servicemembers' immune systems.

Diet. Not only is proper nutrition a critical component to military readiness, but it is also a significant contributor to a healthy immune system. Undernutrition is a critical threat: The absence of key nutrients can directly limit the body's ability to protect itself from pathogens. A lack of vitamin D can limit the production of antimicrobials and compromise the skin, the primary barrier against infectious disease. A lack of iron and zinc directly threatens the function of white blood cells, which include the body's "first responders" against pathogens.[28] Poor nutrition can even increase harm from infectious disease—one study found that low levels of the nutrient selenium caused viral mutations resulting in a more damaging infection.[29]

Obesity can also stress the immune system. Obesity is one of the most pressing challenges to military readiness because it significantly hampers performance. As of August 2019, approximately 17 percent of military personnel were considered obese, with the highest rates in the Navy, at 22 percent.[30] Studies have identified a greater risk of hospital-acquired infections, more severe respiratory infections, and a greater overall risk of viral and bacterial infection for individuals with obesity.[31] Furthermore, individuals with obesity are still at risk of missing critical nutrients from their diets, further compounding potential health risk.[32]

These factors make it all the more critical that leaders and individuals take a balanced, healthy diet seriously. Efforts to improve readiness should consider the nutritional composition of operational rations and meal options available in garrison and at home. Foods provided by the Services, including operational rations and garrison meal plans, must meet the standards for nutritional requirements described in Army Regulation 40-25, *Nutrition and Menu Standards for Human Performance Optimization*.[33] These requirements are based on the Dietary Guidelines for Americans, with adjustments to accommodate increased energy expenditure and other operational demands of military service.[34] That said, military personnel consume the majority of meals outside of military dining facilities. Current efforts are thus focused on improving the nutritional quality of foods offered at on-post locations, such as commissaries, restaurants, and recreational facilities. Harmonizing standards for food and nutrition in all locations serving

Electrician's mate 3rd class Maggie Flatt plays violin during mental health awareness event on mess decks of aircraft carrier USS *Ronald Reagan*, Philippine Sea, September 27, 2021 (U.S. Navy/George Cardenas)

military personnel and their families will be paramount for ensuring optimal immune health and readiness.

Mental Stress. Mental stress can manifest in a range of ways, from lack of engagement with one's job to behavioral health problems. During Operation *Iraqi Freedom* and Operation *New Dawn*, behavioral health problems constituted 12.1 percent of medical evacuations; during Operation *Enduring Freedom*, 10.1 percent.[35] Even for those who were not necessarily evacuated during deployment, 23 percent of Servicemembers report post-traumatic stress disorder after returning home.[36] Not only does mental stress result in diagnosable conditions, but it can also impede performance during combat. Soldiers in combat may become so mentally stressed that they are unable to function for a period of time. In two studies, more than 40 percent of Soldiers who experienced a combat-related event reported encountering team members with an acute stress reaction.[37]

Mental stress may also impact the immune system. One study found that self-reported stress best predicted whether volunteers exposed to the influenza virus would show symptoms.[38] Another study found that individuals who reported high levels of mental stress for at least a month were two to three times more likely to develop colds compared with those reporting less stress when challenged with a cold virus.[39] In addition, mental stress also can worsen disease. Stress may increase the likelihood of a disease becoming symptomatic (as opposed to mild, asymptomatic infection) or more active (some viruses, such as herpes, can lay dormant after infection, with symptoms recurring over time in response to stress).[40]

Efforts have also tracked the COVID-19 pandemic's impact on Soldier mental health. The first iteration of this study linked pandemic concerns to behavioral health symptoms—Soldiers reporting more fears and concerns about the pandemic were up to four times more likely to screen positive for depression or anxiety.[41] These results informed the development of resources to help units address and overcome a range of behavioral health concerns related to the COVID-19 pandemic.[42]

Healthy Lifestyles and Vaccine Efficacy

A healthy lifestyle requires balancing activity, sleep, diet, and stress. Indeed, all four are intrinsically linked to one another. High stress may result in difficulty falling asleep, poor diet (for example, consuming excess alcohol or eating fast food), or lack of motivation to exercise. Poor nutrition can result in diminished physical and cognitive performance and sleep disturbance. Not only can a holistic approach such as H2F support military performance, but

it can also be important in protecting Servicemembers from infectious disease. Likewise, just as leadership is critically important in promoting components of H2F, it is critical that leaders consider and address these elements together when combating a pandemic.

Such factors are particularly important given that sleep, exercise, nutrition, and stress can significantly impact vaccine efficacy. One study found that nonresponsiveness to hepatitis B vaccination was more than eight times greater in individuals with obesity than in those at a healthy body weight.[43] Studies have shown that both acute and chronic stress can impair the production of antibodies, the body's means of flagging invaders for attack by the immune system.[44] Six months after receiving a hepatitis B vaccination, individuals who slept fewer than 6 or 7 hours the night prior to vaccination were at significant risk of being unprotected compared with those who slept more than 7 hours.[45] Both acute and prolonged exercise prior to vaccination can actually enhance the immune response as a result of vaccination.[46] Collectively, such research suggests that a healthy force may help reduce the threat of infectious disease.

Research at WRAIR, the U.S. Army Research Institute of Environmental Medicine, and elsewhere is aimed at identifying how healthy lifestyle changes can improve immune response. Identifying and implementing these healthy behavioral changes can provide the military with an additional edge in combatting infectious disease and support force readiness.

Leadership and Unit Adoption

Leaders are key to implementing and sustaining these changes, with numerous studies documenting their role in health-related outcomes. For example, one study found that, when Soldiers view their officer and noncommissioned officer leadership as effective, there is a near fourfold reduction in risk of psychological problems.[47]

Other studies, conducted in settings from deployment to mandatory quarantine, found that specific leader behaviors

On January 6, 1777, following the Battle of Princeton, George Washington ordered beginning of yearlong mass inoculation of Continental Army forces against smallpox; George Washington and Marquis de Lafayette on horseback during winter quarters at Valley Forge, Pennsylvania, oil painting by John Ward Dunsmore, 1907 (Library of Congress)

are associated with a range of positive outcomes, including increased resilience, better mental health, increased engagement in stress-mitigating activities, and better attitudes toward preventive health measures.[48] Most recently, Soldiers who reported their immediate leaders engaged in COVID-19 leadership behaviors (for example, following COVID-19 health guidelines, acknowledging the stress of the pandemic) also reported fewer mental health symptoms and greater adherence to COVID-19 health guidelines.[49] Importantly, in each study, the benefits of specific leadership behaviors were found even when controlling for overall leadership ratings.

At every level, military leaders can create a culture that supports exercise, sleep, nutrition, and stress mitigation through encouraging healthy behaviors in their units and following their own recommendations. These lifestyle factors can directly impact health outcomes and the ability of their units to reduce the threat of infectious disease.

Conclusion

Infectious diseases have altered the course of history. Smallpox nearly ended the Revolutionary War in 1776, leading to an order from George Washington's headquarters beginning, "The General has nothing more at heart, than the Health of the Troops."[50] More than two centuries later, infectious disease remains one of the most consequential threats to Servicemembers, capable of compromising units in combat or before they even reach the battlefield. In particular, during MDOs when small teams are expected to function effectively with limited support, every casualty represents a significant threat to the overall effectiveness and survival of the team.

