For 70 years, the RAND Corporation has worked side by side with government as a trusted adviser. Through high-quality, objective research and the development of sophisticated analytic tools, RAND researchers from diverse disciplines and perspectives collaborate to create strategies and solutions to keep our nation strong.
MESSAGE FROM THE DIRECTOR

Dear Soldiers and Leaders,

In 1984, the U.S. Army selected the RAND Corporation to manage the Arroyo Center, the Army’s sole federally funded research and development center (FFRDC) for studies and analyses. As intended by Congress, the FFRDC contract has enabled the Army to cultivate a long-term strategic relationship with a trusted source of objective, high-quality research.

RAND is committed to meeting the Army’s analytic requirements. To do so, it attracts and retains a cadre of first-class researchers, develops and innovates relevant research capabilities, and creates and sustains deep expertise in technical and policy domains important to the Army. These strengths permit us to meet unanticipated analytic needs rapidly and respond with agility to the continually evolving priorities of the Army’s highest leadership.

This Arroyo Center Annual Report, covering fiscal year 2019, is designed to highlight the many advantages afforded by the FFRDC relationship—quality and objectivity along with depth, breadth, and responsiveness.

The report opens by surveying studies in seven areas in which we have produced a steady stream of research and analyses on top Army priorities. These include areas of critical relevance to the National Defense Strategy: Russia, China and the Pacific, conflict and deterrence, and allies and partners. Also included are areas that support GEN McConville’s prioritization of personnel: soldiers and families, recruiting, and leadership.

The report then features nine summaries that provide in-depth examples of studies sponsored by senior Army leaders. These summaries illustrate both the breadth of the questions posed by the leaders and the variety of research methods that we use to address the questions.

Among the questions we were asked are these:

- “How does U.S. forward military presence affect the incidence of conflict?”—asked by the Deputy Chief of Staff, G-2
- “Are highly experienced noncommissioned officers worth the extra cost?”—asked by the Deputy Chief of Staff, G-1
- “What does the career of an Army civilian look like?”—asked by the Assistant Secretary of the Army for Manpower and Reserve Affairs
- “How can Army special operations forces better articulate their capabilities?”—asked by the U.S. Army Special Operations Command.
These are typical of our work for the Army, because they are hard questions that require a mix of research disciplines and methodologies to answer satisfactorily.

The report closes by explaining how we are organized to support the Army and how the Army provides guidance and oversight. An infographic displays the “galaxy” of recent unclassified publications we have produced for the Army. To ensure quality and objectivity, RAND publishes only peer-reviewed studies.

I encourage you to share this Annual Report with anyone who would be interested in its contents and messages. Please contact me at any time if you wish to receive more information regarding any aspect of the Arroyo Center or its research activities.

With best wishes,

Sally Sleeper

Director, RAND Arroyo Center

703-413-1100 x5213
The following pages highlight topics of critical importance to Army leadership in which RAND Arroyo Center has sustained streams of research and analyses.

- Russia
- China and the Pacific
- Conflict and Deterrence
- Allies and Partners
- Soldiers and Families
- Recruiting
- Leadership
The National Defense Strategy focuses squarely on the competition between the United States and other great powers, particularly Russia and China, as the driving challenge that should set the priorities of the U.S. Army and other services. RAND possesses a world-class cadre of experts on the military abilities and political ambitions of U.S. adversaries and has sustained streams of research in these areas for seven decades. Recent Army-sponsored research on Russia include the analyses below.

**Russia**

The National Defense Strategy recognizes the United States is currently locked in a great-power competition with Russia. This report analyzes how the United States can compete to its own advantage and capitalize on Russia’s weaknesses.

**Extending Russia: Competing from Advantageous Ground**

[www.rand.org/t/RR3063](http://www.rand.org/t/RR3063)

As the U.S. National Defense Strategy recognizes, the United States is currently locked in a great-power competition with Russia. This report analyzes how the United States can compete to its own advantage and capitalize on Russia’s weaknesses.

**Russia’s Hostile Measures in Europe: Understanding the Threat**

[www.rand.org/t/RR1793](http://www.rand.org/t/RR1793)

This report examines current Russian hostile measures in Europe and forecasts how Russia might threaten Europe using these measures over the next few years.

**Russia’s Use of Media and Information Operations in Turkey: Implications for the United States**

[www.rand.org/t/PE278](http://www.rand.org/t/PE278)

This Perspective assesses how Russia has used media and information operations to support its foreign policy goals related to Turkey.

**The Russian Way of Warfare: A Primer**

[www.rand.org/t/PE231](http://www.rand.org/t/PE231)

This Perspective provides a primer on how Russia’s military might fight in the event of a major conflict against a peer or near-peer adversary.

**Russia Is a Rogue, Not a Peer; China Is a Peer, Not a Rogue: Different Challenges, Different Responses**

[www.rand.org/t/PE310](http://www.rand.org/t/PE310)

This Perspective assesses the strategic competition among Russia, China, and the United States and the different challenges and opportunities that these adversaries present for the United States.

**What Role Can Land-Based, Multi-Domain Anti-Access/Area Denial Forces Play in Deterring or Defeating Aggression?**

[www.rand.org/t/RR1820](http://www.rand.org/t/RR1820)

This report examines the role that land-based, multi-domain anti-access/area denial forces can play in helping the United States and its allies and partners deter or defeat aggression in the western Pacific, European littoral areas, and the Persian Gulf.

**European Relations with Russia: Threat Perceptions, Responses, and Strategies in the Wake of the Ukrainian Crisis**

[www.rand.org/t/RR1579](http://www.rand.org/t/RR1579)

This report analyzes how Europeans perceive the Russian threat following the 2014 Ukraine crisis, how European states have responded to Russia’s behavior, and how European officials see the future of Russo-European relations.

**The Future of the Russian Military: Russia’s Ground Combat Capabilities and Implications for U.S.-Russia Competition**

[www.rand.org/t/RR3099](http://www.rand.org/t/RR3099)

Researchers analyze societal, political, economic, and demographic factors that undergird Russian military power. They also make projections about how Russian ground combat capabilities will evolve in the future and how the U.S. Army can respond.
China and the Pacific

U.S. Indo-Pacific Command encompasses almost 40 nations. Some of these are strong U.S. allies and partners, while others represent formidable potential threats, with large standing militaries and declared nuclear capabilities. Recent Army-sponsored research focused on the Pacific theater emphasizes the implications of China’s increasing hegemony, the multifaceted challenges posed by North Korea, and the potential for effective security cooperation.

Four Problems on the Korean Peninsula: North Korea’s Expanding Nuclear Capabilities Drive a Complex Set of Problems
www.rand.org/t/TL271
This tool kit provides visualizations illuminating four Korea-related problems: North Korea’s nuclear arsenal, North Korean artillery systems, evacuating South Korean population centers, and securing North Korean nuclear weapons and facilities.

The Korean Peninsula: Three Dangerous Scenarios
www.rand.org/t/PE262
This Perspective summarizes the findings of three major RAND studies on security challenges on the Korean Peninsula.

At the Dawn of Belt and Road: China in the Developing World
www.rand.org/t/RR2273
China has always felt vulnerable, and, in the 1990s, it began forming agreements with other nations, eventually culminating in the Belt and Road Initiative. The authors analyze China’s engagement with the developing world.

China and North Korea: Bolstering a Buffer or Hunkering Down in Northeast Asia?
www.rand.org/t/CT477
This testimony addresses China’s and North Korea’s interests and strategies, as well as potential for cooperation between the United States and China on North Korea.

War with China: Thinking Through the Unthinkable
www.rand.org/t/RR1140
A Sino-U.S. war could take various, and unintended, paths. Because intense, reciprocal conventional counterforce attacks could inflict heavy losses and costs on both sides, leaders need options and channels to contain and terminate fighting.

Conflict with China Revisited: Prospects, Consequences, and Strategies for Deterrence
www.rand.org/t/PE248
Although armed conflict between the United States and China is not likely, the possibility is real enough to require prudent policies and effective deterrent measures.

Pacific Engagement: Forging Tighter Connections Between Tactical Security Cooperation Activities and U.S. Strategic Goals in the Asia-Pacific Region
www.rand.org/t/RR1920
This analysis of U.S. Army security cooperation processes in Pacific Command recommends changes to planning, execution, and evaluation that will help forge stronger links between strategic and tactical levels.
Although interstate conflict worldwide has trended downward for many decades, the destructive potential of large-scale military violence has increased—and with it the need for effective deterrence. Army-sponsored analyses of conflict and deterrence have focused on conditions that affect the will to fight; the factors that affect the likelihood of adversary aggression, including the presence of forward-deployed U.S. military forces; and the characteristics of effective U.S. military interventions.

**Characteristics of Successful U.S. Military Interventions**
[www.rand.org/t/RR3062](www.rand.org/t/RR3062)
Using an original data set of 145 ground, air, and naval interventions from 1898 through 2016, this report identifies those factors that have made U.S. military interventions more or less successful at achieving their political objectives.