In a world with dozens of known diseases without safe, reliable countermeasures and the potential for new pandemics to emerge at any moment, leader support for positive lifestyle choices can improve the resilience of the force to disease, potentially improving their odds of remaining safe, healthy, and in the fight. **JFQ**

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Soldiers with Southern landing force on beach at Massacre Bay, Attu Island, Aleutian Islands, May 11, 1943 (U.S. Navy/Library of Congress)

Remembering the "Forgotten War"

The Joint Operations Flaws of the Aleutian Campaign

By Jessica D. Pisano

The lessons that can be gleaned from the Aleutian campaign of 1942–1943 may seem outdated, but they remain significant in today's global environment. The 2019 Department of Defense Arctic Strategy underscores the importance of deterring and defeating Great Power aggression in the Arctic, specifically addressing challenges in understanding the operational environment, joint training proficiency, lack of a robust logistics infrastructure, and communications and technology complexity, all of which are further complicated by the Arctic's rapidly changing physical environment.[1] In the past 2 years, the Army, Navy, and Air Force have all released their own Service-specific Arctic strategies that echo the importance of the Arctic. Diminishing sea ice is making Arctic waters more accessible and navigable, increasing both commercial traffic and military pres-

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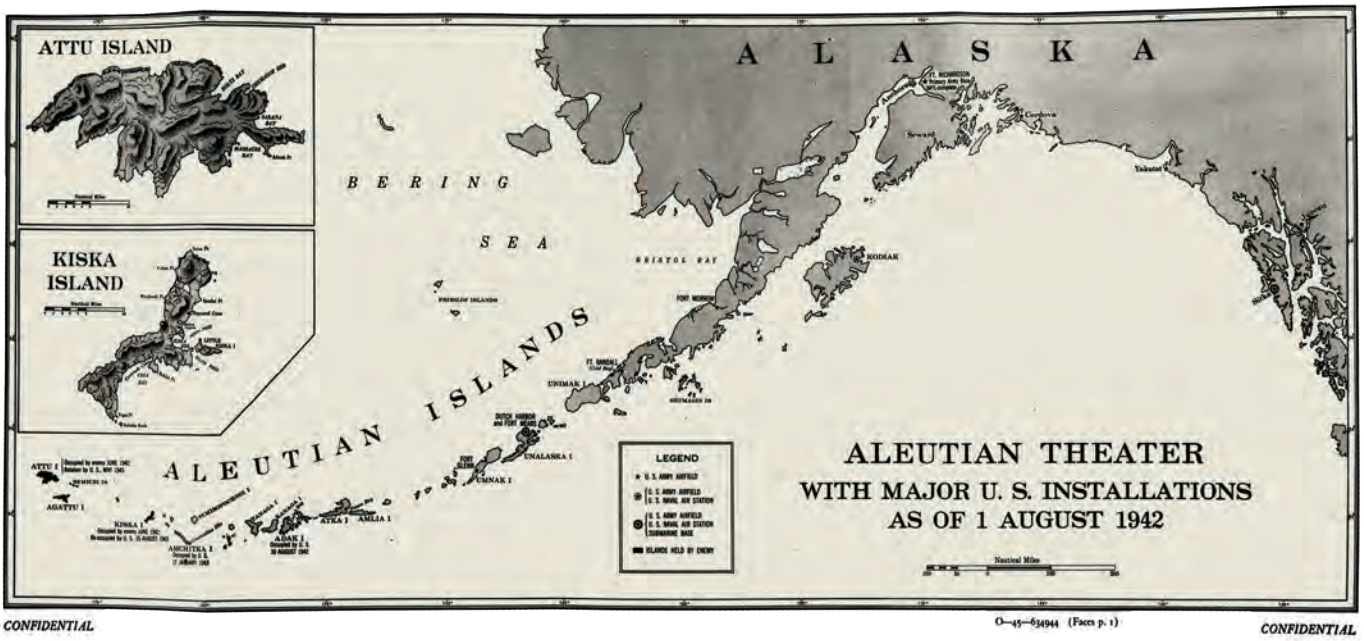

U.S. installations in Aleutian Theater as of August 1, 1942, prepared for U.S. Navy Office of Naval Intelligence Combat Narrative Report (U.S. Navy)

ence.[2] Furthermore, thawing permafrost is destabilizing the already inadequate infrastructure and complicating land accessibility in the Arctic region.

In addition to the Arctic's transforming physical environment, Great Power competitors are asserting their dominance in the region. Russia has focused on increasing its power projection capabilities by modernizing Cold War–era military facilities and building new infrastructure there. With the advent of the Belt and Road Initiative, China is extending its economic reach and increasing its fleet of icebreaking vessels, posturing itself as a major player in the region. The United States will be woefully unprepared to deter and defeat these emerging threats in the Arctic if it does not invest in addressing the challenges and inadequacies depicted in the 2019 Department of Defense Arctic Strategy.

The Air Force's Arctic strategy fittingly states, "The environment is often cited as the greatest adversary to Arctic operations."[3] Communications capabilities, the use of global positioning systems, and domain awareness are complicated in the Arctic due to the atmospheric interference that occurs above 65° north latitude and the harsh weather conditions, which include repeated freezing and thawing cycles in addition to temperatures below minus 60° Fahrenheit.[4] Additionally, the ability of U.S. forces to survive and operate in these extreme temperatures requires specialized training, increased and specialized infrastructure, and a robust logistics network that does not exist today. Although the United States may have made some progress in overcoming some of the flaws exposed in the Aleutian campaign almost 80 years ago, the recently released Arctic strategies make clear that, although joint planners may acknowledge the challenges in the Arctic, the United States still has a long way to go in overcoming these obstacles and being prepared to deter and defeat adversaries in the Arctic battlespace.

Background

The Aleutians theater of the Pacific war might well be called the Theater of Military Frustration. . . . Sailors, soldiers and aviators alike regarded the assignment to this region of almost perpetual mist and snow as little better than penal servitude.

—*Samuel Eliot Morison,* History of U.S. Naval Operations in World War II, *Vol. 7*, Aleutians, Gilberts, and Marshalls: June 1942–April 1944

Set in arguably the most desolate location in the North Pacific, the Aleutians are a practically uninhabited volcanic island chain shrouded in nearly year-round dense fog and characterized by jagged mountains and meager vegetation. Extending 1,000 miles from the Alaskan mainland, the island of Attu on the chain's westernmost point is less than 700 miles from Japan's Kurile Islands and only 6 miles from Siberia. The isolated terrain and seemingly demonic weather of the Aleutians still give pause to modern pilots and sailors.

Almost a half million members of the U.S. military were stationed in the North Pacific during World War II—five times the Japanese force strength.[5] At the height of the campaign, U.S. forces reached 400,000, more than five times the total Alaskan population of 75,000.[6]

The Japanese aerial attack on Dutch Harbor on June 3, 1942, signified the official start of the Aleutian campaign. Japanese strategy included four objectives in the Aleutians: preventing military collaboration between the United States and the Soviet Union, which had not yet entered the war; interdicting the Lend-Lease supply route; protecting the northern flank of the Japanese homeland from U.S. attack, since the Japanese were still convinced the Doolittle Raid had

launched from the Aleutians; and occupying strategic points along the chain of islands that the enemy could use to launch operations in the North Pacific to threaten either the United States or the Soviet Union.[7]

Initially, the Japanese objective of the Dutch Harbor attack, which was scheduled to begin 1 day prior to the Battle of Midway, was a diversionary tactic to mask the attack on the Midway Islands and to draw the U.S. fleet out of Hawaii. After their utter defeat in the Battle of Midway, however, the Japanese looked to the Aleutians to salvage a victory, utilizing successful operations there as a propaganda initiative to boost morale and cloak the Midway mess.[8] Before the sun crested the horizon on June 7, the Japanese forces, undetected and unopposed, invaded and occupied the islands of Kiska and Attu.[9]

The Allied response to the invasion of the Aleutians began on June 11 with an aerial bombardment against Attu and Kiska that did not cease until the conclusion of the campaign on August 24, 1943.[10] U.S. strategic objectives in the Aleutian campaign included evicting the Japanese from U.S. soil, protecting sea lines of communication (SLOCs) for the Lend-Lease route with the Soviet Union, and safeguarding the U.S. homeland by preventing the Japanese from using the Aleutians as a base of operations and staging ground.[11] The United States had its own operational objectives in the Aleutians of building infrastructure by establishing bases and airfields along the island chain.[12]

The Battle of the Komandorski Islands in March 1943 was the turning point in the Aleutian campaign as the U.S. naval blockade effectively severed the Japanese SLOCs for resupply to Kiska and Attu for the remainder of the campaign. Although U.S. naval forces were severely outnumbered by the Japanese imperial fleet, Japanese forces feared the intervention of U.S. bombers and retreated when they held the obvious advantage. The Battle of the Komandorski Islands, "the longest and last classic daylight surface battle in naval history," proved to be the culminating point for the Japanese, effectively isolating their Aleutian garrisons.[13]