**What Deters and Why: Exploring Requirements for Effective Deterrence of Interstate Aggression**
[www.rand.org/t/RR2451](www.rand.org/t/RR2451)
Deterrence of territorial aggression is taking on renewed importance, yet discussion has lagged in military and strategy circles. The authors provide a fresh look, reviewing established concepts and evaluating the strength of deterrent relationships.

[www.rand.org/t/RR1177](www.rand.org/t/RR1177)
This report analyzes trends in violent conflict and their implications for defense planning. It presents models forecasting levels of conflict through 2040 under different scenarios and suggests early warning indicators of potential increases in conflict.

**National Will to Fight: Why Some States Keep Fighting and Others Don’t**
[www.rand.org/t/RR2477](www.rand.org/t/RR2477)
In this report, researchers propose an exploratory model of 15 variables that shape a national government’s decision to continue or end military and other operations during a conflict (i.e., national will to fight).

**Understanding Conflict Trends: A Review of the Social Science Literature on the Causes of Conflict**
[www.rand.org/t/RR1063z1](www.rand.org/t/RR1063z1)
This report explores, through an extensive literature review, whether the extreme rarity of interstate war and reduced incidence of intrastate war represent permanent shifts in world politics or are a temporary aberration.

**U.S. Presence and the Incidence of Conflict**
[www.rand.org/t/RR1906](www.rand.org/t/RR1906)
This report empirically assesses how U.S. military presence—in particular, U.S. troop presence, and military assistance—is associated with the interstate and intrastate conflict behavior of states and nonstate actors.

**Conflict Trends and Conflict Drivers: An Empirical Assessment of Historical Conflict Patterns and Future Conflict Projections**
[www.rand.org/t/RR1063](www.rand.org/t/RR1063)
Based on conflict projections through 2040, this report concludes that despite the generally declining incidence of armed conflict, the Army must prepare for conventional wars against other states, as well as irregular warfare against nonstate actors.
The National Defense Strategy underscores the critical role of allies and partners in helping the United States ensure the nation’s security, achieve strategic goals, deter aggression, and, when deterrence fails, prosecute coordinated military action to defeat adversaries. Army-sponsored RAND research on U.S. allies and partners has focused on identifying effective uses of security assistance and mutually beneficial approaches to security cooperation and on the creation of interoperable forces to enable coalition warfare.

**Modern Political Warfare: Current Practices and Possible Responses**
[www.rand.org/t/RR1772](www.rand.org/t/RR1772)

This report analyzes how political warfare is practiced today and identifies the most-effective ways that the U.S. government, along with its allies and partners, can respond to or engage in this type of conflict to achieve U.S. ends and protect U.S. interests.

**Targeted Interoperability: A New Imperative for Multinational Operations**
[www.rand.org/t/RR2075](www.rand.org/t/RR2075)

This report looks at what motivations exist for interoperability and defines a reasonable framework from which to work if and when interoperability needs and investments meet strategic language in the United States.

**Building Armies, Building Nations: Toward a New Approach to Security Force Assistance**
[www.rand.org/t/RR1832](www.rand.org/t/RR1832)

This report proposes an alternative approach to security force assistance derived from an interpretation of nation-building and legitimacy formation grounded in history.

**The Global Landpower Network: Recommendations for Strengthening Army Engagement**
[www.rand.org/t/RR1813](www.rand.org/t/RR1813)

The U.S. Army’s global landpower network concept integrates, sustains, and advances the Army’s efforts to meet U.S. national security guidance emphasizing the importance of working closely with partner nations to achieve U.S. strategic objectives.

**Assessing, Monitoring, and Evaluating Army Security Cooperation: A Framework for Implementation**
[www.rand.org/t/RR2165](www.rand.org/t/RR2165)

To help the Army increase the effectiveness of its security cooperation activities, this report examines when Army security cooperation can have the greatest impact, and how the Army should assess, monitor, and evaluate security cooperation.

**Assessing the Value of Regionally Aligned Forces in Army Security Cooperation: An Overview**
[www.rand.org/t/RR1341z1](www.rand.org/t/RR1341z1)

This report highlights recent RAND Arroyo Center research on the value of the Army’s regionally aligned forces to U.S. security cooperation activities, particularly those conducted in Africa.

**Smarter Power, Stronger Partners, Volume I: Exploiting U.S. Advantages to Prevent Aggression**
[www.rand.org/t/RR1359](www.rand.org/t/RR1359)

This research examined trends in military capabilities among potential U.S. adversaries and proposes an alternative way for the United States and its allies to secure their interests.
Soldiers and Families

The Army’s commitment to its soldiers extends to the health, safety, and well-being of their spouses and children. RAND is uniquely positioned to conduct research on soldier families because it maintains deep expertise not only in national security but also in health, education, and community resilience, key aspects of every family’s quality of life. Recent Army-sponsored analyses focus on the challenges faced by soldiers and their families through the military career, from life as a private, through deployments, retirement, and transition to civilian life.

Life as a Private: Stories of Service from the Junior Ranks of Today’s Army
www.rand.org/t/RR2749
This report tells the stories of six soldiers in their own words. While a separate RAND Arroyo Center report details the service experiences of 81 junior enlisted soldiers, this report provides deeper insight into the junior enlisted experience.

Effects of the Blended Retirement System on United States Army Reserve Participation and Cost
www.rand.org/t/RR2591
Analysis of the new Blended Retirement System (BRS) finds that it can sustain U.S. Army Reserve participation relative to the legacy system. The analysis also predicts continuation-pay cost and the percentage of reservists opting in to the BRS.

Assessing the Needs of Soldiers and Their Families at the Garrison Level
www.rand.org/t/RR2148
This report provides information on the results of a garrison-level analysis of survey data from RAND Arroyo Center’s 2014 formal needs assessment survey of active component soldiers and an exploration of help-seeking via focus groups.

Helping Soldiers Leverage Army Knowledge, Skills, and Abilities in Civilian Jobs
www.rand.org/t/RR1719
This report discusses the results of occupation surveys administered to soldiers in ten of the most populous Army military occupational specialties to develop improved crosswalks between military and civilian occupations.

Today’s Soldier: Assessing the Needs of Soldiers and Their Families
www.rand.org/t/RR1893
This report describes results of surveying 7,000 soldiers about the problems that they and their families face, their needs for assistance, use of Army and non-Army resources to address those needs, and the implications of unmet needs for soldiers.

The Deployment Life Study: Longitudinal Analysis of Military Families Across the Deployment Cycle
www.rand.org/t/RR1388
In 2009, RAND launched the Deployment Life Study to assess military family readiness. This report presents analyses on marital relationships, family environment, psychological and behavioral health, child well-being, and military integration.
Because people are the Army’s most important resource, recruiting must be a core competency. Since the creation of the all-volunteer force, RAND has continually conducted innovative research to help military recruiters tailor their strategies and practices in response to ever-changing economic and demographic challenges. Recent Army-sponsored research on recruiting focuses on understanding the environment for recruiting, how to estimate the costs of different recruiting strategies, individual motivations for enlisting, new marketing opportunities offered by social media, and the potential levers for increasing accessions under alternative scenarios.

Developing a National Recruiting Difficulty Index
www.rand.org/t/RR2637
The U.S. Army recognizes that the recruiting environment has a significant impact on its ability to recruit. This report presents a forecasting model that measures recruiting difficulty to forecast a difficult or easy recruiting environment.

Resources Required to Meet the U.S. Army’s Enlisted Recruiting Requirements Under Alternative Recruiting Goals, Conditions, and Eligibility Policies
www.rand.org/t/RR2364
The project sought to enhance efficient use of Army recruiting resources and policies by optimizing required resource levels and mix to support recruiting under varying recruiting requirements and environments and recruit eligibility policies.

Prospective Outcome Assessment for Alternative Recruit Selection Policies
www.rand.org/t/RR2267
To help the Army select recruits more likely to complete their first term and avoid adverse outcomes, this report describes a tool that estimates how changes in a variety of recruit characteristics affect first-term outcomes and costs to the Army.

Evaluating the Army’s Ability to Regenerate: History and Future Options
www.rand.org/t/RR1637
This analysis modeled the Army’s ability to increase (“regenerate”) its active component end strength over five years—starting from end strengths of 450,000 and 420,000—to provide the number of deployable troops available in 2010.

Life as a Private: A Study of the Motivations and Experiences of Junior Enlisted Personnel in the U.S. Army
www.rand.org/t/RR2252
Who joins the Army, why, and how satisfied are they with their decisions? This study’s portrayal of U.S. Army privates could serve as an educational tool for Army senior leadership, junior officers, noncommissioned officers, and prospective recruits.

Social Media and the Army: Implications for Outreach and Recruiting
www.rand.org/t/RR2686
Social media platforms play a key role in the U.S. Army’s outreach and recruiting efforts. The authors analyzed these efforts to see whether and how potential recruits and others are engaging with the Army’s content and offer related recommendations.