The recapture of Attu, named Operation *Landcrab*, commenced on May 11, 1943. Ultimately, 15,000 U.S. troops needed almost 3 weeks, instead of the projected 3 days, to defeat a force of fewer than 3,000 Japanese, and scores of lives were lost due to profuse failures in joint operations.[14] The invasion of Attu was the U.S. infantry's first amphibious island assault landing and proved to be the second most costly battle in the Pacific theater, exceeded only by Iwo Jima, in proportion to the number of troops engaged.[15]

Although "the oddest battle of the Aleutian campaign," the mysterious Battle of the Pips, offered no tactical victory to the campaign, the expenditure of fuel and ammunition required the U.S. fleet to abandon its station and return east for resupply, enabling the Japanese evacuation force to reach Kiska undetected.[16] The Battle of the Pips refers to an incident that occurred on the night of July 27, 1943, when a series of unknown radar contacts, or "pips," was picked up by U.S. naval forces west of the island of Kiska. Believing it was the imperial navy, U.S. forces opened fire, but hits were never confirmed, and the Navy could not determine what had been on the radar. According to author Brian Garfield, "Japan had no known surface ships in those waters. [Its] evacuation fleet was hundreds of miles away to the south."[17] Garfield also surmises, based on analysis by modern Aleutian fishing boat captains, that the pips were flocks of short-tailed shearwaters, a species of migratory albatross that pass through the Aleutians every July. These birds fly close together in huge flocks, which would have appeared as a single mass on radar screens of the time period. Furthermore, the flocks zigzag when searching for food, not unlike the path of a ship under fire.[18]

Operation *Cottage*, the Allied invasion of Kiska that comprised 34,400 U.S. and Canadian troops and nearly 100 ships, occurred on August 15.[19] Although some joint lessons in supplies and equipment learned in Operation *Landcrab* were implemented for Operation *Cottage*, other aspects of joint training and intelligence collection were largely ignored by planners. The result was the Allied invasion of an island that the Japanese had deserted almost 3 weeks prior. Despite the absence of an opposing force, the Allies still sustained 306 casualties during the invasion. Seventeen Americans and 4 Canadians died, and a further 50 personnel were wounded by friendly fire or Japanese booby traps. Trench foot claimed 130 troops, and 71 Sailors were killed and 34 injured when the destroyer USS *Abner Read* struck a Japanese mine off the coast of Kiska.[20] By August 24, Kiska was declared devoid of Japanese invaders, and after 439 days, the Aleutian campaign officially ended.

Command and Control Fiasco

Buckner and Theobald would never achieve anything like mutual cooperation. . . . Their bristling rivalry became such a vital issue that it all but superseded the conflict between American and Japanese forces in the Aleutians.

—Brian Garfield

The first lesson from the Aleutian campaign relevant to current joint operations is the absolute requirement to obtain unity of command and ensure authorities are transparent and explicit in any joint operation. The dual chain of command structure in the Aleutian campaign resulted in Rear Admiral Robert Theobald in command of all air and naval forces, reporting directly to Admiral Chester Nimitz in Hawaii, and Major General Simon Buckner retaining authority over ground forces under the immediate supervision of Lieutenant General John DeWitt, headquartered in San Francisco.[21] Under this structure, senior leaders were far removed from the operational theater, making judgments affecting a campaign about which they were ignorant, effectively removing the decisionmaking authority from those in theater with the operational expertise. Because there was no common commander in either chain of command, any differences that could

not be resolved by Nimitz and DeWitt were transferred to the Joint Chiefs of Staff in Washington for dispute resolution.[22] Furthermore, while Buckner's and Theobald's headquarters were in Alaska, neither was physically stationed in the Aleutian Islands, nor were they collocated, which caused further issues for coordinating joint operations.

To further complicate matters, the command roles of Theobald and Buckner were weakly delineated as command through "mutual cooperation."[23] Unfortunately, mutual cooperation never existed. Instead, the personal aversion between Buckner and Theobald manifested in persistent inter-Service bickering, poor command and control, conflicting orders, absent communications, and lack of unity of effort, ultimately costing time, resources, and American lives.[24]

As codified in joint doctrine, "Unity of command must be maintained through an unambiguous chain of command, well-defined command relationships, and clear delineation of responsibilities and authorities."[25] The Aleutian campaign offers a shining example of flawed operational leadership in which unified command authority was doomed from the outset due to the convoluted operational command structure in the North Pacific. Failed command and control in the Aleutians illustrates the importance of achieving unity of command as well as the

Soldiers hurl mortar shells over ridge onto Japanese position, Attu Island, Aleutian Islands, June 4, 1943 (U.S. Navy/Library of Congress)

influence of personalities and building relationships on leadership and joint operations. Joint force commanders must take every opportunity to foster cooperation with partner nations and strive for unity of effort for operations. Being able to focus resources on mutual goals augments the strategic and operational effects of the forces.

Deplorable Preparation for an Unknown Harsh Operating Environment

The forces of nature in the Aleutians could always call the turns. No general or admiral was as powerful as the weather. . . . Men would expend most of their bravery and strength in search, not in battle. Everyone had to look for everyone else, and no one was ever easy to find.

—Brian Garfield

Allied forces were sorely unprepared for the ruthless climate and unique topography of the "mysterious Aleutians," distinguished by craggy mountains, scant vegetation, stark terrain, glacial temperatures, unexpected violent winds called williwaws, and "icy rain that fell sideways and sometimes upside-down."[26] A williwaw is a sudden vicious squall of extremely cold, dense air that occurs in near-polar latitudes descending from a mountainous coast toward the sea, accelerated by the force of gravity. In the Aleutian region, winds have been known to hit hurricane forces of over 140 miles per hour and to capsize or destroy vessels on reefs. The harsh conditions in the North Pacific theater caused overwhelming numbers of casualties that U.S. military leaders could have mitigated with adequate planning and understanding of the operational environment (OE). Savage williwaws smashed aircraft into mountains, and substantial underground mineral deposits repelled magnetic compasses, causing even experienced pilots to become utterly lost with empty fuel tanks.[27] Maneuvering forces presented colossal challenges for both equipment and personnel. This was vividly portrayed when the Army's 7th Infantry Division was employed for Operation *Landcrab* with mechanized vehicles that could not be moved through the muskeg, a bog consisting of a soupy mixture of water, decaying vegetation, and dark volcanic ash. This quicksand-like substance caused many casualties during the Aleutians campaign due to trench foot and exposure. It also severely retarded the movement of personnel, vehicles, and practically anything else that tried to cross it, thus relegating the 7th Infantry Division's mechanized vehicles to permanent fixtures along the barren backdrop of Attu.

As Garfield aptly noted in his book, "Attu . . . was no place for human beings."[28] The inappropriate equipment and ignorance of the weather and terrain by leadership not only extended the invasion of Attu to almost 3 weeks but also resulted in staggering casualties. Of the 3,829 casualties suffered during Operation *Landcrab*, only 1,697 were from combat. The remaining 2,132 casualties resulted from exposure, disease, accidents, and drownings, with the majority comprising severe cold injuries including trench foot, frostbite, and gangrene.[29] The malevolent weather also seized its share of aircraft, leaving them battered in the desolate terrain and waters of the North Pacific. During the Aleutian campaign, the Allied air services lost 471 aircraft, but only 56 were attributable to combat. The remaining losses were due to weather, mechanical failures, and fatigue. In fact, six aircraft were lost to weather for every one lost in combat, while the remainder of the aircraft loss rates in the Pacific theater were three noncombat to one combat.[30] The cause of some losses will forever remain unknown because the pilots simply did not return.[31]

In contrast to the Allies, the imperial forces were suitably prepared for the OE, having spent a significant amount of time and resources on reconnaissance excursions in the Aleutians.[32] Whereas the U.S. forces were ignorant of the austere environment, the Japanese gained a tactical advantage by using the terrain and weather as a force multiplier, including using the leaden fog, which caused "visibility in the Aleutians [to be] measured not in miles, but in feet," to mask their naval movements.[33] The competence of the Japanese in the OE was evidenced by the fact that there were fewer Japanese losses from the 18-month U.S. aerial bombing campaign on Kiska than there were coalition losses due to fratricide in Operation *Cottage*. Twenty-five U.S. and Canadian soldiers were killed invading the uninhabited island of Kiska, while only 15 Japanese soldiers perished.[34]

The consequences, both positive and negative, underscore the critical importance that joint officers have a thorough understanding of their OE. As joint doctrine reminds us, "Understanding the operational environment is fundamental to joint operations."[35] It is still probable in modern joint operations that the United States and our partners will deploy to austere or underdeveloped locations for missions across the range of military operations. If leaders are not aware of the environmental hazards and geographic challenges their forces might face and subsequently are unprepared for those threats, they assume the unnecessary risk of their troops sustaining preventable casualties due to their ignorance.

Bungled Synchronization of Forces

No single campaign plan was ever made or executed.

—Margaret M. Hodas-Walsh

To effectively generate combat power and enhance the adaptability of the force, commanders must ensure an adequate integration of all joint force capabilities and harmonize the expertise of each component.[36] No single commander's intent or mission statement was ever developed for the Aleutian campaign; thus, there was no singular combined list of priorities to focus the employment of operations to achieve maximum advantage.[37] In the absence of unifying guidance, the North Pacific theater suffered from a truly uncoordinated air campaign.

The lack of synchronization of forces was evident in the Battle of the Komandorski Islands. U.S. naval forces focused on exploiting a vulnerable Japanese center of gravity, the long SLOCs, by establishing a blockade to prevent the resupply of the imperial forces. Unfortunately, Army Air Force leadership had its own conflicting priority of proving "the effectiveness of attrition bombardment as a strategic weapon," with the 11th Air Force waging its own independent bombing operation on the enemy at Kiska.[38] As a result, the bombers were loaded with antipersonnel ordnance for their attack on Kiska, not the armor-piercing bombs they would need to engage the Japanese fleet. This ordnance configuration change caused the 11th Air Force to miss the Battle of the Komandorski Islands, leaving the U.S. fleet as the lone defenders against a much larger Japanese force.[39] Fortunately, the battle resulted in a victory for the Allies, but it could have been much more catastrophic for the Japanese if the bombers had arrived in time to bolster the Allied naval forces. If synchronization of naval and air assets had occurred, a catastrophic blow could have been dealt to the Japanese and the Battle of the Komandorski Islands could have had decisive strategic implications, instead of being a mere operational victory for the Allied force.[40]

The Forgotten War was drawn out much longer than it should have been, with coalition casualties in numbers disproportionate to the number of adversaries. These casualties could have been mitigated with proper synchronization. The Aleutian campaign offers myriad other examples of ineffective coordination and nonexistent synchronization of forces, including several instances of strafing of ground forces by friendly aircraft during the invasion of Attu.[41] These failures illustrate the importance of current joint doctrine's emphasis on establishing joint force land, maritime, and air component commanders. Not integrating and synchronizing forces to mass combat power in today's resource-constrained environment with reduced force manning levels is not a prudent option. Commanders must fully utilize the collective strength of all Service components to exponentially increase strategic, operational, and tactical effects.

Flawed and Neglected Intelligence

Most of darkest Africa has been charted more accurately [than the Aleutians]. *Much of Alaska, and all the Aleutian Islands, had never been mapped in any detail.*

—Brian Garfield

Accurate and timely intelligence is fundamental to identify capabilities, centers of gravity, and the possible courses of action of both Allied forces and their adversaries.[42] The information provided by intelligence helps commanders visualize the preparation of the battlespace to plan and execute effective joint operations. Unfortunately, Allied forces in the Aleutian campaign suffered adverse complications from both flawed operational intelligence as well as accurate intelligence that was neglected by leadership. Barely any written information existed on this enigmatic chain of islands, and the sole source of gathering new intelligence was aerial reconnaissance, which the brutal Aleutian weather consistently thwarted.

The Allies vastly underestimated the Japanese force strength and defenses on Attu due to the lack of accurate intelligence information. Allied intelligence originally estimated the enemy force strength on Attu at 500, then later revised that number to 1,600. The actual force strength on Attu was in excess of 2,600 Japanese troops with robust defensive fortification.[43] The miscalculation and the lack of an Allied contingency plan caused the conflict to extend well beyond the 3 days predicted. A consequential leak warned Japanese leadership about the planned invasion of Attu and allowed them ample time to prepare and reinforce their defenses before the Allied amphibious landings.[44] Outdated maps of Attu used by U.S. ground troops during the assault and unfamiliarity with the terrain severely limited their effectiveness and left them vulnerable to enemy forces.[45]

While many lessons were learned and heeded by operational commanders after the invasion to retake Attu, lessons in intelligence were disregarded in the planning of Operation *Cottage*, which resulted in one of the largest embarrassments of World War II. Allied leadership planned an amphibious assault with 34,000 coalition troops and 100 ships to surprise the Japanese garrisons on Kiska. However, intelligence reports showed the possibility that the enemy forces had already evacuated the island, and a scout mission was proposed to validate the intelligence. In the rare case that the intelligence staff recognized its shortcomings or identified inconsistencies in its information, it recommended reconnaissance missions to the commander to validate the information. The arrogance of Admiral Thomas Kinkaid, Theobald's successor, led to his refusal to send a reconnaissance unit ashore to verify the intelligence reports. He instead ordered the full-scale invasion to proceed as planned.[46]

As author George MacGarrigle noted regarding Operation *Cottage*, "Surprise was achieved, but it was not the Japanese who were surprised."[47] The 5,183 Japanese troops had evacuated Kiska undetected on July 28, almost 3 weeks prior to the operation. Consequently, much to the embarrassment of U.S. senior leaders, the substantial coalition force invaded an uninhabited island.[48]

Without valid and timely intelligence, commanders cannot thoroughly or accurately plan and execute joint operations. Joint leaders must emphasize the importance of a thorough intelligence preparation of the battlespace and ensure that intelligence staff provides continual assessments to assist the commander in timely decisionmaking. Joint commanders do not want to suffer the same predicament as the operational leaders in the Aleutian campaign, where failures in operational intelligence and neglected intelligence invalidated operations plans, resulted in weak intelligence preparation of the battlespace, and, in the case of Attu, had devastating effects for Allied forces.

Advance reconnaissance patrol cautiously approaches mouth of tunnel dug by Japanese on Lazy Creek near Gertrude Cove, Kiska Island, Aleutian Islands, August 15, 1943 (U.S. Army/George Meyers/Naval History and Heritage Command)

Inadequate Joint Training

Our people have got to be trained how to fly up there. How to start an engine when it's 40 degrees below zero. How to keep the oil from congealing before you get it into the engine. What happens to a metal plane when you bring it from minus-40 degrees and suddenly put it in a warm hangar. We have every reason to believe the rivets will just fall out.