Recruiting Strategies to Support the Army’s All-Volunteer Force
www.rand.org/t/RR1211
The research described in this report was conducted to improve the Army’s ability to use recruiting resources and enlistment eligibility policies effectively and efficiently to meet accession requirements under varying recruiting conditions.
Leadership

Military leadership is a calling and a time-hallowed profession. The Army is continually challenged to identify, cultivate, and effectively utilize leaders who best exemplify Army values. Doing so is essential because all other aspects of force readiness depend on leadership as their linchpin. Recent Army-sponsored RAND research on leadership focuses on understanding the value of the key attributes of leadership, including experience, adaptiveness, critical thinking, and the will to fight.

Malleability and Measurement of Army Leader Attributes: Personnel Development in the U.S. Army
www.rand.org/t/RR1583
This review addresses the degree to which leader characteristics associated with attributes in the Army Leader Requirements Model can be developed through training and education and identifies approaches to measuring those characteristics.

The Value of Experience in the Enlisted Force
www.rand.org/t/RR2211
The relationships between tenure, experience, and productivity of key noncommissioned officer leadership in the U.S. Army and performance of the junior soldiers they lead are examined in this report.

Will to Fight: Analyzing, Modeling, and Simulating the Will to Fight of Military Units
www.rand.org/t/RR2341
This report defines and describes will to fight and provides a model of unit will to fight that can be applied to ground combat units of any scale. It also provides a theoretical basis for adding will to fight to military war gaming.

www.rand.org/t/RR1006
The U.S. Army is developing a system to inform leaders of individual- and unit-level suicide risk factors and to support prevention and intervention activities. RAND convened an expert panel to identify necessary data and recommend leader actions.

Identifying Promising Approaches to U.S. Army Institutional Change: A Review of the Literature on Organizational Culture and Climate
www.rand.org/t/RR1588
This report uses a review of organizational culture literature to help address the U.S. Army’s organizational challenges, such as behavioral health treatment stigma, negative workplace behaviors, and growing participation of women in combat.

Innovative Leader Development: Evaluation of the U.S. Army Asymmetric Warfare Adaptive Leader Program
www.rand.org/t/RR504
This report presents the results of a systematic evaluation of the U.S. Army’s Asymmetric Warfare Adaptive Leader Program.

Developing Army Leaders: Lessons for Teaching Critical Thinking in Distributed, Resident, and Mixed-Delivery Venues
www.rand.org/t/RR321
This report evaluated the effectiveness of the Common Core—the first phase of the U.S. Army’s system for developing critical-thinking skills in its officer corps—and the extent of differences among distributed, resident, and mixed-delivery course venues.
The following pages present summaries of recently published RAND Arroyo Center analyses that represent the quality and breadth of the research conducted for the Army.

- Russia Is a Rogue, Not a Peer; China Is a Peer, Not a Rogue
- China in the Developing World: Economic, Political, and Military Activities
- How Does U.S. Forward Military Presence Affect the Incidence of Conflict?
- Making Will to Fight Practicable for Gaining Advantage in Competition and War
- Will to Fight: Understanding Why Some States Keep Fighting and Others Don’t
- Are Highly Experienced Noncommissioned Officers Worth the Extra Cost?
- What Does the Career of an Army Civilian Look Like?
- How Can Army Special Operations Forces Better Articulate Their Capabilities?
- A Framework for Building Interoperability with Partners and Allies
The U.S. National Security Strategy equates Russia and China as revisionist powers that seek to change the international order and as key U.S. challengers, but the two represent distinct challenges. Russia is a well-armed rogue state seeking to subvert an international order it can never hope to dominate, while China is a peer competitor that wants to shape an international order it can aspire to lead. This piece summarizes RAND Arroyo Center research on the different challenges the two countries pose and the different responses needed to address them.

**A Tale of Two Countries—How Russia and China Compare**

Both countries seek to alter the status quo, but only Russia has attacked neighboring states, annexed conquered territory, and supported insurgent forces seeking to detach even more territory. Russia assassimates its opponents at home and abroad and interferes in foreign elections, subverts democracies, and works to undermine European and Atlantic institutions. In contrast, China’s growing influence is based largely on more-positive measures: trade, investment, and development assistance.

The two countries also vary widely in size and economic weight. Russia is not in the same league as China (see the table). It is far smaller, has poorer economic prospects, and is less likely to dramatically increase its military power in the long term. It presents a current challenge, but not one destined to become more potent over time.

**Meeting the Russian Challenge**

Russia still poses the more immediate and proximate military challenge: NATO and Russian troops face each other across Russia’s land borders, relations are tense, and Russia is the target of multiple sanctions. And Russia’s appetite and capacity for expeditionary warfare beyond its immediate periphery have been shown in Syria.

The West can contain the Russian military threat with familiar measures of defense, deterrence, and reassurance. These require alliance solidarity, forward presence, layered defenses, and a credible ladder of escalation—many of which are already in place. Russia can also be influenced and—where
necessary—penalized in the economic sphere. U.S. and European sanctions constrain Russia’s economy and could do so more. In the information domain, Russian efforts to subvert Western democracies offer a powerful rationale for a U.S. countercampaign to serve as retribution, reestablish a degree of deterrence, and create the basis for future mutual restraint in such activities.

Meeting the Chinese Challenge
China poses a regional military challenge and a global economic one. In East Asia, Chinese air and sea defenses are continuing to grow, making U.S. forward basing more vulnerable and the direct defense of U.S. interests in the region more costly and less sure of success. As these trends continue, the United States will be pushed more toward the threat of horizontal or vertical escalation for deterrence, with the attendant risks of counterescalation. Militarily, China can still be contained, but, over time, the price for defending U.S. interests there, as currently defined, will be progressively steeper.

To address the military challenges, the United States should continue to hold the line in East and Southeast Asia, accepting the larger costs and risks involved in counterbalancing growing Chinese military capabilities. Simultaneously, it should help regional allies and partners field their own antiaccess and area denial systems and take advantage of opportunities to remove points of Sino-American tension, recognizing that the U.S. bargaining position will gradually deteriorate.

China’s economic challenge is both the more immediate and the more serious one. Rather than focusing on the bilateral balance of trade, the United States needs to compete more effectively in foreign markets, persevere and strengthen international norms for trade and investment, and incentivize China to operate within those norms by collaborating when it does and mobilizing concerted international pressures when it does not.

Meeting the Russia and China Challenge
Sometimes, Russia and China combine efforts to limit U.S. influence in the United Nations, block Western initiatives, or create new multilateral forums that exclude the United States. Both would like to see U.S. leadership of the global order diminished, but only China seriously aspires to inherit that role.

Russia is not in the same league as China

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Russia</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>5.4% decline</td>
<td>1.4% decline</td>
</tr>
<tr>
<td>Economy</td>
<td>1.5-fold growth</td>
<td>2.2-fold growth</td>
</tr>
<tr>
<td>Per capita GDP</td>
<td>1.7-fold growth</td>
<td>2.2-fold growth</td>
</tr>
<tr>
<td>Military expenditures</td>
<td>2.0-fold growth</td>
<td>3.5-fold growth</td>
</tr>
</tbody>
</table>

Both would like to see U.S. leadership of the global order diminished, but only China seriously aspires to inherit that role.

This summary is based on PE-310-A, Russia Is a Rogue, Not a Peer; China Is a Peer, Not a Rogue: Different Challenges, Different Responses, by James Dobbins, Howard J. Shatz, and Ali Wyne, 2019. For questions about this analysis, contact James Dobbins at dobbins@rand.org.

www.rand.org/t/PE310
China considers its ties to developing countries as critical for securing natural resources, developing export markets, expanding its geostrategic influence, and gaining advantages in its global competition with the United States. This piece summarizes RAND Arroyo Center research evaluating China's economic, political, and military activities in the developing world and the implications of those activities for the United States.

**China's Rings of Insecurity**
China views its security environment in the developing world as four concentric rings (see the map): (1) an innermost ring of China itself (including Taiwan, which it claims); (2) territory and bodies of water directly next to China's own land and maritime borders, including portions of Southeast Asia, Central Asia, and South Asia; (3) China's entire Asia-Pacific (including portions of Southeast Asia, Central Asia, and South Asia and all of Oceania); and (4) the Middle East, Africa, and Latin America and the Caribbean.

**Assessing China's Economic, Political, and Military Activities in the Developing World**
As part of the evaluation, researchers drew on economic, political, and military data to quantitatively compare China’s relative priorities for the seven regions identified on the map. For each category, the researchers considered two indicators and data points or a range across time—from the early 2000s to 2014 (see the table). For example, under the economic category, the indicators are trade volume and foreign investment, with data points for two years (2000 and 2014). The numbers in the table reflect the priority of that indicator in one region versus another. According to the data, Southeast Asia is China’s top-priority region in the developing world; economically, it has the largest trade volume and has received the largest amount of China’s outbound foreign direct investment (in both 2003 and 2012); politically, China sent more high-level leaders to Southeast Asia than to any other region of the developing world and has the third-most Confucius Institutes; militarily, it ranks third in volume of arms sales between 2000 and
2014 and second in the number of field exercises conducted between the People’s Liberation Army and regional militaries. Given the data, Africa is second in terms of priority for China.