—Henry "Hap" Arnold

A lack of sufficient and comprehensive joint training in the North Pacific theater caused more than its share of casualties throughout the Aleutian campaign. Training was pitiful and unrealistic when it was conducted at all, and it usually failed to account for the unique conditions in the Aleutians. Allied forces were inexperienced and woefully unprepared for the dangers and conditions they faced during the invasion of Attu, which caused rampant fear and confusion.[49]

The 7th Infantry Division, based out of California, was trained in mechanized desert operations to support war efforts in North Africa. However, in January 1943, this unit was chosen to augment the undermanned operations in the Aleutians, leaving its members a mere 90 days to plan and retrain for this completely different theater in addition to now preparing to execute amphibious operations.[50] This amphibious assault was "only the third amphibious operation of the Second World War, and the first one in the history of the U.S. Infantry."[51] Unfortunately, the faulty training that the 7th Infantry Division received prepared it for neither the battle ahead nor the terrain. Not only was the training conducted in sunny California, the furthest possible environmental condition from the Aleutians, but most of the training was also simulated, leaving forces at a crippling disadvantage. Additionally, the location to which the 7th Infantry Division was being deployed

Soldiers load shell into small mortar on Chicagof Ridge overlooking Chicagof Harbor, Attu Island, Aleutian Islands, May 11, 1943, during battle with last Japanese stronghold on Attu Island (U.S. Navy/Library of Congress/Naval History and Heritage Command)

was kept a secret from all but a few members of senior leadership. Troops were given training and information for a tropical climate and were outfitted with warm-weather uniforms, preparing them physically and mentally for a combat environment that they never saw. Equipment and clothing, in insufficient amounts, were loaded in sealed crates onto the transport ships that took the 7th Infantry Division to war. Information on their actual assigned location was not disclosed to the troops until they were en route to the Aleutians; they set out for war convinced they were heading to the Solomon Islands.[52]

Further inhibiting the readiness of the 7th Infantry Division, its joint training was not really "joint" because the Army Air Forces were already in theater prosecuting air operations against the Japanese garrisons and therefore did not participate in the training.[53] This joint training deficiency and lack of advance coordination resulted in diminished effectiveness of close air support, and in some cases, strafing of Allied forces by 11th Air Force aircraft.[54] In the end, this trained desert warfare mechanized tank unit proved deplorably ineffective as an Arctic amphibious assault force on Attu.[55]

Ineffective training was not limited to the Army force. The naval and air forces experienced their own deficiencies in this arena. In several instances, U.S. Navy ships and bombers shot at each other due to their inability to identify friendly and enemy assets. Moreover, there were even several occasions throughout the campaign when "pilots went back to base to find someone who could [distinguish] friendly ships from enemy ones."[56]

Realistic joint training needs to be a cardinal principle for joint commanders. To maximize effectiveness, leaders must ensure their forces are physically and psychologically prepared for the environment in which they will operate. Troops that are not sufficiently prepared will act in much the same way as those in the Aleutian campaign—with unbridled fear and confusion. Joint leaders must strive to ensure that training follows as closely as possible with the adage, "We train as we fight."

Botched Logistics

The officer who doesn't know his communications and supply as well as his tactics is totally useless.

—George S. Patton

Logistics sustainment planning failures in the Aleutians detracted from available combat power and the ability of commanders to employ the joint force effectively. The Allied invasion of Attu exemplifies the repercussions of botched logistics, where the dire situation for the coalition forces was caused not by the Japanese but by the lack of accessible supplies, ammunition, and food. Weather and terrain stalled supplies on the shores of Attu, leaving troops for days without needed cold-weather gear and even food, which contributed to the immense number of noncombat injuries sustained in Operation *Landcrab*.[57] Artillery was stranded at the beachheads, claimed by the swampy muskeg, proving useless to the forward troops who were bogged down by the entrenched defense positions of the opposing forces. Leadership failed to account for the challenges of maneuvering both vehicles and personnel through the Aleutian terrain. Ammunition, food, and other provisions had to be moved by foot on the backs of Soldiers, which disengaged them from combat operations and diluted the effectiveness of the invading force.[58] The logistics bottlenecks were a serious flaw in the supply system that had grave detrimental effects on the ground tactical battle.

Breakdowns in communications capabilities and flawed communications infrastructure added to the plethora of challenges in the Forgotten War. Communications failures plagued joint leadership throughout the campaign; slow relay times and delayed responses caused many tactical and operational advantages to elapse unexploited. During the attack on Dutch Harbor, U.S. fighters from Cold Bay, Alaska, futilely rushed to traverse the 180 miles to intercept the Japanese planes and back up the U.S. fighters from Umnak, but they did not arrive in time. Unknown to them, a failure in the antiquated communications system left pilots on alert at nearby Umnak ignorant of the attack, having never received the radio call. These communications failures caused Japanese planes to fly uncontested at Dutch Harbor.[59]

There are many other illustrations of the unique logistics and communications failures that joint leadership had to contend with in Alaska. In July 1942, an alert and call-to-arms drill was issued in Western Defense Command from Panama to Alaska. Panama and California stood to arms within minutes, but it took a shocking 4 days for the alert to reach all Alaskan stations. Airplanes, runners, and dogsled teams had to be employed to relay the alert due to the sparse and undermanned radio stations in Alaska, demonstrating massive communications vulnerabilities.[60] Additionally, U.S. senior leaders were naïve to logistics challenges at the commencement of military operations in the Aleutians, claiming that if more air assets were needed, they would rush aircraft to Alaska from the continental United States. In January 1942, however, when it took 6 weeks to deliver the first combat squadron, senior leaders learned that planes could not be "rushed to Alaska."[61]

Wars can be won or lost based on logistics support. A campaign's operational reach is established by its ability to sustain logistics. Without the supplies to fuel operations, combat forces cannot be successful. Joint doctrine teaches that "joint logistics spans all levels of war. It is, however, at the tactical level where the principal outcome . . . of joint logistics must be measured."[62] Many troops in the Forgotten War died from exposure to the elements, while hunger left Servicemembers distracted from fighting their adversaries. Joint officers must recognize that it is not enough to be brilliant tacticians; if they are not also talented logisticians, their operations are doomed to fail.

Conclusion

A soldier stood at the Pearly Gate;
His face was wan and old.

Marines on alert during Japanese attack on Dutch Harbor, Amaknak Island, Aleutian Islands, June 3, 1942
(U.S. Navy/National Archives and Records Administration)

He gently asked the man of fate
Admission to the fold.
"What have you done," St. Peter asked,
"To gain admission here?"
"I've been in the Aleutians
For nigh unto a year."
Then the gates swung open sharply
As St. Peter tolled the bell.
"Come in," said he, "and take a harp.
You've had your share of hell."

—Boswell Boomhower

Although the Forgotten War ended almost 80 years ago in the North Pacific theater, it still offers relevant lessons for today's joint operations in command and control, in understanding the importance of the OE, synchronization of forces, intelligence preparation of the battlespace, training, and logistics. In the Forgotten War, the ignorance of senior U.S. leaders and inexperience within the unique OE led to the inability to establish operational conditions necessary for tactical victory. At times, flawed joint operations practically paralyzed the Aleutian campaign. Lack of Japanese air assets, vulnerable Japanese SLOCs, and the sheer number of coalition forces involved in the attrition tactics all contributed to the Allied success in the North Pacific. Luck, chance, and courageous tactical Servicemembers are due the credit for the ultimate victory.

Victory in the Aleutians was not due to proper joint warfighting execution, and it offers an excellent depiction of how not to conduct a joint campaign. Not attaining unity of command or unity of effort in joint or coalition operations can affect unit morale and constrain operational effectiveness. Additionally, without synchronization of forces, leaders cannot mass effects to achieve operational and strategic objectives. The Aleutian campaign struggled with many of the same challenges in manpower and resources that leaders face today, constantly battling to do more with less. U.S. forces are spread throughout the globe with increasing demands and a shrinking budget. Joint leaders cannot

afford to be inefficient in the employment of their combat power and must capitalize on the exponential effects achieved through synchronization.

Without sound intelligence, commanders are unable to make the best possible decisions for employment of the joint force and are essentially sending their troops into battle blindfolded. As the casualties sustained at Attu show, U.S. forces that are deployed to unfamiliar and remote locations must be prepared for the OE both physically and mentally, and with the proper equipment and logistics support.

Leaders must recognize the relevance of the Forgotten War to today's joint commander who is operating in an austere environment in an underdeveloped and remote area against an unconventional and creative adversary, trying to integrate coalition forces with insufficient resources, support, and manpower. The overwhelming casualties from the Aleutian campaign emphasize the catastrophic consequences that can occur if joint leaders do not abide by the lessons learned by our predecessors through sweat, blood, and lives lost. **JFQ**

Notes

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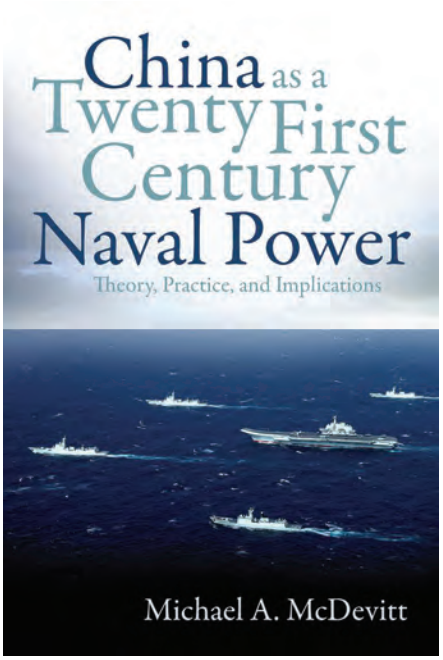

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Reviewed by Edward B. Fienning

Over 3 years, starting in 264 BCE, the Roman military built and launched 1,000 galleys to defeat Carthage in the First Punic War. This intentional, rapid transition from land to maritime power was unprecedented and resulted in 600 years of Roman military and economic dominance. It was a feat not to be repeated in any meaningful way until American naval expansion during World War II. However, according to retired Rear Admiral Michael McDevitt's comprehensive and insightful work, *China as a Twenty-First-Century Naval Power*, China is on the precipice of exceeding historical precedent. In this comprehensive review of rapid Chinese naval expansion, the former director for Strategy, Plans, and Policy (J5) at U.S. Pacific Command applies 34 years of commissioned service focused on the Pacific theater to provide a holistic and clear-eyed analysis of Chinese maritime power.

McDevitt brings into clear focus how China is expanding its capabilities with both long memory and a clear vision of its future role on the global stage. He thoroughly recounts the past 15 years of People's Liberation Army Navy (PLAN) transition from a largely "near seas" force, with only a handful of blue-water-capable warships, to a force McDevitt sees as the second most capable blue-water navy in the world. He illuminates the Chinese national focus on developing maritime power, a numerically superior fleet of warships, incredible ship-building capacity, the integration of command and control through a newly established coast guard, and the militarization of expansive merchant and fishing fleets. Increased training and integration into international operations are also on the rise. The decision in December 2008 to join the United Nation's call for naval forces to counter piracy in the Gulf of Aden has been a key accelerant in the PLAN's evolution from coastal defense to blue-water expeditionary capability, and the 36th PLA Navy antipiracy task force is currently on station in the Northern Arabian Sea.

With an approachable and technically thorough style, McDevitt describes the incredible political and financial shift China has made to focus on the maritime domain. Today, China is the top ship-building nation in the world, is first in merchant marine ship count, and maintains a fishing fleet that is both the largest in the world and the one that acts as a "maritime militia," supplementing the Chinese coast guard. Though China has more warships than the United States, McDevitt is quick to point out that in terms of tonnage the U.S. Navy remains larger and superior in key capabilities, such as sea-based tactical airpower, nuclear-powered attack submarines, advanced air defense, antisubmarine warfare–capable surface combatants, and amphibious forces.

One of the most valuable contributions of McDevitt's work is his strategic analysis of potential maritime flashpoints in and around the South China Sea, particularly Taiwan and the nine-dash line. Taiwan is much more than a rogue province in the eyes of the Chinese—it forms a critical geographic point for strategic defense. Further south, the nine-dash line was originally conceived by the Republic of China to demarcate its island claims, but in the decades since, the People's Republic of China has "flipped the script" from a territorial demarcation to a claim of historic maritime rights, and likely heralds claims of outright sovereignty in the future.

McDevitt warns the joint force to watch for the development of offensive capabilities that extend Chinese naval operations beyond the shore-based missile defenses of China. The expansion of air cover through airfields on reclaimed land, the development and training of aircraft carriers and crews, and the foreign basing of ships and submarines will increase Chinese influence in sea lines of communication and may increase friction for U.S. and partner forces in global waters.

McDevitt's work is a critical addition to joint knowledge at a precarious time. China is rapidly expanding its maritime reach. In early 2021, Chairman Xi Jinping signaled his singular power over the Central Committee by reclaiming a nautically themed title not used since Chairman Mao: "core navigator and helmsman." Days later, opposition lawmakers on Kiribati, 1,860 miles south of Hawaii, expressed concern over Chinese plans to revive the strategic airstrip on Kanton Atoll, creating a "fixed carrier" for China in the middle of the Pacific Ocean. Both announcements arrived on the heels of reports of China working with West African governments to develop a military port capable of combat repair and submarine basing on the Atlantic Ocean.

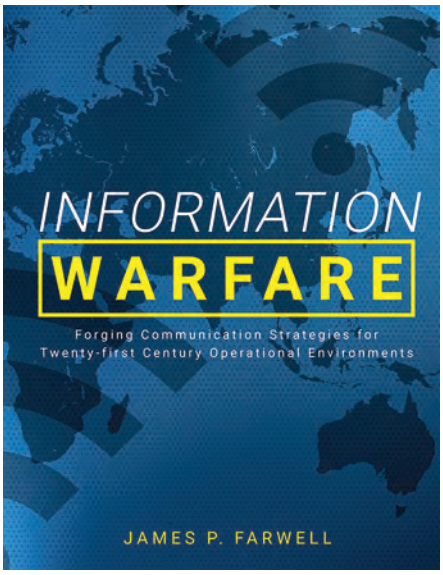
McDevitt also suggests that any flashpoint-driven conflict puts China on the offense and makes the joint force the away team in any conflict. Currently, all joint force components staged in Japan, Korea, and the South China Sea sit inside China's weapons engagement zone, creating significant disadvantages from the outset. McDevitt reminds us in compelling prose that understanding China's

intent, drive, positioning, force composition, and growing capability is critical prior to any potential conflict.

For those interested in a deeper dive on China's role in Great Power competition, consider *Red Star Over the Pacific* (Naval Institute Press, 2010) by Toshi Yoshihara and James Holmes, and *The Great Wall at Sea* (Naval Institute Press, 2001) by Bernard Cole. Another terrific resource for current information on Chinese maritime and other military efforts is the U.S.-China Economic and Security Review Commission.

One reasonable critique of this work is that McDevitt misses an opportunity to contextualize Chinese maritime expansion against the backdrop of a coordinated and aggressive nonmilitary expansion of Chinese influence across the globe, particularly in Africa and Southeast Asia. However, within its maritime area of focus, *China as a Twenty-First-Century Naval Power* is packed with detailed insights and should be on the shelf of every warrior-scholar in the joint force. **JFQ**

Lieutenant Colonel Edward B. Fienning, USMCR, serves as a Leadership and Ethics instructor at The Citadel and as a Reserve officer in the 4th Marine Aircraft Wing.



Information Warfare: Forging Communication Strategies for Twenty-First Century Operational Environments

By James P. Farwell
Marine Corps University Press, 2020
178 pp. Free to Download
ISBN: 978-1732003095

Reviewed by Christopher Paul

What is communication strategy? What steps should defense leaders and planners take to build such a strategy? Curiously, in James Farwell's *Information Warfare*, he answers the second question without ever answering the first. Farwell seeks to provide "a concise treatise on the steps for developing and implementing a communication strategy and includes key historical and contemporary examples for deeper insight." The book includes 12 chapters, most of which are insightful. The book does not end with a traditional chapter of conclusions, but it does include a useful "Winning Communication Strategy Workbook" as a terminal appendix.

The principal strength of *Information Warfare* is its practicality. The material is approachable and presented with great efficiency—the book is only 178 pages, and 30 of those are the workbook appendix. Farwell lays out good first principles for any kind of strategy, beginning with being clear about what you are trying to accomplish. After reading this book, the reader will be much better prepared to think about and plan a communication strategy in support of military operations or campaigns. The workbook is a useful addition as it lays out numerous questions that will guide users around pitfalls and toward strategic success.