**Implications for the United States**

During the past two decades, China has become more active economically, politically, and militarily across the developing world. For example, trade volume in Southeast Asia grew from $39.5 billion in 2000 to $479.8 billion in 2014—a growth rate that is reflected in all seven regions. China’s growing presence in the developing world is likely to continue to expand under President Xi Jinping and extend beyond his tenure.

The researchers conclude that China and the United States are neither in direct conflict nor in close cooperation across the developing world, although there is significant variation by region. In Southeast Asia, for example, Washington and Beijing are in confrontation over Chinese activities in the South China Sea. But outside Southeast Asia (and Northeast Asia, among developed regions), the United States and China appear to be partners in parallel—two states working separately with no real collaboration, in pursuit of similar ends, but with no conflicts.

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This summary is based on RR-2273-A, *At the Dawn of Belt and Road: China in the Developing World*, by Andrew Scobell, Bonny Lin, Howard J. Shatz, Michael Johnson, Larry Hanauer, Michael S. Chase, Astrid Stuth Cevallos, Ivan W. Rasmussen, Arthur Chan, Aaron Strong, Eric Warner, and Logan Ma, 2018. For questions about this analysis, contact Andrew Scobell at scobell@rand.org.

www.rand.org/t/RR2273

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**China’s top-priority region is Southeast Asia**

<table>
<thead>
<tr>
<th>Regions by priority</th>
<th>Priority order within category</th>
<th>Economic</th>
<th>Political</th>
<th>Military</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Southeast Asia</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2. Africa</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>3. Middle East</td>
<td>2</td>
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<td>2</td>
<td>6</td>
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<tr>
<td>4. Central Asia</td>
<td>7</td>
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<tr>
<td>5. South Asia</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>6. Latin America and the Caribbean</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>7. Oceania</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

* Institutes are nonprofits outside China whose stated aim is to promote Chinese language and culture, support local Chinese teaching internationally, and facilitate cultural exchanges.
Some argue that U.S. forward military presence (U.S. military personnel and equipment located in key geographical regions) is stabilizing—that it helps deter adversaries and restrain U.S. partners from adopting provocative policies and makes it easier for the United States to achieve its aims without using force. But others argue that forward military presence makes conflict more likely—that it tends to provoke potential adversaries and encourage allies to adopt more-reckless policies and makes the use of force by the United States more likely. Adjudicating these competing claims can help address current debates about the U.S. pivot to Asia, changes to U.S. posture in Europe, and potential reductions in the U.S. presence in the Middle East. But there has not been enough empirical analysis to support an adjudication. The RAND Arroyo Center research summarized here provides such empirical evidence.

**KEY POINTS**

- U.S. forward troop presence can deter interstate conflict.
- But U.S. forward troop presence can make lower-intensity militarized disputes more likely.
- U.S. forward troop presence does not appear to affect intrastate conflict or the use of repression by partner states.
- The findings can help U.S. decisionmakers understand the likely benefits and trade-offs attendant with forward positioning military forces in Europe, Asia, and the Middle East.

**How Does U.S. Forward Military Presence Affect the Incidence of Conflict?**

Researchers developed competing hypotheses derived from the theoretical literature on the relationship between U.S. forward presence and the incidence of both interstate and intrastate conflict (see the tables). Using the hypotheses, researchers created data sets for each type of conflict and then tested the hypotheses statistically.

The table on interstate conflict (left) summarizes the hypotheses for interstate conflict that link U.S. presence, especially troop presence, to decisions by potential adversaries, partners, and the United States to initiate conflict. Previous studies have theorized or found evidence that U.S. presence could both increase and decrease actors’ likelihood of engaging in conflict.

In terms of intrastate conflict (the table on the right), presence may also alter the strategic calculations of key domestic political actors, including incumbent regimes and opposition
Researchers hypothesize how U.S. presence could either encourage or prevent interstate conflict

<table>
<thead>
<tr>
<th>Actor</th>
<th>Why U.S. presence could decrease likelihood of interstate conflict</th>
<th>Why U.S. presence could increase likelihood of interstate conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential adversary</td>
<td>• Deterred</td>
<td>• Threatened</td>
</tr>
<tr>
<td></td>
<td>• Emboldened by U.S. partner underinvestment</td>
<td>• Emboldened</td>
</tr>
<tr>
<td></td>
<td>• United States gains leverage to restrain</td>
<td>• United States loses leverage to restrain</td>
</tr>
<tr>
<td>U.S. partner</td>
<td>• Reassured</td>
<td>• Enhance ability to achieve aims without conflict</td>
</tr>
<tr>
<td></td>
<td>• United States gains leverage to restrain</td>
<td>• Partners gain influence to restrain</td>
</tr>
<tr>
<td>United States</td>
<td>• Enhanced ability to achieve aims without conflict</td>
<td>• Security concerns expand</td>
</tr>
<tr>
<td></td>
<td>• Partners gain influence to restrain</td>
<td>• Lower cost to using force</td>
</tr>
</tbody>
</table>

Trade-Offs to U.S. Forward Troop Presence
For interstate conflict, the results support a nuanced integration of the competing hypotheses about how U.S. forward troop presence affects a potential adversary’s perceptions. On average, U.S. forward troop presence advances a primary U.S. national security goal—deterrence of interstate wars—but potentially makes militarized disputes short of war more likely. U.S. troops located in countries directly bordering a potential adversary are most likely to lead to these disputes, while U.S. troops located nearby, but in other countries that do not border the adversary, are associated with a reduction in the likelihood of interstate war.

As for intrastate conflict, the results do not provide support for the hypotheses developed in the theoretical literature. Although U.S. forward troop presence may be destabilizing in some cases, on average, such presence does not appear to influence partner states’ risk of intrastate conflict or their use of repression. In the average case, U.S. forces deployed to deter interstate conflict are unlikely to increase the risk of intrastate war. But another form of U.S. involvement abroad, U.S. military assistance, is positively associated with an increased risk of multiple types of intrastate conflict, such as antigovernment activities and greater levels of state repression by incumbent governments. This suggests that policymakers should be aware of adverse effects when deciding to continue aid to partner regimes, especially relating to governments’ willingness to turn such U.S. military assistance on their populaces.

Implications for Current Decisionmaking
These findings have implications for decisionmaking on U.S. forward presence in Europe, Asia, and the Middle East.

- In Europe, basing forces in the Baltic states may lead Russia to initiate more disputes and provocations against those states. By contrast, additional U.S. forward-based capabilities in other parts of the European theater may achieve a deterrent effect—and do so less confrontationally.

- In Asia, a substantial increase in U.S. combat capabilities in the Indo-Pacific region may help deter China from initiating war with neighboring states where it has territorial claims in the East and South China Seas. But if that increase in U.S. presence is located directly on China’s borders, it may lead China to intensify militarized activities and provocations toward the partner states that host U.S. forces.

- In the Middle East, the United States has increased military assistance to many partners in recent years; doing so may strengthen and assure U.S. partners, but possibly at the cost of increased risk of repression and greater domestic instability among the recipient states.

The guidelines from this research are general principles. Thus, any planning for increasing U.S. forward troop presence to deter a particular potential adversary or reassure a particular partner would need to explore how situation-specific strategic and domestic factors could alter the general patterns the researchers found.

This summary is based on RR-1906-A, U.S. Presence and the Incidence of Conflict, by Angela O’Mahony, Miranda Priebe, Bryan Frederick, Jennifer Kavanagh, Matthew Lane, Trevor Johnston, Thomas S. Szayna, Jakub P. Hlávka, Stephen Watts, and Matthew Povlock, 2018. For questions about this analysis, contact Angela O’Mahony at aomahon1@rand.org.

www.rand.org/t/RR1906
Because U.S. military theory is based on the idea that war is a contest of opposing, independent human wills, capstone U.S. military doctrine highlights will to fight as the most important factor in war. But in practice, the U.S. military all but ignores the will to fight of adversaries and allies. This summary highlights RAND Arroyo Center research that seeks to make will to fight practicable. The research provides the U.S. military with a method to clarify the meaning of will to fight and gives warfighters a set of tools to gain advantage in daily competition and, as needed, to win wars.

Identifying Critical Factors
The researchers analyzed will to fight using a multimethod, multidisciplinary research approach that incorporated insights from history, sociology, psychology, anthropology, wargaming, modeling, and computer simulation. They developed a comprehensive model of will to fight that distinguishes the critical factors most likely to influence human decisionmaking in competition and in war. Using the model will provide an empirical basis for applied military actions, such as influence operations and kinetic force, and can help shore up allies and break the will of adversaries.

What We Found About Will to Fight
The analysis confirmed the researchers’ central assumption: The U.S. military is not applying its own capstone concept of warfare. This conclusion is supported by these findings:

- There is no generally accepted definition, explanation, or model of will to fight. Absent a definition and clear instructions that translate will-to-fight theory to practice, military planners and leaders focus on the concrete factors of war: gaining physical advantage in a contest of opposing gear.
- Will to fight can be understood through focused analysis, but there are no easy answers. No single factor—such as cohesion, leadership, or training—explains will to fight.

KEY POINTS

- U.S. understanding of will to fight needs significant improvement to become useful.
- RAND Arroyo Center developed a model of will to fight that can be applied immediately.
- Applying will-to-fight analysis will yield improvements in adversarial competition and war.
- Integrating will-to-fight theory into daily practice will improve U.S. military power.

Making Will to Fight Practicable for Gaining Advantage in Competition and War
Multiple factors affect units’ will to fight

Subfactors for detailed analysis of complex factors

Durability ratings show likelihood of quick change—low for expectation and support; medium for esprit de corps, control, cohesion, and leadership; and high for competence

Factors at the unit level

Factors broken down by culture and capabilities

Level of analysis: unit

on its own. All available factors need to be considered.

- Wargaming and computer simulations provide a way to help explore and explain the complexities of will to fight. The simulation experiments showed that adding the human element always changes combat outcomes, sometimes considerably.

**Understanding the Model as a Tool for Analysis**

The model shows how will to fight can be analyzed and explained. The model represents five levels of will to fight (individual, unit, organization, state, and society) and three categories of factors affecting will to fight (motivations, capabilities, and culture).

The figure shows how the model represents will to fight at the unit level. Factors at the unit level include esprit de corps, cohesion, leadership, and competence, representing both military cultural issues and practical capabilities. For most factors, the model identifies subfactors to help guide more-detailed analyses. Because will to fight can wax or wane, the shade of the orange bars represents the likelihood that a factor is more (darker shade) or less (lighter shade) durable over a single battle; for example, unit support is shown as low durability.

Although the model explains the factors of will to fight, it does not provide a quantifiable formula. From the model, the researchers developed an assessment tool that can be used to explore the meaning and relevance of each factor and to better understand will to fight.

**Applying Will to Fight: Bringing Theory into Practice**

The three overarching recommendations are presented in the table. They all boil down to one key takeaway: **Will to fight can be applied, and it must be applied if the U.S. military wants to improve its success in competition and in war.** The steps the military can take are direct and immediate, and they are also relatively low cost when compared with materiel acquisitions.

**The Army has many opportunities to apply will to fight**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Key step</th>
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</table>
| Integrate will to fight into doctrine, training, education, and application | • Develop and integrate an Army will-to-fight definition and model into capstone doctrine  
• Integrate will to fight into Army doctrine and application manuals |
| Include will to fight in all holistic estimates of ground combat effectiveness | • Integrate will to fight into assessments of partner and adversary effectiveness—grounded estimates of disposition to fight, for the former, and grounded estimates for analytic integrity, for the latter |
| Integrate will to fight into wargames and simulations | • Add will to fight to current Army combat simulations (e.g., One Semi-Automated Forces [OneSAF] and Warfare Simulation [WARSIM]) and into all current and prospective joint force simulations of force-on-force conflict |

This summary is based on RR-2341-A, Will to Fight: Analyzing, Modeling, and Simulating the Will to Fight of Military Units, by Ben Connable, Michael J. McNerney, William Marcellino, Aaron Frank, Henry Hargrove, Marek N. Posard, S. Rebecca Zimmerman, Natasha Lander, Jasen J. Castillo, and James Sladden, 2018. For questions about this analysis, contact Ben Connable at connable@rand.org.  
www.rand.org/t/RR2341
What drives some states to persevere in war at any cost while others choose to stop fighting? It is often less tangible political and economic variables, rather than raw military power, that ultimately determine national will to fight. The research summarized here is part of a broader RAND Arroyo Center effort to help U.S. leaders better understand and influence will to fight at both the national level and tactical and operational levels. Specifically, the research explores how political and economic variables strengthen or weaken a national government’s determination to conduct sustained military operations, even when the expectation of success decreases or the potential for substantial political, economic, and military sacrifices increases.

Developing an Exploratory Model of National Will to Fight
To analyze national will to fight, researchers used multiple research methods, including a wide-ranging literature review, interviews, case studies (such as conflicts involving the Korean Peninsula and Russia), and reviews of relevant modeling and wargaming. They developed an exploratory model of national will to fight that can be tailored and applied to a broad set of conflict scenarios and that drive a much-needed dialogue among analysts conducting threat assessments, contingency plans, wargames, and other efforts that require an evaluation of how future conflicts might unfold. The recommendations should provide insights into how leaders can influence will to fight in both allies and adversaries.

The figure shows the national model, which has seven factors that shape will-to-fight policy decisions (such as stakes and popular support) within four centers of gravity (military, international, nation, and state). The model also includes contexts and mechanisms associated with these factors. A context is an existing or emerging condition that affects will to fight, such as government type. Mechanisms, such as casualties and engagement, are used by leaders on both sides of a conflict to influence will to fight.

KEY POINTS
- Understanding the will to fight of U.S. allies and adversaries is key to preventing future conflicts or prevailing in them.
- RAND Arroyo Center has developed an exploratory model analyzing variables that could strengthen or weaken national will to fight.
- Incorporating will-to-fight considerations into political-military planning, information operations, and international engagements will improve the security of the United States and its allies.

Will to Fight
Understanding Why Some States Keep Fighting and Others Don’t
Understanding and Influencing the National Will to Fight

This research confirmed that will to fight is poorly analyzed and the least-understood aspect of war. The research also identified key factors, contexts, and mechanisms to help understand and influence will to fight:

- A country with more factors in its favor (e.g., high stakes, strong cohesion, and popular support) should have a stronger will to fight and thus a higher chance of victory.
- Political context (i.e., government type and national identity) plays an underlying but important role in strengthening or weakening will to fight. Strong democracies and totalitarian states are better able to maintain will to fight (through very different means) than democracies in turmoil or states with a mix of democratic and autocratic traits.
- The influence of economic variables on will to fight depends on a government’s alliances and its engagement with other countries. A country’s economic dependency on and support from its allies often matter more than economic pressures from an adversary.
- The effective use of engagement and information (both internally directed indoctrination and externally directed messaging) can greatly influence will to fight and thus should improve the chances of victory. These mechanisms are most effective before a conflict begins, when governments and their populations are more susceptible to being influenced.
- When will to fight is evenly matched, superior military capabilities and infliction of greater casualties should lead to victory or stalemate. But in some scenarios, inflicting casualties is more likely to strengthen an adversary’s will to fight; as perceived stakes increase, political and military cohesion grow in the face of a violent external foe, and populations rally around the flag.

Recommendations

- The U.S. Army and other leaders should assess national will to fight in potential wartime allies and adversaries.
- To incorporate considerations of will to fight into future analysis, the U.S. military should update strategic guidance documents and military doctrine.
- Army and other leaders should incorporate will-to-fight considerations into international engagements, from high-level political discussions to multinational military exercises and tactical training events.
- For the Army to help guide U.S. government efforts to operate more effectively in the information space, Army leaders should understand and influence will to fight through the indoctrination and messaging efforts of other countries.

This summary is based on RR-2477-A, National Will to Fight: Why Some States Keep Fighting and Others Don’t, by Michael J. McNerney, Ben Connable, S. Rebecca Zimmerman, Natasha Lander, Marek N. Posard, Jasen J. Castillo, Dan Madden, Ilana Blum, Aaron Frank, Benjamin J. Fernandes, In Hyo Seol, Christopher Paul, and Andrew Parasiliti, 2018. For questions about this analysis, contact Michael J. McNerney at mcnerney@rand.org.

www.rand.org/t/RR2477
Leading and mentoring soldiers are the primary tasks of the U.S. Army’s noncommissioned officers (NCOs). NCOs who do a better job at these tasks will be more likely to develop capable soldiers who themselves go on to become strong leaders and mentors. But past research has placed little emphasis on determining the relationship between the experience and characteristics of NCOs and the performance of the soldiers under their command.

Studying NCOs’ Effectiveness
RAND Arroyo Center researchers examined both the influence of NCOs on their soldiers and whether the Army’s promotion process is identifying and retaining effective NCOs. To test whether NCOs’ experience is related to the performance of their soldiers, researchers used data primarily from the Total Army Personnel Database and calculated three metrics of soldier performance: attrition rates, promotion rates, and demotion rates. Measures of senior NCO experience included months deployed, years of service, and other NCO characteristics, such as time in unit and speed of promotion. To assess whether the Army’s promotion process is identifying and retaining effective NCOs, the researchers examined promotion rates and interviewed soldiers to understand the qualities they associate with effective leaders and compared those responses with the qualities highlighted in Army doctrine.