Among other strengths is the excellent use of historical examples. Farwell presents historical vignettes with just enough detail to situate the reader and then immediately proceeds to distill lessons from the examples. This is made even more powerful by repeatedly returning to some of the same vignettes in later chapters, adding another layer of historical detail and drawing additional lessons. These bite-size bits are perfectly suited to purpose and avoid the risk of overwhelming the reader with lengthy historical accounts before making the point clear.

Information Warfare also has some significant weaknesses. This is not a traditional academic work and so it lacks many of the academic trappings, for good or for ill. Farwell includes more than 20 historical vignettes, ranging from the Battle of the Teutoburg Forest in 9 CE through contemporary operations in Iraq, Afghanistan, and Syria. These are not presented in any discernable order, and there is no clear rationale for the selection of the cases and no announced method for how the lessons were extracted. In fact, there is no discussion of methodology at all. What analysis there is draws from the author's experiences and the narratives of the historical vignettes. That said, the lessons are compelling and have face validity; Farwell offers good advice.

Farwell also uses several different terms related to the subject at hand and does not distinguish between any of them. These include the clearly related but probably distinct "information warfare," "communication strategy," "strategic communication," and "narrative." He evinces disdain for the definitional gyrations of academics and insists that they not be allowed to "obstruct the clear thinking required for effective information warfare strategy

development." Farwell may decline to offer definitions on purpose to avoid unwelcome distractions, and in many ways his argument implies that "communication strategy" is no different from just "strategy," and that a strategy that is not (or does not include) a communication strategy is doomed to fail.

Information Warfare also includes too many competing organizing principles. The titles of the 12 chapters offer one thematic and topical breakdown. The introductory chapter has a numbered list of seven "key factors," only one of which corresponds to a chapter (the chapter on measuring effectiveness). The next chapter begins with a bulleted list of seven "key steps," only two of which are duplicative of the first list, with only one represented by a chapter (again measuring effectiveness). Chapter 6 provides a checklist for building a strategy, which is a great idea. However, the checklist includes 24 characteristics, with no clear mapping to the chapter topics or either of the earlier lists of seven. It is not that any of these elements are *wrong*, per se, but there is some redundancy and some things that are not deserving of the same level of priority. There is strength in consistency and parsimony, and these inconsistent listings represent a missed opportunity.

The workbook that occupies the final sixth of the book is still useful despite some shortcomings. It includes 13 sections, and each poses a series of questions, leaving lines for the user to record their answers. All the questions stem from ideas found in the book, and all are probably good questions for planners to ask. But, like the rest of the book, there is no organizational consistency. Several of the chapter titles appear as section headings, but not all of them, and not in the order in which the chapters appear. Sections do not follow the two lists of seven from the first two chapters but include some elements from both lists. The checklist is not part of the workbook, and few of the checklist elements are included. I do not believe a fully completed workbook would satisfy all 24 checklist requirements. It is a shame that the workbook does not include, or at least directly complement, the checklist.

Bottom line: *Information Warfare* is worth the read. Planners and staff across the joint force, not only those responsible for communication or information, will find useful insights that will immediately benefit the strategies and plans they develop. Readers beyond the joint force will also benefit from Farwell's thinking about the relationship between actions, strategy, and communication strategy, as these lessons are applicable in foreign affairs and international relations more broadly. **JFQ**

Dr. Christopher Paul is a Senior Social Scientist at RAND whose work focuses on information warfare, information operations, operations in the information environment, and strategic communication.

The Kill Chain: Defending America in the Future of High-Tech Warfare

By Christian Brose
Hachette Books, 2020
320 pp. $28.00
ISBN: 978-0316533539

Reviewed by Daniel Sukman

In March, the U.S. Indo-Pacific Command commander warned in testimony to Congress that China could attempt to take control of Taiwan in the next decade. In *The Kill Chain*, by Christian Brose, the former staff director of the Senate Armed Services Committee under the former chairman, the late Senator John McCain, posits that the United States is rapidly falling behind China and, to an extent, Russia, in the development of combat capabilities, platforms, and systems designed for the future of war. If this trend continues, the ability to defend Taiwan in an armed conflict against China will be increasingly in doubt.

Brose introduces the idea of the "kill chain" to demonstrate America's misguided thinking about war and capabilities development and to illustrate how the United States is losing pace to Russia,

but more significantly, to China. Brose sums up the kill chain in three parts: first, understanding the situation; second, decisionmaking; and third, executing an action to achieve an objective. Brose posits that the outcomes of a conflict with China or Russia will be dependent on the ability to retain one's kill chain while breaking the opponent's. Within the kill chain paradigm, Brose advocates for new ways of thinking about how to counter and defeat an adversary's kill chain rather than improving existing combat platforms and traditional ways of warfighting.

Brose argues that the Department of Defense (DOD) is simply updating systems and capabilities to fight in old ways against lesser opponents. He warns that, as China rises to peer status, at the current rate of modernization and technology acquisition, the United States is on pace to have a weaker force. A war with China will not be a tactical or operational rollover like the United States experienced in recent major combat operations. Specifically, he suggests that maritime and air superiority is unlikely, and the homeland will no longer serve as a sanctuary.

Brose singles out the defense innovation ecosystem and acquisitions process for critique, and there is ample blame to go around. According to Brose, the uniformed Services are just as culpable as the slow acquisitions process. For example, true innovation is often stifled by a preference for engaging with a small pool of companies willing to do defense work, creating less incentive for true innovation. A thicket of procedural and bureaucratic hurdles does not help. Brose points out that the creation and acquisition of new technology is not only slower and less creative than ever before but also requires more people and processes to approve them.

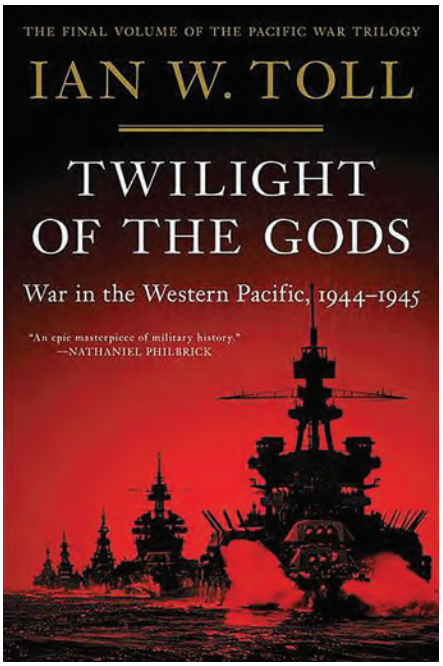
However, the limited pool of defense firms is only one dimension of the problem. Those firms that remain spend more money complying with regulations and navigating the bureaucracy than they do on research and development even though there are plenty of private corporations and technology firms that outspend DOD on research and development. The book also serves as a warning that basing acquisition decisions purely on congressional districts and state economic interests can cause long-term damage to the security of the Nation.

The second central thesis of *The Kill Chain* is the call to move from a culture and doctrine of offense to a culture and doctrine of defense. A defensive mindset offers a new way of thinking about war and challenges policymakers and strategymakers to consider how the United States could best deter China from challenging it in lieu of seeking to impose its will. Brose views defensive thinking as the solution to China's military and technological rise. Leaders throughout the joint force may find the shift offensive. The joint and Service doctrines present offensive tactics, seizing the initiative, as gospel and crucial to victory. But is victory the same today as it was decades ago? Regardless, Brose's advocacy of a defensive mindset is certain to stimulate much debate.

Readers may find the author's pessimism discomforting, if not counterproductive. Indeed, Brose's alarmist writing fails to address some of the purposes of U.S. acquisition processes. There is risk in implementing new capabilities too fast and without proper testing and evaluation. The fate of effects-based operations and the Army's Future Combat Systems should serve as profound warnings about the dangers of moving too fast in doctrine and materiel changes. Also, tactical considerations should not lead the operational or strategic level of war. The author's focus and pursuit of advanced technology-based solutions is a flawed method for military adaptation. Brose does propose the use of smaller systems in large numbers (quantity as a quality) as a method of employment. Furthermore, he continually advocates for more drones and more artificial intelligence–based platforms without considering an operational concept that employs them. The idea that the military could shift to a defensive mindset is a start, but not enough to warrant significant changes to force structure and force design. Indeed, without an operational concept that has been *tested and evaluated*, acquiring new platforms and implementing new doctrine are fool's errands.