NCO Experience Predicts Soldier Outcomes
Senior NCO characteristics and experience do help predict differences in soldiers’ probabilities of attrition and of early promotion to E-5 (sergeant) but do not predict differences in demotion rates. Although experience is valuable, more experience is not always better. The figure provides an illustrative

Are Highly Experienced Noncommissioned Officers Worth the Extra Cost?

KEY POINTS
- Senior noncommissioned officers’ (NCOs’) experience predicts soldiers’ attrition and promotion rates.
- Senior NCOs with moderate levels of experience are associated with lower soldier attrition.
- Because of the effect on attrition, having a senior NCO with the right mix of experience could potentially generate substantial savings in personnel costs.
- The Army’s promotion process captures only a limited amount of senior-leadership experience.
- When promoting NCOs, the Army should consider ways to identify those with the characteristics that soldiers report as valuable, such as compassion and fostering a learning environment.
comparison: Attrition of soldiers is lowest—12.4 percent—in units with leaders who were neither the fastest nor the slowest promotors to E-6 (staff sergeant) and who have 22–25 years in service.

Having a senior NCO with the right mix of experience could potentially generate substantial savings. According to the study results, the effect of a senior NCO with this right mix of experience on soldier attrition could translate into about two to four additional years of service from soldiers in the unit because of decreased levels of attrition. This suggests that the Army would need to recruit fewer soldiers for each unit with a senior NCO of typical experience than for a unit with a less experienced, or a more experienced, senior NCO.

The Promotion Process Does Not Capture All Relevant NCO Characteristics

The characteristics of effective NCOs described by interviewed soldiers included compassion and the ability to foster a learning environment. Such characteristics align well with those in Army doctrine, but they are not explicitly captured in the promotion process until promotion to E-7 (sergeant first class). Therefore, the Army might not be identifying NCOs with strong leadership potential early in their careers and fostering them accordingly. It might be that such soldiers are identified informally through NCO support channels, but, doctrinally, the Army’s process is not oriented to systematically identify those soldiers. An opportunity may exist for the Army to avoid losing effective leaders early and to expand the pool of senior NCOs.

Recommendations

To address these findings, the Army should consider the following:

- Explore providing additional training or support to the least-experienced senior NCOs.
- Seek to maintain continuity during senior NCOs’ transitions between units, with the goal of improving the performance of enlisted personnel.
- Consider altering the promotion process to capture desired leadership qualities. Doing so would likely help identify soldiers with leadership potential.
- Learn more about leadership effects not detected in the analyses. For example, senior NCOs’ influence may work partly through influence on junior NCOs. Also, the match between leaders and soldiers on key characteristics may matter. Learning more about these effects could help improve performance and lower attrition, resulting in decreased personnel costs.

This summary is based on RR-2211-A, *The Value of Experience in the Enlisted Force*, by Jennie W. Wenger, Caolionn O’Connell, Louay Constant, and Andrew J. Lohn, 2018. For questions about this analysis, contact Jennie W. Wenger at jwenger@rand.org.

www.rand.org/t/RR2211

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**Soldier attrition is lowest with NCOs who have 22–25 years of experience**

<table>
<thead>
<tr>
<th>Leader characteristics</th>
<th>Soldier characteristics</th>
<th>Probability soldier will leave Army before 36 months</th>
</tr>
</thead>
</table>
| **Least-experienced NCO** | • Fast to promote to E-6  
• Time in service: <22 years | Same soldier characteristics:  
• white man  
• high school graduate  
• enlisted at age 20  
• Armed Forces Qualification Test in category IIIB  
• combat arms  
• not yet deployed | 14.4% |
| **Most-experienced NCO** | • Average time to E-6  
• Time in service: 22–25 years | 12.4% |
| **Most-experienced NCO** | • Slow to promote to E-6  
• Time in service: 25+ years | 13.4% |
conventional wisdom is that those who take civilian positions do so because they value the relatively high job security of government employment—joining the civilian workforce soon after earning a degree, spending a long career in the U.S. Army, and then leaving upon becoming eligible for retirement. But if data show that many Army civilians follow other career patterns, the Army’s workforce managers may need to tailor existing workforce management policies on hiring, training, and leadership development.

Identifying Civilian Career Patterns
RAND Arroyo Center researchers identified the most-common career patterns among individuals who entered the Army civilian workforce between fiscal years 1981 and 2000 and were on the General Schedule (GS) pay plan. Using the Defense Manpower Data Center Civilian Master File, the researchers applied a statistical clustering method to identify alternative career patterns in terms of length of service, promotion frequency and timing, and transfers between the Army and other U.S. Department of Defense (DoD) components. After identifying these career patterns, the researchers examined how each pattern is related to employees’ individual and job characteristics.

The Seven Patterns of Army Civilian Careers
Researchers identified seven career patterns common among Army civilians; the table lists these in order of prevalence. Nearly two-thirds of Army civilians follow the short-term career pattern, accounting for 34 percent of the person-years. Overall, 40 percent of Army civilians spent five or fewer years in the DoD civilian workforce.

What Does the Career of an Army Civilian Look Like?

KEY POINTS
• Army civilian careers are diverse, falling into seven common patterns.
• The majority of Army civilians spend fewer than ten years in their Army careers.
• Career patterns are related to employees’ individual and job characteristics, including gender, race/ethnicity, age, education and career program at entry, and prior military service.
• Army workforce managers could take a number of steps to better understand the reasons for the career patterns and to increase diversity among Army civilian leaders.
Relationships Between Career Patterns and Individual and Job Characteristics

The study found that women are more likely to be in career patterns that include short-term service, service in a low grade, and a long gap in service. Black and Hispanic employees are more likely to be in one of the low-grade career patterns and less likely to be in the higher-grade ones, relative to whites. Asians are also more likely to be in the low-grade pattern or to spend time in other parts of DoD, at various grade levels. Asians and Hispanics are also less likely to be in the short-term pattern.

The youngest and oldest entrants into the Army civilian workforce are more likely to be in the short-term pattern. But young civilian workers are also more likely to be in career patterns characterized by eventual promotion to the highest grades. More-educated individuals are more likely to be found in higher-grade patterns, which is consistent with higher educational requirements for positions at higher pay grades. Individuals with prior military service, particularly military retirees, are much less likely to be in the short-term pattern and more likely to be mobile across DoD components and to exhibit a gap in service.

Recommendations

Although the findings are descriptive and not causal—the causal impact of individual characteristics on career pattern cannot be identified—they suggest steps Army workforce managers may wish to take:

- Collect systematic information about why employees leave the Army civilian workforce to determine whether the high rate of departure during the first few years is a concern.
- Collect information about motivations for civilian workers moving to the Army from another federal agency.
- Consider whether hiring outreach strategies could be modified to increase diversity in higher pay grades; for example, a focused effort to encourage hiring women in occupations associated with longer-term service in higher grades may improve diversity in the pipeline for leadership positions.
- Examine whether observed career patterns are similar across different segments of the civilian workforce, particularly those in which attrition and leader development are expected to be particularly challenging.
- Explore whether resources are being effectively applied within the civilian workforce, given the wide array of civilian career patterns.
Current political and budgetary constraints will likely complicate U.S. efforts to develop and implement a fully resourced National Security Strategy for years to come. Given these constraints and a challenging strategic environment, U.S. Army special operations forces (SOF) may provide an effective and cost-sensitive source of needed military capabilities in many circumstances. But Army SOF have not always been successful in making the case to relevant policymakers for drawing on their capabilities to meet U.S. national security objectives.

The Value of Special Operations
RAND Arroyo Center researchers examined how the Army and Army SOF, as part of the joint SOF, can better articulate to policymakers the SOF value proposition and potential for contributing to the U.S. National Security Strategy. Researchers constructed detailed case histories to determine the decisionmaking process by which special operations capabilities have developed and been operationally employed. To conduct the case studies, researchers interviewed military and government officials at all levels and analyzed concept papers, briefings, legislative records, and internal policy memoranda. Researchers assessed the windows of opportunity for policymaking, the factors influencing decisions, and the outcomes. They then derived lessons learned and developed recommendations to inform Army SOF and Army initiative planning and execution.

Researchers focused on 13 cases that represent major milestones in the creation, development, and employment of SOF (see the table).

KEY POINTS
• The United States has created, used, and expanded special operations forces (SOF) capabilities for decades, but policymakers might not have a full understanding of the current potential of SOF for contributing to the National Security Strategy.
• There are specific ways in which SOF capabilities and their potential uses can be better articulated to policymakers.
• U.S. Army SOF can change personnel, leader development, and education practices to improve interactions with other agencies.

How Can Army Special Operations Forces Better Articulate Their Capabilities?
Lessons and Recommendations

Using the case studies, researchers developed seven lessons about how to better articulate SOF capabilities: (1) identify whether a propitious policy window exists, (2) understand and leverage established processes to initiate proposals and pursue objectives, (3) map stakeholders and incorporate them from the outset to solicit input and encourage buy-in, (4) cultivate networks and advocates at all levels, (5) provide subject-matter expertise to Congress and develop relationships with staff through authorized engagements, (6) address bureaucratic rivalry with deliberate strategies to promote synergy and avoid zero-sum outcomes, and (7) pursue incremental change as part of a long-range plan.

These lessons, in turn, led to four recommendations for Army and Army SOF leadership:

1. **Prepare SOF to interact at the policy level by revising their personnel, leader development, and education practices to increase and leverage SOF interagency knowledge and experience.**

2. **Emphasize the processes that will continue to develop the unique military capabilities of SOF.**

3. **Further develop the SOF-CIA relationship and leverage respective strengths in conducting unconventional warfare.**

4. **Develop “plain English” explanations of special operations terminology and narrative to avoid inundating policymakers with new terms that create confusion rather than illuminate SOF capabilities and their potential contributions.**

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**Arroyo assessed 13 SOF case studies**

<table>
<thead>
<tr>
<th>Case study</th>
<th>Subject</th>
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<tbody>
<tr>
<td>1. Creation of the 6th Army Special Reconnaissance Unit (Alamo Scouts)</td>
<td>One of the earliest instances in which the Army recognized the need for units with special capabilities</td>
</tr>
<tr>
<td>2. Creation of the Office of Strategic Services (OSS)</td>
<td>The OSS as the organizational predecessor of much of the Army's special warfare capability</td>
</tr>
<tr>
<td>3. Creation of U.S. Army Special Forces</td>
<td>How the creation of U.S. Army Special Forces in 1952 gave the Army the psychological and unconventional warfare capabilities to fight behind enemy lines</td>
</tr>
<tr>
<td>4. Expansion and contraction of U.S. Army Special Forces in the Vietnam era</td>
<td>Policy successes and failures of the U.S. Army Special Forces expansion under President John F. Kennedy and subsequent contraction after the Vietnam War</td>
</tr>
<tr>
<td>5. Cooperation between the CIA and SOF in Southeast Asia, 1961–1975</td>
<td>Foundational efforts of special warfare in its Cold War apex in Southeast Asia</td>
</tr>
<tr>
<td>6. Creation of U.S. Special Operations Command (USSOCOM) and the assistant secretary of defense for special operations and low-intensity conflict (ASD/SOLIC)</td>
<td>Lessons from the creation of USSOCOM and the ASD/SOLIC about the role and influence of Congress and the importance of informal processes to influence policy changes</td>
</tr>
<tr>
<td>7. Expansion of SOF post-9/11</td>
<td>The decision to greatly expand U.S. SOF capabilities following the 9/11 attacks</td>
</tr>
<tr>
<td>8. Expansion of Special Mission Unit (SMU)</td>
<td>One of the major aspects of the post-9/11 SOF expansion—the increase in size, scope, and authority of SMUs</td>
</tr>
<tr>
<td>9. Creation of Section 1208 authority*</td>
<td>Creation of a SOF-specific authority to support counterterrorism partner forces that has been steadily expanded since its passage by Congress in 2005</td>
</tr>
<tr>
<td>10. Creation of the Global SOF Network (GSN) Initiative</td>
<td>GSN, designed to strengthen USSOCOM's ability to respond to global contingencies and to develop a collaborative network among SOF and interagency and international partners</td>
</tr>
<tr>
<td>11. Creation of the irregular warfare (IW) directive</td>
<td>The effort to institutionalize IW requirements for SOF and general-purpose forces to conduct IW by the promulgation of U.S. Department of Defense directive*</td>
</tr>
<tr>
<td>12. Enactment of Plan Colombia</td>
<td>The role of SOF as the primary U.S. military force to provide training, advice, and assistance to the Colombian military as part of the U.S. government effort to support the Colombian government's counternarcotics and counterinsurgency campaign</td>
</tr>
<tr>
<td>13. Support to Syrian fighters</td>
<td>The protracted debate over U.S. policy options in Syria and the decision for SOF to train and equip Syrian fighters</td>
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</tbody>
</table>

*Public Law 108-375, Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, October 28, 2004, Section 1208, “provide[s] support to foreign forces, irregular forces, groups, or individuals engaged in supporting or facilitating ongoing military operations by United States special operations forces to combat terrorism.”

REPORT SUMMARY

Hardly a conversation about U.S. military capabilities occurs in which interoperability with another organization—multinational or not—does not come up. The common refrain is that more and better interoperability is needed. And, with few exceptions in recent decades, the United States tends to engage with partners and allies in military operations, thus bringing multinational interoperability to the fore. Unfortunately, the United States is not fully interoperable when and how it wants, for several reasons: a lack of understanding of the significant resources interoperability takes, a reluctance to expend time and money when the value is not clear, and a one-size-fits-all attitude when it comes to finding solutions.

An Interoperability Framework
RAND Arroyo Center researchers proposed a simple, logical framework for planning and building interoperability that derived from information gathered through interviews and a survey, lessons-learned documents focused on multinational operations, historical cases of interoperability, and in-depth case studies of it.

According to the research, there are two types of interoperability. **General interoperability** is defined as a force and leadership predisposed to, and effective at, solving the complex operational and tactical challenges of working with disparate foreign partners. The second type is **targeted interoperability**, defined as a unit or a collection of units that has overcome the cultural, technical, and procedural barriers to operating with a foreign counterpart for specific functions.

Those two types of interoperability connect to four broad, nonexclusive sources of demand for interoperability (see the figure). Two demand sources—hedging and *ops du jour*—

KEY POINTS

- There are trends at work that require interoperability among multinational forces sooner, in a wider array of operations, with more-disparate partners, and across smaller formations.
- The United States can build the desired interoperability with partners by taking more-deliberate action now.
- The proposed simple, logical framework will help the United States build both general and targeted interoperability.
- Staff exchanges, unit-to-unit relationships, research and development, training and exercises, and consultations can be better oriented to meet the interoperability needs of the future.

A Framework for Building Interoperability with Partners and Allies

Hardly a conversation about U.S. military capabilities occurs in which interoperability with another organization—multinational or not—does not come up. The common refrain is that *more and better interoperability is needed*. And, with few exceptions in recent decades, the United States tends to engage with partners and allies in military operations, thus bringing multinational interoperability to the fore. Unfortunately, the United States is not fully interoperable when and how it wants, for several reasons: a lack of understanding of the significant resources interoperability takes, a reluctance to expend time and money when the value is not clear, and a one-size-fits-all attitude when it comes to finding solutions.

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Those two types of interoperability connect to four broad, nonexclusive sources of demand for interoperability (see the figure). Two demand sources—**hedging** and **ops du jour**—
mostly adhere to general interoperability. However, they can lead to targeted interoperability solutions: with hedging, as units are built from member states (such as NATO’s Very High Readiness Joint Task Force), and with ops du jour, as interoperability solutions are generated in real time to support operations. Another two demand sources—usual suspects and plan-focused—most directly depend on targeted interoperability insomuch as nations can plan together ahead of time to build interoperability that allows them to provide services from one nation to another in support of operations.

**Army Activities That Help Achieve Interoperability Outcomes**

Building interoperability of both types requires achieving five interoperability outcomes, which cover the human, procedural, and technical dimensions promulgated by NATO:

1. **communications and information systems**: systems able to connect and work together
2. **individual**: soldiers able to understand each other
3. **art of command**: commands able to share a sense of purpose and command style
4. **procedural**: units able to follow similar procedures, be they tactical or strategic
5. **equipment**: units able to have pieces of equipment that work together on the battlefield.

Five U.S. Army activities are needed to achieve the interoperability outcomes. Practical activities that promote cohesion and understanding between military staff (staff exchanges) and military units of different nations (unit-to-unit relationships) are of the highest relevance for building interoperability. Research and development, training and exercises, and consultations were also significant, indicating the need for programs that rely on compatible infrastructure (such as weapon systems and communication tools developed through research and development partnerships), frequent information exchange between armed forces, and active participation in exercises and training events.

**Recommendations**

Given this framework, senior leaders can take several actions to improve U.S. interoperability with partners and allies:

- Work with partners to determine, both generally and specifically, what capabilities and interoperability on which functions are most useful.
- Assign an agency, at an appropriate echelon, to build interoperability.
- Develop general interoperability widely and deliberately build targeted interoperability.
- Orient security cooperation activities better to build the general or targeted interoperability desired.
- Require interoperability for units, equipment, and training, with appropriate top-down direction.
- Develop turnkey solutions that can be transferred or shared among disparate actors.
- Actively measure and monitor interoperability.