The Kill Chain will certainly appeal to senior uniformed and civilian national security leaders. For the joint force, *The Kill Chain* provides a way of thinking about future force development and design with an emphasis on new technologies that can fundamentally change the character of war. As America's civilian and military leaders continue to press Great Power competition, the nature and speed of technological adaptation will play a decisive factor in the outcome. *The Kill Chain* should generate much debate and is an essential contribution to the way civilian and uniformed leaders throughout DOD should be thinking about preparing for war. **JFQ**

Lieutenant Colonel Daniel Sukman is an Army Strategist (FA59) serving on the faculty at the Joint Forces Staff College, in Norfolk, Virginia.



Twilight of the Gods: War in the Western Pacific, 1944–1945
By Ian W. Toll
W.W. Norton and Co., 2020
944 pp., $25.00
ISBN: 978-0393080650

Reviewed by Paula G. Thornhill

Twilight of the Gods completes Ian Toll's superb trilogy of America's war in the Pacific during World War II. As with his first two volumes, this dynamic, gifted writer tells a compelling story about how the United States ultimately triumphed in the Pacific. Major amphibious operations, such as Iwo Jima and Okinawa, get considerable attention, as do major sea battles such as Leyte Gulf. His recounting of the Philippines campaign is particularly well done—easy to follow, detailed, and completely gripping. *Twilight of the Gods*, however, is more than the retelling of epic battles. Toll offers an exceptionally well-researched, integrated narrative built around the Services' imperfect and, at times, remarkably parochial efforts in 1944–1945 to fight and ultimately defeat Japan. As joint force members read this book, they will find invaluable lessons even more powerful because of the myriad primary and secondary sources that underpin them.

Toll's work is a masterful study in leadership from the five-star ranks on down. Admiral Raymond Spruance, for example, emerges as the most steady and reliable task force commander, even though his counterpart, Admiral William Halsey, steals the headlines and ultimately receives his fifth star despite his penchant for poor decisionmaking. Fleet Admiral Chester Nimitz ably handles operations in his theater but is not above taking questionable actions, including pursuing a deadly and perhaps unnecessary operation on Peleliu rather than making operational concessions to General Douglas MacArthur and the Army. Throughout his work, Toll paints a picture of senior uniformed commanders struggling to lead immense combined or joint forces yet unable to shed their Services' parochialism. Striking the proper balance between these two—driven by the intellectual imperative of the former and the emotional imperative of the latter—was, and remains, extremely difficult.

Toll demonstrates a command of military theory in assessing strategy and operations in the Pacific. Sun Tzu and Alfred Thayer Mahan both make appearances, but J.C. Wylie's cumulative strategy steals the show. Toll relies on Wylie's theory to examine and assess the relative success of the submarine and air campaigns. Naval and Army air forces leaders executed both campaigns with relative autonomy and with vague measures of effectiveness. His discussion of long-range submarine operations executed under Vice Admiral Charles A. Lockwood's command is particularly well done. By using Wylie to discuss these operations, Toll reintroduces a seminal military theorist and reminds the joint force of the importance of looking for alternative methods to understand, assess, and discuss military operations.

Twilight of the Gods reminds us how difficult it is to end a war. Japanese leaders knew for some time they could not win, but they also could not stop fighting. Toll does a marvelous job describing the agonizing and frustrating conversations in Tokyo during the last months of the war. The reader wants Japan to surrender, knowing that atomic bombs are lurking in the background. But this accomplished author leaves the reader wondering: Would Japan have fought on if the bombs had not been dropped? Ending wars, especially total wars, is extremely difficult and arguably receives insufficient attention in professional military education and from the joint force. Senior civilian and military leaders would do well to devote more thought to teaching and honing the skills associated with the termination of war.

If today's joint force members take the time to read this volume, or even better, Toll's entire trilogy, they shall learn much about the origins, successes, and limitations of jointness during the war. The range of insights are numerous. Toll touches on joint strategy, command boundaries, unity of command, Service rivalries, joint logistics, and theater commanders' relationships with the Joint Chiefs of Staff. In one instance, he examines how Douglas MacArthur's ego and the Navy's interests ultimately clashed over command and control of the final campaign against Japan. In another, he highlights General H.H. Arnold's (the Army Air Force's [AAF] Chief of Staff) successful effort to create an air command structure that ran through the Joint Chiefs of Staff rather than the theater commands. This ensured the AAF had centralized control over the allocation, apportionment, and use of the B-29 bombers, denying that control to MacArthur and Nimitz.

Based on these topics alone, Toll's work could fuel many animated professional military education seminar discussions. In addition, he helps today's reader understand how World War II commanders tackled large operational problems such as conducting dispersed operations and collapsing the antiaccess/area-denial zone around Japan. Those seeking to understand Great Power competition and conflict in the 2020s and beyond will draw many insights about the associated challenges by reading this volume.

Twilight of the Gods might seem a bit repetitive in a few places, but this is a small quibble by a reviewer dazzled by the extent of Toll's impressive achievement—the creation of an instant classic with this volume, not to mention his entire Pacific War trilogy. Sweeping in scope, brilliantly written, and with lessons for the joint force too numerous to list, *Twilight of the Gods*, as well as its two predecessor volumes, should figure prominently in the education of today's joint force. **JFQ**

Dr. Paula G. Thornhill, Brigadier General, USAF (Ret.), is the Associate Director of the Strategic Studies program at The Johns Hopkins University School of Advanced International Studies and the author of *Demystifying the American Military: Institutions, Evolution, and Challenges Since 1789* (Naval Institute Press, 2019).

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JP 2-0, *Joint Intelligence*

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Strategic Assessment 2020: Into a New Era of Great Power Competition

Edited by Thomas F. Lynch III

Great Power competition is a framework for understanding interstate relations that dominated geopolitics for centuries prior to World War II. Past GPC eras have featured multiple powerful states jockeying for relative status and position. After lying dormant during a two-decade period of post–Cold War globalization and American international primacy, the dynamics of GPC returned to international relations and security studies in earnest during the late 2010s.

Strategic Assessment 2020 provides an expert and nuanced understanding of the most important emerging dimensions of GPC between the three Great Powers in 2020: the United States, China, and Russia. It establishes that the United States stands atop the triumvirate, with China a rising competitor and Russia vying for top-level prestige while facing clear signs of decline. The Sino-American competitive dyad is likely to be the dominant Great Power rivalry into the future. Chapters focus on the critical activities among these Great Powers and develop major implications for other state actors, nonstate actors, and global institutions.

Authors include scholars from the National Defense University and the Institute for National Strategic Studies who have been directly engaged as thought leaders and policymaking pioneers grappling with the strategic contours of the new era of GPC. Chapters and combinations of chapters will be not only useful for students of national security, international relations, and foreign affairs in an academic setting, but also of great value to policy practitioners.

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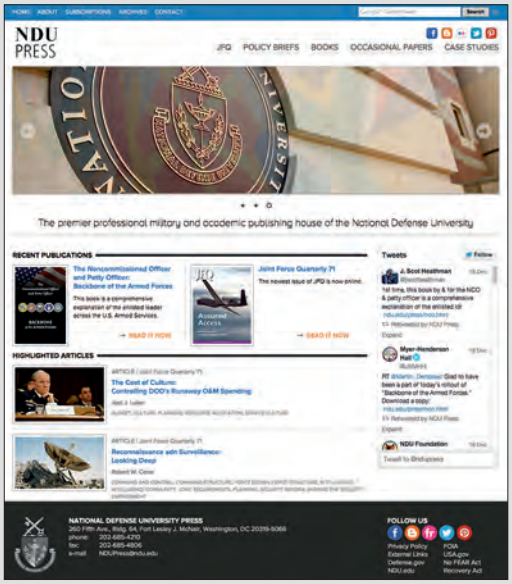

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