This summary is based on RR-2075-A, Targeted Interoperability: A New Imperative for Multinational Operations, by Christopher G. Pernin, Jakub P. Hlávka, Matthew E. Boyer, John Gordon IV, Michael Lerario, Jan Osburg, Michael Shurkin, and Daniel C. Gibson, 2019. For questions about this analysis, contact Chris Pernin at pernin@rand.org.

www.rand.org/t/RR2075

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**Two types of interoperability are needed**

<table>
<thead>
<tr>
<th>Priority order within category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General interoperability</strong></td>
</tr>
<tr>
<td>Hedging</td>
</tr>
<tr>
<td>Alliance partners, bilateral and special relationships</td>
</tr>
<tr>
<td>Ops du jour</td>
</tr>
<tr>
<td>Real-time provision of services among nations</td>
</tr>
<tr>
<td><strong>Targeted interoperability</strong></td>
</tr>
<tr>
<td>Usual suspects</td>
</tr>
<tr>
<td>Commonly operating with or beside the United States, technically capable, generally expeditionary, generally politically aligned</td>
</tr>
<tr>
<td>Plan-focused</td>
</tr>
<tr>
<td>Needs or requirements in known war plans and near-term needs</td>
</tr>
</tbody>
</table>

NOTE: ABCA = American, British, Canadian, Australian and New Zealand Armies Program; FVEY = Five Eyes (Australia, Canada, New Zealand, the UK, and the United States).
ABOUT THE ARROYO CENTER

- Overview
- Arroyo Center Policy Committee
- Recent Publications
A Unique Army Resource
RAND Arroyo Center is the U.S. Army’s sole federally funded research and development center (FFRDC) for studies and analysis. FFRDCs are government-owned, contractor-operated research institutions approved by Congress to provide ongoing analytic support to a federal agency. As an FFRDC, Arroyo enables the Army to maintain a strategic relationship with an independent, nonprofit source of high-quality, objective research and analysis that can sustain deep expertise in domains directly relevant to Army concerns.

Mission
Arroyo’s mission is to conduct objective analyses on enduring policy issues, provide short-term assistance on urgent problems, help the Army improve its effectiveness and efficiency, and be a catalyst for needed change.

Oversight
FFRDCs operate within the framework of the Federal Acquisition Regulation (48 CFR 35.017). In addition, the Army stipulates oversight and management of Arroyo in Army Regulation 5-21.3. The regulation establishes a governing board of Army leaders known as the Arroyo Center Policy Committee, co-chaired by the Vice Chief of Staff, U.S. Army, and the Assistant Secretary of the Army (Acquisition, Logistics and Technology) & Army Acquisition Executive. (See table on page 33.)

As part of RAND, Arroyo conducts research under a “Federal-Wide Assurance” (FWA00003425) and complies with the Code of Federal Regulations for the Protection of Human Subjects Under United States Law (45 CFR 46), also known as “the Common Rule,” as well as with the implementation guidance set forth in Department of Defense Instruction 3216.02. As applicable, this compliance includes reviews and approvals by RAND’s Institutional Review Board and by the U.S. Army.

Management
At RAND, Arroyo is managed within the Army Research Division, directed by Dr. Sally Sleeper, a RAND vice president. Dr. Michael L. Hansen serves as associate director and research quality assurance manager. Marcy Agmon is the director of operations and Army business liaison.
Organization
Arroyo’s research plan is managed and executed in three programs: Strategy, Doctrine, and Resources; Personnel, Training, and Health; and Forces and Logistics.

Strategy, Doctrine, and Resources Program
Directed by Dr. Jennifer Kavanagh, this program conducts research to help the Army understand the emerging strategic context, identify and adjust external demands, and optimize the use of its resources. The program sustains research streams in seven major policy domains: competition with near-peer adversaries, operational concepts, modernization and readiness, posture and force employment, allies and partners, risk assessment and resource use, and strategic and emerging threats.

Personnel, Training, and Health Program
Directed by Dr. Michael E. Linick, this program focuses on policies that help the Army attract and retain the right people, train and manage them in a way that maximizes their capabilities, save lives, and advance wellness. The program’s research and analysis include all Army personnel: active component personnel, members of the Army Reserve and Army National Guard, civilians, and contractors. The program sustains research streams in five policy domains: total workforce management, recruiting and retention, leader development, training readiness and effectiveness, and soldier and family wellness and support.

Forces and Logistics Program
Directed by Bruce Held, this program analyzes how advances in technology, management practices, and organizational theory can be applied to Army organizations to improve operational effectiveness in current and future conflicts against adaptive adversaries, enhance logistical support to Army units, continually improve efficiency, and ensure technical and logistical readiness. The program sustains research streams in eight policy domains: understanding past, current, and possible future Army operations; understanding and improving cyber and network capabilities; improving Army acquisition and modernization; assessing and applying technology to Army combat and support operations; improving Army supply chain operations; maintaining and managing Army equipment; improving Army capabilities to deploy and sustain in operational theaters; and ensuring technical and logistics readiness.

Army Fellows Program
Arroyo provides coursework and on-the-job training in policy analysis to select Army officers through the Army Fellows Program. Each year, the Army competitively selects officers in grades O-4 and O-5 (majors and lieutenant colonels) for one-year fellowships at RAND. Through participation in the program, these officers enhance their analytic skills, contribute to the quality of Arroyo analyses, and help ensure their relevance and usefulness. Since the inception of the program in 1985, more than 200 officers have participated.

For more information, including eligibility requirements and application instructions, see www.rand.org/ard/fellows.
Arroyo Center Policy Committee

The Arroyo Center Policy Committee (ACPC) comprises the senior Army civilian and uniformed leadership charged with oversight of RAND Arroyo Center. The Director for Program Analysis and Evaluation serves as lead agent for Arroyo and oversees its daily operations.

The ACPC meets at least twice a year with Arroyo management to provide overall guidance, review the annual research plan, and approve individual projects. Additionally, each project is sponsored by at least one Army senior leader, either a general officer or a member of the Senior Executive Service. The sponsor has responsibility for helping formulate the project, providing access to needed data and other information, monitoring progress, reviewing publications for accuracy, utilizing project findings, and implementing recommendations.
Recent Publications

**CHINA**
- At the Dawn of Belt and Road: China in the Developing World
  - www.rand.org/t/RR2273
- Russia Is a Rogue, Not a Peer; China Is a Peer, Not a Rogue
  - www.rand.org/t/PE310
- The Future of the Russian Military
  - www.rand.org/t/RR3099
- The Russian Challenge
  - www.rand.org/t/PE250
- Extending Russia
  - www.rand.org/t/RR3063
- Russia’s Use of Media and Information Operations in Turkey
  - www.rand.org/t/PE278

**RUSSIA**
- Pacific Engagement
  - www.rand.org/t/RR2451
- Sectarianism in the Middle East
  - www.rand.org/t/RR1681
- Four Problems on the Korean Peninsula
  - www.rand.org/t/TL271
- The Korean Peninsula: Three Dangerous Scenarios
  - www.rand.org/t/PE262
- The U.S. Army and the Battle for Baghdad
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- Russia is a Rogue, Not a Peer; China is a Peer, Not a Rogue
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- CHINA
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- The Russian Challenge
  - www.rand.org/t/PE250
- Extending Russia
  - www.rand.org/t/RR3063
- Russia’s Use of Media and Information Operations in Turkey
  - www.rand.org/t/PE278

**DEFENSE PLANNING**
- Planning an Army for the 21st Century
  - www.rand.org/t/RR291
- Defense Planning in a Time of Conflict
  - www.rand.org/t/RR1309
- The U.S. Department of Defense’s Planning Process
  - www.rand.org/t/RR2173x2

**DETERRENCE & INTERVENTION**
- National Will to Fight: Why Some States Keep Fighting and Others Don’t
  - www.rand.org/t/RR2477
- Characteristics of Successful U.S. Military Interventions
  - www.rand.org/t/RR3062

**PARTNERS & ALLIES**
- Targeted Interoperability
  - www.rand.org/t/RR2075
- Lessons from Others for Future U.S. Army Operations in and Through the Information Environment
  - www.rand.org/t/RR1925z1
- Limited Intervention
  - www.rand.org/t/RR2037
- What Deters and Why
  - www.rand.org/t/RR2451

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The problem should be well formulated, and the purpose of the study should be clear.

■ The study approach should be well designed and executed.

■ The study should demonstrate understanding of related studies.

■ The data and information should be the best available.

■ Assumptions should be explicit and justified.

■ The findings should advance knowledge and bear on important policy issues.

■ The implications and recommendations should be logical, warranted by the findings, and explained thoroughly, with appropriate caveats.

■ The documentation should be accurate, understandable, clearly structured, and temperate in tone.

■ The study should be compelling, useful, and relevant to stakeholders and decisionmakers.

■ The study should be objective, independent, and balanced.

For more information, see www.rand.org/standards
RAND Arroyo Center is the Army’s federally funded research and development center (FFRDC) for studies and analysis. Its mission is to help Army leaders make decisions that are informed by objective, high-quality analysis.

This Annual Report illustrates the depth and breadth of the research conducted for the Army in fiscal year 2019. It highlights portfolios of research in areas of enduring interest to Army leadership and includes a sampler of research summaries that demonstrate the range of Arroyo’s analytic capabilities. It also describes Arroyo’s organization, leadership, and oversight.